NCPA

NATIONAL COTTONSEED PRODUCTS ASSOCIATION

Established 1897

TRADING RULES

2013-14

2013 2014

R U L E S

of the

NATIONAL COTTONSEED PRODUCTS ASSOCIATION, INC.

ADOPTED AT THE

ONE HUNDRED AND SEVENTEENTH ANNUAL SESSION

OF THE ASSOCIATION

With Charter and By-Laws,

Held at

Tucson, Arizona May 4 - 6, 2013

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901-682-0800
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Introduction

The Trading Rules are organized into thirteen chapters. Chapter I consists of general rules which have application to all contracts, regardless of the commodity that may be involved. Each of the Chapters II through VI applies specifically to the individual commodity designated in the chapter title. Chapter VII sets forth the methods of chemical analysis that are recognized under the Rules. The rules contained in this Chapter are organized on a commodity basis.

Chapter VIII consists of rules applicable solely to the export of cottonseed oil.

Chapters IX through XI apply specifically to sunflower seed and sunflower seed products.

Chapter XII applies specifically to peanut meal and hulls.

Chapter XIII applies specifically to feed grade cottonseed.

The Association's Charter and By-Laws precede the text of the trading rules. Following this text are lists of directors, committees, members, official chemists and official weighers and inspectors, followed b certain historical information.

The Association Secretary or any member of the Rules Committee is available for comment or assistance on matters related to the Rules.

ACTION ON RULES AT THE 2008 ANNUAL CONVENTION

The following changes were made to the NCPA Trading Rules at the Annual Convention:

1. Rule 111 was amended to define a carload of cottonseed as 60 tons.
2. Chapter 1, Article 7, Arbitrations - Rules 80-94 were amended to change the arbitration procedure.

ACTION ON RULES AT THE 2009 ANNUAL CONVENTION

None

ACTION ON RULES AT THE 2010 ANNUAL CONVENTION

None

ACTION ON RULES AT THE 2011 ANNUAL CONVENTION

None

ACTION ON RULES AT THE 2011 ANNUAL CONVENTION

None

ACTION ON RULES AT THE 2012 ANNUAL CONVENTION

None

ACTION ON RULES AT THE 2013 ANNUAL CONVENTION

None

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CHARTER
of the
National Cottonseed Products Association, Inc.

As Amended To August 1, 1994

UNITED STATES OF AMERICA,
STATE OF LOUISIANA,
PARISH OF ORLEANS,
CITY OF NEW ORLEANS.

BE IT KNOWN AND REMEMBERED, that on this 9th day of the month of July, in the year of our Lord, one thousand nine hundred and twenty-nine, and of the independence of the United States of America, the one hundred and fifty-fourth.

BEFORE ME, Dufour Bayle, a Notary Public, duly commissioned, sworn and qualified in and for the Parish of Orleans, State of Louisiana, therein residing, and in the presence of the witnesses hereinafter named and undersigned,

PERSONALLY CAME AND APPEARED:

Christie Benet, the General Counsel of Interstate Cotton Seed Crushers' Association, a Corporation existing under the laws of the State of Louisiana, created by Act before Charles F. Fletchinger, a Notary Public in and for the Parish of Orleans, State of Louisiana, dated April 19, 1921, recorded in the office of Recorder of Mortgages in and for the Parish of Orleans, State of Louisiana, in Book 1253, folio 422, who declared unto me, Notary, that a meeting of the members of said Interstate Cotton Seed Crushers' Association was held in the City of New Orleans, State of Louisiana, on May 16, 1929, pursuant to due and legal notice, and adjourned to July 8, 1929, at 10:00 o'clock A. M.

And the said appearer further declared unto me, Notary, that at said adjourned meeting, held July 8, 1929, it was resolved by the unanimous vote of the members present and represented at said adjourned meeting, constituting more than two-thirds of all the members of said Corporation with voting power, that the Charter or Act of Incorporation of said Corporation be amended as hereinafter set forth.

And the said appeared, acting in his aforesaid capacity, further declared unto me, Notary, that pursuant to the due authority conferred upon him at said adjourned meeting, he does now appear before me, Notary, for the purpose of making effective the action of the members of said Corporation by embodying the amendment to the Charter or Act of Incorporation in notarial form, and he does now further declare unto me, Notary, that the Charter or Act of Incorporation of said Interstate Cotton Seed Crushers' Association shall be amended and restated in its entirety, so as now to be and read as follows, to wit:

Charter

ARTICLE I.

The name and title of this Corporation shall be NATIONAL COTTONSEED PRODUCTS ASSOCIATION, Inc.

ARTICLE II.

The objects and purposes for which this Corporation is formed are stated and declared to be as follows, to-wit:

First: To secure cooperation among the manufacturers of cottonseed and similar products in all lawful methods for furthering and protecting the interests and general welfare of the industry.

Second: To afford a means of cooperating with the Federal and state governments in all matters of general concern to the industry.

Third: To promote and foster domestic and foreign trade in oil mill products.

Fourth: To promote the mutual improvement of its members and the study of the arts and sciences connected with the oil mill industry.

Fifth: To inform and interest the public as to the economic worth of the oil mill industry.

Sixth: To encourage and foster cooperation with growers, producers and distributors of cottonseed and its products.

ARTICLE III.

The domicile of this Corporation shall be in the City of New Orleans, Parish of Orleans, State of Louisiana.

ARTICLE IV.

"All the powers of the Corporation (except as herein otherwise provided to the contrary) shall be vested in and exercised by a Board of Directors to be composed of the President of the Corporation who shall have full voting powers and such other persons (not less than three), to be elected in such manner and for such term as the By-Laws may provide."

Any vacancy occurring among the Directors, or in the office of President or Vice-President by death, resignation or otherwise shall be filled by the remaining Directors by election for the unexpired term.

A failure in any year to have an annual meeting or to elect a President or Directors thereat, shall not dissolve the Corporation or impair its corporate existence or management, but the Directors then in office shall remain in office until their successors shall have been duly elected and qualified.

The officers of the Corporation shall be, together with the President, a Vice-President, and Executive Vice-President, a Secretary, a Treasurer, a General Counsel, and if elected, an Educational Director, and such other officers as the Board of Directors may, from time to time determine, all to be elected by the Board of Directors, except the President and Vice-President. At the annual meeting in 1966 and thereafter, a Vice-President shall be elected by the voting members who shall automatically become the

President the following year. One person may hold the office of both Secretary and Treasurer. The President and Vice-President shall hold office for one year, or until their successor is elected and qualified. All other officers, agents and employees shall hold office and employment for such terms as may be fixed by the Board of Directors. The powers and duties of all officers, agents and employees shall be as may be conferred upon them by the By-Laws and/or the Board of Directors.

A majority of the members of the Board of Directors shall constitute a quorum for the transaction of any and all business.

ARTICLE V.

In lieu of shares of stock, membership or participation in the corporate rights and activities of the Corporation shall be based upon a system of dues and contributions to be fixed by majority vote at any meeting of the corporation, coupled with certain qualifications, to-wit: There shall be four classes of members, namely, Regular Members, Special Members, Associate Members and Honorary Members. Regular Members shall be persons, firms, associations and corporations owning (or operating) crushing mills engaged in the manufacture of oil mill products and other similar commodities, or engaged in the business of refining cottonseed oil and other similar commodities, or dealers for their own account in oil mill products.

Special Members shall be Brokers in cottonseed products and Chemists.

Associate Members shall be persons, firms, associations and corporations engaged in the manufacture and/or sale of machinery, supplies or articles used in the oil mill industry; Executive Officers of Ginners' Associations; buyers and consumers of cottonseed and other vegetable oil products; mixed feed dealers using cottonseed products and Secretaries of state or regional associates. Honorary Members may be elected by the membership at any annual meeting.

For the purpose of Regular Membership in the Corporation, each crushing mill refinery or office for dealing in oil mill products, shall be considered separately, so that one person, firm or corporation owning, or operating more than one such mill, refinery or office shall be entitled to become a member for each such mill, refinery or office owned, with full voting rights and all other rights with respect to each separate membership.

Regular, Special and Associate Members shall pay such annual dues as may be fixed from time to time by vote at an annual or special meeting called for that purpose. Honorary Members shall not be required to pay dues. The sole voting power of the corporation shall be vested in the Regular Members who are in good standing (as below set forth), and whose dues are not in arrears. Special Members, Associate Members and Honorary Members shall have the right of admission to all meetings of the Corporation and the privileges of the floor, but shall have no right to vote except as members of Committees, nor shall any member have the right to vote whose dues are in arrears, or who

is not in good standing as a result of refusal to arbitrate or of failure to comply with the findings of an Arbitration Committee of the Corporation.

An applicant to become a Regular, Special or Associate Member of the Corporation, meeting the requirements for such membership above set forth, shall be admitted to membership upon the approval of the Secretary of the corporation of a written application, in the form prescribed the Board of Directors, signed by the applicant and endorsed by the written recommendation of two Regular Members of the Corporation in good standing; provided that such approval by the Secretary shall be made subject to the approval or rejection of the Board of Directors.

The Corporation shall have the right to expel any member of the association for failure to pay dues, or for a violation of the provisions of the Charter, By-Laws or Rules of this Association, under such regulations as may be defined in this Charter or by the By-Laws.

Any member not in arrears for dues, who has not refused to arbitrate differences, who is not in default in complying with the findings any Arbitration Committee of the Corporation, not under charges for violations of the Charter, By-Laws or Rules of the Corporation and with difference pending on account of any contract likely to result in a demand for arbitration, may resign membership in the corporation and withdraw therefrom by officially notifying the Secretary of the desire of such member so to do; provided, that written notice to the Secretary all have been given at least thirty days prior to the date on which such withdrawal is to become effective, and the Secretary shall have made publication of the fact by a circular letter addressed to each regular member of the Corporation.

Each Regular Member not a natural person shall be represented by a natural person for each mill, refinery or separate office owned or operated by it, to be designated by it. The President, Vice-President and Board of Directors shall be selected from Regular Member candidates as provided in the third paragraph of Article I, Sec. 1 of the By-Laws of the Association.

ARTICLE VI.

There shall be a regular annual meeting of the members of the Corporation at such time and, except as otherwise provided by law, such place as the Board of Directors from time to time shall determine. Written notice of such meeting, and all other meetings, shall be addressed to each Regular Member at his last known address, and deposited, postage prepaid, in the post office at least twenty (20) days prior to the date of the meeting. At every business meeting a majority of members attending such meeting in person or by proxy shall constitute a quorum for the transaction of business, or may adjourn to meet at a future specified time. Any member may vote in person or by written proxy held by a voting member. Except as provided to the contrary by law or this Charter, a majority vote cast shall be sufficient to decide any question.

ARTICLE VII.

Citations or other legal process shall be served upon the President, in his absence, upon the Vice-President or the Executive Vice-President, provided that in the absence of such officers service of legal process may made in the manner provided for domestic business corporations.

ARTICLE VIII.

By-Laws for the government of the Corporation and its members not in conflict with the laws of the State of Louisiana or this Charter, may be adopted and from time to time altered or amended by a majority vote at an annual meeting of the Corporation, or at a special meeting called for this purpose. Rules for governing all transactions by and between its members and penalties for any violation thereof may be adopted in the manner provided by the By-Laws.

ARTICLE IX.

The President or the Board of Directors may appoint any committee that may be deemed desirable for the administration of the Rules, Regulations and By-Laws of this Corporation, or for the promotion of its interests, and with such powers and duties as may be provided by the By-Laws or prescribed by the President or the Board.

ARTICLE X.

The Corporation shall have a perpetual existence, unless sooner dissolved according to law.

ARTICLE XI.

This Charter may be amended at any annual meeting of the Corporation or at a special meeting called for such purpose in accordance with the By-Laws, by the affirmative vote of two-thirds of all the members of the Corporation present having voting power.

ARTICLE XII.

No member of this Corporation shall ever be held liable for the contracts, or faults, or defaults of this Corporation in any further sum than the unpaid amount, if any, of dues or obligations of such member to this Corporation, nor shall any mere informality in organization have the effect of rendering this Charter null, or of exposing any member to any liability beyond the amount aforesaid. And the said appearer did produce unto me, Notary, to be annexed to and made a part of this Act, a duly certified copy of an extract from the Minutes of the aforesaid adjourned meeting of the members of said Corporation, and I, the said Notary, have annexed said copy hereto and paragraphed same "Ne Varietur" for identification herewith, and made the same a part hereof.

THIS DONE AND PASSED, at my office in the City of New Orleans, on the day, month and year first above written, in the presence of Justin V. Wolff and Amelie Luminals, competent witnesses, who have hereunto signed their names, together, with the said appearer and me, Notary, after due reading of the whole.

Witnesses: (ORIGINAL SIGNED)CHRISTIE BENET
JUSTIN V. WOLFF,
AMELIE LUMINALS. DUFOUR BAYLE,Notary Public

BY-LAWS
of the
National Cottonseed Products Association, Inc.

ARTICLE I. Officers and Directors, Their Election and Duties.

Sec. 1. The President shall be ex-officio member of Directors and shall be elected by the regular members at the annual meeting; also a Vice-President shall be elected by the regular members who shall automatically become the President the following year; the Vice-President shall not by virtue of his office become a member of the Board of Directors but shall attend all meetings of the Board. The immediate past president shall attend all meetings by the Board of Directors held during the year following the expiration of his term of office.

Directors for the Board of Directors of the Association shall be determined and consist of the President of the Association and of one (1) Director from each Regular Member entity that qualifies to furnish a Director under the following required eligibility standards and formulas, the term of office of each Director to be one (1) year unless otherwise provided under these By-laws:

a. Persons, firms, associations and corporations owning (or operating) crushing mills engaged in the manufacture of cottonseed products that generate annual dues and assessment contributions to the Association in the sum of Ten Thousand Dollars ($10,000.00) or more, the qualifying sum subject to change annually by vote of the then current Board of Directors.

b. Persons, firms, associations and corporations heretofore and hereafter designated by the Board of Directors as eligible for Directorship due to historical reasons as well as those members having operated a cottonseed crushing mill for twenty (20) years or more.

Those to serve as Directors of and those to be candidates for President or Vice President of the Association shall be natural persons representing persons, firms, associations and corporations owning (or operating) crushing mills engaged in the manufacture of cottonseed products, or shall be included on a list of persons, firms, associations and corporations designated by the Board of Directors as being eligible due to historical reasons as well as those members having operated a cottonseed crushing mill for twenty (20) years or more.

Annually, at the end of each fiscal year and within ninety (90) days thereafter, the Secretary of the Association shall calculate the total dues and assessment contributions remitted to the Association by Regular Members eligible for directorship and shall notify and advise each such Regular Member of the total amount received by the Association

from such Regular Members (100%), the portion thereof contributed by such Regular Member and the percentage of such Regular Member's contribution. At any meeting of the Board of Directors each Director shall be entitled to vote on the basis of such Regular Member's assigned percentage with all combined affirmative votes to prevail and carry on the matter being voted upon if the combined affirmative votes total a percentage in excess of fifty percent (50%). Provided however, that unless a member of the Board of Directors calls for a vote to be conducted under the proportional voting procedure, which any Director is entitled to request and require, the vote shall be conducted on the basis of approval or denial by a majority of those Directors present and voting.

At least sixty (60) days prior to the annual convention, each Regular Member eligible for a directorship shall notify the Association Secretary of the name of the Regular Member's representative chosen and elected to serve as an Association Director, the term of such Director to commence after confirmation and election of such Director at the annual convention.

In the event any eligible Director for any reason is unable to attend or must depart early from a Board of Directors meeting, such eligible Director or the organization which an eligible Director represents shall be entitled to name an alternate representative to attend the Director's meeting and vote the absent regular member Director's assigned percentage on any vote made under the proportional voting procedure above set forth; provided, however, that prior to any such vote the regular member involved shall have notified in writing the Association's Secretary of the name of the alternate representative to cast such vote.

The proportional vote entitlement of each Regular Member Director will be considered confidential information and at each meeting of the Board of Directors the Association's Secretary and General Counsel will be the only persons with knowledge of all of the Directors' proportional voting percentages and after each vote on a proportional basis will confirm whether the matter voted upon passed or failed.

Sec. 2. At least six months prior to the next annual convention, the President shall announce to the membership the appointment of a committee for the purpose of selecting a nominee for the office of Vice-President for the following year. The Committee, which shall be composed of seven regular members with one member from each of the four regions - the Southeast, Mississippi Valley, Southwest and West - plus three at-large members, will accept suggestions from the membership for 30 days. The committee shall make its choice, ascertain his availability to serve - if elected, and submit its recommendation at the outgoing Board meeting at the annual convention.

The Board of Directors shall meet on the first day of each regular annual meeting, at the call of the President, and prepare nominations for Vice-President for the ensuing year, with the right reserved to any Regular Member of the Corporation to make nominations from the floor.

Nomination and election of the Vice-President shall take place on the last day of the regular annual meeting of the Association. When there is more than one candidate for the same office, a ballot shall be had and it shall require a majority of all the votes cast to elect, and when there are more than two candidates for the same office, the one receiving the lowest number of votes on each ballot shall be dropped until two remain, or until an election is had; provided that where there is but one nominee, the presiding officer shall declare him duly elected by consent.

Sec. 3. During the nomination and election of officers, no motion, except to adjourn, shall be entertained or debate permitted.

Sec. 4. The President shall preside at all meetings of this Association and enforce all Rules and By-Laws thereof during recess. It shall be his duty to appoint all committees, and during recess to fill all vacancies therein, unless otherwise provided for; sign all documents and papers requiring his signature to properly authenticate them, and at the commencement of each meeting he shall appoint such special committees as the business of the Association requires.

Sec. 5. The Vice-President shall preside at all meetings in the absence of the President, and in case of death, resignation, disqualification, refusal or neglect of the President to discharge the duties of his office, then the Vice President shall perform all the duties incumbent on the President until an election shall be held; but the question of neglect on the part of the President shall be determined by a majority of the Board of Directors. In the event that the Vice-President shall be unable or neglect to perform the duties of his office, the Board of Directors may elect to the office a Regular Member who shall serve the remainder of the unexpired term; but the member so elected shall not automatically succeed to the presidency unless he shall be regularly nominated for that office by the Board and approved by the membership at the next annual convention.

Sec. 6. The Executive Vice-President shall be chosen annually and his salary determined by the Board of Directors. He shall be the chief executive officer of the Association in promoting the welfare and progress of the industry and of all affected interests, including producers and consumers. It shall be his duty to survey, assemble, analyze and disseminate all such statistical and economic data concerning the operation of the industry as will aid its members in the conduct of their business, and give full and frank publicity to such information as will give the interested public an understanding of the basic facts of the industry, to the end that public good will and co-operation may prevail. He shall have such additional duties and authority as may be delegated to him by the Board of Directors, including the appointment of special committees.

Sec. 7. The Secretary shall be chosen annually and his salary determined by the Board of Directors. It shall be his duty to conduct and administer all organizational affairs and activities of the Association not otherwise committed or provided for; to give notice of and attend all meetings of the Association and keep a proper record of the proceedings thereof; to conduct all correspondence pertaining to his office and to carry into execution all orders,

votes and resolutions not otherwise committed; he shall be the chief executive officer in administering and enforcing the trading rules and standards of the Association, and to assist in all activities looking to the welfare of the industry and its members.

Sec. 8. The Treasurer shall be chosen annually and his salary determined by the Board of Directors. He shall collect all fees, annual dues and subscriptions due the Association. He shall keep an account of all moneys received and expended for the use of the Association, and shall make disbursements only upon vouchers duly approved by the proper officer. He shall deposit all sums received in such bank or banks or trust companies that may be approved by the Board of Directors, and shall make a full report of the Financial condition of the Association at the annual meeting, or whenever called upon by the President or Board of Directors. Association funds may be drawn only upon the signature of the Treasurer, countersigned by the President or the Executive Vice-President, or by such other signatory as may be appointed by the Board of Directors. Before entering upon the duties of his office he shall give a good and sufficient bond in such sum as the Board of Directors may require conditioned for the faithful discharge of his duties. Such bond must be deposited with the General Counsel and all funds, books and vouchers in the Treasurer's hands shall at all times be under the supervision of the Board of Directors and subject to its inspection and control. At the expiration of his term of office the Treasurer shall deliver over to his successor all books and other property, and in the absence of the Treasurer-elect, to the President of the Association.

Sec. 9. In the discretion of the Board of Directors, the offices of Secretary and Treasurer may be held by the same person. In such case the provisions of the two preceding sections shall be interpreted to duly protect the interest and affairs of the Association.

Sec. 10. The General Counsel shall be the legal advisor of the Association. He shall be selected by the Board of Directors, which shall fix his compensation and term of office. His duties shall be the furtherance of the objects and purposes of the Association by all lawful and proper means.

Sec. 11. The Educational Director, if elected, shall be selected by the Board of Directors, and his salary and term of office named by it. His duties shall be the furtherance of the objects and purposes of the Association by educational work with the members of the Association and with the public. The scope of his work shall be defined by the Board of Directors.

Sec. 12. The Board of Directors shall meet on the call of the President, the Executive Vice-President, or by written request of two-thirds of the persons on such Board.

The Board of Directors shall between meetings of the Association represent the Association and have full power and authority to act in all matters pertaining thereto; such action shall be as final and binding as though taken by the Association itself, subject, however, to review by the Association at its next annual meeting or at any special meeting called for that purpose.

Sec. 13. The Board of Directors shall certify not less than six (6) Association Official Chemists, whose tenure of office shall be at the pleasure of the Board of Directors, and only those chemists who meet the requirements of this Association and the Referee Board of the American Oil Chemists' Society shall be considered.

It shall be the duty of such Association Official Chemists to make all analyses of samples in dispute and of Arbitration samples, as provided for in the Rules of this Association.

Association Official Chemists shall be Referee Chemists of the American Oil Chemists' Society who own or are employed by independent commercial laboratories holding membership in this Association. Those certified shall furnish satisfactory proof of ownership before such certifications become effective.

The Association reserves the right to suspend, or to withdraw the certification of any Association Official Chemist at any time in the discretion of the Board of Directors.

Sec. 14. Honorary Members, Suggestions for Honorary Membership must be made in writing to the Board of Directors. If the Board approves such recommendation, the Secretary shall present the name so recommended to the annual meeting for action thereon.

ARTICLE II. Committees and Their Duties

Sec. 1. The President as Chairman and fourteen (14) other members to be selected by the Board of Directors, shall constitute a Committee on Rules. Such Committee shall serve for one year and/or until their successors are selected and shall have qualified.

The Committee on Rules shall meet prior to each Annual Convention of this Association, at the place selected for such convention, for the consideration of such changes in rules as have been presented to it in conformity with the provisions of these By-Laws. Any action taken by it on such proposals shall be reported to the Convention at its first session.

No amendments to or alterations of rules, except changes proposed by the Chemists' Committee in methods of chemical analysis set forth in Chapter VII, may be considered by the Committee on Rules unless such proposed changes, prepared in proper form, are submitted to the Secretary at least thirty days prior to the annual convention of the Association, for transmittal by him to the Committee on Rules and to the membership of this Association, (provided, however, that the committee may, by unanimous consent of the members present consider proposals for changes in the Rules not so submitted). The Committee on Rules shall have authority to amend any rule found not to conform to any amendment to a rule which it has approved under the authority of these By-Laws.

No Rule of this Association shall be amended by reference to Rule or section number, or by the suggestion of the addition or omission of certain words, but in each case the entire rule or section, as it is proposed to be amended, shall be set out at length in writing. The provisions of this By-Law shall apply to all amendments whether offered before the meeting of the Rules Committee or at the annual meeting. Before any proposed amendment can be considered at the annual meeting, such proposed amendment must first have been considered by the Rules Committee, and all amendments offered at the meeting of the Association must immediately be referred to the Rules committee for consideration and report. Provided that where requested by the Rules Committee, or upon its own motion, the Board of Directors of the Association may suspend any rule until the next meeting of the Association. In such case, however, the President of the Association, upon being requested in writing by twenty (20) Regular Members, shall promptly call a special meeting of the Association to which the entire matter shall be referred for action.

A Committee of seven well-known and competent chemists who are members of the American Oil Chemists' Society, appointed by the Board of Directors, shall meet with the Rules Committee, and recommend for adoption official methods of analysis to be used by the Official Chemists of the Association.

Any change in the methods of chemical analysis of this Association must be referred to the Chemists' Committee before presentation to the Rules Committee. The members of the Chemists' Committee shall receive the same compensation as the members of the Rules Committee.

Sec. 2. At its annual meeting, the Board of Directors shall appoint the following standing committee, who shall serve until their successors are appointed and qualify:

A single fifteen (15) member Arbitration Committee, representative of membership and regions and subject to appointee's consent to serve. Upon demand for arbitration in accordance with the By-Laws, the Secretary will draw the names of four arbitrators at random from the arbitration committee and the four selected arbitrators will select a fifth member to serve as chairman of the selected arbitration committee, the decision of which in the arbitration proceeding shall be final and binding on the contestants and not subject to appeal. In the event the four (4) selected arbitrators cannot mutually agree on the selection of the fifth (5th) Arbitrator Chairman, the President of the Association shall select the fifth (5th) Arbitrator-Chairman. Any member of the arbitration committee who is party to the arbitration submitted will be ineligible to serve on the panel.

Sec. 3. In order that the business of the committee of this Association may not be interfered with or delayed, but facilitated, and that there may be a quorum present of all committees at all regular or called meetings, the majority of the members of any committee that are present at such meetings shall have the right to appoint any other member or members of the Association in good standing to take the place temporarily on any committee of any member of any committee of this Association who is disqualified for any reason, or who, having been notified of such meeting, fails to be personally present;

preference when there are substitutions being given to members in the same line of business as that of the committeeman whose place is being filled. In the case of selected Arbitration Committees, the committees must be filled, and a majority vote shall constitute the decision of such committee. In the case of all committees other than selected Arbitration Committees, a quorum of such other committees is authorized to act and a majority vote of the members present shall be binding.

The actions and decisions of any committee so constituted shall have the same force and effect as if the duly constituted members of such committee had all served.

In the event of the inability or disqualification for any reason of the President or Vice-President to preside at any meeting of the Board of Directors, a temporary substitute may be selected by the Board to fill his place, in the same manner as provided herein for filling the places of any other member of a committee.

Sec. 4. The President may, in his discretion, order paid the expenses of any member of a committee when such expense is incurred upon the business of the Association.

ARTICLE III.

Members of the Association may be expelled:

1) For refusal to arbitrate differences with another member.
2) For refusal to abide by or perform the final award of an arbitration committee.
3) For failure to pay dues in accordance with the provisions of these By-Laws.
4) For any conduct unbecoming a member of the Association or calculated to bring this Association into disrepute.

The President of the Association shall have the power and it shall be his duty to suspend a member of the Association who has violated any of the foregoing provisions.

Any member who has been so suspended shall be immediately notified by the President through the Secretary by registered mail, return receipt requested. Such member shall have the right of appeal to the Board of Directors of the Association. Should the suspended member elect to appeal as provided, he shall notify the Secretary within ten days after receipt of notice of suspension and appear before the Board of Directors at its next meeting, at which time the facts shall be considered by the Board of Directors, and its decision in the case shall be final.

Should a suspended member fail to appeal to the Board of Directors as provided, or should the Board of Directors sustain the suspension after hearing, such member, without further action, shall stand expelled from the Association, and the Secretary shall notify the members by circular letter.

ARTICLE IV. Dues.

The Board of Directors shall recommend to the Annual Meeting of the Association a schedule of dues which in the opinion of the Board will produce sufficient revenue for the purposes of the Association for the ensuing year. Such schedule when submitted to the Association and adopted at the Annual Meeting shall be effective and binding in the amount stated upon each and every member of the Association.

All members of the Association whose dues are payable on the tonnage or volume basis are required to report such tonnage or volume monthly to the Treasurer that proper check on dues collections may be had.

The dues, as hereinabove provided, shall be payable at such times and in such manner as the Board of Directors may prescribe. Failure of any member to pay such dues within thirty days after they are due and payable shall make such member in arrears and delinquent.

No individual, corporation or partnership may have membership in this Association for any mill, refinery, or office dealing in oil mill products without maintaining a membership and paying dues for each and every other mill, refinery or such office owned by it.

ARTICLE V. Conventions and Meetings.

Sec. 1. A convention of the members of this Association shall be held annually at such time and place as may be selected by the Board of Directors, and notice shall be mailed to each member at least 20 days before the day set for its opening. The conduct of business at the convention and at special meetings shall be regulated by the By-Laws insofar as they may be applicable.

Sec. 2. A meeting of the Board of Directors shall be held annually, at such time as may be selected by a majority vote of the persons on such Board, and ten days' previous notice of such meeting shall be mailed to each member by the Secretary; provided that such meeting shall be held not later than 30 days after the adjournment of the annual convention, but such ten days' notice shall be waived where the meeting of the Board of Directors is held during or immediately after the adjournment of the annual convention. In the conduct of business the meeting shall take into consideration the sense of the convention upon any questions or matters that were duly passed upon by the convention.

Sec. 3. Special meetings of the Association may be called by the President. Upon the written request of a majority of the persons on the Board of Directors, the President shall call a special meeting, to be held at a time and place selected by the Board of Directors. At least ten days' notice must be mailed by the Secretary to each member stating the purpose of the special meeting and the time and place at which it will be held. No business other than that specified in the call shall be transacted at such meeting.

ARTICLE VI. Order of Business.

Sec. 1. At each annual meeting the regular order of business shall be as follows:

1. Roll Call
2. Presentation of credentials.
3. Enrollment and introduction of new members.
4. Reading of minutes of previous meeting and communications.
5. Address of President.
6. Report of Rules Committee and suggestions of amendments to Rules by members of the Association.
7. Report of the Secretary.
8. Report of the Treasurer.
9. Reports of Committees.
10. General business
11. Supplemental report of Rules Committee.
12. Election of officers.
13. Presentation of resolutions.
14. Adjournment.

Sec. 2. This order of business may be transposed at any time as occasion may require, and at all times privileged reports shall have immediate consideration.

ARTICLE VII. Corporate Seal.

The Board of Directors shall adopt an official seal which shall be affixed to all documents requiring official authentication, issued by and under authority of the Association.

ARTICLE VIII. Voting by Mail.

Sec. 1. Whenever, in the judgment of the President, any question shall arise which he shall consider should be put to a vote of the Board of Directors and he shall deem it inexpedient to call a special meeting of the Board for such purpose, the President may submit such matter to the Board of Directors in writing for vote and decision by mail. The question thus presented shall be determined according to:

a. majority of the votes; or

b. in the event any Director has requested voting in accordance with the proportional voting procedure under Article I., Sec. 1.b. of the Association's By-laws, by a percentage vote in excess of fifty percent (50%) of the total assigned eligible percentage votes, received by mail within two weeks after such submission to the Board of Directors; provided, that in a nonproportional voting procedure, the votes of at least a majority of the persons on the Board of Directors shall be received. Any and all action taken or not taken, in pursuance of either such voting procedures shall be as fully binding upon the Association and upon

the members thereof as if taken by the Board of Directors in formal meeting assembled.

Sec. 2. If an emergency shall arise requiring more speedy action by the Board of Directors than can be had by a vote by mail as provided in Sec.1 hereinabove, the submission of the question and the vote thereon may be taken by telegraph. In such cases a time limit of forty-eight hours from the time of sending out the telegram or facsimile of inquiry in which replies can be received must be observed and the provisions in Sec. 1. herein above, as to the type of voting procedure (proportional or nonproportional) shall be fully applicable and controlling in a telegram or facsimile vote submission. A careful record of the telegrams sent and received must be kept and the entire matter submitted for ratification to the Board of Directors at its next regular ensuing meeting.

ARTICLE IX.

Sec. 1. The rights, privileges and facilities described in and provided by the Charter, By-Laws and Rules of this Association shall only be available for and used by members of the Association in good standing. It shall be the duty of the officers and of the various committees of the Association to enforce the provisions of this section.

ARTICLE X. Amendments.

Sec. 1. These By-Laws may be amended by a majority vote of the regular members present and voting at any annual meeting, or at a special meeting called in accordance with the provisions of these By-Laws, but no amendment shall be considered unless submitted in writing, when it must be referred by the President to a special committee of three regular members, whose duty it shall be to report thereon at the earliest practicable moment and in time to allow of its consideration at the meeting at which submitted. All amendments adopted shall immediately be in full force and effect.

Sec. 2. No amendment to the Charter of this Association shall be considered unless submitted in writing, when it must be referred by the President to a special committee of three regular members, whose duty it shall be to report thereon at the earliest practicable moment and in time to allow of its consideration at the meeting at which submitted. All amendments to the Charter as adopted shall be in full force and effect as soon as filed with the Secretary of State of the State of Louisiana.

ARTICLE XI. Indemnification of Officers and Directors

The Corporation shall indemnify and hold harmless each person who shall serve at any time hereafter as a director or officer of the corporation from and against any and all claims and liabilities to which such person shall become subject by reason of his having heretofore or hereafter been a director or officer of the corporation, or by reason of any action alleged to have been heretofore or hereafter taken or omitted by him as such director or officer, and shall reimburse each such person for all legal and other expenses reasonably incurred

by him in connection with any such claim or liability, provided, however, that no such person shall be indemnified against, or be reimbursed for, any expense incurred in connection with any claim or liability arising out of his own negligence or willful misconduct.

The rights accruing to any person under the foregoing provisions of this article shall not exclude any other right to which he may be lawfully entitled, nor shall anything herein contained restrict the right of the corporation to indemnify or reimburse such person in any proper case even though not specifically herein provided for. The corporation, its directors, officers, employees, and agents shall be fully protected in taking any action or making any payment under this Article XI, or in refusing so to do, in reliance upon the advice of counsel.

CHAPTER I. GENERAL RULES

Article 1. Rules of General Application

RULE 1: Applicability Of These Rules.

On and after August 1, 2013 these Rules shall apply to and be considered a part of all contracts between members of the National Cottonseed Products Association for the purchase or sale of any of the commodities herein referred to, and every applicable provision of these Rules shall be read into every such contract whether made directly or through a broker, as if set out at length therein and signed by the parties, unless otherwise specified to the contrary. Rules in this Chapter apply to all contracts; however, the provisions of Rules in other Domestic or Export chapters take precedence over the General Rules in cases where there is a conflict in working or interpretation.

Members may make contracts with non-members, subject to these Rules, for the purchase or sale of the commodities herein referred to. Such contracts shall be subject to the limitation upon arbitration privileges set forth in Rule 93.

If contracts for commodities herein referred to include terms or conditions not expressly provided for in these Rules, the arbitration privileges of the Association shall be limited to those provisions of such contracts that conform to these Rules.

RULE 2: Commodities Of United States Origin Intended.

Unless specified to the contrary, all contracts made under these Rules contemplate delivery of commodities either produced in the United States or manufactured in the United States, regardless of the origin of the raw material.

RULE 3: Delivery F.0.B. Intended.

Unless specified to the contrary, all offers and acceptances shall be understood as intended f.o.b. point of shipment, and any transit privileges shall follow shipment through, all benefits of transit privileges belonging to the buyer.

RULE 4: Risks In Transit.

Sec. 1. Except as provided in this Rule, and in Rules 233, 283 and 323, on all contracts for the purchase or sale of commodities made under these Rules whether sold f.o.b. point of shipment, c.a.f., or delivered, seller guarantees weight and quality, as determined by the Rules specifically applicable to each commodity, at first United State or Canadian destination, when received in the original package if shipped l.c.l., or in the original tank car in good order if shipped carload; provided seller will not be responsible for loss or damage in transit caused by the carrier or inevitable accident, except on sales made on a delivered basis or shipped in seller's tank cars, in which case all risks in transit belong to seller. Seller will be responsible for loss in transit of commodities shipped in tank cars if seller has failed to comply with instructions regarding loading of tank cars, as outlined in Rule 214.

The provisions of this section shall also apply on shipments ordered to a reconsignment point and forwarded to United States or Canadian destination, except seller shall not be responsible for condition at final destination unless shipments are ordered forward from such reconsignment point within 48 hours after arrival, and in no case shall seller be responsible if a second reconsignment or diversion is made.

Sec. 2. Seller's responsibility for weight and physical condition of commodities shall cease when loaded on trucks furnished by the buyer. In the case of commodities sold on a delivered basis or shipped in seller's trucks, weight and quality are guaranteed at destination by the seller.

RULE 5: Payment.

Unless otherwise specified in the contract or in these Rules, all sales shall be for cash. Payment shall be made (1) upon delivery of invoice with bill of lading, signed railroad ticket or truck receipt attached, showing delivery of commodities to carrier in good order or (2) by demand draft free of exchange to buyer with bill of lading or truck receipt attached, showing delivery of commodities to carrier in good order. The foregoing provisions do not apply to cottonseed purchased by mills from growers or gins, payment for which shall be made promptly upon its arrival at destination.

Seller reserves the right to alter the terms of payment if in his judgment the financial responsibility of the Buyer does not warrant shipment on terms originally stated in contract.

RULE 6: Refunds.

If a commodity at destination is shown to be of rejectable quality, seller shall immediately refund to buyer all of the purchase money that may have been paid. Seller shall likewise make a pro rata refund for short weights, except on contracts c.a.f. or f.o.b. point of shipment, when such shortage in weight is caused by the carrier or accident in transit.

RULE 7: Refusal or Failure of Buyer to Pay Draft or Invoice.

When a commodity is shipped and a draft properly drawn, with documents attached, buyer shall pay such draft on presentation. If payment is to be made upon delivery of an invoice, buyer shall pay such invoice in accordance with the terms thereon and with those contained in the contract. If buyer refuse or fails to pay a properly drawn draft or invoice, seller may cancel any undelivered balance of the contract, including the shipment covered by the unpaid draft or invoice. If the seller so elects to cancel, he shall follow the requirements of Rules 50, 51, 52, and 53.

RULE 8: Failure to Pay Amount Due.

Sec. 1. Provided no arbitration is pending, any amount owed by seller or buyer, in the form of a premium, discount, or weight claim, shall be payable by the buyer or seller within thirty days after receipt of statement of the amount due.

Amounts due either seller or buyer claiming breach of contract shall be payable within thirty days after the claimant has taken the appropriate action required by Rules 50, 51, and 52.

Sec. 2. Failure of buyer or seller to pay an amount due, in accordance with Sec. I of this Rule, shall give the creditor the right to charge the debtor a penalty of two percent of the amount due for each month or fraction thereof beyond the thirty-day limit set forth in Sec. 1.

Sec. 3. If any amount is not paid at its due date on demand and if no arbitration proceeding is pending, the creditor may notify the President of the Association who shall follow the procedure which is established in Rule 90 covering failure to comply with an arbitration award.

RULE 9: Deposits.

Whenever, under these Rules, any sum is required as a payment or a deposit, it is understood that such payment or deposit shall be made in cash or bank exchange.

RULE 10: Maturity Of Commercial Paper.

If the day of maturity falls upon Sunday or a legal holiday, the instrument is payable on the next business day.

RULE 11: Misbranding And Adulteration.

Any member of this Association who delivers or attempts to deliver mixed or adulterated commodities, except as such, and with full and explicit statement to this effect, fully and accurately describing the commodities, or who willfully and deliberately brands or tags any commodity with the intention to defraud, claiming or indicating a quality or grade not warranted by the commodities themselves, shall be guilty of an offense against the dignity and character of this Association. Any buyer who is a member of this Association may complain of such offense to the Board of Directors, who shall promptly summon before them the party accused, and his accuser, give the charge full investigation and, if established, shall dismiss the offender from membership in the Association. When such action is taken, the President and Secretary shall notify the members of the Association, as provided in Rule 90.

RULE 12: Saturdays, Sundays and Legal Holidays Excepted.

Whenever, under these rules, a given number of days or hours are allowed either seller or buyer for carrying out the terms of any contract or for complying with these Rules, it shall be understood, unless otherwise specified, that Saturdays, Sundays and legal holidays are excepted. For purposes of this Rule, legal holidays shall be those days which have been designated as such by a unit of government and which are generally observed as holidays by the business community at the location where one or more of these Rules are being applied.

RULE 13: Seller Must Equalize Freight Rates and Transit Privileges.

In contracts specifying grade, it is understood that the seller has the right to ship from any mill point carrying no greater freight rate and having equal milling in transit privileges, and if shipped from a point carrying a greater freight rate to point of instructed destination than from he origin mill specified in contract, and not having equal milling in transit privileges, seller must equalize freight rates and transit privileges. This Rule shall apply where no brand or mill's make is specified at the time of sale. The name of the town where more than one mill

is located shall not be taken as constituting the make of any particular mill unless name of mill is given.

RULE 14: Demurrage and/or Additional Railroad Charges on Account of Non-Arrival of Documents.

If unloading of shipments is delayed on account of the non-arrival of documents necessary to permit such unloading, claim for demurrage and/or additional railroad charges accruing shall be made upon the last seller, without reference to previous hands through which the transaction may have passed. In like manner, each party paying the demurrage and/or additional railroad charges is entitled to reimbursement from his supplier for all accrued demurrage and/or additional railroad charges, except such as he himself caused.

RULE 15: Changes In Transportation Rates.

Sec. 1. When commodities of United States manufacture, or imported commodities which are warehoused in the United States at the time of the ;ale are sold for domestic shipment within the United States, changes in the applicable published transportation rates or taxes on transportation included in the contract price shall be for the account of buyer.

S**ec. 2**. When commodities of United States manufacture, or imported commodities which are warehoused in the United States at the time of the sale are sold for export from the United States, changes in the applicable published transportation rates or taxes on transportation included in the contract price shall be for the account of seller.

Sec. 3. When commodities manufactured outside of the United States which are not within the United States at the time of sale are sold, changes n the applicable published transportation rates or taxes on transportation included in the contract price shall be for account of seller.

Note: F.0.B. steamer and F.A.S. sales, as well as C.&F., C.A.F. and C.I.F. sales to named destinations outside of the continental United States hall automatically be considered export sales. Sales made F.O.B. cars at port cities shall be considered as domestic sales unless otherwise specified or export in the contract.

RULE 16: Changes In Tax Rates.

Sec. 1. When commodities of United States manufacture, or imported commodities which are warehoused in the United States at the time of the sale are sold for domestic shipment within the United States, any increase or decrease in United States governmental sales or excise taxes applicable to the manufacture or sale of such commodities included in the contract price shall be for the account of buyer.

Sec. 2. When commodities of United States manufacture, or imported commodities which are warehoused in the United States at the time of the sale are sold for export from the United States, any increase or decrease in United States governmental sales or excise taxes, or export taxes, applicable to the manufacture, sale or export of such commodities included in the contract price, shall be for the account of seller.

Sec. 3. When commodities manufactured outside of the United States which are not within the United States at the time of sale are sold, any increase or decrease in governmental (United States or any other Government) sales or excise taxes, import duties or export duties, applicable to the manufacture, sale, import or export of such commodities included in the contract price, shall be for account of seller.

Note: F.O.B. steamer and F.A.S. sales, as well as C.&F., C.A.F. and C.I.F. sales to named destinations outside of the continental United States shall automatically be considered export sales. Sales made F.O.B. cars at port cities shall be considered as domestic sales unless otherwise specified for export in the contract.

RULE 17: Force Majeure.

Sec. 1. **Conditions.** If performance of the obligations of a party to an existing contract made under these Rules is obstructed or prevented during the contract period by any act of God, fire, flood, wind, explosion, war, embargo, civil commotion, strike, sabotage, law or other act of government, which is not due to said party's own act(s) or negligence, the time for performance of the contract may be extended.

Sec. 2. Notice and Proof. The party who claims an extension (designated the disabled party) must, within two (2) business days of the disabling event notify the other contracting party of his intention. Within seven (7) calendar days of receiving such notice, the latter party may request proof of the disability and evidence that the disabled party has exerted his best efforts to meet the terms of the contract. The disabled party has five (5) calendar days to respond.

This Rule may not be applied where commodities have been delivered to a carrier prior to receipt of notice of the disabling event. in any case where the parties cannot agree that the Rule is applicable, either party may file for arbitration in accordance with Rule 84.

Sec. 3. Duration. The extension permitted under this Rule is limited o the duration of the disability or to 30 calendar days from the date said disability occurs, whichever occurs first. If the disability ceases prior to the expiration of the thirty calendar day period, the disabled party shall immediately notify the other party to the contract and the extension shall at that time be terminated.

The party who claimed the extension shall then give preference to those contracts that existed on the date the disability began and shall prorate shipments or receipts equitably among them. A party who was in default prior to the date of the disability shall not be entitled to preference or proration.

In the case of contracts which call for performance to begin after the 30 calendar day extension has expired, a party still disabled may claim an extension, limited as above, beginning on the first day of such contract period.

Sec. 4 Second Party Disability. If a party's claim of contract extension places the other party in a position. where he cannot meet his won contract obligations, he may claim a similar extension in accordance with Sections 2 and 3 of this Rule.

Sec. 5. Partial Disability. If a party is only partially disabled by one of the causes listed in Sec. I of this Rule and claims an extension of contract(s), he shall prorate deliveries or receipts equitably among all contracts existing on the date the disability began and shall fulfill such contracts prior to any made after that date.

Sec. 6. Termination. If, at the termination of an extension period, (1) the disabled party has not notified the other party that the disability has ceased and (2) the parties have reached no agreement and (3) no arbitration is pending, the party not disabled may cancel the contract. If he does so, the difference between contract price and market price, at the close of business on the day the extension terminates, shall be paid by buyer to seller if the market price is lower and by seller to buyer if the market price is higher, regardless of whether buyer or seller has claimed the extension.

RULE 18: Bankruptcy or Insolvency.

If prior to the delivery of a commodity or commodities contracted for under these Rules, either party shall be declared bankrupt or become insolvent, the other party shall have the option of canceling the contract and may establish a claim against the other party, for any loss incurred, by proceeding in accordance with Rules 50, 51, and 52.

Article 2. Definition of Words and Terms

RULE 25: A Ton.

Unless otherwise specified, a ton shall be 2,000 pounds. If contracts specify metric tons or long tons, a metric ton shall contain 2,204.6 pounds and a long ton shall contain 2,240 pounds.

RULE 26: Season.

Season, as used in these Rules, means the period from August 1st to the following July 31st, both dates included.

RULE 27: Season's Output.

Season's output means the total quantity of any specified commodity which a seller produces during a season.

When a contract is made for a season's output or the balance of a season's output of a specified commodity, with no estimated quantity being stated, seller must ship and buyer must receive and pay for all of such commodity that seller produces from date of contract to the end of the season. When an estimated quantity is stated in the contract and seller does not produce that quantity, 90 per cent of the estimated quantity will fulfill the contract. To the extent that seller's production exceeds the estimated quantity, buyer may demand and seller must ship, or may ship whether demanded or not, up to 110 per cent of the estimated quantity. If seller should close his mill and sell his accumulation of

seed, buyer may demand the quantity of the commodity that the seed so sold would have produced.

RULE 28: Shipping Terms.

Exclusive of the day on which contract is made, Sundays and legal holidays, time limits shall be as follows:

Quick Shipment or Forwarding: Two days.

Immediate Shipment or Forwarding: Five days.

Prompt Shipment or Forwarding: Ten days.

Scattered Shipment or Forwarding: Spread evenly over the contract period.

Specified Shipment or Forwarding: Specified shipment or forwarding means shipment within a period named in the contract, usually a named month or half month. The words "first half" of a named month shall mean the period ending midnight of the 15th day of the month, regardless of the number of days in the month. Contract periods covering one or more months or the "last half" of a named month shall mean the period ending at midnight on the last day of the month or half month named. If the end of the contract period falls on a Sunday or legal holiday, shipment on the day following will be considered a good delivery.

RULE 29: Telegrams.

Sec. 1. Time Limits. Where these Rules refer to "telegrams" or "by telegraph", the following time limits shall apply:

a. Answers to day messages requiring day answers shall be filed before 12 o'clock, midnight, of the day on which sent.

b. Answers to night messages requiring answers shall be filed before noon of the day following the night on which sent.

c. The words "immediate" or "immediately" mean within two business hours.

d. The words "prompt" or "promptly" mean within three business hours.

e. "Business hours" mean the hours from 9 a.m. to 5 p.m. Monday through Friday, at origin or destination as the case may be. The records of the telegraph office will determine the time of receipt or dispatch of telegrams.

Sec. 2. Teletype Messages. Where these Rules refer to "telegrams" or by telegraph", teletype (TWX) messages may be used provided the sender incorporates the date and time in the message and preserves the original copy of the message for at least one year from date of dispatch.

Sec. 3. Phone and Letter Messages. Where these Rules refer to "telegrams", "by telegraph" or "teletype", a telephone message, confirmed by a certified mail letter, mailed within 3 business days of the telephone call, may be used, provided the sender records the time of the telephone call and of the dispatch of the certified mail communication and retains such records together with a copy of the letter for at least one year.

Sec. 4. Facsimile messages. Where these Rules refer to "telegrams", "by telegraph" or "teletype", a facsimile may be used provided the sender incorporates the

date and time in the facsimile and preserves the original facsimile for at least one year from the date of dispatch.

RULE 30: Commodities.

As used in these Rules, the term "commodities" shall mean those oilseeds and oilseed products which are specifically covered by these Rules.

RULE 31: Person or Party.

"Person" or "party" shall mean a person, an individual, a partnership, firm, corporation, or other legal entity.

RULE 32: Trading Terms.

As used in these Rules, trading terms shall have the following meanings, subject to Rules 15 and 16:

F.O.B. means free on board and includes the cost of the commodity at a specified point of shipment loaded on, or in, a specified means of transportation. All expenses of delivering commodities to and loading aboard the conveyance are for account of the seller.

C.A.F. means cost, assurance and freight, and includes the cost of the commodity, freight and all other expenses, exclusive of insurance, incurred in delivering the shipment to a specified destination. Insurance is covered by the carrier.

C&F means cost and freight, and includes the cost of the commodity, freight and all other expenses, exclusive of insurance, incurred in delivering the shipment to a specified destination. Insurance is for the account of the buyer.

C.I.F. means cost, insurance, and freight, and includes the cost of the commodity, insurance, freight and all other expenses incurred in delivering the shipment to a specified destination.

F.A.S. means free alongside and includes the cost of the commodity placed alongside the carrying vessel, within reach of its loading tackle, at a specified point of delivery. All expenses incident to such delivery are for the account of the seller.
DELIVERED includes all costs incurred in delivering a shipment to a specified destination. Such costs are for the account of the seller. Insurance is covered by the carrier.

Article 3. Adjustments and Variations

RULE 40: Tender Of Better Grade.

A tender of a grade of any commodity traded in under these Rules, better than the grade sold, shall constitute a good tender.

RULE 41: Overweights Or Underweights.

Settlement for overweights or underweights that exceed the tolerances prescribed in these Rules (Cottonseed-Rule 121; Oil-Rule 200; Cake or Meal-Rule 283; Linters-Rule 355; Feed Grade Cottonseed-Rule F-8) shall be made on total deviation from contract weights and on the basis of the market price on the date of the bill of lading. Settlement for overweights or underweights that fall within the tolerances herein provided shall be made on the basis of the contract price.

Article 4. Remedies for Breach of Contract

RULE 50: Options To Party Claiming Breach Of Contract.

Sec. 1. Default by the Seller. When the Seller finds that he is in default on the shipping schedule, and/or the contract-shipping period, he shall notify the Buyer at once by telephone, facsimile, or electronic mail.

Upon receipt of such notice, the Buyer shall, within 24 hours thereafter, advise the Seller by telephone, facsimile, or electronic mail, which of the following options he elects to exercise:

1. Agree to extend the shipping period; or
2. Buy-in, for the Seller's account, the defaulted portion of the shipment; or
3. Cancel the defaulted portion of the shipments at fair market value based on the day this option is exercised.

If the Seller fails to notify the Buyer of his default, the liability remains in force until the Buyer, by the exercise of due diligence, can determine whether the Seller has defaulted. The Buyer shall notify the Seller at once by telephone, facsimile, or electronic mail and within twenty-four hours thereafter, advise the Seller by telephone, facsimile, or electronic mail which of the options (1) or (2) or (3) above he elects to exercise.

If the Seller defaults on the contract, he is liable for all reasonable costs and expenses as shall have been incurred to and including the day the Buyer elects one of the three options

Sec. 2 Default by the Buyer. When the Buyer finds that he is in default on the shipping schedule, and/or the contract-shipping period, he shall notify the Seller at once by telephone, facsimile, or electronic mail.

Upon receipt of such notice, the Seller shall, within 24 hours thereafter, advise the Buyer by telephone, facsimile, or electronic mail, which of the following options he elects to exercise:

1. Agree to extend the shipping period; or
2. Sell-out, for the Buyer's account, the defaulted portion of the shipment; or
3. Cancel the defaulted portion of the shipments at fair market value based on the day this option is exercised.

If the Buyer fails to notify the Seller of his default, the liability remains in force until the Seller, by the exercise of due diligence, can determine whether the Buyer has defaulted. The Seller shall notify the Buyer at once by telephone, facsimile, or electronic mail and within twenty-four hours thereafter, advise the Buyer by telephone, facsimile, or Electronic mail which of the options (1) or (2) or (3) above he elects to exercise. If the Buyer defaults on the contract, he is liable for all reasonable costs and expenses as shall have been incurred to and including the day the Seller elects one of the three options**.**

Sec. 3. If a buyer has on hand a rejected commodity, for which he has paid the purchase price, and seller refuses to refund such purchase price or to replace the commodity, buyer must either take the commodity in at the market price or sell it for the account of whom it may concern.

Sec. 4. Payment for breach shall be made within thirty calendar days.

RULE 51: Taking A Commodity In At The Market Price.

If a buyer or seller takes a commodity in at the market price, no sale or other action through a broker is required. The transaction will be consummated by such buyer or seller notifying the other person by telegram that the sender takes the commodity in at the market price. Such notice must be given within 24 hours after the right to take in at the market price has accrued. If the parties are unable to agree as to what the market price is, the question may be submitted to arbitration and the arbitration committee will determine said market price from evidence submitted or data accessible to them.

RULE 52: Purchases Or Sales For Account Of Whom It May Concern.

Whenever a buyer or seller, whose right to do so has accrued, all rights of the opposite party having been forfeited, elects to buy or sell a commodity for the account of whom it may concern, he must immediately notify the opposite party by telegram of his intention. Such purchase or sale must be made in not less than 24 nor more than 72 hours after such notice and shall be for a period of shipping conforming as nearly as possible to that of the original contract. The purchase or sale may be made through a broker member of the Association in good standing or by soliciting written confirmed bids (offers) from at least three dealer, mills and/or other parties. In the event that a broker member of the Association is used, as soon as the broker/dealer receives such an order, he must immediately notify the interested party by telegram.

In addition to the names of buyer and seller in the transaction, the broker must note on his confirmation contract the name of the interested party and the fact that the purchase or sale was made for the account of whom it may concern. He shall send a copy of such confirmation contract to each of the three parties named therein.

In the event that three bids (offers) are solicited, the commodity shall be sold (bought) at the highest (lowest) price. In addition to the names of buyer and seller in the transaction, the contract must note the name of the interested party and the fact that the purchase or sale was

made for the account of whom it may concern. A copy of the contract shall be sent to each of the three parties named therein.

Furthermore, the party for whom it may concern is not an eligible bidder (seller) regardless of if they are the highest (lowest) bid (offer), unless approved by the party claiming the breach of contract.

RULE 53: Methods Of Fixing Damages Exclusive.

The methods of fixing damages for breach of contract outlined in Rules 50, 51 and 52 are exclusive and failure to follow the procedure there required will defeat a claim for breach of contract.

Article 5. Brokers

RULE 60: Confirmation, Errors and Discrepancies.

When a broker member of the Association arranges a trade for a member or members of the Association, it shall be the duty of such broker to immediately confirm by telephone to each principal or interested party the terms of such trade. It will be the duty of the broker to either mail contracts or transmit a facsimile of the contract on the day of the transaction to all interested parties. When such contract or facsimile is received by the principals and found not to be in accord with the offer or acceptance, they, or either of them shall no later than the next business day notify the broker by telephone or facsimile of any error or discrepancy and the broker shall issue a corrected contract or facsimile to each party.

The broker shall be relieved of any responsibility to the principal failing to give the foregoing required notice and said principal shall protect the broker against the other principal.

RULE 61: Brokers Contract Binding.

A broker's contract or facsimile shall be binding on both buyer and seller, as though signed by both parties. Such contracts shall be issued in triplicate, one copy or facsimile being sent to the buyer and one copy or facsimile being sent to the seller, with one copy being retained by the broker.

RULE 62: Broker's Fees.

All brokerage fees shall be paid by the seller. Except as provided below, when a trade is closed by a broker, the broker has earned his fee, whether or not the commodities are finally delivered.

In a sale of linters, subject to inspection and acceptance before shipment, the broker's fee shall not be earned if the linters are rejected and delivery is not made because of quality.

Article 6. Weighing and Inspecting

RULE 65: Weighers & Inspectors.

Sec. 1. Certification. The Board of Directors shall annually certify official weighers and inspectors and deputies at such points as it deems necessary.

Sec. 2. Qualification. Official weighers and inspectors and their deputies shall be persons or firms who are independent of and in no manner, financially or otherwise, connected with or obligated to any buyer or seller by whom they may be employed to perform services as provided for in these Rules. The Board of Directors may require that applicants for certification as official weighers and inspectors, and their deputies, furnish satisfactory assurances that they meet the foregoing qualifications, and that they are familiar with the methods of inspection, sampling, handling of samples, weighing and all other duties provided for in these Rules. Official weighers and inspectors shall be held responsible for faithful performance by their deputies.

The Association reserves the right to suspend or to withdraw the certification of an official weigher and inspector, or a deputy, at any time in the discretion of the Board of Directors.

Sec. 3. Duties. It shall be the duty of official weighers and inspectors to inspect, sample and/or weigh commodities and to perform such other duties as are required by these Rules. In the performance of such duties, official weighers and inspectors shall represent both buyer and seller.

RULE 66: Who Shall Weigh And Sample.

Where weighing, sampling or other inspection service is required by these Rules, it shall be performed by or under the direct supervision of an official Association weigher and inspector. If none is available, weighing, sampling or other inspection services may be performed, except as provided in Rule 230, Section I and Rule 292, by a sworn public weigher, by a representative of a recognized board of trade or similar organization, or by a qualified and disinterested person or persons acceptable to both buyer and seller.

Under the special circumstances set forth in Rule 69, buyer shall have the right to designate a qualified and disinterested person to perform the weighing, sampling, or other inspection service required.

RULE 67: Official Samples.

Only samples drawn as specified in these Rules by persons authorized by such Rules, shall be official samples. Only one sample shall be official under a contract.

RULE 68: Sampling and Weighing Procedure.

Sec. 1. Except as provided in Rule 230 and Rule 292, upon demand by either buyer or seller, the official weigher and inspector, or other properly authorized person shall perform the weighing, sampling or other inspection services requested. The person requesting such services shall furnish the inspector or other authorized person with the

names and addresses of the buyer, seller, and original United States shipper, if the latter is not the seller.

Sec. 2. Within five days after performing the services requested, the weigher and inspector shall mail copies of his certificate to buyer, seller, and original United States shipper, if the latter is not the seller. Where services are performed by a person other than an official weigher and inspector, said person shall furnish an affidavit in substantially the form set out in Rule 74.

Sec. 3. Where sampling is performed and the weigher and inspector is requested to do so, he shall furnish a portion of each sample to each of the interested parties within 48 hours after request for inspection is received. An extension of this 48 hour period is permitted where the official weigher and inspector, or other authorized party, lacks official sample preparation equipment. In such cases, said portions of the sample shall be forwarded with the least possible delay.

Sec. 4. The official weigher and inspector, or other authorized party, shall retain for 60 days portions of all samples taken, subject to call by the Secretary of the Association or by any arbitration committee.

RULE 69: Failure Of Seller To Arrange Inspection.

If buyer has notified seller that a shipment does not conform to the contract, as regards either weight or quality, and seller refuses or neglects for 48 hours to arrange for an official inspection, the buyer may have such an official inspection made. If a sample is drawn, it shall be sent to an official chemist to be named by the buyer and seller or by buyer alone if seller refuses or neglects to state a choice.

RULE 70: Weight Certificates.

If commodities are weighed or reweighed at destination, the weigher and inspector, or other authorized person, shall furnish both buyer and seller with a weight certificate. If commodities are in carlots, such certificate shall show the date of weighing, the date of arrival at destination, the condition of the car, gross, tare, and net weight, seal numbers and whether or not seals are intact.

RULE 71: Sampling Certificates.

Whenever commodities are sampled, the inspector shall furnish both buyer and seller with a certificate. Such certificate shall name the commodity, the date sampled, the location, the numbers and other identification of cars or trucks, their condition and the numbers and condition of any seals attached thereto.

RULE 72: Weighing and Sampling Expenses.

Sec. 1. Weighing. All expenses of weighing will normally be paid by the buyer. If the seller requests a special weigher or different scales and weights prove to be short of invoice weights, seller shall pay all extra weighing expenses.

If reweighing is demanded by the seller or arranged by the buyer upon his own volition, all expenses of such reweighing shall be paid by the party whose weights are farthest from the weights as finally determined.

Sec. 2. Sampling. Except as otherwise provided in these Rules, all expenses of sampling will be paid by the party against whom a claim or arbitration is decided.

RULE 73: Railroad And Truck Scales.

If commodities are weighed on either public or private scales, the following regulations shall apply:

(a) Where weights are for settlement purposes, all carload and truckload shipments shall be weighed both loaded and empty on the same scale. A scale ticket or certified weight sheet showing gross, tare and net weights shall accompany all settlement outturns or claims.

(b) Scales for official weighing shall bear certificate of approval issued by a recognized authority dated not more than one year prior to date of weighing. Track scales shall be checked for accuracy by a test car at least each six months. Truck scales shall be checked for accuracy at least each six months by a test truck.

(c) The scales shall be correctly balanced before each car, or string of cars, or truck is weighed. Weighers shall make certain that the scale beam is clean, so that figures will be clear and legible and that scale platform is clear of any foreign matter that might bind the scales or otherwise affect the weights of cars or trucks.

(d) In weighing railroad cars, the weigher shall insure (1) that the approach rails and live rails do not come in contact with each other, and (2) that all cars are weighed while at rest, uncoupled and free at both ends, and (3) that all weight-bearing wheels are on the scale platform at one time.

(e) In the case of trucks, the weigher shall insure (1) that all weight bearing tires are on the scale platform at one time and (2) that nothing has been added to or subtracted from the truck and/or trailer between tare weighing and gross weighing except the commodity on which weights are desired.

RULE 74: Affidavits.

Where affidavits are required by these Rules, they shall be prepared in substantially the following form:

Form of Affidavit Covering Sampling

I, the undersigned, hereby affirm that I have this.....day of.....20....., drawn or personally supervised the drawing of a fair and true sample as follows:
Commodity.....
Location.....
Car or Truck No. and Identification.....
Condition of Car or Truck.....
Seal No. and Condition of Seals.....Special Comment.....

I certify that the sample was drawn in accordance with the Rules of the National Cottonseed Products Association (Oil-230-231; Soapstock-232; Cake and Meal-290-291; Linters-370) and Is marked or identified as follows: .....

I further certify that the sample was drawn at the request of .... and that my relationship, business or otherwise, to said party is: .....
Signed _____
Subscribed and sworn to before me, a Notary Public in and for ..... County, and State of ..... this ..... day of ..... 20.....

Form of Affidavit Covering Weighing

I, the undersigned, hereby affirm that I have this ..... day of ..... 19....., performed or personally supervised the weighing services as follows:
Commodity .....
Location.....
Car or Truck No. and Identification.....
Condition of Car or Truck.....
Seal No. and Condition of Seals
Gross Wt. .....lbs. Tare Wt..... lbs
Net Wt. .....lbs.
Special Comment.....

I certify that the weighing was performed In accordance with the Rules of the National Cottonseed Products Association (Oil or Soapstock-233; Meal and Hulls-293; Linters-376).

I further certify that the sample was drawn at the request of ..... and that my relationship, business or otherwise, to said party is:.....

Signed _____
Subscribed and sworn to before me, a Notary Public in and for ..... County, and State of ..... this ..... day of ..... 20.....

Article 7. Arbitration

The arbitration system of this Association shall comprise as many Arbitration Committees, consisting of at least three but no more than five members, as may be required by the nature and variety of disputes arising. The Secretary shall have the authority to make such decisions as are necessary to carry out these Rules. The purpose of arbitration in this Association is to settle disputes, adjust unsatisfactory conditions, and avoid litigation among its members and nonmembers subject to these rules. All terms used in these rules are intended to be gender neutral (i.e., references to "him" include "her" and "it"; references to chairman are without regard to gender).

RULE 80: Agreement To Arbitrate.

National Cottonseed Products Association (NCPA) may properly consider a case involving a dispute between or among any of the following:
(1) Active members of the National Cottonseed Products Association (NCPA) (among whom arbitration by the Association is made compulsory by the Association Bylaws). For purposes of compulsory arbitration, the term "dispute" shall mean issues involving the warehousing, processing, manufacturing, merchandising, financing, transportation, or distribution of Cottonseed or Cottonseed Products within or between the United States, Mexico or Canada; or any issue involving the NCPA Trade Rules;

(2) Active members of the National Cottonseed Products Association (NCPA) and nonmembers, by consent of both parties or by court order. In the absence of a court order a case between a member and a nonmember may not be properly considered by the Arbitration Committee without the consent of both parties. If the contract in dispute between a member and nonmember provides for arbitration by the National Cottonseed Products Association (NCPA) or under its Arbitration Rules, the parties to the contract shall be deemed to have consented to arbitration under these Arbitration Rules;

The following general rules of contract interpretation shall apply in NCPA arbitration cases:
(1) In cases between NCPA Active members, the NCPA Trade Rules shall be deemed to apply unless they are inconsistent with the express contractual terms governing a transaction;
(2) If a contract between a member and nonmember references NCPA Arbitration but does not also reference the NCPA Trade Rules, the NCPA Trade Rules do not expressly govern the transaction but they may reflect general customs and practices of the trade.
(3) A general reference to NCPA rules shall be deemed to incorporate all rules of this Association including the Trade Rules and Arbitration Rules.

The original complaint in connection with any disputed matter proposed for arbitration must be filed with the Secretary within twelve (12) months after a claim arises, or within twelve (12) months after the expiration date for performance of the contract or contracts involved, whichever occurs last; except that in cases between a member and nonmember arbitrated pursuant to a court order, the complaint must be filed within 30 days of

issuance of the court order, or within twelve (12) months after a claim arises, or within twelve (12) months after the expiration date for performance of the contract or contracts involved, whichever occurs last. Except where otherwise provided, the term member(s) as used in these Arbitration Rules shall mean Active members accorded arbitration rights by the NCPA Board of Directors. The term nonmember(s) shall mean any other individual or firm**.**

Each member of this Association, upon applying for membership, has agreed to submit to arbitration any dispute with another member arising out of any contract for the purchase or sale of commodities covered by these Rules. Each member has also agreed and obligated himself to abide by any final award made by an arbitration committee of the Association.

Any member involved in a dispute may demand arbitration and, when such demand has been made, each disputant shall sign the standard form of agreement to arbitrate, as set forth in Rule 81. If the questions at issue and the evidence pertaining thereto are the same, two or more contracts between the same parties may be included in one arbitration agreement. If the questions and evidence are different or relate to quality, requiring different sets of samples, a separate arbitration agreement shall be signed for each contract; or, if the disputants request that different issues be covered by a single arbitration agreement, a separate fee shall be assessed for each contract involved.

In an effort to reduce arbitrations and minor disputes, a Non-Binding Mediation is available to members at no cost to help in resolving issues and avoiding costly arbitration.

If both parties agree to Non-Binding Mediation a current, past or retired member of the board of directors, rules committee, or arbitration committee will act as a mediator. The secretary will present a list of available mediators to both parties and a mutually agreeable mediator will accept simple briefs from both parties describing the disagreement. The mediator, at his or her discretion will review briefs, conduct phone interviews, and conduct conference calls in an effort to resolve dispute. After careful review, the mediator will send a written opinion to both parties involved. Parties may either resolve dispute or continue with filing for arbitration. Non-Binding Mediation will remain confidential to parties and mediator involved and mediator will not be eligible to serve on arbitration.

In arbitrations involving the Cottonseed Oil Export Trading Rules, arbitration shall be conducted according to Article 9., Chapter VIII, Cottonseed Oil Export Rules.

RULE 81: Standard Form Of Agreement For Arbitration.
This Article of Agreement, made and entered into this .... day of .... 20.........

WITNESSETH:

That whereas differences and controversies are now existing and pending between .... as Complainant and .... as Defendant in relation .... as covered by contract identified as follows:
Date...............Broker ....

NOW, THEREFORE, WE, THE UNDERSIGNED, do hereby mutually agree to submit the entire controversy arising out of said transaction to the arbitration and decision of an Arbitration committee of the National Cottonseed Products Association, Inc., according to the rules, regulations and By-Laws of said National Cottonseed Products Association, Inc., and we do further authorize and empower the said Committees to arbitrate, award, adjust and determine the differences now existing between us in the aforesaid matter.

AND WE DO FURTHER COVENANT AND AGREE that the award to be made as aforesaid, by the said Committee on Arbitration, shall in all things, by us and each of us respectively, be well and faithfully performed; that we will stand to, abide by, and fulfill the same, and that we will pay whatever sum of money may be awarded, as aforesaid.

AND FURTHER, that we will abide by the rules, regulations and By-Laws of said National Cottonseed Products Association, Inc., and deposit all funds as outlined in the fees for arbitration with the Secretary prior to commencement of arbitration.

AND WE DO FURTHER AGREE that the award, if made in writing and signed by the arbitrators, and attested by the Secretary of the National Cottonseed Products Association, Inc., may be entered on the records of the court of jurisdiction in the State and County or Parish in which we or either of us reside, and that judgement may be had thereon in accordance with the terms thereof.

AND WE DO FURTHER AGREE that whatever samples, if any, which may be submitted by either party to the controversy for examination, may be destroyed or otherwise disposed of at the end of thirty days after the hearing of this case, if not otherwise instructed.

- Complainant

- -

Defendant

Note: Complainant should prepare and sign five copies of this Agreement or Arbitration, retaining one for his files and sending four to the Secretary if the

Association. All copies of papers submitted as evidence in arbitration must be certified to, in accordance with Rule 85.

RULE 82: Duties of Arbitration Committee.

If a dispute is submitted to an arbitration committee, it shall be the duty of such committee, as soon as practicable after it has received all evidence, to review and to render a decision. The committee's decision shall 'e made in accordance with these Rules.

The committee shall set forth in writing its decision and the reasons therefore. Three copies shall be submitted to the Secretary who shall send one copy to each person involved and retain the third copy with his records. All documents, samples, or the evidence shall be returned to the Secretary to be retained by him in the event that an appeal from the committee's decision is taken.

RULE 83: Powers and Duties Of The Secretary.

The Secretary shall follow the procedure set forth in Rule 84, procuring from each contestant the standard form of agreement to arbitrate, properly executed, and the fees required by Rule 91. The Secretary also shall receive from and transmit to the contestants the several documents that must be exchanged, call meetings of the arbitration committees when necessary, disburse the fees and expenses allowed under Rule 91, and furnish each contestant to a dispute with a copy of the arbitration committee's decision and award.

Unless otherwise specified, all notices issued by the Secretary and all briefs and other documents transmitted by him shall be sent by registered or certified mail with and a return receipt, or overnight carrier that provides proof of delivery.

Such receipts shall be retained by the Secretary so that his records will show that the time limits provided in Rule 84 have been observed. The Secretary, at his discretion, based on the complexity and logistics of each case may modify time limits in rule 84 to accommodate parties involved as long as both parties are advised of time limit changes.

RULE 84: Arbitration Procedure.

Sec. 1. The member demanding arbitration will be referred to as the complainant. The person against whom arbitration is demanded will be referred to as the defendant.

Demand for arbitration shall be made by letter or telegram addressed to the Secretary of the Association within 90 days after the complainant's right to arbitrate has accrued. When such demand is made, the Secretary will immediately furnish five copies of the standard form of agreement to arbitrate. Complainant shall promptly prepare and sign such forms, retaining one copy and returning four copies to the Secretary.

Sec. 2. With such agreement, complainant shall file seven copies of his brief and supporting evidence, and the deposit required by Rule 91. In the brief, complainant shall open his case fully.

As soon as he receives them, the Secretary shall forward to the defendant three of the signed copies of the agreement to arbitrate and a copy of the complainant's brief and supporting documentary evidence. Within five days after receipt of these documents, the defendant shall file with the Secretary two copies of the agreement to arbitrate, properly signed, and the fees required by Rule 91. Within fifteen additional days, the defendant shall file with the Secretary seven copies of his brief and evidence.

Sec. 3. Upon receipt of these documents from the defendant, the Secretary shall furnish the complainant a copy of the fully executed agreement to arbitrate and a copy of the defendant's brief and supporting documentary evidence. Ten days after complainant receives the defendant's brief, the case shall be submitted to an arbitration committee. Within that ten-day period, complainant may reply to defendant's brief and the Secretary shall immediately furnish the defendant a copy of such reply and any supporting permissible documentary evidence. No additional evidence may be submitted with such reply, except such as may be required to answer points raised in defendant's brief.

Sec. 4. For good cause shown, the President of the Association may, upon written or telegraphic request made within the time limits specified above, extend the time for filing briefs and evidence. In no case, however, shall the time of defendant for filing his brief be extended by more than twenty days, and in no case shall the time of complainant for filing a reply be extended by more than ten days.

Sec. 5. When a case is fully prepared and ready to be assigned for hearing, the Secretary shall assign it to a qualified committee as he may deem advisable for the expeditious handling of the case in the Association. A member of the committee shall disclose to the Secretary any circumstances likely to affect his impartiality, including any bias or any financial or personal interest in the result of the arbitration. Upon receipt of any such information from a committee member, the Secretary shall transmit such information to both parties and replace said member if either party requests such action within five (5) days from receipt of such information or after the voluntary withdrawal of such committee member. Upon assigning a case as herein provided, the Secretary shall notify each party of the names and addresses of the chairman and members of the Arbitration Committee processing said case. Upon receipt of such notice, either party to the case may challenge the appointment of a member of the Arbitration Committee for prejudicial or other causes within five (5) days of receipt of this notice. Upon determination that such challenge is valid the Secretary shall replace such member.

The Chairman of a Arbitration Committee may choose for his committee to determine its awards, by one or more of the methods hereinafter set out provided however, that if either disputant requests an oral hearing same must be held:

(1) By passing the papers from one to another by mail;
(2) By calling a meeting of the members of a Committee;
(3) By calling a meeting of members of the Committee to hear oral argument;
(4) By such other means as the Chairman may deem necessary.

A decision of the members of an Arbitration Committee shall be by majority vote.

A Committee cannot be called together more than once each calendar month, except by the consent of every member of a Committee. A Committee cannot act at a meeting thereof, unless all members are present.

When either party to arbitration requests an oral hearing, the same must be held. Such written request must be made to the Secretary on or before the filing of the defendant's briefs. The introduction of new documents or written evidence at an oral hearing is not permitted.

The party requesting such an oral hearing must pay whatever amounts, in addition to the regular deposits as provided in rule 91, as shall be necessary to cover the approximate additional expenses of the Committee and the Association for the hearing. The amount of such additional expenses shall be determined and fixed by the Secretary. The party requesting an oral hearing shall advance the amount determined necessary to cover approximately the additional hearing expenses, including a stenographic record as set forth and travel expenses as set forth by the Secretary. The Secretary shall notify the requesting party within ten (10) days after appointment of the Arbitration Committee what the approximate expenses of the hearing will be. If both parties request an oral hearing, the amount to be paid by each in advance shall not exceed one-half of the estimated amounts. The amount specified shall be advanced by the requesting party no later than ten (10) days after notification from the Secretary. Failure to advance expenses may be grounds for denying a request for an oral hearing. After the Committee determines and fixes the actual amount of additional expense incurred, the party or parties shall be refunded or billed by the Secretary for the difference between the amounts advanced and actual costs.

In the event of an oral hearing, the Secretary shall make the necessary arrangements for the taking of an official stenographic record of the hearing. The party or parties requesting the oral hearing shall pay the cost of such record directly to the Secretary in accordance with the normal procedure for paying the hearing costs. The Secretary shall pay the reporting agency in accordance with their agreement. The stenographic record shall be made a part of the official transcript of the case. When a case is to be considered as above for oral hearing, the Chairman of the Committee shall fix a time and a place for its hearing, and shall give the Secretary twenty (20) days notice of the date and the place so fixed, so as to enable the Secretary to give the parties to the arbitration fifteen (15) days notification of the date and the place of the hearing. Neither party shall seek to postpone the hearing of a case longer than ten (10) days after such date has been set, unless good cause, satisfactory to the Committee, can be shown therefore. Requests for postponement must be received by the Secretary at least ten (10) days prior to the date set for hearing. The members of the Arbitration Committee, the Secretary, and the Association's legal counsel shall receive the amount of their actual traveling and hotel expenses when attending meetings to consider a case by oral testimony. Arbitration

Committee shall act promptly on all cases submitted. The awards of the Arbitration Committee shall be dated on the day they are received at the office of the Secretary, and copies of said awards shall be mailed by the Secretary to the parties to the arbitration within five (5) days after receipt thereof. Each award shall contain a concise statement of the pertinent facts and the conclusions of the Arbitration Committee and the reasons therefore. The parties to the arbitration shall file a notice of appeal, or comply with the terms of the Arbitration Committee's Award within ten (10) days from the receipt of said award.

A bulletin shall be published as frequently as is necessary to give the details, as hereinafter provided, of all cases arbitrated, awards made, and any other information relative to the subject of arbitration which may be deemed of interest to the members of the Association. Copies of the bulletin shall be mailed to all NCPA members.

Said bulletin shall set forth:
(1) The names of the plaintiff and the defendant;
(2) The award(s) of the Committee, giving the names of the plaintiff and the defendant in each case, the nature of the case and the amount involved, the award and such other information as may be of interest to the members;
(3) Notice of failures to comply with the terms of awards, giving a record of each case;
(4) Notice of refusals to arbitrate, giving a record of each case, and any reasons offered for said refusals;
(5) Notice of failures to answer the correspondence of the Secretary relative to arbitration.

The Arbitration Committee may include an amount of interest in an award. If interest is awarded, unless otherwise provided by agreement between the parties, the applicable rate of interest shall be the Prime Rate as published in the Wall Street Journal on the date the case was filed.

RULE 85: Appearance And Evidence Before Arbitration Committees.

Sec. 1. Evidence may be submitted in the form of samples of the commodities involved, letters, telegrams, contracts or the documents, and ex parte affidavits. Letters, telegrams, contracts or other documents may be either originals or copies. If other than photo static copies are furnished, they shall be accompanied by the affidavit of a credible person that they are true and correct copies of the originals. If copies are used, the arbitration committee shall have the right to demand the originals.

Sec. 2. The arbitration committee shall have the right to require either contestant to furnish any additional documentary or other evidence available to said contestant, which would enable it to give the case intelligent and proper consideration. If the complainant refuses to produce such additional evidence, the committee may, at its discretion, dismiss the complaint. If the defendant refuses to produce such additional evidence, the committee may, at its discretion, decide against him, as if by default.

RULE 86: Handling Samples Submitted For Arbitration Purposes.

If differences exist involving quality, either buyer or seller may instruct the official weigher and inspector or other authorized person holding samples of the commodity involved to forward such samples to the Secretary of the Association. If the contestants are not agreed on the sample(s) to be used in deciding the controversy, the arbitration committee will consider samples furnished by each contestant, provided such samples have been drawn according to methods prescribed in and by persons authorized by these Rules.

Each sample submitted for arbitration purposes shall be given a serial number for identification and all original tags or other identification marks shall be removed and preserved under the same serial number. If analysis is required, such sample shall be referred to an official chemist, designated by the chairman of the arbitration committee. The official chemist shall promptly make the required analysis and shall report his findings to the arbitration committee chairman only. Violation of this Rule by an official chemist will make such chemist liable to expulsion from the Association by a majority vote of the Board of Directors.

RULE 87: Rehearing Before Arbitration Committee.

Any contestant in arbitration who has discovered additional evidence and is dissatisfied with the award of an arbitration committee may have the case reheard by the committee. Application for such rehearing must be filed with the Secretary within ten days after such contestant receives notice of the award.

Within twenty days after he receives notice of the award, the applicant for a rehearing must file with the Secretary, seven copies of such additional evidence and brief as he desires to submit. The Secretary shall promptly furnish the opposite party with a copy thereof. Within ten days after receipt of the brief, said opposite party may file a reply. At the end of such ten-day period, the Secretary shall resubmit the case to the arbitration committee.

RULE 89: Ex Parte Arbitration.

If, in any dispute where arbitration has been demanded, the defendant fails or refuses, within the five-day period provided in Rule 84, to return to the Secretary the standard agreement to arbitrate, properly executed, the complainant may demand an ex parte arbitration. Such demand shall be made by letter or telegram addressed to the Secretary.

Upon receipt of such demand, the Secretary shall notify the defendant that demand for ex parte arbitration has been made. If the defendant fails within five days after receipt of such notice, to return to the Secretary properly executed agreements to arbitrate the Secretary shall refer the matter to an arbitration committee to be selected by the President. Such committee shall consist of not less than 3 or more than 5 members. He shall by telegram notify both complainant and defendant of his action.

The designated committee will proceed with the arbitration and its decision will be binding on all contestants involved. Any documents filed with the Secretary by the defendant before the case is heard may be considered by the committee, if it so desires. Costs of the arbitration will be charged to the complainant but the committee shall if it decides in the complainant's favor, add such costs to the award.

RULE 91: Arbitration Fees.

Sec. 1. Claim up to $100,000: $500, plus 1% of the claim;
Claim up to $100,001 to $500,000: $1,000, plus ½% of the claim;
Claim up to $500,001 and greater: $2,000, plus ¼% of the claim;
The maximum arbitration service fee shall be $10,000.

In the event a case is settled prior to the request to the plaintiff for rebuttal, parties may receive as refund of arbitration fees, up to fifty percent (50%) of the previously submitted fees. In all cases, the Secretary may reduce refunds by direct or indirect costs incurred by the Association in connection with a case. For cases settled following submission of the rebuttal, fees are non-refundable. In string or other multiparty cases treated as a single arbitration by the Association, a party shall not be required to pay more than a maximum of two arbitration service fees.

Sec. 2. Each Association member of an arbitration committee shall have refunded to him the actual expense incurred by him to attend a meeting of the committee. Such expense shall be treated as costs. If a committee decides more than one case at a single meeting, the expenses of committee members shall be prorated equally to the cases so heard.

RULE 92: Notice of Claims And Resignations Pending Arbitration.

Members of the Association should promptly notify the Secretary of the existence of any dispute(s) that may lead to arbitration. The resignation of a member against whom such a complaint has been made or against whom arbitration has been demanded shall not be accepted until such complaint or arbitration is finally settled.

RULE 93: Arbitration Between Members And Non-Members.

No non-member may demand arbitration against a member of this Association.

RULE 94: Arbitration Between Non-Members.
This Association will not arbitrate differences between non-members.

Article 8. Chemists

RULE 100: Official Methods of Analysis.
The methods of chemical analysis prescribed in Chapter VII of the Rules must be observed by all official chemists and their reports shall bear a certificate to this effect.

RULE 101: Analyses for Settlement Purposes.
Sec. 1. If a contract does not name the chemist or chemists whose analysis shall determine quality, buyer shall furnish seller with the results of an analysis, based upon official or agreed samples. If a seller declines to accept a buyer's analysis on a contract for oil, he shall submit an analysis of an official sample made in his own laboratory or by an official chemist. Settlement shall be based upon the mean of the two analyses.

Sec. 2. In the event that either buyer or seller questions the results of the opposite party's analysis referred to in Section 1, the third portion of the official sample shall be sent to an official chemist approved by both buyer and seller. The official chemists' analysis shall include free fatty acids, refining loss and color and all three analyses shall be used in determining the monetary values based on that sample. Settlement should be based on the mean of two of the three monetary settlement values coming closest together when analysis results of refining loss and color are within acceptance limits. *(See example). If the average of any pair of the three analyses being used indicates rejection, while the average of some other pair of analyses results in the shipment being tenderable, any averaging which indicates rejection will not be considered further in arriving at a settlement basis. In the event that two pairs of analyses average within tenderable limits while one pair indicates rejection, the pair of tenderable analyses which results in the lowest dollar return to the seller will be used for settlement. If buyer and seller cannot agree on a chemist, the Secretary of the Association shall select the third chemist.

Sec. 3. If two official cake or meal analyses of the same lot do not agree within one-half unit of protein on a dry basis (for comparative purposes only), and where two official cottonseed analyses of the same lot show a difference in excess of two full grades, a third official analyses (Referee analysis) by an official chemist agreed upon by both parties shall be arranged and settlement made upon the Referee Analysis.

Sec. 4. In the event that either buyer or seller questions the results of the opposite party's analysis for the combination of moisture and insoluble impurities the third portion of the official sample shall be sent to an official chemist approved by both buyer and seller. The average of the two analyses coming closest together shall determine whether the shipment is tenderable.

EXAMPLE

	Buyer	Seller	Referee	Mean Settlement
FFA	4.2	4.4	3.8	4.1
RL	15.4	14.8	14.6	14.7
Color	8.5	7.6	8.1	7.85
Settlements	$2,902.37	$2,532.60	$2,562.5	$2,547.57

150,000 tank car @ $0.30/lb = $45,000 contract value

Buyer's Settlement

FFA = (100-15.4) X .00015 X $45,000	= $ 571.05
RL = .0075 X (9.0-15.4) X $45,000	= 2,160.00
Color = (100-15.4) X .0005 X (.76-.85) X $45,000	= 171.32
	$2,902.37

Seller's Settlement

FFA = (100-14.8) X .00015 X $45,000	= $ 575.10
RL = .0075 X (9.0-14.8) X $45,000	= 1,957.50
Color = None	= -0-
	$2,532.60

Referee's Settlement

FFA = (100-14.6) X .00015 X $45,000	= $ 576.45
RL = .0075 X (9.0-14.6) X $45,000	= 1,890.00
Color = (100-14.6) X .0005 X (.76-.81) X $45,000	= 96.88
	$2,562.53

RULE 102: Chemists' Reports.

When an official sample is submitted by either buyer or seller to an official chemist for official analysis, the other party shall be notified and the chemist shall report to both parties.

RULE 103: Chemists' Fees.

If a contract carries a guarantee of quality that must be determined by chemical analysis and seller has to pay an allowance for a deficiency, he shall also pay the cost of official analysis. If no allowance is chargeable to seller, buyer shall pay the cost of official analysis.

If buyer's original analysis of oil in tank cars or tank trucks is not accepted by seller and final settlement analysis proves the commodity to be of higher value than such original analysis, buyer shall pay the cost of official analysis. With these two exceptions, seller shall pay the cost of official analysis.

If official analysis of samples submitted for arbitration purposes is requested by the chairman of an arbitration committee or the Secretary and the case is settled between

the contestants without completing the arbitration procedure, the party or parties submitting the samples shall pay the cost of official analysis.

CHAPTER II. COTTONSEED

Article 1: Definitions of Words and Terms

RULE 110: A Contract.
Unless otherwise specified, contracts for cottonseed shall designate the number of tons, except as provided in Rule 135, each carload or truckload lot of cottonseed shall be treated as a separate contract for purposes of quality determination.

RULE 111: A Carload Lot Of Cottonseed.
Except in cases where the tariff of the railroad, over which a shipment moves, specifies a higher minimum weight, a carload lot of cottonseed, for contract purposes, shall be sixty (60) tons.

RULE 112. Glandless Cottonseed.
Glandless cottonseed is the seed of cotton which has been selected through plant breeding to eliminate, or reduce to the extent practicable, seed pigment glands. There shall be three classes which shall be determined by total gossypol content of moisture and foreign matter-free undelinted seed:

Class A shall contain not more than 400 parts per million of total gossypol.*
Class AA shall contain not more than 100 parts per million of total gossypol.*
Class AAA shall contain not more than 10 parts per million of total gossypol.*

*Gossypol as determined by the AOCS official method, nuclear magnetic resonance, high performance liquid chromatography, or thin layer chromatography. Method of analysis must be specified in the contract.

RULE 113. Feed Grade Cottonseed
Feed grade cottonseed is that intended for feed to livestock. It shall be traded in accordance with the Rules in Chapter XIII.

Article 2. Grade and Quality

RULE 115: Basis Grade Cottonseed.
Unless specified to the contrary, all offers and acceptances of cottonseed shall be understood to apply to basis grade cottonseed, as defined in Rule 116, with premiums or discounts to be determined in accordance with that rule. Off quality cottonseed and below grade cottonseed may be rejected.

On lots of 10 tons or more, the grade shall be determined on the basis of samples drawn and analyzed in accordance with Rules 135 and 400.

On lots of less than 10 tons, the grade shall be the average grade for the community or district where the cottonseed are grown, determined by the analysis of samples of current deliveries or from the latest grade report of the United States Department of Agriculture.

RULE 116: Grades of Cottonseed.

Sec. 1. Determination of Grade. The grade of cottonseed shall be determined from the analysis of samples, and it shall be the result stated in the nearest whole or half numbers obtained by multiplying a quantity index by a quality index and dividing the result by 100. The quantity index and the quality index shall be determined as hereinafter provided.

(a) The basis grade of cottonseed shall be grade 100.
(b) High grades of cottonseed shall be those grades above 100.
(c) Low grades of cottonseed shall be those grades below 100.
(d) The grade for American Pima cottonseed shall be followed by the designation "American Pima" or the symbol "AP "

Sec. 2. Determination of Quantity Index.

(a) For upland cottonseed, the quantity index shall equal 4 times the percentage of oil, plus 6 times the percentage of ammonia, plus 5.
(b) For American Pima cottonseed, the quantity index shall equal 4 times the percentage of oil, plus 6 times the percentage of ammonia, minus 10.

Sec. 3. Determination of Quality Index. The quality index of cottonseed shall be an index of purity and soundness, and shall be determined as follows:

(a) Prime Quality Cottonseed. Cottonseed that by analysis contains not more than 1.0 percent of foreign matter, not more than 12.0 percent of moisture, and not more than 1.8 percent of free fatty acids in the oil in the seed, shall be known as prime quality cottonseed and shall have a quality index of 100.

(b) Below Prime Quality Cottonseed. The quality index of cottonseed that, by analysis, contain foreign matter, moisture, or free fatty acids in the oil in the seed, in excess of the percentage prescribed in Sec. 3(a) of this Rule shall be found by reducing the quality index of prime quality cottonseed as follows:

(1) Four-tenths of a unit for each 0.1 percent of free fatty acids in the oil in the seed in excess of 1.8 percent.
(2) One-tenth of a unit for each 0.1 percent of foreign matter in excess of 1.0 percent.
(3) One-tenth of a unit for each 0.1 percent of moisture in excess of 12.0 percent.

(c) Off Quality Cottonseed. Cottonseed that has been treated by either mechanical or chemical process other than the usual cleaning, drying, and ginning (except sterilization required by the United States Department of Agriculture for quarantine purposes) or that are fermented or hot, or that upon analysis are found to contain 12.5 percent or more of free fatty acids in the oil in the seed, or more than 10.0 percent of foreign matter, or more than 20.0 percent of moisture, or more than 25.0 percent of moisture and foreign matter combined, shall be designated as "off quality cottonseed".
(d) Below Grade Cottonseed. Cottonseed the grade of which when calculated according to Sec. 1 of this Rule is below grade 40.0 shall be designated as "below grade cottonseed", and a numerical grade shall not be indicated.

EXAMPLES OF GRADE CALCULATIONS

A. PRIME QUALITY UPLAND COTTONSEED - Normal Oil and Ammonia Content

17.9% Oil — 4 x 17.9 = 71.60
3.90% Ammonia — 6 x 3.90 = 23.40
Plus 5.00
Quantity Index 100.00

1.0% Foreign Matter
12.0% Moisture
1.8% Free Fatty Acids

Quality Index 100.0

$\frac{100.00 \times 100.00}{100}$ = GRADE 100.0

B. PRIME QUALITY UPLAND COTTONSEED - Low Oil - Normal Ammonia

16.0% Oil — 4 x 16.0 = 64.00
3.90% Ammonia — 6 x 3.90 = 23.40
Plus 5.00
Quantity Index 92.40

1.0% Foreign Matter
12.O% Moisture
1.8% Free Fatty Acids

Quality Index 100.0

$\frac{92.40 \times 100.0}{100}$ = 92.40 GRADE = 92.40

C. BELOW PRIME QUALITY UPLAND COTTONSEED

18.0% Oil 4 x 18.0 = 72.00
3.90% Ammonia 6 x 3.90 = 23.40
Plus 5.00
Quantity Index 100.40
1.O% Foreign Matter
14.O% Moisture (14.0 - 12.0) = 2.0 units
2.O% Free Fatty Acids (2.0 - 1.8) x 4 = 0.8 units
100.0 - 2.8 = Quality Index 97.2

100.40 x 97.2 = GRADE = 97.5
100

D. OFF QUALITY UPLAND COTTONSEED

18.0% Oil 4 x 18.0 = 72.00
3.90% Ammonia 6 x 3.90 = 23.40
Plus 5.00
Quantity Index 100.40
1.0% Foreign Matter
12.0% Moisture
15.O% Free Fatty Acids (15.0 - 1.8) x 4 = 52.8 units
100.0 - 52.8 units = Quality Index = 47.2

100.40 x 47.2 = GRADE = 47.5
100

E. BELOW GRADE UPLAND COTTONSEED

14.0% Oil 4 x 14.0 = 56.00
3.O% Ammonia 6 x 3.0 = 18.00
Plus 5.00
Quantity Index 79.00

4.0% Foreign Matter (4.0 - 1.0) = 3.0 units
18.0% Moisture (18.0 - 12.0) = 6.0 units
12.0% Free Fatty Acids (12.0 - 1.8) x 4 = 40.8 units
100.0 - 49.8 = Quality Index 50.2

79.0 x 50.2 = 39.65 BELOW GRADE
100

QUALITY INDEX REDUCTIONS ON ACCOUNT OF F.F.A.

F.F.A. %	Units	F.F.A. %	Units
1.9	0.4	4.1	9.2
2.0	0.8	4.2	9.6
2.1	1.2	4.3	10.0
2.2	1.6	4.4	10.4
2.3	2.0	4.5	10.8
2.4	2.4	4.6	11.2
2.5	2.8	4.7	11.6
2.6	3.2	4.8	12.0
2.7	3.6	4.9	12.4
2.8	4.0	5.0	12.8
2.9	4.4	5.5	14.8
3.0	4.8	6.0	16.8
3.1	5.2	6.5	18.8
3.2	5.6	7.0	20.8
3.3	6.0	7.5	22.8
3.4	6.4	8.0	24.8
3.5	6.8	8.5	26.8
3.6	7.2	9.0	28.8
3.7	7.6	9.5	30.8
3.8	8.0	10.0	32.8
3.9	8.4	10.5	34.8
4.0	8.8	11.0	36.8

Article 3. Adjustments and Variations

RULE 120: Clean Cottonseed Weight At Destination.

Unless otherwise specified, all purchases of cottonseed shall be settled for on the basis of clean cottonseed weight at destination. If cottonseed delivered on a basis grade contract contain foreign matter in excess of 1 percent, the clean cottonseed weight shall be determined by deducting from the weight of the shipment the weight of all foreign matter in excess of 1 percent. This deduction for foreign matter shall be in addition to the reduction in the Quality Index because of foreign matter in excess of 1 percent, as provided in Rule 116.

Cost of transportation on the weight of foreign matter in excess of 1 percent shall be paid by the seller by deduction in the settlement.

RULE 121: Quantity Variations.

On contracts for cottonseed, a variation of 5 percent above or below contract quantity shall constitute a good delivery, provided 1 percent does not exceed 5 tons.

Settlement for underweights or overweights shall be made in accordance with Rule 41.

Article 4. Performance of Contract

RULE 125: Default In Acceptance Or Delivery.

If seller delivers cottonseed in the quantity and of the quality contracted for and buyer fails to accept any portion of such cottonseed, the seller may treat such portion of the contract as breached by buyer and, if he elects to do so, he shall proceed in accordance with Rules 50, 51, 52 and 53. Such action by the seller shall not affect the balance of a contract which shall remain in full force and effect.

If seller fails to deliver cottonseed contracted for, the buyer may treat the contract as breached by the seller and, if he elects to do so, he shall proceed in accordance with Rules 50, 51, 52 and 53.

Article 5. Claims

RULE 130: Period For Filing Claims.

All claims on account of shipments of cottonseed must be made by the buyer within ten days after arrival of the shipment at destination and, by the seller, within ten days after receipt of statement from the buyer.

Article 6. Sampling

RULE 135: Sampling Cottonseed.

Sec. 1. Who Shall Sample. (a) When cottonseed are purchased on United States Standard Grades, sampling shall be performed only by persons licensed by and in accordance with methods approved by the United States Department of Agriculture.

(b) When cottonseed are purchased under Rules 115, 116, and F-4, sampling shall be performed only by persons licensed or designated by a State or Federal agency, by an official weigher and inspector of this Association, or by a qualified, disinterested person who shall, upon request, make an affidavit fully covering his performance of the sampling.

(c) Sampling Methods. The following methods for drawing, cleaning, preparing, sealing, and certificating official samples of cottonseed are approved:

Sec. 2. Equipment. (a) General. Each licensed cottonseed sampler shall have available: suitable sampling tools or triers; sufficient containers of 2-1/2 bushel capacity with close-fitting covers, or large polyethylene bags of sufficient size to hold at least 60 pounds of seed and be securely closed, to meet the needs of individual shippers; sufficient friction-top cans of 155 cubic inch capacity, or sufficient bags 7-1/2 x 3 x 14-1/2 inches, 1/90 Asphalt Laminated, or 1/60 duraloid, sewn, open-mouthed, bottoms dipped in wax or polyethylene bags approximately 9 x 14-1/2 inches, with a minimum thickness of 2.5 mils, for Official and Duplicate samples; scales graduated in 1/2 ounces for weighing foreign matter, and scales graduated in 1/2 pounds for weighing gross samples and a

mechanical mixer, or a shaker-cleaner provided with a bypass sample-reducing device; and a thermometer suitable for determining the temperature of cottonseed.

(b) Triers. Triers of the cork-screw type made of strip steel 1/2 inch wide by 5/32 inch thick, bent to form an open cylinder 3 inches in diameter, the pitch of the twist being approximately 2 inches and the screw portion being approximately 42 inches in length, are approved.

(c) Pneumatic Probe Sampler. Unit powered with 7/8 h.p., Class II, Group G motor installed with specially designed cyclone air pump and a cyclone collector tank having bottom release shutter, 48 inches long by 11-3/4 inches inside diameter; rolled aluminum probe tube 8 feet in length by 2-1/2 inches inside diameter; bottom of probe tube to be equipped with light weight steel saw-tooth cutter blade and at top with swivel type 90 ell (elbow) so that section turns freely the full 360 around top of probe tube; sufficient length (15 to 30 feet) of 2-1/2 inch inside diameter flexible, wire-reinforced, neoprene tubing. Cyclone collector tank intake nozzle to have 2-1/2 inch inside diameter.

(d) Receptacles. Receptacles for taking samples of cottonseed during unloading of a truck or car made by attaching an 8 x 5 x 5 1/2 inch elevator bucket to a pole long enough to enable the sampler to place the bucket throughout the falling stream of cottonseed, are approved.

(e) Shaker-cleaner. Shaker-cleaner with screens not less than 3 x 7 feet and provided with not less than three adjustable bypasses for obtaining a cross section official sample are approved. Perforations in the top screen shall be 1/2 to 5/8-inch diameter, perforations in the middle screen shall be 1/8-inch diameter, and the third or bottom deck shall be of sheet metal without perforations or transverse seams. The upper end of the shaker-cleaner should be equipped with a hopper-feeder for even distribution of the gross sample on the upper screen.

Sec. 3. Methods.

(a) Carlots Before Unloading. For this purpose an approved sampling tool shall be inserted at different points in each end and in the middle of the carload of seed; it is recommended that not less than 5 probes full be drawn. When a car is so filled that an approved trier or pneumatic probe cannot be used, the sampler shall divide the car into four sections. In the center of each section he shall dig a hole at least 30 inches deep. From the bottom and sides of each hole a portion of not less than six pounds of seed shall be taken. The portions drawn at each hole shall be placed in a strong, moisture-proof bag. The several portions shall be placed in one of the metal or plastic containers specified in Sec. 2 (a) above.

(b) Carlots During Unloading. For this purpose the sampler shall use the receptacle specified in Sec. 2(c) which he shall place in the center of the unloading chute at regular intervals, depending upon the rate of unloading, so that not less than 25 pounds of seed will be taken.

(c) Pneumatic Probe Sampler. When using the pneumatic probe sampler, the probe shall be inserted vertically into the loads, using a slight up and down motion of the tube as it goes downward through the loads. The probe should not be forced into the cottonseed or clogging of the tube to the collector tank may result.

(d) Truck or Wagon Lots. (1) Trucks or wagon lots of cottonseed may be sampled before unloading with an approved trier or pneumatic probe. A minimum of two insertions shall be made on loads containing 10 or more tons. At least one insertion shall be made on loads containing less than 10 tons. Regardless of the size of the load, at least one probe shall reach the bottom of the load. (2) The sampler shall use an approved receptacle specified in Sec. 2(d) to take segments of the gross sample if the seed are sampled while being unloaded by dumping or power shovel. Not less than 8 pounds of seed must be taken from each load. (3) Seed unloaded by air (suction pipe) may be sampled with a fork. Segments of the gross sample should be taken throughout the load with one or two segments taken from the bottom, depending on the size of the load. Not less than 8 pounds of seed must be taken from each load.

(e) Sample Designations. The portions drawn from trucks, wagons, railroad cars, or other conveyances shall be known as the "original" or "gross" sample. The gross sample shall represent seed from only one shipper. The portion prepared for forwarding to licensed cottonseed chemists shall be known as the "Official Sample". The portion retained by the sampler to be substituted for the official sample should it be lost or destroyed is known as the "Duplicate" sample. Both the official and duplicate samples shall be representative of the entire gross sample.

(f) Hot Seed. When a sampler believes a shipment of cottonseed to be hot at the time of sampling, he shall determine the actual temperature with a thermometer placed for not less than 5 minutes as near as possible to the center of the load, at each end of a car or near the center of the load in a truck. The temperature found shall be recorded on the certificate hereinafter described.

Sec. 4. Handling Samples.

(a) Each portion of the original or gross sample as drawn shall be placed immediately in a properly identified container specified in Sec. 2(a) and the container promptly closed. As soon as the full original or gross sample shall have been drawn it shall be carefully weighed. In no case shall an original or gross sample be struck off or reduced in size, but the entire sample as drawn shall be weighed. After being weighed, the original or gross sample shall be passed over an approved shaker-cleaner, after which the foreign matter, as specified in Sec. 4(b), shall be carefully gathered and weighed. The total weight of foreign matter must be recorded. The sampler may also record the weight of the different fractions of foreign matter.

(b) Foreign Matter. Foreign matter in cottonseed shall include the following: Dirt, sand, stones or gravel, hulls, leaves, sticks, grabbots, flues, lint cotton and all other material foreign to cottonseed. Should grabbots, flues or lint cotton having enmeshed seed be removed when the gross sample is passed over the shaker-cleaner, such material

should be torn into small pieces, by hand, and thrown on the upper screen of the shaker-cleaner near the hopper. All material reentering the boll tray shall be weighed as foreign matter. (This procedure for recovering enmeshed seed shall be done only one time.) The material should not be rubbed against the upper screen, by hand or otherwise, to recover enmeshed seed.

(c) Reducing Sample. When the shaker-cleaner is not equipped with a sample-reducing device, the entire cleaned sample shall be mixed by means of mechanical mixer that is so designed as to thoroughly mix the sample. After mixing, the seed is dumped and the official and duplicate samples taken without further mixing or stirring. When a shaker-cleaner with automatic sampling device is used, the reducing device shall be adjusted so that not less than 4 pounds of seed will be collected. The reducing device must be set so that the reduced sample container does not completely fill. Should the container fill before the entire gross sample has passed, a portion of the gross sample will not be sampled. Seed in the reduced sample container should be divided in such a manner that both the Official and Duplicate samples will be representative of the entire gross sample. Segments of seed-from top to bottom of the layer in the reduced sample container-shall be taken for the official sample and like segments taken for the duplicate sample (upper half of seed shall not be placed in one sample and lower half in the other). All cleaning, mixing and handling shall be done expeditiously and without undue exposure.

Sec. 5. Official Samples.

(a) Weight, Disposition. The Official Sample shall consist of not less than 2 pounds, which shall be packed in an air-tight container specified in Sec. 2(a), and, together with the licensed cottonseed sampler's certificate, specified in Sec. 6, shall be sealed and immediately forwarded to a licensed cottonseed chemist for analysis and grading.

(b) Representativeness. One Official Sample representing each lot of cottonseed and one duplicate shall be prepared and certified as follows: (1) for each carload of cottonseed, regardless of the tonnage contained therein; and (2) for each delivery of not more than 150 tons by trucks within 3 consecutive days or the maximum tonnage specified by USDA/AMS, whichever is greater.

Sec. 6. Sampler's Certificate.

Each cottonseed sampler shall completely fill in and sign a certificate in the form hereinafter set forth. The certificate shall be enclosed with Official Sample and a copy shall be placed in the Duplicate Sample.

Approved Form of Cottonseed Sampler's Certificate
NATIONAL COTTONSEED PRODUCTS ASSOCIATION, INC.

.....
Name of Mill

- - - - - - - - - - - - - - - -
Address

COTTONSEED SAMPLER'S CERTIFICATE

Date sample was drawn* ..... to....

Identification of shipment * *.....

Point of origin of seed ..... County..... State
Weight of original sample .....lbs. ..... oz.
Net weight of cleaned seed .....lbs. ..... oz.
or
Weight of dirty tray contents ..... lbs. ..... oz.

Weight of boll catcher contents ..... lbs. ..... oz.

Portion represented by
grabbots, flues, lint cotton ..... lbs. ..... oz.

Total shaker-cleaner foreign
matter ..... lbs..... oz.

Remarks .....
(If seed are hot, give temperature)

I hereby certify that the accompanying sample of cottonseed is the OFFICIAL SAMPLE representing the lot of cottonseed marked or identified as above and that the drawing and preparation were done in accordance with the methods prescribed by the NATIONAL COTTONSEED PRODUCTS ASSOCIATION, INC.

Signature .....

* If the Official Sample represents wagon or truck deliveries covering more than one day, give inclusive dates.
** Make identification explicit as to seller of seed. If by car, give initials and number. If by truck or wagon, so state.

If cottonseed are bought under the United States Standard Grades, the form of licensed cottonseed sampler's certificate approved by the United States Department of Agriculture shall be used.

CHAPTER III. OIL, SOAPSTOCK and TANK BOTTOMS

Article 1. Definitions of Words and Terms

RULE 140: Applicability.

Unless otherwise specified, all Rules in Chapter III shall apply only to contracts for the several grades and kinds of oil, soapstock and tank bottoms described in this Chapter.

RULE 141: A Contract.

Except as provided in Rule 200, each tank car or tank truck of products shall be treated and handled throughout as a separate purchase or sale, regardless of the number of tank cars or tank trucks called for in any given contract. Adjustments as to weight and quality shall be made on each individual tank car or tank truck. Multiple-car or truck contracts shall be construed to be divisible and not entire, so that default or error as to one or more tank cars or tank trucks shall not affect the remainder of the contract.

RULE 142: A Barrel.

A barrel is four hundred pounds, net.

RULE 143: A Tank Car.

Unless otherwise specified, a tank car is sixty thousand pounds, net.

Article 2. Grade and Quality

A. CRUDE COTTONSEED OIL

RULE 144: Crude Cottonseed Oil.

Crude cottonseed oil means the oil as produced from cottonseed only, by either the hydraulic, expeller or screw press, prepress solvent, or solvent extraction process.

RULE 145: Prime Crude Cottonseed Oil.

Prime Crude Cottonseed Oil shall be prime in flavor and odor, as determined by Rule 201 and must refine, as required by these rules, to a color no higher than AOCS 7.6 and with a loss in weight not exceeding 12 percent. Combined moisture and insoluble impurities shall not exceed 1.0 percent as determined by AOCS test methods. Settlement on refining loss shall be made in accordance with Rule 201.

RULE 146: Basis Prime Crude Cottonseed Oil.

To be tenderable on a "basis prime" contract, crude cottonseed oil must refine, as required by these rules, to a color no higher than AOCS 12 and with a loss in weight not exceeding 20 percent. Combined moisture and insoluble impurities shall not exceed 1.0 percent as determined by AOCS test methods. Settlement shall be made in accordance with Rule 201.

RULE 147: Off Crude Cottonseed Oil

Under an "off-crude" contract, oil must refine, as required by these Rules, to a color no higher than AOCS 20, with a loss in weight not exceeding 25 percent. Settlement shall be made in accordance with Rule 201.

RULE 148: Reddish Off Crude Cottonseed Oil.

Under a "reddish off-crude" contract, oil must refine, as required by these Rules, to a color no higher than AOCS 30, with a loss in weight not exceeding 40 percent. Settlement shall be made in accordance with Rule 201.

RULE 149: Low Grade Crude Cottonseed Oil.

Crude cottonseed oil not coming up to the specifications set forth in Rules 147 and 148 shall be sold either by sample or as "low grade" cottonseed oil.

RULE 150: Screw Press or Expeller Cottonseed Oil.

Crude cottonseed oil produced by the screw press or expeller process is tenderable on contracts for the grades of oil previously defined, if such oil will refine within the requirements of the fore-going Rules. Unless seller indicates that he wishes oil analyzed by the special procedure provided in Rule 404, for screw press or expeller oil, such oil shall be analyzed by the regular methods for hydraulic oil.

RULE 151: Solvent Extracted Cottonseed Oil.

Crude cottonseed oil produced by solvent extraction, with or without pre-pressing, shall be tenderable on contracts for the grades of oil previously defined, if the type of oil is declared at the time of sale. Solvent extracted oil shall be analyzed by the regular or slow break method for hydraulic oil, as provided in Rule 404. Oil with a flash point below 250 °F is rejectable.

RULE 152: Slow Breaking Cottonseed Oil.

Should seller notify buyer, by the time of arrival at destination of any shipment of crude cottonseed oil, that the oil is of slow breaking type, such oil shall be analyzed by the special "slow-break" procedure provided for in Rule 404, Section 5.

B. REFINED COTTONSEED OIL

RULE 155: Choice Summer Yellow Cottonseed Oil.

Choice summer yellow cottonseed oil must be reasonably free from visible foreign material, clear and brilliant at temperatures sufficient to melt the stearine, sweet in flavor and odor, of a color no higher than AOCS 7.6, and shall contain not more than 0.125 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 156: Prime Summer Yellow Cottonseed Oil.

Prime summer yellow cottonseed oil must be reasonably free from visible foreign material, clear at temperatures sufficient to melt the stearine, sweet in flavor and odor, of

a color no higher than AOCS 7.6, and shall contain not more than 0.25 percent free fatty acid nor in excess of a 0.10 percent moisture and volatile matter.

RULE 157: Prime Winter Yellow Cottonseed Oil.

Prime winter yellow cottonseed oil must be reasonably free from visible foreign material, sweet in flavor and odor, of a color no higher than AOCS 7.6, and must stand the cold test as prescribed in these Rules, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 158: Good Off Summer Yellow Cottonseed Oil.

Good off summer yellow cottonseed oil may be off in flavor and odor, must be reasonably free from visible foreign material, of a color no higher than AOCS 7.6, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 159: Summer Yellow Cottonseed Oil.

Summer yellow cottonseed oil must be reasonably free from visible foreign material, sweet in flavor and odor, of a color no higher than AOCS 12, and shall contain not more than 0.25 percent free fatty acid nor in excess of a 0.10 percent moisture and volatile matter.

RULE 160: Off Summer Yellow Cottonseed Oil.

Off summer yellow cottonseed oil may be off in flavor and odor, must be reasonably free from visible foreign material, of a color no higher than AOCS 12, and shall contain not more than 0.50 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 161: Reddish Off Summer Yellow Cottonseed Oil.

Reddish off summer yellow cottonseed oil may be off in flavor and odor, must be reasonably free from visible foreign material, of a color no higher than AOCS 20, and shall contain not more than 0.75 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 162: Prime Bleachable Summer Yellow Cottonseed Oil.

Prime bleachable summer yellow cottonseed oil must be reasonably free from visible foreign material, clear at temperatures sufficiently high to melt the stearine, sweet in flavor and odor, and when bleached in the laboratory in accordance with NCPA Rule 405, Section 4, shall be of a color no higher than AOCS 2.5, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 163: Prime Summer White Cottonseed Oil.

Prime summer white cottonseed oil must be reasonably free from visible foreign material, clear at temperatures sufficient to melt the stearine, sweet in flavor and odor other than an earthy flavor, of a color no higher than AOCS 2.5, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 164: Prime Winter White Cottonseed Oil.

Prime winter white cottonseed oil must be reasonably free from visible foreign material, brilliant, sweet in flavor and odor other than an earthy flavor, of a color no higher than AOCS 2.5, must stand the cold test as prescribed in these Rules, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 165: Cottonseed Oil Stearine.

Sec. 1. Prime Bleachable Cottonseed Oil Stearine. Prime bleachable cottonseed oil stearine must be only the residue after the removal of prime winter cottonseed oil, must be free from visible foreign material, clear at a temperature of 10-15 degrees Centigrade above the melting point of the stearine, sweet in flavor and odor and when bleached in the laboratory in accordance with NCPA Rule 405, Section 4, shall be of a color no higher than AOCS 2.5, shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter and shall have a maximum iodine value of 98.

Sec. 2. Cottonseed Oil Stearine Other Than Bleachable. Cottonseed oil stearine other than bleachable conforms to all of the specifications of Section 1 of this Rule with the exception of the bleach color, which shall be subject to agreement between buyer and seller.

RULE 166: Prime Bleachable Winter Yellow Cottonseed Oil Olein.

Prime bleachable winter yellow cottonseed oil olein must be reasonably free from visible foreign material, sweet in flavor and odor, and when bleached in the laboratory in accordance with NCPA Rule 405, Section 4, shall be of a color no higher than AOCS 2.5, and must stand the cold test as prescribed in these Rules, and shall contain not more than 0.25 percent free fatty acid, nor in excess of 0.10 percent moisture and volatile matter.

C. CRUDE PEANUT OIL

RULE 175: Prime Crude Peanut Oil.

Prime crude peanut oil must be made from sound peanuts, must be sweet in flavor and odor, and must produce prime yellow peanut oil when refined by these rules, with a loss in weight not exceeding 5 percent, provided that any oil that refines with a greater loss than 5 percent, but still makes prime yellow peanut oil shall not be rejected, but shall be settled for in accordance with Rule 201. Combined moisture and insoluble impurities shall not exceed 1.0 percent as determined by AOCS test methods.

RULE 176: Basis Prime Crude Peanut Oil.

To be tenderable on a "basis prime" contract, crude peanut oil must refine as required by these Rules, to a color no higher than AOCS 10 and with a loss in weight not exceeding 12 percent. Combined moisture and insoluble impurities shall not exceed 1.0 percent as determined by AOCS test methods. Settlement shall be made in accordance with Rule 201.

RULE 177: Off Crude Peanut Oil.

Crude peanut oil not coming up to the specifications for prime crude peanut oil or basis prime crude peanut oil as set forth in Rule 175 and Rule 176 shall be called "off" crude peanut oil and shall he sold as such.

RULE 178: Solvent Extracted Peanut Oil.

Crude peanut oil produced by solvent extraction, with or without pre-pressing, shall be tenderable on contracts made under these Rules, provided the type of oil is declared at the time of sale. Crude peanut oil with a flash point below 250^0 F is rejectable.

RULE 179: Peanut-Cottonseed Oil Mixture.

Peanut oil which, when subjected to the Halphen test, shows a color reaction darker than that produced by an oil known to contain 1/2 of 1 percent of cottonseed oil may be rejected. Such oil should be sold on sample.

D. REFINED PEANUT OIL

RULE 185: Choice Peanut Oil.

Choice peanut oil must be free from visible foreign material, clear and brilliant at temperatures sufficient to melt the stearine, sweet in flavor and odor, of a color no higher than AOCS 5.0, and shall contain not more than 0.10 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 186: Prime Yellow Peanut Oil.

Prime yellow peanut oil must be free from visible foreign material, clear at temperatures sufficient to melt the stearine, sweet in flavor and odor, of a color no higher than AOCS 5.0, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

RULE 187: Good Off Yellow Peanut Oil.

Good off yellow peanut oil may be off in flavor and odor, must be free from visible foreign material, of a color no higher than AOCS 5.0, and shall contain not more than 0.25 percent free fatty acid nor in excess of 0.10 percent moisture and volatile matter.

E. COLOR DETERMINATION

RULE 190: Color Determination.

Unless seller shall otherwise indicate on invoices or contracts covering shipment of crude cottonseed or peanut oil, or refined or bleached cottonseed or peanut oil, or by telegram delivered to buyer prior to arrival of tank car or tank truck at destination, oil color shall be determined in accordance with AOCS Method Cc-13 b-45, Reapproved 1993, "Wesson Method Using Lovibond Glasses".

Wherever reference is made in this Chapter to AOCS color and Lovibond Method is used, it shall be understood to mean red color obtained with Lovibond glasses.

F. MINERAL OIL CONTAMINATION

RULE 191: Mineral Oil Contamination.

Vegetable oil contaminated with mineral oil is not deliverable on contracts made under these Rules.

G. SOAPSTOCK AND TANK BOTTOMS

RULE 195: Soapstock.

Soapstock is the by-product obtained from the refining of any vegetable oil. Contracts shall specify the name of the oil from which the soapstock is made and, when so named, the commodity shall not be adulterated with any other oil or soapstock without specific consent of the purchaser. If preservatives are added to soapstock, the nature and amount must be declared in the contract.

Unless otherwise specified, contracts shall be based upon 50 percent total fatty acid content, and soapstock containing less than 35 percent total fatty acid may be rejected. No claim on account of absence of glycerine will be considered unless the contract specifies glycerine content.

A draft against a sale of soapstock shall be drawn for 80 percent of the invoice price, unless seller's certificate of analysis accompanies the invoice. In the latter case, the draft may be drawn for the amount indicated by seller's analysis.

RULE 196: Acidulated Soapstock.

Acidulated soapstock is the product obtained from the complete acidulation and thorough settling of soapstock, as defined in Rule 195.

Unless otherwise specified, contracts shall be based upon total fatty acid content of 95 percent, and acidulated soapstock containing less than 85 percent total fatty acid may be rejected. No claim on account of absence of glycerine will be considered unless the contract specifies glycerine content.

A draft against a sale of acidulated soapstock shall be drawn for 90 percent of the invoice price, unless seller's certificate of analysis accompanies the invoice. In the latter case, the draft may be drawn for the amount indicated by seller's analysis.

RULE 197: Tank Bottoms.

Tank bottoms consist of the settlings that accumulate in crude vegetable oil storage tanks. They shall be sold on sample only.

Article 3. Adjustments and Variations

RULE 200: Quantity Variations.

A variation of 1/2 of 1 percent above or below contract quantity shall constitute a good delivery as to weight. When oil is shipped in tank cars, the variation shall apply against each tank car. If oil is shipped in tank trucks, the variation shall apply to the total quantity so shipped.

Settlement for under-weights or over-weights shall be made in accordance with Rule 41.

RULE 201: Crude Oil Settlements.

Sec. 1. Where crude oil is delivered on a prime, basis prime, off or reddish off crude contract, buyer shall credit seller at the rate of 3/4 of 1 percent of the contract price for each 1 percent refining loss under 9 percent in the case of cottonseed oil or under 5 percent in the case of peanut oil.

Sec. 2. Where crude oil is delivered on a prime, basis prime, off or reddish off crude contract, seller shall pay buyer at the rate of 1/2 of 1 percent of the contract price for each 1 point in excess of AOCS color 7.6 in the case of cottonseed oil or AOCS color 5 in the case of peanut oil, and at the rate of 1-1/2 percent of the contract price for off flavor and odor; and at the rate of 3/4 of 1 percent of the contract price for each 1 percent refining loss above 9 percent in the case of cottonseed oil or 5 percent in the case of peanut oil.

Where crude cottonseed oil is delivered on a basis prime crude contract and the refining loss exceeds 16 percent, seller shall pay buyer, in addition to the discount set forth above, at the rate of 3/4 of 1 percent of the contract price for each 1 percent of refining loss in excess of 16 percent.

Sec. 3. Oil, in which free fatty acid does not exceed 3.25 percent and which, when refined, is sweet in flavor and odor, shall be graded prime in flavor and odor. Oil, in which free fatty acid exceeds 3.25 percent and/or which, when refined, is not sweet in flavor and odor, shall be graded off in flavor and odor.

When off oil is sold by sample, the oil tendered must equal the sample in all respects, except that refining loss may exceed that of the sample by not more than 5 percent, with the price to be reduced in proportion to the excess loss. If refining loss of the tendered oil exceeds that of the sample by more than 5 percent, the oil is rejectable.

Sec. 4. Refining loss shall in all cases be calculated on the weight of the crude oil. Adjustments for color and flavor or odor shall in all cases be calculated on the settlement weight of the refined oil as determined by analysis. Color and refining loss shall in all cases be calculated fractionally.

Article 4. Packages

RULE 205: Type of Package.

Oil, soapstock and tank bottoms may be delivered in tank cars, tank trucks, drums or barrels, in accordance with the terms of the contract. Unless otherwise specified, it shall be understood that delivery will be in tank cars furnished by the buyer.

RULE 206: Tank Cars or Trucks.

Where a contract calls for one or more tank cars or trucks of specified capacity, it shall be understood that the party furnishing such cars or trucks shall supply cars or trucks of the specified capacity or its equivalent, provided that any additional expense arising from switching, stopping or weighing charges caused by an increase in the number of tanks or trucks shall be borne by the party furnishing such tanks or trucks.

In no event, shall buyer or seller furnish a car of greater capacity than 95,000 lbs. without agreement between buyer and seller.

When soapstock, raw or acidulated, is sold in seller's tanks, such tanks must be equipped with steam coils. When not so equipped, buyer may reject.

RULE 207: Barrels.

If crude or refined oil is sold in barrels, it shall be understood that such barrels shall be new or thoroughly cleaned, used steel drums, of the open head or bung type. Drums shall be in good shipping order and shall contain not less than 360 lbs. nor more than 440 lbs., net, provided that the aggregate weight of oil delivered on any such contract shall equal 400 lbs. for each barrel sold.

Article 5. Performance of Contract

A. Buyers' Tanks

RULE 210: Origin, Destination and Routing Notices.

Sec. 1. Specified Origin-Buyers' Routing. Where the contract specifies point of origin and buyers routing, no notice or declaration is required, but the buyer shall forward tank cars or tank trucks as provided in Rule 211.

Sec. 2. F.0.B. Common Points or F.0.B. Several Points-Buyer's Routing. Where contract specifies f.o.b. common points or f.o.b. more than one point, buyer's routing, for specified shipment, seller shall notify buyer before the first day of the contract period, or immediately if period is less than 30 days, of point or points from which shipment will be made. If seller does not give such notice within the period specified, the buyer must, at least 15 days prior to expiration of the contract period, request such notice, confirming his request by letter. Failure by seller thereupon to furnish such notice immediately will give the buyer the option, at any time during but not after the contract period, to treat the contract as breached by the seller. If he elects to do so, he must proceed as provided in Rule 50, 51, 52, and 53.

Sec. 3. Seller's Routing. Where the contract specifies seller's routing, for specified shipment, buyer must notify seller of destination before seller is required to give location and routing. Such notification must be furnished at least fifteen days prior to the expiration of the contract period or immediately if period is less than fifteen days. Upon receiving such notice, seller must, within the foregoing time limits, notify buyer of the point from which shipment will be made.

Failure by either person to comply with the provisions of this Rule will give the other party the option, at any time during but not after the contract period, to treat the contract as breached by the person in default. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

RULE 211: Forwarding Buyer's Tanks.

Sec. 1. In contracts for immediate, prompt or specified shipment from specified point of origin, and in all other cases where buyer has received notices provided in Rule 210, Sec. 2 and 3, buyer must forward tank cars or tank trucks in time to reach, by the ordinary course of transportation and before expiration of the contract period, the point from which shipment is to be made.

Sec. 2. In the case of contracts providing for shipments not covered under Sec. 1 of this Rule, either buyer or seller may, at the time the contract is made or at least five days prior to the beginning of the contract delivery period, furnish the other contracting party with a shipping schedule. Unless such a schedule is rejected in writing by one of the contracting parties, it shall be considered a part of the contract and tank cars or tank trucks shall be forwarded accordingly. If the contracting parties cannot agree on such a schedule or if no such schedule is furnished by either party, then it shall be understood that tank cars or tank trucks shall be forwarded on a scattered basis as defined in Rule 28.

Sec. 3. If the first buyer of a contract for oil resells that contract, it shall be understood that, unless otherwise agreed to by the original seller, the terms for forwarding tank cars and/or trucks, as established by Sec. 1 and Sec. 2 of this Rule, shall apply to this and any subsequent resale contracts.

Sec. 4. If the first buyer of a contract for oil resells that contract, it shall be understood that they will notify the mill in writing and release the oil to be loaded in the succeeding buyer's equipment. Subsequent resales, if they occur, shall be handled in the same manner. Notification shall be made by the first day of each shipment month, or within two business days of date of sale.

Sec. 5. When tank cars are specified in the contract, buyer must notify seller giving location, number and initial of each car and contents when last loaded, if loaded with other than edible vegetable oil and soapstock. Buyer shall promptly follow up such notice with railroad receipt and bill of lading. The railroad record will determine date of forwarding. When tank trucks are specified in the contract, buyer shall give advance notice and seller may require at least 72 hours advance notice of the expected arrival date.

Sec. 6. Failure of buyer to forward tanks, as herein required, shall give seller the option to exact penalty against first buyer at the rate of $8.00 per (standard) tank car or tank truck for each day's delay, with proportional charges of $10.00 per tank car day or fraction thereof for 10,000 gallon tank cars. For 20,000-23,500 gallon tank cars, the penalty charge per car per day or fraction thereof shall be $20.00 for the first two (2) days, $30.00 per day for the next two (2) days and $60.00 per day thereafter. He shall alternatively have the option to treat the contract as breached. In the latter case, seller must notify buyer by telegram of his intention and the contract shall remain in force until such notice is given. If seller fails to give such notice within 24 (twenty-four) hours after expiration of contract period, he must load such tank cars or tank trucks as have already been forwarded by buyer. When seller elects to treat a contract as breached under this Rule, he must proceed as provided in Rules 50, 51, 52 and 53.

RULE 212: Delay Of Tanks By Carrier.

If arrival of tank cars is delayed through fault of the carrier, buyer shall not be required to pay penalty or be held to be in default. Where such delay prevents a tank car from reaching seller prior to expiration of contract period, the time within which seller must load and ship shall be extended for 48 hours after the car is placed at seller's plant.

If a tank car or tank truck is disabled or lost en route for loading, buyer must forward another tank car or tank truck within 72 hours after receipt of information to that effect, or in time to reach destination within contract period. Failure to make such substitution within the time permitted shall give the seller the option to treat the contract as breached by buyer. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

RULE 213: Arrival Of Tank Cars.

Except as provided in Rule 216, arrival of tank cars, within the free switching limits of the town where the plant from which shipment is to be made is located, will constitute delivery of tank cars by buyer to seller.

RULE 214: Loading Tanks.

Sec. 1. The shipper shall inspect all tank cars or tank trucks before loading to determine that tanks are clean and that their mechanical parts, especially steam pipes, coils, and outlet pipes and valves, are in good condition.

Sec. 2. Where tanks are found mechanically defective or if tank trucks cannot be effectively inspected, they shall not be loaded until buyer has been notified by telegram and specifically authorizes such loading. Shipper shall also inspect tanks after loading to see that valves are properly seated, that caps are properly applied to outlet pipes, that caps or plugs are properly applied to steam pipes, and that dome covers are properly applied, and sealed, if they can be sealed effectively. Failure by a shipper to observe the foregoing procedure shall constitute negligence on his part and shall relieve the buyer of responsibility for any and all loss or damage resulting therefrom.

Sec. 3. Where tanks require cleaning, shipper shall clean them and charge the buyer the actual cost therefor. If buyer furnishes a tank previously used for any commodity the residue of which would damage the product to be loaded therein, the shipper shall clean such tank as effectively as possible and shall, before loading, notify buyer of the condition of the tank and of possible product contamination if tank is loaded. Buyer must then advise seller whether he desires such tank loaded or will furnish another tank.

Sec. 4. If buyer fails to furnish another tank or if he directs loading into the contaminated tank, shipper will not be responsible for damage to the product so loaded and the quality of such product shall be determined by seller's point-of-origin sample drawn in accordance with these Rules.

Note: The following excerpt from the rules for loading tank cars, issued by the Association of American Railroads, is printed here as information only and is not a part of these Rules:

"Before tank cars are loaded, the shipper must examine the tanks and their appurtenances to see that the safety and outlet valves, the safety vents, the closures of all openings, and the protective covers of all appurtenances are In proper condition, Tanks with bottom discharge outlets must have their outlet caps off or outlet cap plugs open during entire time tanks are being loaded. After loading, tanks which show any dropping of liquid contents at the seams or rivets, or with bottom outlet valves which perm/t more than a dropping of the liquid with the outlet caps off or outlet cap plugs open, must not be offered for transportation until proper repairs have been made.

Tank cars equipped with interior heater coils must be loaded with heater coil inlet and outlet caps off during entire time tanks are being loaded and show no leakage with these caps off. All closures of openings in tank cars and of their protective housings must be properly secured in place by the use of a bar, wrench, or other suitable tool. A wrench having a handle at least 48 inches long must be used to apply the outlet valve cap. Manhole covers and outlet valve caps must be made tight against leakage of vapor and liquid, by use of gaskets of suitable material before cars are tendered to carrier for transportation. Luting materials must not be used in outlet cap or on threads of bottom outlet."

RULE 215: Tanks - Capacity And Loading.

Sec. 1. Buyer must furnish tanks of sufficient capacity to permit fulfillment of contract and seller must load tanks to full capacity, within the limits of the contract. Either party failing to comply with the requirements of this Rule shall pay the other party, for such deficiency, the difference between market and contract price at time of shipment.

Sec. 2. If seller fails to load to capacity within the limits of the contract, he shall pay the buyer any freight charges incurred by the latter as a result of such failure. Such payment shall be determined by the difference between settlement weight and minimum weight for freight purposes.

RULE 216: Loading And Shipping Periods.

Sec. 1. Tank Cars. Seller shall have 24 hours, beginning at the first 7:00 a.m. after placement of tank cars at his plant, in which to load and ship, even though such 24 hour period extends beyond the expiration of the contract period; provided however that such cars shall not be placed before the scheduled loading dates unless agreed to by the seller. Immediately upon receipt of notice of arrival of tank cars at town where his plant is located, seller must give orders for placing cars at his plant and must receive such cars on tender by the carrier.

Any delay in placement of cars at seller's plant due to failure of seller to have his track clear will give the buyer the right, at any time after 24 hours and before tank is loaded to treat the contract as breached by seller. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

Sec. 2. When the buyer has made a good delivery of tank cars and the seller fails to load and ship such cars within the 24-hour period referred to in Sec. 1, buyer may charge the seller a penalty of $8.00 per 8,000 gallon tank car per day or fraction thereof, beginning with the expiration of said period, and proportional charges of $10.00 per tank car per day or fraction thereof for 10,000 gallon tank cars. For 20,000-23,500 gallon tank cars, the penalty charge per car per day or fraction thereof shall be $20.00 for the first two (2) days, $30.00 per day for the next two (2) days and $60.00 per day thereafter. If the 24 hour period and the contract period have both expired and the seller has not loaded and shipped, the buyer will have a continuing option to treat the contract as breached by the seller. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

Sec. 3. Tank Trucks. When tank trucks are to be used for delivery of oil or soapstock, buyer and seller shall agree on the approximate time of loading and buyer shall have trucks arrive at seller's plant not more than 48 hours after the time agreed upon. Seller shall begin loading promptly and shall complete loading within 4 hours after truck arrival; provided, if trucks arrive after 4 p.m., seller shall not be obligated to begin loading before 8 a.m. the following working day. Failure of seller to order tank trucks for loading within the contract period shall give buyer the right to treat the contract as breached by seller. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

For loading delays in excess of the above time limits, buyer may assess seller for the applicable published public motor carrier detention charges or, where none are published, at the rate of $2.50 per tank truck per hour or fraction thereof. If loading is delayed 24 hours after expiration of the contract period, buyer may treat the contract as breached by the seller. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

B. SELLERS' TANKS

RULE 217: Shipping Period.

If oil or soapstock is sold in seller's tank cars or tank trucks, f.o.b. plant or c.a.f. a named point for specified shipment, seller shall have the right to ship at his convenience during the contract period.

RULE 218: Shipping Instructions.

If contracts specify seller's tank cars or tank trucks, f.o.b. plant, c.a.f., or basis c.a.f. a named point for shipments during a given month, the buyer must notify seller of destination and give shipping instructions within five days after request for same, provided such request is not dated prior to the contract month.

If buyer fails to comply with this Rule, seller will have the option, at any time during but not after the contract period, to treat the contract as breached. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

RULE 219: Failure To Ship.

If seller has received destination notice and shipping instructions as provided in Rule 218, and fails to ship within the contract period, buyer may treat the contract as breached by seller. If he elects to do so, he must proceed as provided in Rules 50, 51, 52 and 53.

Should buyer fail to exercise his option for twenty-four hours after expiration of the contract period, he shall accept such tanks as have already been loaded and shipped at the time he thereafter elects to treat the contract as breached.

RULE 220: Unloading Seller's Tanks.

Sec. 1. If a product of contract quality is delivered in seller's tank cars with serviceable coils, buyer must unload such product promptly upon arrival. Twenty-four (24) hours free time will be allowed for unloading; free time shall start at the first 7: 00 a.m. after placement of tank cars at buyer's plant. If delivered in tank trucks, buyer must unload within four (4) hours after arrival of truck or trucks; however, if tank trucks arrive after 4 p.m. buyer shall not be obligated to begin unloading before 8 a.m. the following work day.

Sec. 2. If lack of serviceable coils delays unloading, buyer may take up to three additional working days to complete unloading of tank cars. On deliveries in seller's tank trucks, it shall be seller's responsibility to provide, at his own expense, equipment in such condition as will permit buyer to unload within the above time limits.

Sec. 3. When the buyer is responsible for unloading delays in excess of the above time limits, seller may assess buyer the following penalties: $8.00 per 8,000 gallon tank car per day, or fraction thereof, and proportional charges of $10.00 per tank car per day for 10,000 gallon tank cars. For 20,000-23,500 gallon tank cars, the penalty charge per car per day or fraction thereof shall be $20.00 for the first two (2) days, $30.00 per day for the next two (2) days and $60.00 per day thereafter. On truck shipments, the applicable published public motor carrier detention charges or, where none are published, the rate of $2.50 per tank truck per hour or fraction thereof will apply.

C. PRODUCTS AT DESTINATION

RULE 221: Notice Of Shortage In Weight.

Sec. 1. If the gross weight of oil, soapstock or tank bottoms, determined according to these Rules, indicates a shortage exceeding 500 pounds if in 60,000 pound tank cars, 1,000

pounds if in 150,000 pound tank cars or 300 pounds if in tank trucks, with due allowance for change in fuel weight, buyer shall so notify seller immediately by telegram, stating weight, seal numbers, if any, and whether seals are intact. In the case of tank cars, seller shall have 24 hours from time of dispatch of buyer's telegram in which to examine the case and the product shall be held without unloading during this period. Seller must, however, immediately upon receipt of above notice, notify buyer by telegram of his intention.

Sec. 2. In the case of tank trucks, seller shall immediately reply by telegram to buyer's notification, advising buyer whether to proceed with unloading on the basis of buyer's weights or to have the truck inspected and weighed as provided in Rule 66. Truck shall be held without unloading until receipt of seller's telegram. If such telegram is not received within 2 hours after dispatch of buyer's wire, buyer may have truck weighed as provided in Rule 66 and unload it.

Sec. 3. If no shortage in gross weight exists under Section 1 of this Rule but a shortage in net weight exceeding the quantities specified in that Section is indicated, buyer shall so notify seller immediately by telephone. Seller, in turn, shall immediately advise buyer whether he wishes the car or truck inspected and weighed by one of the parties named in Rule 66. Seller will be responsible for arranging such inspection no later than the next business day after buyer's notification. Cost of such inspection shall be paid by the party whose reported net weight shows the greatest difference from that determined by the inspection. Additional demurrage and car rental will be for the account of the party who is at fault.

Sec. 4. So that the consignee can comply with Section 1 of this Rule, the shipper shall, immediately after loading and weighing tank cars, mail a copy of the bill of lading to the consignee. If a tank car arrives in good order at consignee's plant prior to arrival of the bill of lading, consignee may weigh and unload such car in accordance with Rule 73 and such weight shall govern for settlement purposes.

RULE 222: Non-Arrival Of Documents.

If a tank car arrives at destination before the buyer has had an opportunity to take up the draft with the bill of lading, the time within which the car must be sampled, unloaded, rejected or claim filed against such car shall run from the date the bill of lading is tendered the buyer.

RULE 223: Rejection.

Sec. 1. Tank Cars. Buyer shall have 72 hours after receipt of tank cars at destination for sampling and examination as provided in Rule 230. If, within this period, buyer elects to reject, he must so advise seller by telegram, stating railroad record of time of arrival. If seller decides to replace, as provided in Section 3, buyer will, if possible, furnish tank cars upon request of seller. If buyer is unable to do so, seller may furnish such tank cars.

Sec. 2. Tank Trucks. If a product which, in the judgment of the buyer is below contract quality, is received by tank truck, buyer may either hold it in a clean, separate tank or may unload it into his general storage. An official sample, drawn as provided in Rule 230, shall

be promptly analyzed and the results reported to the seller. If a product is below contract quality and has been held in separate storage, buyer may reject, notifying seller by telegram of his decision to do so.

If a product is below contract quality but has not been held in separate storage, buyer may not reject. In such event, settlement shall be made on the basis of the official sample in accordance with Rule 201; provided, that the maximum discount for refining loss in excess of 16% shall not be limited to 3%.

Sec. 3. Replacement. If seller is notified of rejection, he shall have the privilege of replacement with a product of contract quality within the contract period. If contract period has expired, seller may replace with a product of contract quality by notifying buyer, within 48 hours after receipt of rejection notice, of his intention to do so. Only one replacement is permitted and transportation costs may not exceed those of the original shipment. If seller declines or fails to replace, as herein provided, the buyer must, to preserve a claim, proceed in accordance with Rules 50, 51, 52 and 53.

Sec. 4. Rejection Costs. If a product is properly rejected, seller must, within 48 hours after receipt of rejection notice, dispose of the rejected product and repay to buyer all expenses incurred by buyer on account of said product. In calculating rejection costs, tank car rental shall be computed at the rate of $8.00 per 8,000 gallon tank car per day or fraction thereof and proportional charges of $10.00 per tank car per day for 10,000 gallon tank cars. For 20,000-23,500 gallon tank cars, the charge per car per day or fraction thereof shall be $20,00 for the first two (2) days, $30.00 per day for the next two (2) days and $60.00 per day thereafter. If seller fails to perform the foregoing obligations, the buyer must, to preserve a claim, proceed as provided in Rules 50, 51, 52 and 53.

RULE 224: Tank Cars Or Trucks Delayed In Dispute.

Either buyer's or seller's tank cars or tank trucks delayed during settlement of dispute, by arbitration or otherwise, shall be subject to penalty at the rates and with the free time provided in Rule 216. The penalty shall be paid by the party in default.

Article 6. Weighing and Sampling

RULE 230: Samples For Settlement Purposes.

Sec. 1. Crude or Refined Oil or Soapstock at Point of Origin. If the seller so elects, he shall have the right at his own expense to have a sample of crude or refined oil or soapstock in tank car or tank truck drawn at the point of origin. Such sampling shall be performed only by an official weigher and inspector. If the buyer furnishes a tank contaminated by its previous use and said tank is to be loaded at buyer's risk as provided in Rule 214, seller's sample shall be taken while the oil or soapstock is flowing into the tank.

Seller shall indicate on his invoice that official sample was so drawn at origin. If seller intends to have his portion of said sample chemically analyzed he shall note this fact on his invoice and shall send the buyer a copy of the analytical report.

In the case of tank cars, a portion of the sample, properly identified, shall be immediately forwarded by the official weigher and inspector to the buyer. If said portion of the sample reaches the buyer before the tank car arrives at destination, it shall become the official sample for settlement purposes. The buyer shall analyze such sample and report to the seller In accordance with Section 3 of this Rule.

In the case of tank trucks, a portion of the sample, properly identified, shall be immediately forwarded by the Official Weigher and Inspector to the buyer via the tank truck driver. Such sample upon receipt by buyer, shall become the official sample for settlement purposes. The buyer shall analyze such sample and report to the seller in accordance with Section 3 of this Rule.

When furnishing shipping instructions, the buyer may direct that a portion of the sample be immediately forwarded to an address other than the destination of the shipment. In such event, the requirement that buyer's portion of the sample reach destinationwith or prior to arrival of the shipment shall not apply, and such sample shall be recognized as official for settlement purposes.

Sec. 2. Crude or Refined Oil or Soapstock at Destination. Unless seller has furnished buyer with an official sample, as provided in Section 1 of this Rule, buyer shall, upon arrival of tank car or tank truck, draw a sample in the manner prescribed in these Rules. Buyer shall analyze such sample and report to the seller in accordance with Section 3 of this Rule.

If buyer's analysis indicates that product is of contract quality or better, seller agrees to accept buyer's sample as official. If buyer's analysis indicates that product is below

contract quality, either party may call for an official sample to be taken in accordance with these Rules and settlement shall be made thereon.

Sec. 3. Reporting Buyer's Analysis. Buyer shall report to seller the results of his analysis of sample, drawn according to Sec. 1 or Sec. 2 of this Rule, within 72 hours after arrival of tank car or tank truck at buyer's plant, except when such analysis indicates the oil is not prime in the case of crude or is not of contract quality in the case of refined. In the latter case, buyer shall immediately notify seller of results by telegram. In either event, seller shall have 48 hours after receipt of notification to accept or reject buyers analysis. If he rejects, analysis shall be arranged in accordance with Rule 101.

Sec. 4. Where an official sample of crude oil is submitted, by either buyer or seller, to an official chemist for official analysis, the sampling certificate shall show the kind of oil (cottonseed, peanut, etc.), the type of process (mechanical or extracted), and,if requested by the seller, the analysis procedure (regular, slow breaking, and expeller or screwpress) to be used and the method of color determination. The chemist shall include, in his reports to buyer and seller, all of the foregoing information.

RULE 231: Methods of Sampling Oil.

Sec. 1. Barrels. Samples shall be drawn with an oil thief conforming to the specifications in AOCS Method C 1-47 (Reapproved 1993). At least 10 percent of the barrels, selected at random, shall be sampled. Individual samples shall be composited, mixed thoroughly, and distributed in laboratory containers, as provided in Section 2 of this Rule. For complete details of the sampling method to be used, refer to AOCS Method C 1-47 (Reapproved 1993).

Sec. 2. Tank Cars and Tank Trucks Loaded. A vertical section of the oil from top to bottom of the car must be taken with an official trier which conforms to the following specifications. This trier must be furnished by buyer at destination, or seller at shipping point:

Diameter - 2 inches uniform diameter throughout.

Length - Sufficient to take a sample of the entire depth of oil in tank - usually 10 feet.

Closure - A tight valve or cock at lower end which allows an unrestricted opening 2 inches in diameter when fully opened, and is free from leaks when closed. The valve shall be opened and closed by means of a rod from the top of the trier and so constructed as to take sample within 1/4 inch (or less) of the bottom of the tank.

The trier must be clean, dry and free from contamination with other oils. When two or more cars are sampled consecutively, all sampling equipment must be thoroughly cleaned after sampling each car.

The trier must be lowered vertically through the oil with the bottom valve wide open, at a uniform rate slow enough to permit the trier to fill as it is lowered, requiring 10 to 15 seconds to reach the bottom. The bottom valve is then closed and the tube withdrawn.

Several takes shall be drawn by this method in a manner that will prevent the introduction of any moisture. They shall, within one hour, be placed in a clean container and thoroughly mixed. From this mixture, there shall be drawn a three-gallon sample,

equal portions of which shall, through the use of a three-spouted funnel, be put into three new, clean, one-gallon tinned metal or odor-free high-density polyethylene containers of natural color, modified square type, 115 gm., with 1 - 1/2" neck opening, which shall be filled to not closer than two inches of the top. All these portions shall be carefully marked and handled in accordance with Rules 101 or 230.

Should sample be drawn at point of origin by official weigher and inspector, he shall, if seals can be applied effectively, seal tank both top and bottom with official seals provided by the Association.

Sec. 3. Tank Cars and Trucks - Loading and Unloading. Where a sample is taken during loading or unloading, the continuous flow method of sampling (AOCS C 1-47, Reapproved 1993) shall be used as follows:

(a) A bleeder line, made of 3/8" standard pipe with a slight downward slope, is located in a vertical section of the pumping line through which the product is continuously flowing upward to the individual tank, tank car or tank truck being sampled. The sample line should be located as far away from elbows or tees as possible, should penetrate to the center of the pumping line, should be cut beveled at the end looking downward and should discharge into a sample tank or drum. The sample line should not have a petcock.

(b) The metal sample tank or drum is of approximately 50 gallon capacity, having a suitable metal cover and an inverted cone bottom welded securely in place. Just above the bottom of the drum, a 3/8" draw-off line, equipped with a petcock is installed and is used for obtaining the required sample(s) from the gross sample. To facilitate complete draining and easy cleaning, the bottom of the drum should be replaced by a securely welded cone bottom, having an apex angle of approximately 120 with the other two angles each about 30 to the horizontal. To prevent loss of solvent by evaporation, a suitable metal cover, with slots or holes to permit insertion of the sampler pipe and mixer shaft, should be placed over the sample tank during the sampling and mixing operation.

(c) Prior to the start of the pumping period, the sampling equipment should be examined and the draw-off lines closed. During the pumping period, it should be made certain that a continuous flow of oil is being obtained. When the tank car, tank truck, or tank has been filled, the mechanical mixer is started and the gross sample is mixed thoroughly to obtain uniform distribution of moisture, meal and impurities. After thorough mixing and with agitator still running, the draw-off line is opened and three 1-gallon samples withdrawn into new and dry 1-gallon containers, filled to a level about 2" from the top. The sample containers are immediately closed and properly labeled.

(d) Through the 3" line connected to the apex of the conical bottom, surplus oil is returned to oil storage or to the tank car if the official weight was obtained prior to sampling. After draining, the tank is thoroughly cleaned by flushing, washing and drying or by other suitable means where conditions warrant and the cleanings withdrawn through the cleanout line. The cleaning procedure should be such that there will be no contamination of the next sample drawn.

Note: This method is applicable only if the product is completely liquid and free-flowing and does not contain any material that may plug the bleeder line. Where

multiple loading or unloading facilities are in use, a separate sample tank should be available for each unit, although individual agitators are not required."

Sec. 4. Storage Tanks. Samples of bulk oil in storage tanks shall be drained as follows: Samples shall be taken at one-foot levels of the tank from bottom to top, by use of a bomb type sampler, or a similar device. From the well-mixed composite sample, four one- gallon samples shall be taken as the official representative samples of the oil in storage. All cans and utensils used must be perfectly clean and dry and the containers of the official samples shall be securely fastened. All these portions shall be carefully marked and held for disposition in accordance with Rule 101.

RULE 232: Soapstock - Methods Of Sampling And Adjusting Differences.

Sec. 1. Raw Soapstock. Soapstock shall be sampled only during loading. Samples must be drawn from the flowing stock at the discharge end of the pipe as the material enters the tank car or other container, as follows:

Sample the fling stock at regular and frequent intervals, using a ladle with a handle, and tong not less than 25 individual samples of uniform size. Place these samples in a drum, can or other container, with a tight cover. The total gross sample should amount to 1/10% to 2/10%, by weight, of the shipment, i.e., 60 to 120 Lbs. per tank car.

Except during the actual sampling, the sample container must be closed with the tight cover, to prevent loss of moisture by evaporation, and also to prevent contamination with water or other foreign material. This is particularly important, If the loading is interrupted for any reason. If the flow is interrupted and it is necessary to clear the line, the use of air Is preferable to steam. When necessary to blow the line with steam, the steam must be blown back from the end of the line to or toward the supply tank and not toward the sampling end of the line.

Add 1/10% of oil of cassia to the composite sample, - thoroughly, fill four cans, 1 lb. or larger, and seal them hermetically (air tight). Mark them properly for identification.

Sec. 2. Acidulated Soapstock. This material may be sampled during loading or upon delivery by the method described in Section I of this Rule or by any of the official methods for sampling liquid fats in tank cars, tank trucks or drums, provided the material is sufficiently liquid to be sampled in this manner.

Samples shall be prepared in accordance with Section I of this Rule except that the addition of oil of cassia may be omitted.

Sec. 3. Handling Samples. The official sampler shall properly mark and identify each sample portion, sending one to the buyer, giving one to the seller, and retaining two. Sample shall be plainly marked to show date sampled, contents, car number or truck identification, and shipper, and buyer's portion shall be sent to same address as destination of the shipment, unless otherwise directed by the buyer. Official sampler shall show on his certificate the dates when sampling was started and completed. In the case of truck

shipment the sample shall be forwarded to buyer via the truck driver unless otherwise directed by the buyer.

If in the case of rail shipments the loading sample doer not reach destination before the car arrives and seller cannot show that delay is due to causes beyond his control, buyer may charge seller with penalty of $3.00 per tank car per day until sample is received.

Sec. 4. Adjusting Differences. Seller's analysis shall be furnished buyer within 10 days after he receives sample and buyer's analysis shall be famished seller within 10 days after the latter receives sample. If the difference between buyer's and seller's analyses is not more than I per cent in total fatty acid content, the two shall be averaged for settlement. If the difference in total fatty acid content exceeds I per cent, the official sampler shall forward a portion of the sample to an official chemist, agreed upon by buyer and seller, for umpire analysis. If buyer and seller cannot agree, the Association Secretary shall name such umpire chemist. The mean of the umpire chemist's analysis and the analysis of the buyer or seller closest thereto shall be used for settlement.

The fourth sample portion shall be retained by the sampler to replace any of the other three portions that may be lost.

RULE 233: Weighing.

Sec. 1. Tank Car. Tank cars shall be weighed at destination as provided in Rule 73. Certification to this effect by the weigher shall be evidence in the case of claims or arbitration. If, however, the shipper, with his invoice, furnishes an official weight certificate signed by one of the parties described in Rule 66, the weight shown on that certificate shall govern settlement.

Sec. 2. Tank Trucks. Except where seller is not responsible for destination weights on truck deliveries, as provided in Rule 4, tank trucks shall be weighed at destination in accordance with conditions of Rule 73. Certification to this effect by official weigher shall be evidence in the case of claim or arbitration.

Sec. 3. Barrel. Tares shall be determined by emptying 4 of each 100 barrels selected at random. Allowance shall be made for difference in tares in excess of I pound per barrel. Weigher shall place a distinguishing mark on each barrel emptied and such mark shall be shown on the weight certificate.

Article 7. Claims

RULE 235: Period For Filing Claims.

Sec. 1. Oil. All claims on account of shipment of oil shall be made by the buyer within 10 days after arrival of the sample forwarded by seller under Rule 230. If seller fails to forward his analysis within 10 days, in accordance with Rule 230, the period within which buyer may file claim shall be extended by the number of days the seller delays. Settlement shall be made by seller within 10 days after receipt of statement from the buyer.

Sec. 2. Soapstock. All claims for loss in weight on shipments of raw or acidulated soapstock shall be made within 10 days after arrival of product at destination. All claims for adjustment of fatty acid content must be made within 10 days after buyer has received the samples forwarded by seller under Rule 232. If seller fails to forward his analysis within 10 days, in accordance with Rule 232, period within which buyer may file claim shall be extended by the number of days the seller delays.

Sec. 3. Tank Bottoms. All claims for loss in weight on shipments of tank bottoms shall be made within 10 days after arrival of product at destination.

CHAPTER IV. COTTONSEED MEAL AND COTTONSEED HULLS

Article 1. Definitions of Words and Terms

RULE 240: Applicability.

Unless otherwise specified, all Rules in Chapter IV shall apply to contracts for cottonseed meal, and cottonseed hulls.

RULE 241: A Contract.

Sec. 1. Unless otherwise stated, contracts shall be expressed as a specific number of tons as defined in Rule 25. Contracts covering more than one carload or truckload shall be construed as divisible and not entire so that default, in quantity or quality, on one or more cars or trucks will not affect the remainder of the contract. Each carload or truckload shipment shall be treated as a separate contract for purposes of quality determination, except in the case of shipments for export where quality shall be determined on the basis of each 112-ton lot or fraction thereof.

Nothing in this Rule shall prevent buyer and seller from agreeing to average out weights on contracts involving shipments over more than one month or to more than one consignee.

RULE 242: A Car.

Unless otherwise specified in the contract, a car of cottonseed meal or pellets shall be a minimum of 80 tons

RULE 243: A Truckload.

Unless otherwise specified in the contract, a truckload of cottonseed meal shall be 25 tons; a truckload of cottonseed hulls shall be 23 tons. Processing plants will comply with state and federal laws not to exceed maximum weights.

Article 2. Grade and Quality

A. COTTONSEED MEAL

RULE 260: Cottonseed Meal.

Cottonseed meal is a product of the cottonseed only, composed principally of the kernel, with such portions of the fiber, hull, and oil as may be left in the course of manufacture. It shall be graded and classed according to the following Rules

RULE 261: Cottonseed Meal, Prime Quality.

Cottonseed meal, prime quality must be finely ground not necessarily bolted, must not have a sour or musty or burnt odor must be free from excess of lint, and shall contain not less than 36 per cent of protein or 5.76 per cent of nitrogen It shall be designated and sold according to its protein or its nitrogen content. Cottonseed meal with 36 per cent of protein or 5.76 per cent of nitrogen shall be termed "36 per cent protein cottonseed meal, prime quality", or "5.76 per cent nitrogen cottonseed meal prime quality", and higher grades appropriately designated to reflect the guaranteed analysis.

RULE 262: Solvent Extracted Cottonseed Meal, Prime Quality.

Solvent extracted cottonseed meal, prime quality, shall be meal manufactured by the solvent extraction process, shall be so designated at the time of sale and so tagged. It shall meet the quality specifications provided in Rule 261.

RULE 263: Low Gossypol Cottonseed Meal.

Low Gossypol cottonseed meal shall mean cottonseed meal that contains not more than 0.04 per cent free gossypol. It shall be designated at the time of sale, so tagged, and shall meet the quality specifications contained in Rule 261.

RULE 264: Cottonseed Meal, Off Quality.

Cottonseed meal that has a sour or musty or burnt odor**,** contains more than 5% hard lumps or has insect infestation shall be graded cottonseed meal, off quality.

B. SIZED COTTONSEED MEAL

Rule 265: Conditioning Agents.

Any of the above meal products (listed in Rules 260 to 264) may contain a non-nutritive, inert, non-toxic conditioning agent to reduce caking and improve flow ability, in an amount not to exceed that necessary to accomplish its intended effect and in no case to exceed 0.5%. The name of the conditioning agent must be shown as an added ingredient.

RULE 266: Pelleted Cottonseed Meal, Prime Quality.

. . . . Percent protein cottonseed meal pellets, prime quality, shall be sized and pelleted as stated in contract. It shall not contain in excess of 5 per cent loose cottonseed meal unless specifically stated in contract.

C. WHOLE PRESSED COTTONSEED

RULE 267: Whole Pressed Cottonseed.

Whole pressed cottonseed is the product that results from subjecting whole undecorticated cottonseed to the expeller, extruder, or screw press process for extraction of the oil. It includes the entire cottonseed less the oil extracted and the linters removed.

RULE 268: Whole Pressed Cottonseed, Prime Quality.

Whole pressed cottonseed, prime quality, must be produced from sound cottonseed, shall be firm in texture, must not have a sour or musty or burnt odor, and shall contain not less than 22 per cent of crude protein. It shall be sold according to its protein content.

Whole pressed cottonseed with 22 per cent of crude protein shall be termed "22 per cent whole pressed cottonseed, prime quality", and higher grades appropriately designated to reflect the guaranteed analysis.

D. COTTONSEED HULLS

RULE 280: Prime Cottonseed Hulls.

Prime cottonseed hulls shall be sound, not musty, and shall contain no more than 5% foreign substances and trash, and shall have no lint taken off except through the linters in the usual oil milling of cottonseed. Cotton burrs and stems, even though reground, also hull pepper, bran and loose lint reclaimed from a lint beater, shall be considered foreign substances, if added to cottonseed hulls.

RULE 281: Off Quality Cottonseed Hulls.

Cottonseed hulls that do not meet the standard set forth in Rule 280, or that have been made from off grade, heated, bolly or trashy cottonseed, or that have heated after being made, or are otherwise damaged, or contain products not associated with cottonseed**,** shall be graded off quality cottonseed hulls.

E. SIZED COTTONSEED HULLS

RULE 282: Cottonseed Hull Pellets, Prime Quality

Cottonseed hulls that meet the specifications of Rule 280 shall be sized and pelleted as stated in the contract. Pelleted shipments may contain no more than 5% loose cottonseed hulls unless specifically stated in contract.

Chapter IV. Cottonseed Meal and Cottonseed Hulls

Article 3. Adjustments and Variations

RULE 283: Quantity Variations.

On contracts for either bulk or sacked cottonseed meal or cottonseed hulls, a variation of 5 per cent above or below contract quantity shall constitute a good delivery as to weight; provided that 5 per cent shall not exceed 2-1/2 tons.

Settlement for overweight or underweight shall be made in accordance with Rule 41.

RULE 284: Meal Settlements.

Sec. 1. No claim for deficiency in protein or combined protein and fat shall be made by the buyer unless such deficiency shall exceed 1/2 unit of protein, or 1/2 unit of combined protein and fat, if sold that way. If a contract carries a separate fat guarantee, no claim for fat deficiency shall be made unless the deficiency exceeds two-tenths of one per cent.

Sec. 2. Cottonseed meal not coming up in analysis to contract grade, shall be a good delivery if within 1-1/4 units of the protein, or 1-1/4 units of combined protein and fat, if sold that way, specified in the contract. Settlement prices shall be reduced in such proportion as the deficiency bears to the guarantee. If a contract carries a separate fat guarantee, the product shall be a good delivery, with respect to fat content if within five-tenths of one per cent of the fat specified in the contract. Settlement price shall be reduced by three-tenths of one per cent of the contract price for each one-tenth of one per cent of fat deficiency.

Sec. 3. Reductions in price made according to Section 2 of this Rule shall be based on the F.O.B. contract price.

Sec. 4. If a product is sold on sample, the permissible variation in analysis and in other quality factors shall be in accordance with this Rule and Rule 285.

Sec. 5. If a product is sold on a nitrogen or ammonia basis, the permissible variation shall be determined from the equivalent protein content obtained from the conversion table in Chapter VII of these Rules.

RULE 285: Variation In Value.

Where all or any portion of a shipment of a product equals 95 per cent or more of contract value, on the basis of quality, buyer shall accept delivery at an allowance to be agreed upon or fixed by arbitration. If the value of a product does not equal 95 per cent or more of contract value, the buyer may reject. Value under this Rule, shall be determined on the basis of contract price.

The variation permitted in this Rule is exclusive of that permitted under Rule 284 and a product may be rejected under that Rule even though it equals 95 per cent or more of contract value.

Article 4. Packages

RULE 286: Types of Packages.

Products may be sold either in bulk or sacked, as specified in the contract. Sacked products shall be tagged as such and each sack shall show the product description, the net weight, and the name and address of the manufacturer.

Article 5. Performance of Contract

RULE 287: Shipping Instructions.

Sec. 1. Specified or Scattered Shipments. In the case of contracts providing for delivery on a basis other than quick, immediate or prompt, either buyer or seller may, at the time the contract is made or at least five (5) days prior to the beginning of the contract delivery period, furnish the other party with a shipping schedule. Unless such a schedule is rejected in writing by either contracting party at least two (2) days prior to first shipping date, it shall be considered part of the contract. If the contracting parties cannot agree on a schedule or if none is furnished by either party, it shall be understood that shipments will be made on a scattered basis as defined in Rule 28.

Sec. 2. Equipment Requirements and Complete Instructions. Where shipments are to be made on a scattered or specified basis, the buyer shall furnish the seller with equipment requirements at least five (5) days prior to scheduled shipments. If, at the time of loading, shipping instructions have not been furnished in accordance with the terms of the contract, the shipper may load either a box car or a hopper car. At least one day prior to scheduled shipment, buyer must furnish complete shipping instructions which shall permit seller to ship in an orderly manner and to complete shipment according to schedule and within the contract period.

Sec. 3. Other Shipments. When contracts call for quick or immediate shipment, buyer shall furnish shipping instructions within 24 hours of date of contract. When sold for prompt shipment, buyer shall furnish such instructions within 5 days of date of contract.

Sec. 4. Furnishing Tags. On all interstate shipments, the mill may apply tags (or, if in bulk) report tonnage to the State of destination and charge the tax to the buyer.

Sec. 5. Failure or Refusal to Furnish Instructions. Failure or refusal by the buyer to furnish shipping instructions, as required by this Rule shall give the seller the

options, during any contract delivery period or any date after expiration thereof, (1) to load car or cars as scheduled and to place same on track, notifying buyer and railroad that all charges are for buyer's account; or (2) to treat as breached by the buyer all or any part of the contract for which such instructions have not been furnished. If seller elects the latter option, be must proceed as provided in Rules 50, 51, 52 and 53.

RULE 288: Shipment.

Sec. 1. One or More Months. When a shipping schedule has been established as provided in Rule 287, seller must begin shipment in accordance with such schedule and must complete shipments within the contract period(s), unless (1) seller has ordered and received railroad assurance of available car or cars; (2) railroad fails to furnish such cars on schedule; and (3) seller has notified buyer of the delay.

Sec. 2. Failure or Refusal to Ship. If seller fails or refuses to ship in accordance with Section I of this Rule or within such period or periods as may be specified in the contract, buyer shall have the option to treat as breached any part of the contract not shipped on schedule. If buyer elects to do so, he must proceed after failure of seller to ship on schedule as provided in Rules 50, 51, 52 and 53.

Sec. 3. Extension of Contract. Nothing in this Rule shall prevent buyer and seller from agreeing to extend a contract beyond its expiration date. The terms of such an extension shall be exchanged in writing after the original expiration date.

RULE 289: Shipper's Official Weights.

If the shipper, with his invoice, furnishes an official weight certificate signed by one of the parties described in Rule 66, the weight shown on that certificate shall govern settlement.

RULE 290: Rejection.

Sec. 1. If all or any portion of shipment of products is not equal to contract quality, within the tolerances permitted in Rules 284 and 285, the buyer may reject. If he does so, he must so advise the seller by facsimile or e-mail within 48 hours after arrival of shipment at destination.

In the case of shipments for export, buyer may reject within 5 days after delivery of product at port of export, provided the car is held without unloading during such period.

Sec. 2. If seller is notified of rejection, he shall have the privilege of replacement with a product of contract quality provided, within 48 hours of receipt of rejection notice, he informs buyer of his intention to do so. If a shipment is for export, seller may replace after expiration of the contract period. All replacements shall be for immediate shipment as defined in Rule 28.

Each replacement shall be made from the original point of shipment or from any point if shipper equalizes freight and transit privileges. Only one replacement is permitted.

Sec. 3. Whether or not seller exercises his privilege of replacement, he must, within 48 hours after receipt of rejection notice, repay to buyer all amounts paid out by the buyer on account of the rejected product. If seller declines to replace or make the refund herein required, buyer must, to preserve a claim, proceed as provided in Rules 50, 51, 52 and 53.

Sec. 4. If buyer unloads a shipment of a product which he claims to be of rejectable quality, thereby making it impossible for seller to obtain an official sample, settlement shall be made on the basis of shipper's analysis at point of origin.

Article 6. Weighing and Sampling

RULE 291: Methods of Sampling Products.

Sec. 1. Sacked Products. Two ounces or more from a sack of meal or 4 ounces or more from a sack of pellets shall be drawn so as to fairly represent the contents of the sack. At least 5 per cent of the number of sacks in each carload or truckload shall be sampled. In the case of pellets, samples shall be promptly ground into meal in an attrition mill. If the sampler does not have grinding facilities, he shall draw at least 4 pounds per car or 10 pounds per 100 tons of sized cake or pellets.

Unless a car or truck contains products of different kinds or grades, only one sample is required. If several shipments by car or truck are to be analyzed as one sample (i.e. export shipments), the sampler shall commingle equal proportional parts by weight from each car or truck. If 100 tons or more are involved, a commingled sample consisting of 4 ounces from each car or truck will be acceptable.

Sec. 2 (a) Bulk Meal. Bulk meal may be sampled with a standard 63" double tube, open handle grain probe. The probe shall have 10 openings and shall be without partitions.

The probe shall be inserted at an angle of about 10 degrees from the vertical with the slots closed. The slots shall be faced up when the probe is opened. While the slots remain open give the probe several twists or up and down motions so that all openings will be filled. Close slots and withdraw the probe, emptying the contents through the open end onto a sampling cloth or into a suitable container. The individual probes are composited and mixed as in Section 3.

a) Bulk meal in cars-At least 25 probes must be taken al uniformly separated sections of the car.
b) Bulk meal in trucks-At least 8 probes must be taken as follows:
    (1) Four probes in center of truck equally spaced from end to end along center line of truck.

(2) Two probes on opposite sides of the truck about two feet in from the front and sides of the truck.
(3) Two probes on opposite sides of the truck about two feet from the rear and sides of the truck.

Sec. 2 (b) Bulk Meal. Bulk meal may be sampled with a Pneumatic Probe Sampler which is an electric powered unit having an air pump and collection tank with bottom release shutter, and a probe consisting of a series of sections of inner and outer tubes, which can be assembled to reach the bottom of a truck, box car or hopper car.

The bottom and outer tube is fitted with a steel, saw-tooth cutter blade for cutting through the meal. The outer tube is 2 inches in diameter and the inner tube, 11/4 inches in diameter. The chamber formed between the two tubes delivers the air to convey the sample upward and through a reinforced plastic tube into the cyclone collection tank. A filter collects any fines in the sample. Any pneumatic probe sampler equal or equivalent in performance to the "Probe-A-Va" (supplied by Corn States Hybrid Services, Des Moines, Iowa,) will be satisfactory.

Assemble sufficient sections of the probe of the pneumatic sampler to reach the bottom of the loaded car or truck. With the motor running, insert the probe into the top of the meal and thrust at a uniform rate with a rotation motion through the meal until the bottom is reached. Quickly withdraw the probe and insert at the next location.

A number of probes, sufficient to provide a minimum of 2 oz. of sample for each 1,000 lbs. of meal, shall be taken as follows:

a) Bulk meal in boxcars and trucks, a minimum of five probes shall be taken in a roughly symmetrical pattern. One probe shall be in the center of the car or truck. The other probes shall be on lines on both sides about 2 feet from the wall at points from 2 to 4 feet back from the center posts towards both ends of the car or truck.
b) Bulk meal in hopper cars, one probe shall be taken from each opening with a minimum of six probes for each car. The individual probes shall be composited and mixed as described in Section 3.

Sec 2. (c) Bulk Meal. Bulk meal may be sampled with an automatic mechanical sampler (AOCS Official Method Ba 1-38, revised 1958, Reapproved 1993).

The automatic sampler and auxiliary equipment shall be inspected for cleanliness and soundness and placed in operation before loading is begun.

The sampler shall cut a portion for the entire cross section of the meal stream at a point where the meal is free falling. Portions so taken shall be at frequent and regularly spaced intervals to obtain not less than four ounces of meal for each 1,000 pounds as loaded, and shall be deposited in a covered 10-gallon container through a closed, airtight chute from the mechanical sampler.

If desired, a sample divider may be installed in the chute between the automatic sampler and sample container, reducing the volume to be retained, returning the unused portion to the meal stream.

Note: For information pertaining to suppliers of sampling equipment, communicate with the Secretary of this Association.

Sec. 3. Handling Samples. A sample secured in accordance with Sections 1 and 2 of this Rule shall be thoroughly mixed and then reduced to 4 portions of about 1 pound each by means of a mechanical splitting device such as a Jones or Boerner divider, or its equivalent. Each portion shall be placed in an airtight container and each shall be identified as to car or truck number and date drawn. The inspector shall forward 1 portion to the buyer and 1 to the seller and shall retain 2 portions which may be called for in the event of a dispute.

RULE 292: Point of Origin Samples.

Sec. 1. If the seller so elects, he may, at his own expense, have a sample of meal drawn at point of origin by an official weigher and inspector. If the shipper follows the procedure set forth in Sec. 2 of this Rule, this sample shall be the official sample for settlement purposes.

Sec. 2. When shipment is made by rail, a properly identified portion of the sample shall, on the day the sample is drawn or on the first business day thereafter, be forwarded to the buyer by the official weigher and inspector. On truck shipments, a properly- identified portion of the sample shall be forwarded to the buyer via the truck driver.

Sec. 3. When furnishing shipping instructions, the buyer may direct that his portion of an origin sample be forwarded to an address other than the destination of the shipment. In that event, the official weigher and inspector shall, within the time limit provided in Sec. 2, forward buyer's portion of the sample in accordance with such instructions.

RULE 293: Weighing.

Sec. 1. Bulk Shipments. Unless the shipper, with his invoice, furnishes an official weight certificate, as described in Rule 289, bulk carload shipments of the products covered by this Chapter shall be weighed at destination in the manner prescribed in

Rule 73. After unloading and before weighing, empty cars shall be thoroughly swept and cleaned.

If bulk shipments are delivered in trucks and seller guarantees weight at destination as provided in Rule 4, each truck shall be weighed as provided in Rule 73. The weight ticket for each truckload shall be so numbered or marked that the weigher can identify it.

Sec. 2. Sacked Products. Carload and truckload shipments of sacked products may be weighed on track or truck scales as provided in Section I of this Rule. If not so weighed, the weigher shall select at random 5 per cent of the number of bags in the car or truck. Such bags shall be weighed and the average weight thereof applied to all bags in the car or truck. The weight certificate shall show the total number of bags in the car or truck.

Article 7. Claims

RULE 295: Period For Filing Claims.

Sec. 1. Domestic Shipments. All claims on domestic shipments of products must be made within 45 days after arrival at first United States or Canadian destination.

Sec. 2. Export Shipments. All claims on shipments of products for export must be made within 30 days after arrival, at United States or Canadian destination, of last car or truck completing the contract for the month.

RULE 296: Basis For Claims.

All weight claims shall be supported by a weight certificate, as provided in Rule 70, showing weight of each car or truck and date of arrival at destination. The weight of the contract as defined in Rule 241 shall be the basis of a weight claim.

Claims for quality shall be based upon each carload or truckload except in the case of export shipments where such claims shall be based upon each 112-ton lot or fraction thereof.

CHAPTER VI. LINTERS

Article 1. Definitions of Words and Terms

RULE 340: Applicability.

Unless otherwise specified, all rules in Chapter VI shall apply to cotton linters, hull fiber, oil mill motes, flues, sweepings, and grabbots.

RULE 341: A Contract.

All contracts covering more than one carload or truckloads of linters shall be construed to be divisible and not entire, so that default or error as to one or more cars or trucks will not affect the remainder of the contract. In addition, and unless otherwise specified, each car- load or truckloads of linters shall be treated as a separate contract for purposes of claims for shortage in weight or quality or cellulose determination.

RULE 342: Dimensions And Tare.

The standard bale of cotton linters shall, for contract purposes, be uncompressed, and of such dimensions as to permit loading contractual requirements. The tare shall not exceed 5 per cent.

RULE 343: Quantity Designations.

Unless otherwise specified, a bale is six hundred pounds, gross weight.

A carload is that weight required to insure the lowest published rail freight rate in effect at time of shipment unless otherwise agreed between buyer and seller.

A truckload shall be 40,000 lbs. minimum or loaded to capacity, whichever is less, unless otherwise agreed between buyer and seller.

Article 2. Grade and Quality

RULE 345: Type Designation:

Cotton Linters. Cotton linters mean the residual fibers removed from cottonseed by mechanical processes. They include the following general categories:

Mill Run Linters. Mill run linters are cotton linters obtained by passing cottonseed through linter machines only once.

First Cut Linters. First cut linters are cotton linters obtained by the first passing of cottonseed through linter machines if subsequent passes are made.

Second Cut Linters. Second cut linters are cotton linters obtained by passing cottonseed through linter machines after first-cut linters have been removed.

Chemical Linters. Chemical linters are cotton linters which are traded on a cellulose content basis.

RULE 347: Linters From Damaged Or Burned Seed Or Having Bad Odor.

Unless otherwise specified, linters made from burned or dam- aged seed, and which are consequently affected in quality, or linters carrying an objectionable odor, shall not be a good delivery on contract, and may be rejected by buyer, and replacement may be demanded.

RULE 348: Weather Damage.

Unless otherwise specified, linters must be suitably baled and tied and free from weather damage.

RULE 350: Cottonseed Hull Fiber.

Cottonseed hull fiber shall be that form of fiber removed from cottonseed hulls by passing through a hull fiber machine or a defibrator.

Article 3. Adjustment and Variations

RULE 355: Quantity Variations.

The weight of linters specified in a contract shall be delivered with a variation of one per cent above or below contract quantity. Settlement for overweighs and underweights shall be made in accordance with Rule 41.

Article 4. Performance of the Contract

RULE 360: Inspection And Acceptance.

Where linters are sold subject to quick, immediate or prompt inspection and acceptance, buyer shall inspect and accept or reject within the following time limits, all exclusive of the data on which the contract is made:

(a) Quick..... 2 working days
(b) Immediate..... 5 working days
(c) Prompt..... 10 working days

RULE 361: Passage Of Title.

When contracts of sale specify f.o.b. cars or trucks, the product covered thereby will not become the property of buyer until actually loaded at point of origin and covered by bill of lading. If such product is destroyed before contract terms are completed, seller may replace and buyer may demand replacement within the time limits provided in Rule 365.

If by special agreement, partial or complete payment for the product has been made by buyer, prior to loading, title to such product passes to buyer with and at the time of such payment. Such product will be at buyer's risk of insurance and in case of destruction no replacement can be demanded.

RULE 362: Shipping Instructions.

Sec. 1. If products are sold for quick, immediate or prompt shipment, shipping instructions shall be furnished by buyer within the following time limits computed from the time the trade is closed:

Quick shipment ..... 1 day
Immediate shipment .... 2 days
Prompt shipment .. . . .5 days

When sale is made subject to buyer's inspection and acceptance, the trade shall be considered closed when the linters are accepted by buyer.

If sold for shipment not hereinbefore provided for, buyer shall furnish shipping instructions in time for seller to complete shipment or shipments within the contract time.

Sec. 2. In case seller has not asked for shipping instructions at least twenty days before the expiration of contract period, buyer may then furnish same. Seller may request shipping instructions on or after the beginning of contract period, and the buyer must furnish shipping instructions for half-month contracts within five days after receipt of request, and for monthly contracts as follows: not less than 50 per cent of contract tonnage within ten days after receipt of such request and 50 per cent within twenty days after receipt of such request. Such instructions must provide for shipments to begin immediately and permit seller to continue shipments in an orderly manner throughout the contract period. Shipping instructions on the entire contract shall be furnished so as to permit shipments being completed within contract time.

Sec. 3. Failure or refusal on the part of the buyer to furnish shipping instructions as provided in this Rule shall give the seller the option during contract period, or within five days after expiration thereof, to treat as breached by buyer such portion of the contract for which shipping instructions have not been properly furnished, and, in the event he elects to do so, he must proceed as required by Rules 50, 51, 52 and 53.

RULE 364: Shipment.

Sec. 1. One or More Months. Unless otherwise specified, contracts requiring shipment over one or more months shall permit the seller to ship at his convenience within contract period; provided, that contracts covering two or more months shall be understood to require equal shipments during each month.

If shipping instructions have been requested and given during contract month or have been furnished in accordance with Rule 362, seller must begin shipping within 5 days after receipt of such instructions and must complete shipment within the contract period.

Sec. 2. Failure or Refusal to Ship. If seller fails or refuses, for 10 days after receipt of shipping instructions, to ship in accordance with Section I of this Rule or within the period specified in the contract, buyer may treat the contract as breached. If buyer elects to do so, he must, within 5 days after expiration of the contract period, proceed as provided in Rules 50, 51, 52 and 53.

RULE 365: Rejections And Replacements.

Sec. 1. If products are purchased or sold subject to buyer's inspection and acceptance, and the contract does not specify quality, the replacement of any tender on contract not accepted by buyer may not be demanded by either party.

Sec. 2. If products are purchased or sold on the basis of actual samples or private sales types, the tender must be equal to the contract quality. If buyer and seller agree that the quality of the tender is not equal to the contract quality or if there is a sustained rejection, replacement may be demanded by either party. The actual expense connected with sustained rejections shall be paid by the seller.

Sec. 3. Whenever, under these Rules, following agreed or sustained rejection, replacement is made, seller shall have the following time limits to make such replacement. It is understood that this time limit is to begin with the actual date of notice or demand by buyer or seller, as the case may be, that replacement is desired, and it is further understood in computing time that delivery f.o.b. a shipping point is implied.

(a) Where contracts provides for "quick" or "immediate" shipment, replacement is to be made within three days.

(b) In all other cases, replacement is to be made within ten days.

Article 5. Sampling

RULE 370: Chemical Linters And Hull Fiber.

If products are sampled at mills, at warehouses, or upon unloading at first United States or Canadian destination, the following procedures shall apply:

Sec. 1. Samples for Cellulose Determination. All bales must be dry when sampled, and sampling shall be in units of a carload or more, except remnants of less than carload quantity, when desired. Cellulose samples of 3 to 4 ounces each shall be taken from one shoulder, and from opposite side of at least each third bale, unless otherwise agreed between buyer and seller. If sampled from only one place of a bale, all bales must

be sampled. The covering shall be cut between bands at different side positions of each bale, and surface sample of at least one inch in depth discarded before the cellulose sample is taken. Each sample shall be placed in a bag or other container, when and as taken from the bale.

Sec. 2. Samples for Moisture Determination. At the time of taking cellulose samples, a smaller sample, of at least 1/2-ounce in weight shall be taken immediately at greater depth from the same bale hole from which the cellulose sample was taken. This moisture sample shall be immediately packed in an airtight container of adequate size with proper lot identification inside the container and place in the container with the cellulose sample, properly addressed to the laboratory or other consignee, as the case may be.

Cellulose sample as drawn in accordance with the above specified procedure shall be forwarded to official chemist for analysis together with moisture sample. Chemist shall perform analysis in accordance with the official methods of analysis set forth in Rule 403. Approximately one-half of the cellulose sample shall be retained by the official chemist for a period of not less than 30 days after the date of issuance of the certificate of analysis covering the sample, for use, if needed, as a referee sample.

Article 6. Claims

RULE 375: Period For Filing Claims.

All claims by the buyer must be made within fifteen days after arrival at first United States or Canadian unloading point or, in case of the seller, within ten days after receipt of statement from buyer.

RULE 376: Weight Claims.

Unless otherwise agreed between buyer and seller, all claims for shortage in weight shall be supported by sworn weight documents of the general form of the seller's documents by which the invoice is supported. If bales are individually weighed, tagged, and listed, claims shall be similarly detailed and documented. Where only the total shipment weight is provided by seller, truckload or carload weighing and documentation in accordance with General Rule No. 73 shall suffice for claim purposes. Also, in any case where untagged and/or unlisted bales are shipped, weighing of bales in pairs on certified scales shall be acceptable for claim purposes provided a certified weight sheet is provided. No tagging or listing shall be required of buyer where none is initially provided by seller. No claim for shortage in weight shall be made unless the shortage exceeds 1/2 of 11%.

Where only the total shipment weight is provided by seller, the consignee may substantiate claim for shortage in weight by reweighing the contents of the rail carload or trailer load in question listing individual bale weights and identifying tags or markings when existent.

Buyer shall advise seller by written notice of his intention to file claim, stating amount of weight claimed, car number and date of shipment. If seller wishes the shipment

reweighed, he shall advise buyer by written notice within 24 hours of receipt of claim notice. Failure to do so shall indicate seller's willingness to honor claim when supported as described above.

CHAPTER VII. METHODS OF CHEMICAL ANALYSIS

RULE 400(a): Cottonseed

Sec. 1. Foreign Matter in Laboratory Sample (A.0.C.S. Official Method Aa 2-38, Revised 1981, Corrected 1984, Reapproved 1989).

Definition: All material passing a No. 6 NBS sieve plus any portions of bolls, sticks, and leaf from the cotton plant plus any noncotton material. Unginned locks of cotton are removed as foreign material.

Scope: Application to cottonseed (Laboratory Sample).

A. Apparatus:

1. Scale, capacity 2,000 to 3,000 g. and sensitive to 1 g.
2. Sieve, No. 6 NBS, 12 to 15 in. (Cloth meeting ASTM E 11-81 specs.)
3. Henry Cottonseed Mixer, USDA design mixer, or equivalent. See Note 2.
4. Suitable containers with tight-fitting covers in which portions of the sample for moisture, oil, nitrogen, and free fatty acids determinations can be placed.

B. Procedure:

1. Prior to cleaning and mixing the laboratory sample, small portions of the seed, totaling at least 100g., shall be withdrawn and placed in a suitable container with a tight-fitting cover. This part of the sample is to be used for the determination of moisture under A.0.C.S. Official Method Aa 3-38, Reapproved 1993.
2. a. Weigh the entire laboratory sample of ea. 1,000 g., pass the sample over the 6-mesh screen, remove as much foreign matter as possible, and pick out the remainder by hand after spreading out on a clean, dry surface.
   b. Place in an approved mixer, mix until sample is uniform (ea. 2 min.)
3. If the cleaner-mixer is used, entire laboratory sample is placed in cleaner-mixer where it will be cleaned and mixed for 3 min. Pick out remaining foreign matter by hand.
4. Empty mixed and cleaned sample onto a large piece of paper and divide into four quarters, avoiding remixing. Return quarters 1 and 3 to the original sample container. Place quarters 2 and 4 in the containers designated in Section A, paragraph 4.

C. Calculation:

1. Foreign matter, % = $\frac{\text{Weight of foreign matter x 100}}{\text{Weight of sample}}$
2. If foreign matter in the laboratory sample is to be reported as part of the total matter in the original ea. 50-lb. sample, it is calculated as follows:

$$\% \text{ Total foreign matter in original (ea. 50-lb.) sample} = \frac{fm}{FM + (100 - FM) \times 100}$$

Where FM is % of foreign matter in large sample
Where fm is % of foreign matter in laboratory sample

D. Note:

1. If foreign material determination is to be used in the calculation of the "Grade" of cottonseed, references should be made to U.S. Department of Agriculture Regulations.
2. Henry Cottonseed Mixer may be obtained on special order from William C. Ellis & Sons, 245 S. Front St., Memphis, TN 38103. U.S.D.A. design cleaner- mixer may be obtained on special order from Will Riza, 3312 Horton Rd., Ft. Worth, TX 76119, telephone (817) 534-9616.

Sec. 2. Moisture and Volatile Matter (A.0.C.S. Official Method Aa 3-38, Revised 1974, Reapproved 1989).

Definition: This method determines the moisture and any material which is volatile under the conditions of the test.

Scope: Applicable to cottonseed.

A. Apparatus:

1. Forced draft oven, A.0.C.S. Specifications H 1-39, Reapproved 1993.
2. Aluminum moisture dishes, minimum 30 gauge, approximately 50 x 20 - with tight-fitting slipover covers, similar to E.H. Sargent number S-25675 and Arthur H. Thomas number 4522.
3. Desiccator containing an efficient desiccant Calcium chloride is not satisfactory. See A.0.C.S. Specification H 9-87.

B. Procedure:

1. Weigh accurately, and as rapidly as possible, duplicate samples of 5 to 10 g. each (prepared as directed in A.0.C.S. Official Method Aa 2-38, Reapproved 1993, Section B, paragraph 1) into tared moisture dishes, picking out and discarding pieces of foreign matter which might affect the accuracy of the determination.
2. Slip the cover on the bottom of the dish and place the uncovered dish in the oven and dry at 130ºC for 3 hours.
3. Remove the dishes from the oven, cover immediately, cool in a desiccator to room temperature and weigh.

C. Calculation:

$$\text{Moisture and volatile matter, \%} = \frac{\text{Loss in weigh} \times 100}{\text{Weight of sample}}$$

Sec. 3. Oil (A.0.C.S. Official Method Aa 4-38, Revised 1970, '71, '72, '84, '93, '95, and '96, Reapproved 1989).

Definition: This method determines the substances extracted by petroleum ether under conditions of the test (see Notes, 1).
Scope: Applicable to cottonseed.

A. Apparatus:

1. Butt type extraction apparatus. The Butt tube which holds the sample extraction thimble is similar in design to a chromatography column without a glass frit. The approximate dimensions of the Butt tube in mm are body o.d./i.d./lenght, 32/29/125; overall length, 230; stem o.d., 16. Suppliers listing the availability of the Butt tube are Sargent-Welch (Skokie, IL, USA) and Wilkens-Anderson (Chicago, IL, USA).
2. Filter paper--150 mm; S&S No. 597, Reeve Angel No. 211, Whatman No. 2 or equivalent.
3. Absorbent cotton, free of petroleum ether extract.
4. Air-tight sample containers.
5. Forced draft oven, A.0.C.S. Specification H 1-39, Reapproved 1993.
6. Flat-bottom containers--metal or paper, 60 g. capacity for predrying.
7. Fuming oven--a forced draft circulation oven (Henry model) thermostatically controlled to deliver heated air uniformly to the oven, capacity 24 pots minimum Available from Mid-Continent Laboratories, Inc. (1279 Jackson Ave., Memphis, TN 38101). Infrared fuming oven (see Apparatus, 1 in AOCS Official Method Aa7-55 for specifications) may be used. Available at same source.
8. Fuming vessels--unglazed porous earthenware vessels (SK-B) and clay lids (SK-BL) for Henry oven, available from Seedboro Equipment Co. (1022 W. Jackson Blvd., Chicago, IL 60607). Pyrex glass petri dishes (150 x 20 mm, for infrared oven), available from Corning Glass, Corning, NY (Corning Glass No. 3160-152).
9. Grinding mill, Mikro-Samplmill, 12,000 rpm, pulley size 1-7/8"), (4.75 cm), using swing hammers with 0.035" x .05-in. (0.9 x 1.3 mm) herringbone screen, no. 4366, (see Notes, 1).

B. Preparation of Sample:

1. The following preliminary treatment of cottonseed is essential before the determination of oil and nitrogen. Each step in a analysis of samples of cottonseed must be executed promptly with a minimum of exposure to oxidation. Once started, analytical operations should proceed continuously without interruption or delay.
2. Dry approximately 60 g of thoroughly mixed sample (AOCS Official Method Aa 2-38) for 2 hrs. at 130° ± 3°C. in the forced-draft circulation oven (Henry oven), or for 30 min. at 118° ± 3°C. in the infrared oven, in appropriate-sized containers (Apparatus, 8). Adjust drying time to obtain about 3% moisture for the ground (second) moisture determination. Check the oven temperature daily with a calibrated thermometer and record the oven drying temperature in a record book. When drying in the infrared oven, use both upper and lower heating banks. Absorb 1.5 mL concentrated hydrochloric acid (HCL, Sp. Gr. 1.19) into the inner walls and bottom of the fuming vessels for the Henry oven method, or into the inside of the bottom of the glass petri dishes for the infrared oven

method. The acid should be well distributed on the surface and no residual droplets of acid should remain.

3. Place the dried seed in the appropriate acid-treated fuming vessel and heat for 1 hr. in the Henry oven or 20 min. in the infrared oven at a maximum fuming temperature of 118 ± 3 C. When fuming with the infrared oven, use the lower heating bank only. The lint should be loose and brittle, but not scorched with this treatment. Check the oven temperature with a calibrated thermometer and record the oven drying temperature in a record book.
4. Grind the entire sample by rapid feeding (40 sec or less) through the mill. Upon completion , stop mill, open and carefully brush all the remaining ground seed onto a smooth surface and add the main portion.
5. Mix the ground sample thoroughly by rapidly shaking 25 times in a one foot arc within 7 sec in a one-half gallon Mason fruit jar or equivalent, containing a solid rubber stopper (size 11). A Henry Velocity Mixer, available from Mid-Continent Laboratories, inc. (1279 Jackson Avenue, Memphis, TN 38101), may also be used to mix the sample.
6. For the second (ground) moisture determination, use 5 g of ground sample weighed into an aluminum 50 x 20 mm tared dish with cover. Dry at 130 ± 1 C for 1 hr in the mechanical convection, forced-air oven with dish uncovered. Remove the dish form the oven, cover and place in a desiccator for 30 min and weigh. The second moisture is used to convert oil and ammonia determination to original moisture basis for reporting purposes.

Reagents

1. Petroleum ether--AOCS Specification H 2-41 (see Notes, Caution).
2. Hydrochloric acid (HC1)--concentrated, sp. gr. 1.19, reagent grade.

Procedure

1. Weigh accurately 4-5 g of the ground sample into a filter paper and ecnlose a second filter paper folded in such a fashion as to prevent escape of the material. The second paper is left open at the top like a thimble. A piece of absorbent coton may be placed in the top of the thimble to distribute the solvent as it drops on the sample.
2. Place the wrapped sample in the Butt extraction tube and assemble the appareatus as shown in Figure 1. Put about 225 mL of petroleum ether into the tared extraction flask before attaching to the tube.
3. Heat in a water bath or on an electric hot place at such a rate that the solvent will drop from the condenser on the center of the thimble at the rate of at least 150 drops/min.
4. Keep the volume of solvent fairly constant by adding enough to make up for any that may be lost due to evaporation. Continue extracton for 4 hrs.
5. Cool and disconnect the extraction flask. Evaporate the ether on a steam or water bath until no odor of ether remains. A gentle stream of clean, dry air or nuitrogen may be used to facilitate removal of the solvent. Cool to room temperature, carefully remove any moisture or dirt from the outside of flask and weigh. Repeat heating until constant weight is obtained.
6. Determine the moisture in the ground sample as follows:
   a. Weigh 5 g. into a tared A0CS moisture dish.
   b. Slip the cover on the bottom of the dish and place dish in a forced-draft oven. Dry at 130ºC for 1 hour.

c. Remove the dish from the oven and cover immediately. Cool in a desiccator containing an efficient desiccant for 30 minutes and weigh. Note--Calcium chloride is not satisfactory. See AOCS Specification H 9-87.

$$\text{Moisture in ground sample, \%} = \frac{\text{Loss in weight} \times 100}{\text{Weight of sample}}$$

E. Calculation:

$$\text{Oil in ground sample, \%} = \frac{\text{Weight of oil} \times 100}{\text{Weight of sample}}$$

The percentage oil is calculated to any desired moisture basis with the following formula:

$$\text{Oil, desired moisture basis, \%} = \frac{F(100 - \text{\% moisture desired})}{100 - \text{\% moisture in ground sample}}$$

F = % oil determined in ground sample.

F. Precision:

1. Two single determinations performed in one laboratory shall not differ by more than 0.42%.
2. Single determinations performed in two different laboratories shall not differ by more than 0.73%.

Sec. 4 Nitrogen.

Procedure: Use a sample prepared as directed in Rule 400(a), Sec. 3. Determine nitrogen in accordance with Rule 401, Sec. 6.

Sec. 5. Free Fatty Acid (A.0.C.S. Official Method Aa 6-38, Reapproved 1993, Revised 1991).

Definition: This method determines the free fatty acids in the oil removed from the seed by petroleum ether extraction at room temperature.

Scope: Applicable to cottonseed.

A. Apparatus:

1. Laboratory huller, a Bauer mill No. 148, with the plates adjusted to just break the seed (see Notes, 4).
2. Cotton: clean and bleached.
3. Butt type extraction apparatus, assembled exactly as indicated in A.0.C.S. Official Method Aa 4-38 (89). See Apparatus section. The bottom constricted part of the tubes should be plugged with cotton to support the ground meats (see Notes, 1).

4. Oil sample bottle or flask of convenient size.
5. Sieve, 4- to 6-mesh.
6. Universal food chopper No. 1 with 12-tooth blade. (Can be purchased at most hardware stores, or in housewares department of other stores.)

B. Reagents:

1. Petroleum ether, A.0.C.S. Specification H 2-41, Reapproved 1993 or hexane, A.0.C.S. Specification H 16-56, Reapproved 1993 (see Notes, Caution).
2. Isopropyl alcohol, 99%. The alcohol must be neutralized with 0.25 N sodium hydroxide solution to a faint pink color before adding to the sample.
3. Phenolphthalein indicator solution, 1% in 95% alcohol.
4. Sodium hydroxide (NaOH), 0.25 N, accurately standardized (see A.0.C.S. Specification H 12-52).

C. Procedure:

1. If necessary for effective hulling, reduce moisture content by drying 200 g. of the mixed sample (A.0.C.S. Official Method Aa 2-38, Reapproved 1993) about 30 minutes at 100° to 105°C in an air oven and cool. Grind the seed through the Bauer mill with the mill opened so that the seed is only broken. Remove the meat from the hulls by screening on a 4- to 6-mesh screen. Grind the meats in a Universal food chopper using the 12-tooth blade. Regrind the first material through the chopper. Complete separation of meats from hulls and good grinding are essential. Immediately mix the ground sample on a clean, dry surface; divide the mass into 4 quarters with a spatula; and quarter to 40 to 50 g.
2. Place the entire sample of 40 to 50 g. in the extraction apparatus. Add 50 mL of petroleum ether or hexane and allow all of it to percolate through the sample into a flask or beaker. Repeat with two 25 mL portions of solvent.
3. Evaporate the solvent from the oil on a water bath under a gentle steam of clean, dry air until free from petroleum ether or hexane.
4. Weigh 7.05 g of extracted oil into a suitable size oil-sample bottle or flask. Add 50-75 mL of neutral alcohol and a 1 mL of indicator. Titrate with 0.25 N NaOH shaking vigorously until a faint pink color is obtained which will persist for at least 1 minute (see Notes, 2).

D. Calculation:

Free fatty acids, calculated as oleic - % free fatty acids (FFA) = mL. of 0.25 N alkali used.

E. Notes:

Caution: Both petroleum ether and hexane are extremely flammable. Avoid static electricity. A fume hood should be used at all times when using these solvents.

Numbered Notes:

1. The compactness of the cotton plug and packing of the ground meats in the extraction apparatus should be such that the cold percolation rate will be about 150 drops per minute and will not pass any of the ground sample.
2. About 15 mL of petroleum ether or hexane may be added to aid solubilizing the oil in the alcohol, if necessary.
3. The result, expressed as oleic acid, is dependent upon using the sample weight

of 7.05 g and 0.25 N sodium hydroxide as specified. Any deviation from either the sample weight or the normality will yield erroneous results.

4. For service and parts for existing Bauer Mills, or for new Bauer Mills (Model No. 148. 148-2), contact: W.C. Cantrell Co., 3245 May Street, P.0. Box 11216, Ft. Worth, TX 76110, telephone (817) 923-7383.

Sec. 6. Calculation.

(a) Data on reports of seed analyses should be expressed as follows:

Foreign Matter to..... 0.1%
Oil to..... 0.1%
Ammonia to..... 0.01%
Free Fatty Acid, when 5% or under, to..... 0.1%
Free Fatty Acid, when over 5%, to..... 0.5%
Quantity Index to..... 0.01%
Quality Index to..... 0.1%

Grade to whole or half units, whichever the actual calculation is nearest. **Yields to whole units.**

(b) From the moisture determined on the seed as received plus total foreign matter up to and including one per cent and the moisture determined on the fumed and ground sample, the figures for oil and ammonia are calculated back to the original basis as received, from the following formula:

M = Moisture in original seed.
FM = Total foreign matter up to and including one per cent.
P = Moisture in fumed and ground sample.
F = Factor to multiply by to reduce to original basis as received.
100 - (M + FM) divided by (100 - P) = F.

Example:
Percent moisture in original seed..... 12.2
Percent total foreign matter up to and including 1%..... 8
Percent oil in fumed, ground seed..... 20.5
Percent ammonia in fumed, ground seed..... 3.90
Percent moisture in fumed, ground seed..... 2.6
(100-[12.2+.8] divided by (100-2.6)..... 89.32
F (factor)..... 89.32

89.32 x 20.5..... 18.3
89.32 x 3.90..... 3.48

Calculation of Available Yields:

When available yields are reported, they should be calculated as follows: To calculate the pounds of cake that can be made from a ton of seed, multiply total ammonia by .94 to get available ammonia. Multiply available ammonia by 2000 and divide the produce by the ammonia percent age in the cake produced to get the pounds of cake.

Example:

3.50 x .94 = 3.29% Available Ammonia

$\frac{3.29 \times 2000}{8.00}$ = 822 Lbs. of 8% Ammonia Cake

or

4.25 x .94 = 4.0% Available Ammonia

$\frac{4.00 \times 2000}{8.37}$ = 956 Lbs. of 8.37% Ammonia Cake

E. Notes:

1. In procedure, C4., ca 15 ml. of petroleum ether or hexane may be added to aid solubilizing the oil in the alcohol.
2. The compactness of the cotton plug and packing of the ground meats in the extraction apparatus should be such that the cold percolation rate will be ca 150 drops per minute and will not pass any of the ground sample.
3. For Sunflower Seed, it is not necessary to separate meats from the hulls.
4. If results are 4% higher, a duplicate test should be run and two results averaged.

Sec.7. Residual Lint (A.O.C.S. Official Method Aa 7-55, Revised 1971, Reapproved 1993)

Definition: This method determines the residual lint (cellulose fiber) on the seed.

Scope: Application to cottonseed.

A. Apparatus:

1. Infrared oven. The oven is of double-wall construction, insulated with 1" rock wool or fiber glass between the inner and outer wall. The inner wall should be of a highly reflective metal such as aluminum or, preferably, stainless steel. The same material may also be used for the outer casing. Width and depth of oven is contingent upon the number of samples to be treated at one time. Upper and lower heating banks,

composed of 125 watt, 110-115 volt infrared lamps spaced 6-7" on centers, are opposite in direction, and measure 13" between the convex surfaces of the opposing lamps. An expanded metal tray, located 6" from the convex surface of the lower lamps, and 7" from the upper lamps, is supported by channel brackets on both sides. Tray should be marked for placement of dishes so as to be directly between the opposing lamps. Oven temperature is maintained at 118 degree C+/- 3 degree C., by a thermo-regulator located just below the tray and outside of the direct lamp beam. An exhaust opening of 1-1/2" tubing is located in the top center of the oven and

discharged into an exhaust system for the removal of fumes. Six 3/8" holes should be in the bottom of the oven to permit passage of air. The door, on the front of the oven, may be hinged at the top and retained in either open or closed position by tension springs, or other suitable arrangements. Two switches should be installed, the first of which controls both banks of lamps, and the second to control only the lower bank of lamps. An interval timing device may be wired into the circuit or attached to a signal system for convenience.

2. Heat resistant glass dishes, 1" depth, 6" diameter (Pyrex No.206 or equivalent).
3. Dish covers--unglazed porous earthware, tan or light brown in color on top side (Seedburo Equipment Co., Chicago, IL USA).
4. Aluminum moisture dishes--2" x 3/4", with covers.
5. Aluminum weighing scoop and tare weight.
6. Mechanical brushing machine--equipped with Tyler 35 mesh (U.S. No. 40) wire screen sieves. The brushes are set at the bottom of a vertical shaft and set slightly off-center so that the outer edge of the brush contacts the perimeter of the sieve over which the brush revolves. Sieve shall be U.S. No. 40 mesh and shall be equipped with a 14-gauge piece of copper or galvanized wire that has been bent or shaped into a slight letter "S" across the center of the sieve. It is desirable to have the sides of the sieve about 1- 1.5 in. higher than the side of a normal sieve so as to prevent seed from being thrown out when the brush begins to revolve. Brushes to be "Speed Wash" type, (Milwaukee Dustless Brush Co., Milwaukee, WI, USA) with bristles 2-1/4 in. long, made from horse hair and slightly treated with a light plastic. Revolving speed of the brushes shall be a minimum of 110 rpm to a maximum of 120 rpm. It is important that the slight letter "S" be so placed that the concave shaped part of the wire be in the same direction as the brush moves, causing the seed to be thrown back to the center of the sieve. Time of brushing required is approximately 2 min. Specifications and illustrations may be obtained from Jim Falk, Science Division, AS, US Department of Agriculture, Washington, DC 20250.

B. Reagents:

1. Dilute hydrochloric acid (HC1) solution--made by adding one volume of concentrated reagent hydrochloric acid (37.0-38.O% HCl) to an equal volume of distilled water. (see Notes, Caution).

C. Procedure:

1. Use a well mixed sample free of foreign matter.
2. Weigh 50 g (to nearest ± 0.1 g) of sample into glass dish, distribute evenly and dry, uncovered, for 15 min. at 118 ± 3C, using top and bottom banks of lamps. Dishes

should be placed so that the heat rays shall bear directly on the samples. Samples containingmoe than 15% moisture shall be dried an additional 15 min.

3. Toward the end of the drying period, absorb into the inner side of the clay cover 2.0 mL of the diluted solution of HCL (1.0 mL. for mechanically delinted seed).
4. At the expiration of the drying period, place the cover on the glass dish with treated side toward the seed. Heat for 20 minutes at 118 ± 3 C using top bank of llights only. The same oven as used for drying may be used. (See Notes, 2.)
5. Remove and cool at room temperature without desiccation.
6. Transfer seed to weighing scoop and weigh, recording weigh as "A".
7. Remove lint by means of a mechanical brushing machine.
8. Transfer delinted seed to weighing scoop and weigh, recording weight as "B".
9. Determine moisture in composite sample of lint removed at intervals, recording moisture as "C".

D. Calculation

1. The residual linters (linters on the original seed) is conventionally calculated to an 8.0% moisture basis as follows (when 50-g sample is used):

$$\% \text{ linters} = 2 (A - B) \times \frac{100 - C}{92}$$

Where --

A = as defined in Procedure. 6
B = as defined in Procedure. 8
C = as defined in Procedure. 9

E. Note:

Caution

Hydrochloric acid is a strong acid and will cause severe burns. Protective clothing should be worn when working with this acid. It is toxic by ingestion and inhalation and a strong irritant to eyes and skin. The use of a properly operating fume hood is recommended. When diluting the acid, always add the acid to the water, never the reverse.

Numbered Notes

1. Mechanical brushing machine and infrared oven may be obtained by special order from Mid-Continent Engineering, Memphis, TN, USA.
2. If it is preferred to use the large flat clay pots [inside dimensions: approximately 5-3/16" x dia 1-5/8" depth (Seedburo Equipment Co.) satisfactory results will be obtained. However, it will be necessary that both upper and lower banks of light be used for both predrying and fuming; otherwise the method remains the same.

Sec 8. Aflatoxin (A.0.C.S. Official Methods, Aa - 8-83. J.0.A.C., Volume 63, No. 4, 1980, Page 899). Cottonseed hulls and meats will be separated as in the A.0.C.S. method.

Definition: This method determines aflatoxin in cottonseed.

RULE 400(b): Sunflower Seed.
Sec. 1. Sampling & Foreign Matter (A.0.C.S. Official Method Ai 1-80, Reapproved 1993).

Scope: Applicable to sunflower seed.

A. Apparatus:

1. Triers, double tube brass, 1-3/8" outside diameter, heavy bronze point, compartment type and conforming to U.S.D.A. specifications. The following lengths are for sampling bulk seed: barges and hopper cars - 10 or 12 foot triers with 20 compartments; boxcars and trucks - 5 to 6 foot trier with 12 compartments. Other containers: use a grain trier that will reach bottom of container.
2. Pelican grain sampler or Ellis sampler may be used to obtain a sample at a "free falling point" when the use of automatic diverter type sampling equipment is not feasible.
3. Boerner divider such as No. 34 or a Riffle (Jones Sampler) with 3/4" openings.
4. Scales graduated in grams, sensitive to 0.1 g. or less.
5. Air-tight, moisture-proof containers or bags.
6. Carter dockage tester containing a number 3 sieve in the top sieve carriage, no sieve in the middle sieve carriage and a number 8 sieve in bottom sieve carriage (double perforation, large buck, triangular).
7. Hand sieves-grain dockage sieves, 13" in diameter, 2 3/8" inside depth. Top sieve - 12/64" diameter round hole; bottom sieve- 9/64" triangular.

B. Procedure:

1. *Sunflower seed in bulk*:
   a. Seven or more places should be probed with a standard trier. Insert trier in the seed at an angle of about 10 degrees from the vertical, with the slots closed. Open the slots and give the trier several up and down movements. Then close the slots and withdraw the trier.
      i. Probe in the center of the car.
      ii. Probe 3 to 5 feet from door-post toward the end of the car approximately 2 feet out from one side of the car.
      iii. Probe from 3 to 5 feet from the same end of the car and approximately 2 feet from opposite side of car as described in "ii".
      iv. Repeat ii and iii above in opposite end and sides of the car.
      v. Probe 2 feet from each end of car in center.
   b. A minimum sample of 1000 g. or 3 quarts shall be collected and stored in air-tight, moisture-proof container.

2. *Sunflower seed in truck loads or small bins*:
   Use same procedure as for sunflower seed in bulk.

3. *Sunflower seed in bags*:
   a. Take samples from the bags by a standard or approved grain trier of sufficient length to reach center of bag.
   b. Draw samples from as many individual sacks, selected at random through the lot, as will be necessary to obtain a representative sample of at least 1000 g.

4. *Loading and unloading sunflower seed*:
When a sample is to be taken during loading or unloading operation, a "Pelican" or "Ellis" type sampler may be used at a "free falling point." Samples are taken at regular and frequent intervals to assure a correct and representative sample.

C. Cleaning and Reduction of Sample:

1. *Hand Cleaning Method*:
   a. Prior to cleaning and mixing the laboratory sample, about 100 g. of seed shall be withdrawn and placed in a suitable container with a tight-fitting cover. This part of the sample may be used for the determination of moisture under A.0.C.S. Official Method Ai 2-75, Reapproved 1993.
   b. Reduce sample to approximately 600 g. with a Boerner divider (record weight WI).
   c. Screen 1/2 of sample at a time on hand screens as follows:
      i. Top sieve- 12/64" diameter round hole.
      ii. Bottom sieve- 9/64" triangular.
   d. The sieves should be held horizontally and thirty complete cycles of gentle shaking should be used.
   e. Weigh all the foreign matter passing through the 9/64" triangular sieve from the original ca. 600 g. sample (record weight W2).
   f. Combine the two sieved portions and split three times through the Boerner divider to obtain about 75 g. (record weight W3). Hand pick all foreign material from this sample (record weight W4). Do not remove kernels or pieces of sunflower seed. Preserve the cleaned sample in air-tight container and use for subsequent analyses.
   g. Calculation:

      i. Total foreign matter (weight) = $W2 + (WI - W2) * \frac{W4}{W3}$

      ii. % total foreign matter in original (ca 600 g.) sample =
      $$\frac{\text{Weight of total foreign matter} \times 100}{\text{Weight of original sample (W1)}}$$

2. *Machine Cleaning Method (using Carter Dockage Tester)*:
   a. Prior to cleaning and mixing the laboratory sample, about 100 g. of seed shall be withdrawn and placed in a suitable container with a tight-fitting cover. This part of the sample is to be used for the determination of moisture under A.0.C.S. Tentative Method Ai 2-75, Reapproved 1993.
   b. Reduce sample to approximately 600 g. with a Boerner divider (record weight W1).

Sec. 2. Moisture and Volatile Matter (A.0.C.S. Official Method Ai 2-75, Revised 1980, ‘88, ‘91, ‘93, ‘95, ‘96, Reapproved 1993).

Sec. 3. Oil (A.0.C.S. Official Method Ai 3-75, Revised 1980).

Sec. 4. Nitrogen (A.0.C.S. Tentative Method Ai 4-91).

Sec. 5. Free Fatty Acid (Rule 400(a), Sec. 5, A.0.C.S. Official Method Aa 6-38, Reapproved 1993, except not necessary to separate meats from hulls).

RULE 401: Cake, Meal And Meats.

Sec. 1. Chemists' Reports.

Chemists' reports of analysis for protein and/or oil or fat on cottonseed, or sunflower seed, or peanut cake or meal must also show percentage of moisture.

Sec. 2. Preparation of Sample.

Grind the sample, if necessary, to uniform fineness and then thoroughly mix without sieving. Perform the grinding and mixing as rapidly as possible to avoid loss or gain of moisture during the operation.

Sec. 3. Moisture and Volatile Matter (A.0.C.S. Official Method Ba2a 3-38, Revised 1982, Reapproved 1993).

Definition: This method determines the moisture in the products specified, and any material which is volatile under the conditions of the test.

Scope: Applicable to cottonseed meats, meal, and ground cake or pellets from cottonseed, soybeans, peanuts, flaxseed and sunflower seed.

A. Apparatus:

1. Aluminum or tinned metal dishes, ca 50 x 20 mm, with tight covers.
2. Forced draft oven, A.0.C.S. Specification H 1-39, Reapproved 1993.
3. Desiccator containing an efficient desiccant. Calcium chloride is not satisfactory. See A.0.C.S. Specification H 9-45, Reapproved 1993.
4. Jones sampler, riffle type, 6 x 6-inch.
5. Boerner sampler, 36 pocket.
6. Air-tight sample containers, capacity ca 100 g.

B. Preparation of Sample:

Reduce the original 1 000 g. sample through the riffle to ca 1 00 g. and immediately place in air-tight container. Weigh moisture sample immediately.

C. Procedure:

1. Weigh ca 5 g. (2 g. for soybean oil cake or meal and for linseed meal) of the sample into tared moisture dish.
2. Place a dish in the oven and dry at 130º +/- 3ºC. for 2 hours. Moisture content for safflower meal will be made according to NIOP Rules (1-1/2 hours at 130ºC.)
3. Remove from the oven, cover immediately, cool in a desiccator to room temperature and weigh.

D. Calculation:

Moisture and volatile matter, % = Loss in weight x 100 / Weight of sample

Sec. 4. Oil (A.0.C.S. Official Method Ba 3-38, Reapproved 1993).

Definition: This method determines the substances extracted by petroleum ether under the conditions of the test.

Scope: Applicable to cottonseed meats, and cake and meal from cottonseed, soybeans, peanuts, and flaxseed.

A. Apparatus:

1. Butt type extraction apparatus.
2. Filter paper S & S No. 597, Whatman No. 2, Reeve-Angel No. 211 or equivalent, 150 mm.
3. Absorbent cotton, free of petroleum ether extract.
4. Porcelain mortar and pestle, the mortar must be at least 4 inches i.d. at the top. The pestle handle must be large enough to afford a firm hand grip. The inner surface of the mortar is kept rough by occasionally grinding sand in it.
5. Sieve, U.S. No. 20.
6. Sieve, U.S. No. 30.
7. Laboratory mill suitable for grinding the samples to a maximum particle size of U.S. No. 20 sieve (No. 30 for linseed meal).

B. Reagents:

Petroleum ether, A.0.C.S. Specification H 2-41, Reapproved 1993.

C. Preparation of Sample:

Grind the 100 g. portion from A.0.C.S. Official Method Ba 2a-38, Section B, through the laboratory mill to a uniform fineness, ca 20-mesh (ca 30-mesh for linseed meal). Return immediately to an air-tight container. Oil, ground-moisture, and ammonia are determined on this portion.

D. Procedure:

1. *Meal and Ground Cake or Pellets*
   a. Weigh ca 5 g. of the ground sample into a filter paper and enclose in a second filter paper folded in such a fashion as to prevent escape of the meal. The second paper is

left open at the top like a thimble. A piece of absorbent cotton may be placed in the top of the thimble to distribute the solvent as it drops on the sample.

b. Place wrapped sample in the Butt extraction tube and assemble the apparatus.
c. Heat on a water bath or electric hot plate as such a rate that the solvent will drop from the condenser on the center of the thimble at the rate of at least 150 drops per minute.
d. Keep the volume of solvent fairly constant by adding enough to make up for any that may be lost due to evaporation. Continue extraction for 3 hours.
e. Cool and disconnect the extraction flask Evaporate the ether on a steam or water bath until no odor of ether remains. A gentle stream of clean, dry air may be used to facilitate removal of the solvent. Cool to room temperature, carefully remove any moisture or dirt from the outside of the flask and weigh. Repeat heating until constant weight is obtained.
f. Determine the moisture in the ground sample as directed in A.0.C.S. Official Method Ba 2a-38.

2. *Cottonseed Meats*

a. Weigh accurately ca 2 g. of the ground sample and proceed as directed in(a) above, continuing the extraction for 2 hours only.
b. Remove the thimble from the Butt tube, allow the ether to evaporate from the filter paper and sample at room temperature. Then carefully transfer the sample to the mortar so that there will be no loss. Grind the sample in the mortar with the pestle for at least 1 minute or with 100 vigorous strokes. Use no abrasive.
c. Return the reground sample to the same filter paper and continue the extraction as before for 2 additional hours. From here on, proceed as directed in (1) above, paragraphs d, e, and f.

E. Calculations:

$$\text{Oil \%} = \frac{\text{Weight of oil} \times 100}{\text{Weight of sample}}$$

The percentage oil may be calculated to any desired moisture basis with the following formula:

$$\text{Oil, desired moisture basis, \%} = \frac{\text{F (100 - \% moisture desired)}}{\text{100\% - \% moisture in sample analyzed}}$$

F = % oil in sample analyzed.

Sec. 5. Fat

Whenever cottonseed or sunflower meal is sold as a feedstuff, requiring a determination of "Fat" analyze the sample for "Fat" according to the official methods of the Association of Official Agricultural Chemists.

Sec. 6. Nitrogen - Ammonia - Protein (A.0.C.S. Official Method Aa 5-91. Revised 1992, Reapproved 1993).

Nitrogen-Ammonia-Protein
Modified Kjeldahl Method
Titanium Dioxide + Copper Sulfate Catalyst

Definition: This method determines total nitrogen and protein as 6.25 times the nitrogen content of the sample (see Notes, I and References, 1).

Scope: Applicable to cottonseed, cottonseed meats, and meal and ground cake or pellets from cottonseed.

A. Apparatus:

1. Kjeldahl digestion and distillation apparatus-complete with heat source, traps and block-tin, or equivalent noncorrosive tubing condensers (see Notes, 2).
2. Kjeldahl flasks-800 mL.
3. Distillate receiving flasks-500 mL, or any convenient size.

B. Reagents:

1. Catalyst mixture-containing potassium sulfate, 16.7g + titanium dioxide, 0.6g. + copper sulfate, 0.01g. + pumice, 0.3g.
2. Sulfuric acid-sp.gr. 1.84 (see Notes, Caution).3. Sodium hydroxide solution-sp.gr. 1.50 (see Notes, Caution).
4. Sodium gydroxide solution-0.25 N, accurately standardized (see A.O.C.S. Specification H 13-52.
5. Sulfuric acid-0.5 N, accurately standardized (see A.O.C.S. Specification H 13-52).
6. Methyl red indicator solution-0.1% in ethyl alcohol, OR Alizarian Red S-0.3% in distilled water.
7. Alundum boiling stones-8- to 14-mesh.
8. Zinc metal-granular. (If the catalyst is used with added pumice, granular zinc metal need not be added as an antibumping agent).

C. Preparation of Sample:

For cottonseed, it is essential that steps 1-4 in Preparation of Sample, A.O.C.S. Official Method Aa 4-38, Reapproved 1989, be followed as written. After sample preparation, continue with following procedure.

D. Procedure:

1. Weigh 0.250-1.750g. of the ground sample (see Notes, 3) into the Kjeldahl flask. Add the catalyst mixture (premixed catalyst packs are commercially available and may be used).
2. Add 30 mL of concentrated H_2SO_4 (see Notes, 4) to the sample and catalyst in the digestion flask. Include at least 1 sample of high purity lysine hydrochloride in each

day's run as a check of the correctness of digestion parameters. If recovery is not complete, make appropriate adjustments.

3. Add a few Alundum boiling stones to the sample flask.
4. To digest the sample, first adjust heat to bring 250 mL of water at 25^0 C to rolling boil in 5 min. Place the sample flask on the digestion rack in an inclined position and then heat sample flask at the 5-min boil rate until dense, white fumes clear bulb of flask (approximately 5 min). Swirl gently and continue heating an additional 40 min after the liquid has become clear and colorless (see Notes, 5). The Kjeldahl flasks should be rotated a minimum of three times during the digestion.
5. Cool, cautiously add about 300 mL of 0.5 water. Add sufficient distilled water to cover the end of the outlet tube and attach to outlet end of condenser tube. The distillate should discharge through a glass tube at the bottom of the receiving flask.
6. Accurately transfer a sufficient quantity of the standard acid into receiving flask so that there will be an excess of at least 0.5 mL of 0.5 acid. Add sufficient distilled water to cover the end of the outlet tube and attach to outlet end of condenser tube. The distillate should discharge through a glass tube at the bottom of the receiving flask.
7. Add an additional 0. 5- 1.0 g. Alundum boiling stones to cooled digestion flask. Mix thoroughly and add sufficient alkali solution (Reagents, 3) to make strongly alkaline. Pour the alkali down the side of the Kjeldahl flask so that it does not mix quickly with the acid.
8. Immediately connect the Kjeldahl flask to the other end of the condenser tube and thoroughly mix the contents by shaking. Apply heat at about a 7.5-min boil rate and distill until at least 150 mL of distillate have been collected.
9. Titrate the contents of the receiving flask with 0.25 N NaOH solution, using 3 or 4 drops of indicator.
10. Conduct a blank determination of all reagents simultaneously with the samples and similar in all respects. Correct for blank determined on reagents.
11. The performance of the entire method should be checked frequently by analyzing either National Institute of Testing (MST)-certified ammonium dihydrogen phosphate (standard reference material 194) or high-purity lysine hydrochloride.
12. Determine moisture in the ground sample as directed in A.0.C.S. Official Method Ba 2a-38, Reapproved 1993, Procedure section.

E. Calculations:

1. Nitrogen, % =

$$\frac{[(NA \times mLA) - (mLBK \times NB) - (mLB \times NB)] \times 1400.67}{\text{mg sample}}$$

Where -

mLB = mL standard base used for the sample

mLA = mL standard acid used for that sample

mLBK = mL standard base needed to titrate 1 mL of standard acid minus mL standard base needed to titrate reagent blank carried through method and distilled into 1 mL standard acid.

NA = normality of standard acid

NB = normality of standard base

Note - To determine %o ammonia, substitute 1703.06 for 1400.67 in the equation for the calculation of % nitrogen.

2. Refer to the Conversion Table for Nitrogen, Ammonia and Protein included in this method for conversion from nitrogen (based on conversion factor of 6.15) or ammonia (based on conversion factor of 5. 14) to protein.
3. Table 1 (on next page) lists U.S. Department of Agriculture (USDA) factors for converting from percent nitrogen to percent protein (see Notes, 7 and References, 2).

F. Precision:

Tables 2, 3 and 4 list the results of the second collaborative study, March 1991, for the determination of nitrogen in cottonseed and cottonseed meal, using a 0.56 catalyst to acid ratio for $TiO_2/CuSO_4$ catalyst. The project coordinator was James Falk, member of the A.0.C.S. Seed and Meal Analysis Technical Committee.

Table I
Products and protein conversion factors.

Cottonseed (roasted)	Protein = N x 5.30
Peanuts (dried)	Protein = N x 5.46
Soybeans (roasted)	Protein = N x 5.71
Sunflower seed (dried)	Protein = N x 5.30
Safflower seed (dried)	Protein = N x 5.30
Coconut meat (raw)	Protein = N x 5.30
Sesame (dried)	Protein = N x 5.30
Corn	Protein = N x 6.25
Millet (raw)	Protein = N x 5.83
Rice (brown, long grain)	Protein = N x 5.95
Wheat (hard red)	Protein = N x 5.83
Cottonseed flour	Protein = N x 5.30
Peanut flour	Protein = N x 5.46
Soybean flour	Protein = N x 5.71
Sunflower flour	Protein = N x 5.30
Corn flour	Protein = N x 6.25
Safflower meal	Protein = N x 5.30

Notes:

Caution

Sulfuric acid is a strong acid and will cause severe burns. Protective clothing should be worn when working with this acid. It is an oxidizing agent and should not be stored in the

vicinity of organic materials. Use great caution in mixing with water due to heat evolution that can cause explosive spattering. Always add the acid to water, never the reverse.

Table 2
Summary of collaborative study results for determination of percent nitrogen (dry-weight basis) in delinted cottonseed with 21.2% oil content, using 30 mL of acid for digestion.

	1		9		1 + 9	
Sample	Ti-Cu	HgO	Ti-Cu	HgO	Ti-Cu	HgO
% Nitrogen	4.28	4.29	4.31	4.30	4.30	4.30
SD	0.04	0.06	0.06	0.06	0.04	0.04
CV%	0.97	1.31	1.43	1.43	0.99	0.87
Range	0.13	0.22	0.18	0.20	0.13	0.12

Table 3. Summary of collaborative study results for determination of percent nitrogen (dry-weight basis) in high protein cottonseed meal, using 30 mL of acid for digestion.

	1		2		1 + 2	
Sample	Ti-Cu	HgO	Ti-Cu	HgO	Ti-Cu	HgO
% Nitrogen	7.82	7.78	7.82	7.80	7.82	7.79
SD	0.09	0.09	0.07	0.05	0.07	0.06
CV%	1.14	1.15	0.90	0.64	0.90	0.73
Range	0.27	0.33	0.19	0.17	0.20	0.17

Table 4. Summary of collaborative study results for determination of percent nitrogen (dry-weight basis) in 52% protein cottonseed meal, using 30 mL of acid for digestion.

	4		8		4 + 8	
Sample	Ti-Cu	HgO	Ti-Cu	HgO	Ti-Cu	HgO
% Nitrogen	8.24	8.26	8.29	8.25	8.26	8.25
SD	0.23	0.09	0.06	0.09	0.14	0.08
CV%	0.97	0.34	0.20	0.30	0.59	0.30
Range	0.27	0.33	0.19	0.17	0.20	0.17

Alkalies can burn skin, eyes and respiratory tract severely. Wear heavy rubber gloves and face shield to protect against concentrated alkali solutions. Use effective fume-removal device or gas mask to protect respiratory tract against alkali dusts and vapors. When working with extremely caustic materials like sodium hydroxide and potassium hydroxide, always add pellets to water and not vice versa. These alkalies are extremely exothermic when mixed with water. Take precautions to contain the caustic solution in the event the mixing container breaks from the extreme heat generated.

Numbered Notes:

1. This method has been evaluated through interlaboratory comparison of catalysts and has been adopted by the committee as the official replacement for the mercuric oxide catalyzed method, A.0.C.S. Official Method Ba 4a-38, Reapproved 1989. An interlaboratory evaluation (References, 3) indicated that A.0.C.S. Official Method Ba 4d-90 (using the copper/titanium catalyst mixture) produces results closer in agreement with A.0.C.S. Official Method Ba 4a-38, Reapproved 1989 (using mercuric oxide catalyst) than methods using copper sulfate catalyst. As a result of this study, A.0.C.S. Official Methods Ba 4a-38, Reapproved 1989 (mercuric oxide), 4b-87 (copper sulfate) and 4c-87 (Kjel-Foss Automatic) were declared surplus (obsolete) in 1991.

The Association of Official Analytical Chemists (AOAC) collaborative study (References, 4) showed no bias when comparing Cu/Ti catalyst with HgO.

The A.0.C.S. interlaboratory evaluation (References, 3), based on sample weight, acid, volume, digestion temperature and time, previously specified in A.0.C.S. Official Method Ba 4a-38, Reapproved 1989, indicated an average bias of -0.244%, which was statistically significant at the 99% confidence level. Factors that may affect method bias are sample weight and particle size, catalyst composition, digestion temperature and digestion time. In 1991, two additional collaborative studies (cottonseed and cottonseed meal) showed that when 30 mL of sulfuric acid were used, caking of the digest was reduced and results were comparable to the mercuric oxide catalyzed method. As a result, the A.0.C.S. versions of this method may specify the use of more than 20 mL of sulfuric acid, but otherwise conform with the AOAC version (References, 5).

2. Use of steam- and water-resistant rubber tubing and stoppers to connect the glass parts is strongly recommended.
3. Due to large particle size, a larger sample, in the range of 1.4 to 1.7 g. is recommended for cottonseed meal. This may also require an adjustment in the volume of sulfuric acid used for sample digestion.
4. More than 20 mL of concentrated sulfuric acid is needed for samples high in fat or oil, because more acid is required to effect complete digestion, avoid loss in nitrogen and prevent caking. In recent collaborative studies involving the application of this method to cottonseed meal, it was observed that when 30 mL of H_2SO_4 were used, caking was reduced and results were comparable to the mercuric oxide catalyzed method.
5. Complete conversion of organic nitrogen to ammoniacal nitrogen is essential to obtain accurate and precise results. After the liquid has become clear and colorless, it may be necessary to digest the sample for approximately an additional 30-50 min. Reagent proportions, heat input and digestion time are critical factors and should not be changed. Prolonged digestion and high temperatures must be avoided, because the larger particles will require a longer digestion time.

6. The cooled digest should be liquid, or liquid with a few small crystals. Caking before the addition of water indicates too little residual acid at the end of the digestion period and may result in low nitrogen values.
7. The factors listed in Table I are for informational purposes only. See References, 6 for a discussion relating to nitrogen-protein conversion factors.

Sec. 7. Odor of Cottonseed Cake and Cottonseed Meal.

(Note: See Rules 246 and 261 for definitions.)

"Of sweet odor" is interpreted as the natural odor of cottonseed, sunflower seed, or peanut cake or meal produced from sound seed and free form contamination. It shall be expressed as an opinion only.

TABLE 1 FOR THE CONVERSION OF NITROGEN INTO AMMONIA AND PROTEIN

N	NH3	Prot	N	NH3	Prot	N	NH3	Prot	N	NH3	Prot
0.00	0.00	0.00	0.50	0.61	3.13	1.00	1.22	6.25	1.50	1.82	9.38
0.01	0.01	0.06	0.51	0.62	3.19	1.01	1.23	6.31	1.51	1.84	9.44
0.02	0.02	0.13	0.52	0.63	3.25	1.02	.124	6.38	1.52	1.85	9.50
0.03	0.04	0.19	0.53	0.64	3.31	1.03	1.25	6.44	1.53	1.86	9.56
0.04	0.05	0.25	0.54	0.66	3.38	1.04	1.26	6.50	1.54	1.87	9.63
0.05	0.06	0.31	0.55	0.67	3.44	1.05	1.28	6.56	1.55	1.88	9.69
0.06	0.07	0.38	0.56	0.68	3.50	1.06	1.29	6.63	1.56	1.90	9.75
0.07	0.09	0.44	0.57	0.69	3.56	1.07	1.30	6.69	1.57	1.91	9.81
0.08	0.10	0.50	0.58	0.71	3.63	1.08	1.31	6.75	1.58	1.92	9.88
0.09	0.11	0.56	0.59	0.72	3.69	1.09	1.33	6.81	1.59	1.96	9.94
0.10	0.12	0.63	0.60	0.73	3.75	1.10	1.34	6.88	1.60	1.95	10.00
0.11	0.13	0.69	0.61	0.74	3.81	1.11	1.35	6.94	1.61	1.96	10.06
0.12	0.15	0.75	0.62	0.75	3.88	1.12	1.36	7.00	1.62	1.97	10.13
0.13	0.16	0.81	0.63	0.77	3.94	1.13	1.37	7.06	1.63	1.98	10.19
0.14	0.17	0.88	0.64	0.78	4.00	1.14	1.39	7.13	1.64	1.99	10.25
0.15	0.18	0.94	0.65	0.79	4.06	1.15	1.40	7.19	1.65	2.01	10.31
0.16	0.19	1.00	0.66	0.80	4.13	1.16	1.41	7.25	1.66	2.02	10.38
0.17	0.21	1.06	0.67	0.81	4.19	1.17	1.42	7.31	1.67	2.03	10.44
0.18	0.22	1.13	0.68	0.83	4.25	1.18	1.43	7.38	1.68	2.04	10.50
0.19	0.23	1.19	0.69	0.84	4.31	1.19	1.45	7.44	1.69	2.05	10.56
0.20	0.24	1.25	0.70	0.85	4.38	1.20	1.46	7.50	1.70	2.07	10.63
0.21	0.26	1.31	0.71	0.86	4.44	1.21	1.47	7.56	1.71	2.08	10.69
0.22	0.27	1.38	0.72	0.88	4.50	1.22	1.48	7.63	1.72	2.09	10.75
0.23	0.28	1.44	0.73	0.89	4.56	1.23	1.50	7.69	1.73	2.10	10.81
0.24	0.29	1.50	0.74	0.90	4.63	1.24	1.51	7.75	1.74	2.12	10.88
0.25	0.30	1.56	0.75	0.91	4.69	1.25	1.52	7.81	1.75	2.13	10.94
0.26	0.32	1.63	0.76	0.92	4.75	1.26	1.53	7.88	1.76	2.14	11.00
0.27	0.33	1.69	0.77	0.94	4.81	1.27	1.54	7.94	1.77	2.15	11.06
0.28	0.34	1.75	0.78	0.95	4.88	1.28	1.56	8.00	1.78	2.16	11.13
0.29	0.35	1.81	0.79	0.96	4.94	1.29	1.57	8.06	1.79	2.18	11.19
0.30	0.36	1.88	0.80	0.97	5.00	1.30	1.52	8.13	1.80	2.19	11.25
0.31	0.38	1.94	0.81	0.98	5.06	1.31	1.59	8.19	1.81	2.20	11.31
0.32	0.39	2.00	0.82	1.00	5.13	1.32	1.61	8.25	1.82	2.21	11.38
0.33	0.40	2.06	0.83	1.01	5.19	1.33	1.62	8.31	1.83	2.23	11.44
0.34	0.41	2.13	0.84	10.2	5.25	1.34	1.63	8.38	1.84	2.24	11.50
0.35	0.43	2.19	0.85	1.03	5.31	1.35	1.64	8.44	1.85	2.25	11.56
0.36	0.44	2.25	0.86	1.05	5.38	1.36	1.65	8.50	1.86	2.26	11.63
0.37	0.45	2.31	0.87	1.06	5.44	1.37	1.67	8.56	1.87	2.27	11.69
0.38	0.46	2.37	0.88	1.07	5.50	1.38	1.68	8.63	1.88	2.29	11.75
0.39	0.47	2.44	0.89	1.08	5.56	1.39	1.69	8.69	1.89	2.30	11.81
0.40	0.49	2.50	0.90	1.09	5.63	1.40	1.70	8.75	1.90	2.31	11.88
0.41	0.50	2.56	0.91	1.11	5.69	1.41	1.71	8.81	1.91	2.32	11.94
0.42	0.51	2.63	0.92	1.12	5.75	1.42	1.73	8.88	1.92	2.33	12.00
0.43	0.52	2.69	0.93	1.13	5.81	1.43	1.74	8.94	1.93	2.35	12.06
0.44	0.54	2.75	0.94	1.14	5.88	1.44	1.75	9.00	1.94	2.36	12.13
0.45	0.55	2.81	0.95	1.16	5.94	1.45	1.76	9.06	1.95	2.37	12.19
0.46	0.56	2.87	0.96	1.17	6.00	1.46	1.78	9.13	1.96	2.38	12.25
0.47	0.57	2.94	0.97	1.18	6.06	1.47	1.79	9.19	1.97	2.40	12.31
0.48	0.58	3.00	0.98	1.19	6.13	1.48	1.80	9.25	1.98	2.41	12.38
0.49	0.60	3.06	0.99	1.20	6.19	1.49	1.81	9.31	1.99	2.42	12.44

TABLE 2 FOR THE CONVERSION OF NITROGEN INTO AMMONIA AND PROTEIN

N	NH3	Prot	N	NH3	Prot	N	NH3	Prot	N	NH3	Prot
2.00	2.43	12.50	2.50	3.04	15.63	3.00	3.65	18.75	3.50	4.26	21.88
2.01	2.44	12.56	2.51	3.05	15.69	3.01	3.66	18.81	3.51	4.27	21.94
2.02	2.46	12.63	2.52	3.06	15.75	3.02	3.67	18.88	3.52	4.28	22.00
2.03	2.47	12.69	2.53	3.08	15.81	3.03	3.68	18.94	3.53	4.29	22.06
2.04	2.48	12.75	2.54	3.09	15.88	3.04	3.70	19.00	3.54	4.30	22.13
2.05	2.49	12.81	2.55	3.10	15.94	3.05	3.71	19.06	3.55	4.32	22.19
2.06	2.50	12.88	2.56	3.11	16.00	3.06	3.72	19.13	3.56	4.33	22.25
2.07	2.52	12.94	2.57	3.13	16.06	3.07	3.73	19.19	3.57	4.34	22.31
2.08	2.53	13.00	2.58	3.14	16.13	3.08	3.75	19.25	3.58	4.35	22.38
2.09	2.54	13.06	2.59	3.15	16.19	3.09	3.76	19.31	3.59	4.37	22.44
2.10	2.55	13.13	2.60	3.16	16.25	3.10	3.77	19.38	3.60	4.38	22.50
2.11	2.57	13.19	2.61	3.17	16.31	3.11	3.78	19.44	3.61	4.39	22.56
2.12	2.58	13.25	2.62	3.19	16.38	3.12	3.79	19.50	3.62	4.40	22.63
2.13	2.59	13.31	2.63	3.20	16.44	3.13	3.81	19.56	3.63	4.41	22.69
2.14	2.60	13.38	2.64	3.21	16.50	3.14	3.82	19.63	3.64	4.43	22.75
2.15	2.62	13.44	2.65	3.22	16.56	3.15	3.83	19.69	3.65	4.44	22.81
2.16	2.63	13.50	2.66	3.23	16.63	3.16	3.84	19.75	3.66	4.45	22.88
2.17	2.64	13.56	2.67	3.25	16.69	3.17	3.85	19.81	3.67	4.46	22.94
2.18	2.65	13.63	2.68	3.26	16.75	3.18	3.87	19.88	3.68	4.47	23.00
2.19	2.66	13.69	2.69	3.27	16.81	3.19	3.88	19.94	3.69	4.49	23.06
2.20	2.68	13.75	2.70	3.28	16.88	3.20	3.89	20.00	3.70	4.50	23.13
2.21	2.69	13.81	2.71	3.30	16.94	3.21	3.90	20.06	3.71	4.51	23.19
2.22	2.70	13.88	2.72	3.31	17.00	3.22	3.92	20.13	3.72	4.52	23.25
2.23	2.71	13.94	2.73	3.32	17.06	3.23	3.93	20.19	3.73	4.54	23.31
2.24	2.72	14.00	2.74	3.33	17.13	3.24	3.94	20.25	3.74	4.55	23.38
2.25	2.74	14.06	2.75	3.34	17.19	3.25	3.95	20.31	3.75	4.56	23.44
2.26	2.75	14.13	2.76	3.36	17.25	3.26	3.96	20.38	3.76	4.57	23.50
2.27	2.76	14.19	2.77	3.37	17.31	3.27	3.98	20.44	3.77	4.58	23.56
2.28	2.77	14.25	2.78	3.38	17.38	3.28	3.99	20.50	3.78	4.60	23.63
2.29	2.78	14.31	2.79	3.39	17.44	3.29	4.00	20.56	3.79	4.61	23.69
2.30	2.80	14.38	2.80	3.40	17.50	3.30	4.01	20.63	3.80	4.62	23.75
2.31	2.81	14.44	2.81	3.42	17.56	3.31	4.02	20.69	3.81	4.63	23.81
2.32	2.82	14.50	2.82	3.43	17.63	3.32	4.04	20.75	3.82	4.64	23.88
2.33	2.83	14.56	2.83	3.44	17.69	3.33	4.05	20.81	3.83	4.66	23.94
2.34	2.85	14.63	2.84	3.45	17.75	3.34	4.06	20.88	3.84	4.68	24.00
2.35	2.86	14.69	2.85	3.47	17.81	3.35	4.07	20.94	3.85	4.68	24.06
2.36	2.87	14.75	2.86	3.48	17.88	3.36	4.09	21.00	3.86	4.69	24.13
2.37	2.88	14.81	2.87	3.49	17.94	3.37	4.10	21.06	3.87	4.71	24.19
2.38	2.89	14.88	2.88	3.50	18.00	3.38	4.11	21.13	3.88	4.72	24.25
2.39	2.91	14.94	2.89	3.51	18.06	3.39	4.12	21.19	3.89	4.73	24.31
2.40	2.92	15.00	2.90	3.53	18.13	3.40	4.13	21.25	3.90	4.74	24.38
2.41	2.93	15.06	2.91	3.54	18.19	3.41	4.15	21.31	3.91	4.75	24.44
2.42	2.94	15.13	2.92	3.55	18.25	3.42	4.16	21.38	3.92	4.77	24.50
2.43	2.95	15.19	2.93	3.56	18.31	3.43	4.17	21.44	3.93	4.78	24.56
2.44	2.97	15.25	2.94	3.57	18.38	3.44	4.18	21.50	3.94	4.79	24.63
2.45	2.98	15.31	2.95	3.59	18.44	3.45	4.20	21.56	3.95	4.80	24.69
2.46	2.99	15.38	2.96	3.60	18.50	3.46	4.21	21.63	3.96	4.82	24.75
2.47	3.00	15.44	2.97	3.61	18.56	3.47	4.22	21.69	3.97	4.83	24.81
2.48	3.02	15.50	2.98	3.62	18.63	3.48	4.23	21.75	3.98	4.84	24.88
2.49	3.03	15.56	2.99	3.64	18.69	3.49	4.24	21.81	3.99	4.85	24.94

TABLE 3 FOR THE CONVERSION OF NITROGEN INTO AMMONIA AND PROTEIN

N	NH3	Prot	N	NH3	Prot	N	NH3	Prot	N	NH3	Prot
4.00	4.86	25.00	4.50	5.47	28.13	5.00	6.08	31.25	5.50	6.69	34.38
4.01	4.88	25.06	4.51	5.48	28.19	5.01	6.09	31.31	5.51	6.70	34.44
4.02	4.89	25.13	4.52	5.50	28.25	5.02	6.10	31.38	5.52	6.71	34.50
4.03	4.90	25.19	4.53	5.51	28.31	5.03	6.12	31.44	5.53	6.72	34.56
4.04	4.91	25.25	4.54	5.52	28.38	5.04	6.13	31.50	5.54	6.74	34.63
4.05	4.92	25.31	4.55	5.53	28.44	5.05	6.14	31.56	5.55	6.75	34.69
4.06	4.94	25.38	4.56	5.54	28.50	5.06	6.15	31.63	5.56	6.76	34.75
4.07	4.95	25.44	4.57	5.56	28.56	5.07	6.16	31.69	5.57	6.77	34.81
4.08	4.96	25.50	4.58	5.57	28.63	5.08	6.18	31.75	5.58	6.79	34.88
4.09	4.97	25.56	4.59	5.58	28.69	5.09	6.19	31.81	5.59	6.80	34.94
4.10	4.99	25.63	4.60	5.59	28.75	5.10	6.20	31.88	5.60	6.81	35.00
4.11	5.00	25.69	4.61	5.61	28.81	5.11	6.21	31.94	5.61	6.82	35.06
4.12	5.01	25.75	4.62	5.62	28.88	5.12	6.23	32.00	5.62	6.83	35.13
4.13	5.02	25.81	4.63	5.63	28.94	5.13	6.24	32.06	5.63	6.85	35.19
4.14	5.03	25.88	4.64	5.64	29.00	5.14	6.25	32.13	5.64	6.86	35.25
4.15	5.05	25.94	4.65	5.65	29.06	5.15	6.26	32.19	5.65	6.87	35.31
4.16	5.06	26.00	4.66	5.67	29.13	5.16	6.27	32.25	5.66	6.88	38.38
4.17	5.07	26.06	4.67	5.68	29.19	5.17	6.29	32.31	5.67	6.89	35.44
4.18	5.08	26.13	4.68	5.69	29.25	5.18	6.30	32.38	5.68	6.91	35.50
4.19	5.09	26.19	4.69	5.70	29.31	5.19	6.31	32.44	5.69	6.92	35.56
4.20	5.11	26.25	4.70	5.71	29.38	5.20	6.32	32.50	5.70	6.93	35.63
4.21	5.12	26.31	4.71	5.73	29.44	5.21	6.34	32.56	5.71	6.94	35.69
4.22	5.13	26.38	4.72	5.74	29.50	5.22	6.35	32.63	5.72	6.96	35.75
4.23	5.14	26.44	4.73	5.75	29.56	5.23	6.36	32.69	5.73	6.97	35.81
4.24	5.16	26.50	4.74	5.76	29.63	5.24	6.37	32.75	5.74	6.98	35.88
4.25	5.17	26.56	4.75	5.78	29.69	5.25	6.38	32.81	5.75	6.99	35.94
4.26	5.18	26.63	4.76	5.79	29.75	5.26	6.40	32.88	5.76	7.00	36.00
4.27	5.19	26.69	4.77	5.80	29.81	5.27	6.41	32.94	5.77	7.02	36.06
4.28	5.20	26.75	4.78	5.81	29.88	5.28	6.42	33.00	5.78	7.03	36.13
4.29	5.22	26.81	4.79	5.82	29.94	5.29	6.43	33.06	5.79	7.04	36.19
4.30	5.23	26.88	4.80	5.84	30.00	5.30	6.44	33.13	5.80	7.05	36.25
4.31	5.24	26.94	4.81	5.85	30.06	5.31	6.46	33.19	5.81	7.06	36.31
4.32	5.25	27.00	4.82	5.86	30.13	5.32	6.47	33.25	5.82	7.08	36.38
4.33	5.27	27.06	4.83	5.87	30.19	5.33	6.48	33.31	5.83	7.09	36.44
4.34	5.28	27.13	4.84	5.89	30.25	5.34	6.49	33.38	5.84	7.10	36.50
4.35	5.29	27.19	4.85	5.90	30.31	5.35	6.51	33.44	5.85	7.11	36.56
4.36	5.30	27.25	4.86	5.91	30.38	5.36	6.52	33.50	5.86	7.13	36.63
4.37	5.31	27.31	4.87	5.92	30.44	5.37	6.53	33.56	5.87	7.14	36.69
4.38	5.33	27.38	4.88	5.93	30.50	5.38	6.54	33.63	5.88	7.15	36.75
4.39	5.34	27.44	4.89	5.95	30.56	5.39	6.55	33.69	5.89	7.16	36.81
4.40	5.35	27.50	4.90	5.96	60.63	5.40	6.57	33.75	5.90	7.17	36.88
4.41	5.36	27.56	4.91	5.97	60.69	5.41	6.58	33.81	5.91	7.19	36.94
4.42	5.37	27.63	4.92	5.98	30.75	5.42	6.59	33.88	5.92	7.20	37.00
4.43	5.39	27.69	4.93	5.99	30.81	5.43	6.60	33.94	5.93	7.21	37.06
4.44	5.40	27.75	4.94	6.01	30.88	5.44	6.61	34.00	5.94	7.22	37.13
4.45	5.41	27.81	4.95	9.02	30.94	5.45	6.63	34.06	5.95	7.23	37.19
4.46	5.42	27.88	4.96	6.03	31.00	5.46	6.64	34.13	5.96	7.25	37.25
4.47	5.44	27.94	4.97	6.04	31.06	5.47	6.65	34.19	5.97	7.26	37.31
4.48	5.45	28.00	4.98	6.06	31.13	5.48	6.66	34.25	5.98	7.27	37.38
4.49	5.46	28.06	4.99	6.07	31.19	5.49	6.68	34.31	5.99	7.28	37.44

TABLE 4 FOR THE CONVERSION OF NITROGEN INTO AMMONIA AND PROTEIN

N	NH3	Prot	N	NH3	Prot	N	NH3	Prot	N	NH3	Prot
6.00	7.30	37.50	6.50	7.90	40.63	7.00	8.51	43.75	7.50	9.12	46.88
6.01	7.31	37.56	6.51	7.92	40.69	7.01	8.52	43.81	7.51	9.13	46.94
6.02	7.32	37.63	6.52	7.93	40.75	7.02	8.54	43.88	7.52	9.14	47.00
6.03	7.33	37.69	6.53	7.94	40.81	7.03	8.55	43.94	7.53	9.16	47.06
6.04	7.34	37.75	6.54	7.95	40.88	7.04	8.56	44.00	7.54	9.17	47.13
6.05	7.36	37.81	6.55	7.96	40.94	7.05	8.57	44.06	7.55	9.18	47.19
6.06	7.37	37.88	6.56	7.98	41.00	7.06	8.58	44.13	7.56	9.19	47.25
6.07	7.38	37.94	6.57	7.99	41.06	7.07	8.60	44.19	7.57	9.20	47.31
6.08	7.39	38.00	6.58	8.00	41.13	7.08	8.61	44.25	7.58	9.22	47.38
6.09	7.41	38.06	6.59	8.01	41.19	7.09	8.62	44.31	7.59	9.23	47.44
6.10	7.42	38.13	6.60	8.03	41.25	7.10	8.63	44.38	7.60	9.24	47.50
6.11	7.43	38.19	6.61	8.04	41.31	7.11	8.65	44.44	7.61	9.25	47.56
6.12	7.44	38.25	6.62	8.05	41.38	7.12	8.66	44.50	7.62	9.27	47.63
6.13	7.45	38.31	6.63	8.06	41.44	7.13	8.67	44.56	7.63	9.28	47.69
6.14	7.47	38.38	6.64	8.07	41.50	7.14	8.68	44.63	7.64	9.29	47.75
6.15	7.48	38.44	6.65	8.09	41.56	7.15	8.69	44.69	7.65	9.30	47.81
6.16	7.49	38.50	6.66	8.10	41.63	7.16	8.71	44.75	7.66	9.31	47.88
6.17	7.50	38.56	6.67	8.11	41.69	7.17	8.72	44.81	7.67	9.33	47.94
6.18	7.51	38.63	6.68	8.12	41.75	7.18	8.73	44.88	7.68	9.34	48.00
6.19	7.53	38.69	6.69	8.13	41.81	7.19	8.74	44.94	7.69	9.35	48.06
6.20	7.54	38.75	6.70	8.15	41.88	7.20	8.75	45.00	7.70	9.36	48.13
6.21	7.55	38.81	6.71	8.16	41.94	7.21	8.77	45.06	7.71	9.38	48.19
6.22	7.56	38.88	6.72	8.17	42.00	7.22	8.78	45.13	7.72	9.39	48.25
6.23	7.58	38.94	6.73	8.18	42.06	7.23	8.79	45.19	7.73	9.40	48.31
6.24	7.59	39.00	6.74	8.20	42.13	7.24	8.80	45.25	7.74	9.41	48.38
6.25	7.60	39.06	6.75	8.21	42.19	7.25	8.82	45.31	7.75	9.42	48.44
6.26	7.61	39.13	6.76	8.22	42.25	7.26	8.83	45.38	7.76	9.44	48.50
6.27	7.62	39.19	6.77	8.23	42.31	7.27	8.84	45.44	7.77	9.45	48.56
6.28	7.64	39.25	6.78	8.24	42.38	7.28	8.85	45.50	7.78	9.46	48.63
6.29	7.65	39.31	6.79	8.26	42.44	7.29	8.86	45.56	7.79	9.47	48.69
6.30	7.66	39.38	6.80	8.27	42.50	7.30	8.88	45.63	7.80	9.48	48.75
6.31	7.67	39.44	6.81	8.28	42.56	7.31	8.89	45.69	7.81	9.50	48.81
6.32	7.68	39.50	6.82	8.29	42.63	7.32	8.90	45.75	7.82	9.51	48.88
6.33	7.70	39.56	6.83	8.30	42.69	7.33	8.91	45.81	7.83	9.52	48.94
6.34	7.71	39.63	6.84	8.32	42.75	7.34	8.93	45.88	7.84	9.53	49.00
6.35	7.72	39.69	6.85	8.33	42.81	7.35	8.94	45.94	7.85	9.55	49.06
6.36	7.73	39.75	6.86	8.34	42.88	7.36	8.95	46.00	7.86	9.56	49.13
6.37	7.75	39.81	6.87	8.35	42.94	7.37	8.96	46.06	7.87	9.57	49.19
6.38	7.76	39.88	6.88	8.37	43.00	7.38	8.97	46.13	7.88	9.58	49.25
6.39	7.77	39.94	6.89	8.38	43.06	7.39	8.99	46.19	7.89	9.59	49.31
6.40	7.78	40.00	6.90	8.39	43.13	7.40	9.00	46.25	7.90	9.61	49.38
6.41	7.79	40.06	6.91	8.40	43.19	7.41	9.01	46.31	7.91	9.62	49.44
6.42	7.81	40.13	6.92	8.41	43.25	7.42	9.02	46.38	7.92	9.63	49.50
6.43	7.82	40.19	6.93	8.43	43.31	7.43	9.03	46.44	7.93	9.64	49.56
6.44	7.83	40.25	6.94	8.44	43.38	7.44	9.05	46.50	7.94	9.65	49.63
6.45	7.84	40.31	6.95	8.45	43.44	7.45	9.06	46.56	7.95	9.67	49.69
6.46	7.86	40.38	6.96	8.46	43.50	7.46	9.07	46.63	7.96	9.68	49.75
6.47	7.87	40.44	6.97	8.48	43.56	7.47	9.08	46.69	7.97	9.69	49.81
6.48	7.88	4050	6.98	8.49	43.63	7.48	9.10	46.75	7.98	9.70	49.88
6.49	7.89	40.56	6.99	8.50	43.69	7.49	9.11	46.81	7.99	9.72	49.94

TABLE 5 FOR THE CONVERSION OF NITROGEN INTO AMMONIA AND PROTEIN

N	NH3	Prot	N	NH3	Prot	N	NH3	Prot	N	NH3	Prot
8.00	9.73	50.00	8.50	10.34	53.13	9.00	10.94	56.25	9.50	11.55	59.38
8.01	9.74	50.06	8.51	10.35	53.19	9.01	10.96	56.31	9.51	11.56	59.44
8.02	9.75	50.13	8.52	10.36	53.25	9.02	10.97	56.38	9.52	11.58	59.50
8.03	9.76	50.19	8.53	10.37	53.31	9.03	10.98	56.44	9.53	11.59	59.56
8.04	9.78	50.25	8.54	10.38	53.38	9.04	10.99	56.50	9.54	11.60	59.63
8.05	9.79	50.31	8.55	10.40	53.44	9.05	11.00	56.56	9.55	11.61	59.69
8.06	9.80	50.38	8.56	10.41	53.50	9.06	11.02	56.63	9.56	11.62	59.75
8.07	9.81	50.44	8.57	10.42	53.56	9.07	11.03	56.69	9.57	11.64	59.81
8.08	9.82	50.50	8.58	10.43	53.63	9.08	11.04	56.75	9.58	11.65	59.88
8.09	9.84	50.56	8.59	10.45	53.69	9.09	11.05	56.81	9.59	11.66	59.94
8.10	9.85	50.63	8.60	10.46	53.75	9.10	11.07	56.88	9.60	11.67	60.00
8.11	9.86	50.69	8.61	10.47	53.81	9.11	11.08	56.94	9.61	11.69	60.06
8.12	9.87	50.75	8.62	10.48	53.88	9.12	11.09	57.00	9.62	11.70	60.13
8.13	9.89	50.81	8.63	10.49	53.94	9.13	11.10	57.06	9.63	11.71	60.19
8.14	9.90	50.88	8.64	10.51	54.00	9.14	11.11	57.13	9.64	11.72	60.25
8.15	9.91	50.94	8.65	10.52	54.06	9.15	11.13	57.19	9.65	11.73	60.31
8.16	9.92	51.00	8.66	10.53	54.13	9.16	11.14	57.25	9.66	11.75	60.38
8.17	9.93	51.06	8.67	10.54	54.19	9.17	11.15	57.31	9.67	11.76	60.44
8.18	9.95	51.13	8.68	10.55	54.25	9.18	11.16	57.38	9.68	11.77	60.50
8.19	9.96	51.19	8.69	10.57	54.31	9.19	11.17	57.44	9.69	11.78	60.56
8.20	9.97	51.25	8.70	10.58	54.38	9.20	11.19	57.50	9.70	11.79	60.63
8.21	9.97	51.31	8.71	10.59	54.44	9.21	11.20	57.56	9.71	11.81	60.69
8.22	10.0	51.38	8.72	10.60	54.50	9.22	11.21	57.63	9.72	11.82	60.75
8.23	10.01	51.44	8.73	10.62	54.56	9.23	11.22	57.69	9.73	11.83	60.81
8.24	10.02	51.50	8.74	10.63	54.63	9.24	11.24	57.75	9.74	11.84	60.88
8.25	10.03	51.56	8.75	10.64	54.69	9.25	11.25	57.81	9.75	11.86	60.94
8.26	10.04	51.63	8.76	10.65	54.75	9.26	11.26	57.88	9.76	11.87	61.00
8.27	10.06	51.69	8.77	10.66	54.81	9.27	11.27	57.94	9.77	11.88	61.06
8.28	10.07	51.75	8.78	10.68	54.88	9.28	11.28	58.00	9.78	11.89	61.13
8.29	10.08	51.81	8.79	10.69	54.94	9.29	11.30	58.06	9.79	11.90	61.19
8.30	10.09	51.88	8.80	10.70	55.00	9.30	11.31	58.13	9.80	11.92	61.25
8.31	10.10	51.94	8.81	10.71	55.06	9.31	11.32	58.19	9.81	11.93	61.31
8.32	10.12	52.00	8.82	10.72	55.13	9.32	11.33	58.25	9.82	11.94	61.38
8.33	10.13	52.06	8.83	10.74	55.19	9.33	11.34	58.31	9.83	11.95	61.44
8.34	10.14	52.13	8.84	10.75	55.25	9.34	11.36	58.38	9.84	11.96	61.50
8.35	10.15	52.19	8.85	10.76	55.31	9.35	11.37	58.44	9.85	11.98	61.56
8.36	10.17	52.25	8.86	10.77	55.38	9.36	11.38	58.50	9.86	11.99	61.63
8.37	10.18	52.31	8.87	10.79	55.44	9.37	11.39	58.56	9.87	12.00	61.69
8.38	10.19	52.38	8.88	10.80	55.50	9.38	11.41	58.63	9.88	12.01	61.75
8.39	10.20	52.44	8.89	10.81	55.56	9.39	11.42	58.69	9.89	12.03	61.81
8.40	10.21	52.50	8.90	10.82	55.63	9.40	11.43	58.75	9.90	12.04	61.88
8.41	10.23	52.56	8.91	10.83	55.69	9.41	11.44	58.81	9.91	12.05	61.94
8.42	10.24	52.63	8.92	10.85	55.75	9.42	11.45	58.88	9.92	12.06	62.00
8.43	10.25	52.69	8.93	10.86	55.81	9.43	11.47	58.94	9.93	12.07	62.06
8.44	10.26	52.75	8.94	10.87	55.88	9.44	11.48	59.00	9.94	12.09	62.13
8.45	10.27	52.81	8.95	10.88	55.94	9.45	11.49	59.06	9.95	12.10	62.19
8.46	10.29	52.88	8.96	10.89	56.00	9.46	11.50	59.13	9.96	12.11	62.25
8.47	10.30	52.94	8.97	10.91	56.06	9.47	11.52	59.19	9.97	12.12	62.31
8.48	10.31	53.00	8.98	10.92	56.13	9.48	11.53	59.25	9.98	12.14	62.38
8.49	10.32	53.06	8.99	10.93	56.19	9.49	11.54	59.31	9.99	12.15	62.44

Sec. 8. Free Gossypol (A.0.C.S. Official Method Ba 7-58, Reapproved 1973, Updated 1987, Reapproved 1993).

Definition: The term free gossypol defines gossypol and gossypol derivatives in cottonseed products which are soluble in aqueous acetone under the conditions of the method.

Scope: Application to cottonseed, cottonseed meats, cottonseed slab and sized cake, and cottonseed meals of normal commercial production. Application to chemically treated meals should be verified before use.

A. Apparatus:

1. Mechanical shaker equipped to hold 250 ml. **T** Erlenmeyer flasks, and to provide vigorous agitation. Burrell "Wrist Action" shaker, or equivalent.
2. Spectrophotometer isolating a band at 440 m*u* and equipped with cells of 1 cm light path is preferred. Alternately a photoelectric colorimeter equipped with a filter having maximum transmittance between 440-460 m*u* may be used.
3. Grinding mill, Baker Bros. No. 148 laboratory mill with No. 6912 plate, 3600 r.p.m.
4. Grinding mill, Wiley, with 1 mm. screen.
5. Solid glass beads, ca. 6 mm. diameter.
6. Erlenmeyer flasks, **T**, 250 ml. capacity, fitted with leakproof glass, or polyethylene stoppers (Kimble No. 28160, size 27, or equivalent).
7. Pipets, volumetric.
8. Filter paper, medium retentivity, 11 cm. diam. circles. (S&S 597, Whatman No. 2, or equivalent).
9. Volumetric flasks, , 25, 200, and 250 ml.
10. Water bath for operation at 100-C., equipped with clamps for supporting 25 ml. volumetric flasks. Alternatively rust proof metal washers slipped over the necks of the flasks may be used for stability. Operation of the bath in a well ventilated hood is recommended.

B. Reagents:

1. Solvents. Acetone, isopropyl alcohol (2-Propanol), A.C.S. reagent grade.
2. Aqueous acetone. Mix 700 ml. acetone and 300 ml. of distilled water.
3. Aqueous isopropyl alcohol. Mix 800 ml. isopropyl alcohol and 200 ml. of distilled water.
4. Thiourea solution. Dissolve 10 g. of reagent grade thiourea in distilled water, dilute to 100 ml.
5. Hydrochloric acid, 1.2 N. Dilute 106 ml. of concentrated hydrochloric acid (35-37% HCl) to 1 liter with distilled water.
6. Aniline. Distill A.C.S. reagent grade aniline over a small amount of zinc dust, using an efficient water cooled condenser, and discarding the first and last 10 percent of the distillate. Store in a glass stoppered brown bottle in refrigerator. Redistill when the reagent blank (E, 11) exceeds 0.022 absorbance (95% transmittance).
7. Gossypol. Primary standard quality gossypol, gossypol acetic acid (89.62% gossypol by weight), should be used for calibration. Gossypol and gossypol acetic acid standards are available from: Atomergic Chemicals Corp., 100 Fairchild Ave., Plainview, NY 11803; Sigma Chemicals, P.0. Box 14508, St. Louis, MO 63178; Chemical Dynamics Corp., 3001 Hadley Rd., South Plainfield, NJ 07080; Aldrich Chemical Co., P.0. Box 355, Milwaukee, WI 53201. For determination of purity, accurately weight 2 mg. of gossypol or gossypol acetic acid, using a semi-micro or

micro balance, into a 100 ml. volumetric flask. Add ca. 40 ml. of spectro quality cyclohexane, and warm on a steam bath, with swirling, to dissolve the compound. Cool to room spectrophotometer such as a Beckman Model DU, DK, DK 2-A, B; Cary Model 14 or 15; or equivalent; and equipped with matched 1.000 cm. standard, or far ultraviolet, silica cells determine the Absorbance of the gossypol solution against the cyclohexane solvent at 358 m. Calculate the absorptivity as follows:

$$a = A/cl$$

Where a = Absorptivity
A = Absorbance
c = concentration, in g. per liter
l = Light path, 1.000 cm

The absorptivity of highest purity primary standard gossypol should be 39.9+/-0.2. Absorptivity values in the range of 39. 1 - 39.9 for gossypol, and 35.1 - 35.8 for gossypol acetic acid, (90 - 100% purity), denote primary standards satisfactory for calibration.

8. Standard gossypol solution. Weigh accurately 25 mg. of primary standard gossypol, or 27.9 mg. of primary standard gossypol acetic acid, and transfer quantitatively to a 250 ml. volumetric flask using ca. 100 ml. of A.C.S. acetone to effect transfer. Add 1.0 ml. glacial acetic acid, 75 ml. of distilled water, dilute to volume with acetone, and mix well. Pipet 50 ml. of the above solution into a 200 ml. volumetric flask, add ca. 100 ml. acetone, 60 ml. distilled water and dilute to volume with acetone, and mix well. This standard gossypol solution contains 0.025 mg. of gossypol per ml. if exactly 25 mg. of gossypol, or 27.9 mg. of gossypol acetic acid were weighed. It is stable for 24 hrs. when protected from the light.

C. Preparation of Sample:

1. *Cottonseed*. De-hull ca 50 grams of the sample, prepared as directed in A.0.C.S. Official Method Aa 2-38, Reapproved 1993, using a Bauer mill with the plates separated so that the seed are just broken. Remove the meats from the hulls and lint by screening on a 4-6 mesh screen. Grind the meats in a Wiley mill to pass a 2 mm. screen. Do not pre-heat cottonseed, and avoid heating during grinding.
2. *Slab and sized cake, meals*. Prepare sample as directed in A.0.C.S. Official Method Ba 1-38, Reapproved 1993. Grind ca 50 grams in a Wiley mill to pass a 1 mm. screen.

D. Sample Size:

The sample weight and aliquot for analysis will depend on the free gossypol content of the cottonseed material. The table below is intended as a guide. Although most accurate values are obtained when the sample weight is 1 gram or less, it is necessary to increase the sample size for very low free gossypol meals.

Type of Sample	Expected Free Gossypol Content	Sample Weight	Aliquot Size
	%	g.	ml.
Meats	0.5 - 1.5	0.25	2

Meal	0.2 - 0.4	0.50	2
Meal	0.1 - 0.2	1.00	2
Meal	0.05 - 0.10	1.00	5
Meal	0.02 - 0.05	1.00	10
Meal	0.01 - 0.02	2.00	10
Meal	Below 0.01	5.00	10

E. Procedure:

1. Transfer the accurately weighed sample (See D) to a **T** 250 ml. Erlenmeyer flask, and cover the bottom of the flask with glass beads.
2. Add 50 ml. of aqueous acetone (B, 2) by pipet, stopper the flask with a leakproof glass or polyethylene stopper (A, 6), and shake vigorously on a mechanical shaker for 1 hour.
3. Filter through dry filter paper on medium retentivity (A, 8), discarding ca. the first 5 ml. of filtrate, and collecting filtrate in a small flask. Place a watch glass over the funnel to reduce evaporation during filtration.
4. Pipet appropriate duplicate aliquots of the filtrate (See D) into 25 ml. volumetric flasks.
5. To one sample aliquot, designated as solution A, add 2 drops (0. 10 ml.) of 10% aqueous thiourea (B, 4), 1 drop of 1.2 *N* HCI (B, 5), and 2 ml. of redistilled aniline (B, 6). A rapid delivery pipet may be used for dispensing aniline.
7. Prepare a reagent blank containing a volume of aqueous acetone solution (B, 2) equal to that of the sample aliquot, and add 2 drops of 10% aqueous thiourea (do not add any 1.2 *N* HCI), and 2 ml. of aniline.
8. Heat the sample aliquot B (E, 6 above) and the reagent blank (E, 7 above) in a boiling water bath (100C.) for 30 minutes.
9. Remove the solutions from the bath, and ca. 10 ml. of aqueous isopropyl alcohol to effect homogenous solution, and cool to room temperature in an appropriate water bath. Dilute to volume with aqueous isopropyl alcohol.
10. Determine the Absorbance (Optical Density) of sample aliquot A (E, 5) at 440 m using aqueous isopropyl alcohol to set the instrument at 0 Absorbance (100% transmittance).
11. With the instrument set at 0 Absorbance (100% transmittance) with aqueous isopropyl alcohol, determine the Absorbance of the reagent blank (E, 7, 8), taking care that a clean cuvette is used for the blank. If the reagent blank exceeds 0.022 Absorbance (below 95% transmittance) the analysis must be repeated using freshly distilled aniline.
12. Determine the Absorbance of sample aliquot B (E, 6, 8) at 440 m, using the reagent blank (E, 7, 8) to set the instrument at 0 Absorbance (100% transmittance).
13. Calculate the corrected Absorbance of the sample aliquot as follows: Corrected Absorbance = [Absorbance Soln B - Absorbance Soln A]
14. If the readings on solns. A and B above were taken in terms of transmittance, convert to Absorbance. (Absorbance = 2 - logarithm transmittance)
15. From the corrected Absorbance of the sample aliquot (E, 13) determine the mg. of gossypol in the sample aliquot by reference to a calibration graph (F, 8, 9) or by use of the calibration factor (F, 10, 11).

F. Calibration:

1. Pipet duplicate 1, 2, 3, 4, 5, 7, 8, and 10 ml. aliquots of the standard gossypol solution (0.025 mg. per ml.) (B, 8) into 25 ml. of volumetric flasks.
2. To one set of aliquots, designated as A, add 2 drops of 10% aqueous thiourea, 1 drop of 1.2 *N* HCI, and dilute to volume with aqueous isopropyl alcohol.
3. Determine the absorbance as outlined in E, 10.
4. To the other set of standard gossypol aliquots, designated as B, add 2 drops of 10% aqueous thiourea, 2 drops of 1.2 *N* HCI, and 2 ml. of redistilled aniline. Prepare a reagent blank containing 10 ml. of aniline (do not add any 1.2 HCI to the reagent blank).
5. Heat the standards and the reagent blank in a boiling water bath (100^0C.) for 30 min., remove, cool to room temp. and dilute to volume with aqueous isopropyl alcohol.
6. Determine the Absorbance as directed in E, 11, 12.
7. Calculate the corrected Absorbance for each standard gossypol aliquot as follow: Corrected Absorbance = [Absorbance Soln B - Absorbance Soln A]
8. Plot the corrected Absorbance (F, 7) of each gossypol standard against the corresponding milligrams of gossypol in the 25 ml. volumes, on regular coordinate paper, to obtain the calibration graph.
9. If the calibration graph is non-linear (some photoelectric colorimeters) it is necessary to refer to the calibration graph to determine the mg. of gossypol in the sample aliquots in E, 15.
10. If the calibration graph is linear (most spectrophotometers) it is convenient to use a factor for calculating the mg. of gossypol in sample aliquots in E, 15. To obtain the factor, divide the mg. of gossypol in each gossypol standard by the corresponding Absorbance.

$$\text{Factor} = \frac{\text{Mg gossypol in 25 ml. volume}}{\text{[Corrected Absorbance (F, 7)]}}$$

Average the factors for all the gossypol standards.

11. The mg. of gossypol in the sample aliquots (E, 15) is then found by multiplying the corrected Absorbance of the sample aliquot (E, 13) by the calibration factor:

mg gossypol = corrected Absorbance x factor

G. Calculations:

Calculate the free gossypol content as follows:

$$\text{Free gossypol, \%} = \frac{5G}{WV}$$, where,

G = mg. gossypol in the sample aliquot (E, 15).
W = Sample weight, in grams.
V = Volume of sample aliquot used (E, 4).

H. Notes:

The absorption maxima of the gossypol-aniline reaction product should be at 440 m. However, depending on the wavelength accuracy of the spectrophotometer and the band

isolated, the maxima may be in the range of 440-450 m. All absorbance measurements should be taken at the actual maxima for the spectrophotometer used.

Sec. 9. Aflatoxin (A.0.C.S. Official Methods, Aa 8-83, as revised J.A.0.A.C., Volume 63, No. 4, 1980, Page 899). Cottonseed hulls and meats will be separated as in the A.0.C.S. method.

Definition: This method determines aflatoxin in cottonseed meal.

RULE 402: Cottonseed and Sunflower Seed and Peanut Hulls.

Sec. 1. Whole Seed and Uncut Meats.

Pick out the whole seed and uncut meats in 100 grams of the sample, weigh and report in percent.

Sec. 2. Oil (A.0.C.S. Official Method Bb 2-38, Revised 1995, Reapproved 1973).

Definition: This method determines the substances extracted by petroleum ether under the conditions of the test.

Scope: Applicable to cottonseed hulls.

A. Apparatus:

The apparatus is exactly as described in A.0.C.S. Official Method Ba 3-38, Reapproved 1993, Section A.

B. Reagents:

Petroleum ether, A.0.C.S. Specifications H 2-41, Reapproved 1993.

C. Procedure:

1. Weigh accurately ca 5 g. of well mixed hulls with whole seed and meat particles removed.
2. Proceed as directed in A.0.C.S. Official Method Ba 3-38, Reapproved 1993, subsection (a), paragraphs 1 to 5 inclusive.

D. Calculation:

Proceed as directed in A.O.C.S. Official Method Ba3-38, Section E.

Sec. 3. Form of Report

The following form of report is recommended:

Oil in whole seed ..... %
Oil in uncut meats ..... %
Oil in picked hulls ..... %
Total oil in sample ..... %

Note: To convert whole seed to oil -
For Cottonseed, use factor 0.2
For Sunflower Seed, use factor 0.4
For Peanuts, use factor 0.4

To convert uncut meats to oil-
For Cottonseed, use factor 0.33
For Sunflower Seed, use factor 0.6
For Peanuts, use factor 0.5

RULE 403: Cellulose Yield-Pressure Cook Method (A.0.C.S. Official Method Bb 3-47, Reapproved 1973, 1993).

(A.0.C.S. Official Method Bb 3-47, Revised May, 1966, Reapproved 1989, Revised 1991, Reapproved 1993).

Definition: This method determines the available yield of cellulose from cottonseed linters, specifically that amount of dry cellulose remaining after linters are pressure cooked and washed by this procedure. Values are expressed as a percentage of the as received sample.

Scope : Applicable to cottonseed linters and cottonseed hull fiber.

A. Apparatus:

1. *Forced Draft Oven:* A.0.C.S. Specification H I-39, Reapproved 1993, maintained at 107.5 +/- 2.5^{0}C.
2. *Mechanical Lint Mixer*: Mixer must thoroughly mix the sample and throw hull pepper, dust and foreign material back into the sample during mixing. Two sizes of mixers are available: one for samples of 4 to 6 pounds; and the other for samples in the 2 pound range.
3. *Mechanical Washer*: Mechanical washer is designed to permit the suspension of the sample in water with subjection to the beating action of small jets of water. If desired, a separate flowmeter for each washer may be used. Flowmeter should be sized to maintain the specified 3.9 to 4.0 gpm of wash water. The washer spray tubes are important in the performance of the washer. These tubes are made from 1/8" standard weight brass pipe with 44 holes of 1/32" diameter. Size of the holes in the spray tubes is critical in obtaining the specified flow rate and pressure. The holes are drilled in 6 equally spaced rows around the circumference and within a distance of 6-1/4" from the plugged end. One row has 13 boles (the top row), the opposite row has 7 holes (bottom row), and the four intermediate rows have 6 boles each. The washer may be purchased from William E. Ellis and Sons, Memphis, TN.
4. *Pressure Cooker*: Cooker or autoclave must maintain an internal steam pressure of 105 +/- 1 lb. per square inch (equivalent to 341^{0}F. or 172^{0}C.).

5. *Digestion Vessels*: Stainless steel pots with a capacity ca 1,000 ml. Tie following acceptable pot is a modified catalog item:

   Stainless steel metal specimen container - Atlas Electric Devices Co., #L-2416 modified as follows:
   a. Containers shall be cut down at the top so that the overall dimensions will be 3 - 1/2" dia. x 6 - 1/2" ht.
   b. Eliminate the straight restricted mouth at top which will leave a straight wall.
   c. Omit positioning knob on side.
   d. Eliminate gaskets and set cover clamp proportionally lower to compensate for same.
   e. Use Type 316 stainless steel in both the cover and main body of the container.
   f. Drill six 1/32" diameter holes in the cover at equal spacing on a 1" radius (2" dia. circle).
   g. Cover to fit within 1/64" maximum.

   Supplier: Atlas Electric Devices Co., Inc.
   4114 North Ravenswood Avenue
   Chicago, IL 60613

   Also, the old 1,000 ml. iron containers (glue pots) originally specified for this test are still acceptable.
6. *Metal Moisture Dishes*: Capacity ca 25 cubic inches with tight fitting covers.
7. *Metal Yield Sample Dishes*: Capacity ca 25 cubic inches with tight fitting covers.
8. *Analytical Balance*: Capable of weighing to +/- 0.01 g.

B. Reagents:

1. Oleic acid, commercial grade. Refined tall oil in an equivalent amount is a satisfactory substitute.
2. Sodium hydroxide solution 1.0% NaOH by weight, accurately standardized.
3. Cooking solution prepared by adding 0.5 ml. of commercial oleic acid to 525 ml. of the l% alkali solution.

C. Procedure:

1. Sample should be 4 - 6 pounds for car or truck lot shipments (see A.0.C.S. Official Method Bb 1-38,Reapproved 1993, for sampling instructions). Smaller samples can be processed for special test results (not representing lot shipments).
2. Place lot sample of lint or hull fiber in the large mixer, and rotate for 3 to 5 minutes. Three minutes are sufficient for second cut and hull fiber. Five minutes are necessary for mill run. For samples in the 2 pound range the small mixer should be used. After mixing, the sample is ready for the moisture and yield aliquots (which must be run simultaneously when running the cellulose yield test).
3. For moisture test, weight ca 25 g. of sample into tared metal dish (Section A, No. 6). Dry in oven at 107.5 +/- 2.5^{0}C. for four hours. Remove from oven, replace cover, cool to room temperature and weigh.

4. For yield sample, weigh accurately 35 g. of the sample and place in digestion vessel. Add 525 ml. of the cooking solution (see B, 3 above). It is essential that all of the sample be wet. Stir the sample thoroughly with a steel or stainless steel rod, fasten lids securely, and place in autoclave.
5. Fasten the lid of the autoclave securely. Vent by blowing steam through vessel for a short interval to remove air. Gradually increase the steam pressure up to 105 lbs. Steamup should be controlled within a 30-45 minute range. Observe the temperature (or pressure) closely during the entire digestion period. Continue the digestion for 3 hours after a temperature of 341^0F. has been reached and then reduce the steam pressure gradually (blow-down time should be ca 15 minutes).
6. Remove the sample from the autoclave and add sufficient water to fill the digester container. Pour the mixture directly into the lower half of the lint washer. Rinse the sample container with enough water to insure a complete transfer of all fiber and pour into the washer. Fill lower half of washer with water, approximately 2,300 ml. Attach the upper portion of the cylinder, and turn the screened end of the washer down by hand and allow the water to drain. After draining, the position of the washing cylinder is reversed and the closed cylinder is then filled with water through the perforated tube. The cylinder is then reversed and the water allowed to drain through the sieve end. Start washer after last draining and open water valve. Observe the time at which the water is turned on. Maintain the water pressure at a constant level between 21 - 22 lb. per square inch at a rate of 3.9 to 4.0 gallons per minute. Wash for 5 minutes. Wash water temperature should be maintained between $60\text{-}85^0$F. Flow meter calibration should be checked at regular intervals.
7. Close the water valve and stop the washer when the screened end of the washer reaches the bottom of its rotation. The cylinder should be slightly off vertical to insure complete drainage. When the flow of drainage is almost stopped, open the water valve again for an instant to wash any adhering fibers from the walls of the cylinder. Remove the lower half of the washer containing the sample. Carefully remove the sample from the screen and compress it to remove as much water as possible.
8. Place a sample in a tared metal moisture dish (see A, 7 above). Dry in forced draft oven at 105^0 to 110^0C. for 15 - 18 hours. Remove from the oven, replace cover, cool to room temperature, and weigh.

D. Calculations:

1. Moisture, % = $\frac{\text{Loss in weight x 100}}{\text{Weight of sample}}$

2. Cellulose yield (dry cellulose) received basis,

$$\% = \frac{\text{Weight of dry residue x 100}}{\sim}$$

Weight of sample

3. The cellulose yield may be calculated to any desired moisture basis with the following formula:

Cellulose yield, desired moisture basis,

$$\% = \frac{A\ (100 - \%o \text{ moisture desired})}{100 - \%o \text{ moisture in sample analyzed}}$$

A = % dry cellulose yield determined from 2 above.

E. Report:

1. Report cellulose yield to one decimal place on an "as received" moisture basis and report moisture to one decimal place.
2. Yield values calculated to any moisture basis other than "as received" must be described as derived results at a specified moisture level.
3. All recheck analyses must be calculated on the "as received" moisture basis that was determined at the original test date.

F. Precision:

A.0.C.S. Procedure M 1-92 was used to obtain precision data in a three year program with ten cooperating laboratories. Precision of the method varies with yield level as tabulated below:

Yield Level	78%	73%	68%
Std. Dev. Within Labs	0.4	0.6	1.1
LSD* Within Labs	1.1	1.7	3.0
Std. Dev. Between Labs	0.6	0.7	1.4
LSD* * Between Labs	1 .7	1.9	3.9

* Two single determinations performed within a single laboratory shall not differ by more than this tabulated value.

** Single determinations performed in two different laboratories shall not differ by more than this tabulated value.

G. Notes:

1. *Special Moisture Tests for Lot Shipments*: If the conditions of temperature and humidity in the laboratory are such that the moisture may change during preparation, a moisture sample must be taken immediately upon receipt of the sample *before mixing*. This must be ascertained in each laboratory periodically by determining moisture before and after mixing.

   Also, as specified in the sampling instructions (A.0.C.S. Official Method Bb 1-38, Reapproved 1993), if the sample will not be analyzed promptly, a separate 100 g.

portion of the original sample should be placed in an air-tight quart container. This sample is used for the moisture determination in case the larger portion changes, then the cellulose yield may be calculated to the moisture basis of the original material.

RULE 404: Crude Cottonseed and Peanut Oils.
Sec. 1. Chemists' Reports.

(a) When only two refinings are made or when results are not concordant, the test to be reported must be confirmed by one or more duplicate tests with the same lye, and the chemists' report must then be based on the average results of two or more closely agreeing tests.
(b) The test to be reported shall be selected as follows: If any of the refining tests show a prime color with loss not over 9%, report for settlement the test showing the lowest loss with prime color. In all other cases, report the test which gives the highest settlement value, giving due consideration to avoiding rejectability in case the combination of color and loss reduces grade.
(c) Chemists' report for use in settlements must show the following data:

Free fatty acids, to tenths of one per cent.

Color of refined or refined and bleached oil in terms of A.0.C.S. color (See Rule 190).

Report oils darker than 50 as 50 plus.

Flavor of refined oil (See Rule 201).

Amount and strength of lye used in refining.

Refining loss, to tenths of one per cent.

Method used, if regular, slow break, or expeller.

Sec. 2. Moisture and Volatile Matter-Hot-Plate Method (A.0.C.S. Official Method, Ca 2b-38, Revised 1955, Reapproved 1973, 1993).

Definition: This method determines the mixture and any other material volatile under the conditions of the test.

Scope: Applicable to all of the ordinary fats and oils, including emulsions, such as butter and oleomargarine, and high-acid coconut oil. It is not applicable to certain abnormal samples such as solvent extracted fats and oils which may contain residue from solvents with fairly high boiling points or to samples containing added monoglycerides.

A. Apparatus:

1. Electric hot plate, the surface should have a high polish, otherwise cover with an asbestos pad to prevent wear on the moisture dish.
2. Glass beakers, 100 to 150 ml. or other similar and convenient dish.
3. Desiccator containing an efficient desiccant. Calcium chloride is not satisfactory. See A.0.C.S. Specification H 9-87.

B. Preparation of Sample:

Since water tends to settle in samples which have softened or melted, care must be taken to mix samples thoroughly so as to distribute the water uniformly. Soften with gentle heat (do not melt) and mix thoroughly with an efficient mixer.

C. Procedure:

1. Weight accurately 5 to 20 g. of well mixed sample into a tared beaker which has been previously dried and cooled in a desiccator.
2. Heat the sample on the hot plate, rotating the beaker gently by hand to avoid spattering which may result from too rapid ebullition of moisture.
3. The approach of the end-point may be judged by the cessation of the rising bubbles of steam as well as by the absence of foam. Another good method of judging the end-point is to place a clean, dry watch glass on top of the beaker. The evolution of steam is indicated by condensation on the watch glass. The temperature of the sample is at no time allowed to exceed $13O^0CV$ except at the end of the test.
4. When the apparent end-point has been reached, heat momentarily to the point of incipient smoking but use caution to not overheat.
5. Cool to room temperature in a desiccator and weigh.

D. Calculation:

$$\text{Moisture and volatile matter, \%} = \frac{\text{Loss in weight} \times 100}{\text{Weight of sample}}$$

Sec. 3. Moisture and Volatile Matter-Air Oven Method (A.0.C.S. Official Method, Ca 2c-25, Revised 1983, Reapproved 1993).

Definition: This method determines the moisture and any other material volatile under conditions of the test.

Scope: Applicable to animal and vegetable fats, but not to drying or semi-drying oils of the coconut oil group. It is not applicable to fats containing added monoglycerides.

A. Apparatus:

1. Air oven, A.0.C.S. Specification H 3-45, Reapproved 1993.
2. Aluminum moisture dishes, 30-gauge, 2 - 3/4 inch (ca. 50 x 19 mm) with tight-fitting slip-over covers or 100-ml beakers.
3. Desiccator containing an efficient desiccant. Calcium chloride is not satisfactory. See A.0.C.S. Specification H 9-87.

B. Preparation of Sample:

Since water tends to settle in samples which have softened or melted, care must be taken to mix samples thoroughly so as to distribute the water uniformly. Soften with gentle heat (do not melt) and mix thoroughly with an efficient mixer.

C. Procedure:

1. Weigh accurately ca 5 g. of sample into a tared moisture dish which has been previously dried and cooled in a desiccator.
2. Place in air oven and dry for 30 minutes at 130 +/- 1^0C. Remove from the oven cool, in a desiccator to room temperature and weigh.
3. Repeat this until the loss in weight does not exceed 0.05% per 30-minute drying period.

D. Calculation:

$$\text{Moisture and volatile matter, \%} = \frac{\text{Loss in weight x 100}}{\text{Weight of sample}}$$

Sec. 4. Insoluble Impurities (A.0.C.S. Official Method Ca 3a-46, Revised 1987, Reapproved 1989).

Definition: This method determines dirt, meal and other foreign substances insoluble in kerosene and petroleum ether.

Scope: Applicable to all normal fats and oils.

A. Apparatus:

1. Gooch crucible, prepared with a glass fiber filter without organic filler (Reeve Angel 934 AH or Whatman GF/C). (See Notes, F, 1). Wash the filter with water, alcohol and ether. Dry to constant weight at 101 +/- 1^0C. Cool in desiccator to room temperature and weigh.
2. Filter-flask of convenient size Gooch size and Gooch crucible adapter.

B. Reagents:

1. Petroleum ether, A.0.C.S. Specification H 2-41, Reapproved 1993.
2. Kerosene, refined petroleum distillate with a flash point not below 23^0C. (75^0F) as determined by the A.S.T.M. Standard Method D56 using the Tag Closed Tester. The kerosene should be filtered through a Gooch crucible prepared in A, 1, above, before using.

C. Preparation of Sample:

Samples must be thoroughly mixed. If necessary, soften with gentle heat (do not melt) and mix with an efficient mixer.

D. Procedure:

1. Use the residue from the moisture and volatile matter determination (A.0.C.S. Official Methods Ca 2b-38, Revised 1955, or Ca 2d-25, Reapproved 1993) or a sample prepared in the same manner.
2. Add 50 ml. of kerosene to the residue and heat on a water bath to dissolve the fat.
3. Filter through the prepared Gooch crucible with the aid of a vacuum. Wash with five 10-ml portions of hot kerosene, allowing each portion to drain before adding the next.
4. Wash thoroughly with petroleum ether to remove all the kerosene. Dry the crucible and contents to constant weight at 101 +/- 1^0 C, cool to room temperature in a desiccator and weigh.

E. Calculation:

$$\text{Insoluble impurities, \%} = \frac{\text{Gain in weight of crucible} \times 100}{\text{Weight of sample taken for moisture}}$$

F. Notes:

Samples with a higher than usual percentage of insoluble impurities may be difficult to filter. One laboratory has reported success in using a slurry of shredded glass fiber filters, prepared by shredding 10 to 12 sheets of number 934 AH filter paper. The

shredded filter paper is used to prepare a Gooch filter pad about 3 mm in thickness, but not less 2 mm in thickness.

Sec. 5. Free Fatty Acids (A.O.C.S. Official Method Ca 5a-40, Reapproved 1977, 1993, Revised 1987, 1996).

Definition: This method determines the free fatty acids existing in the sample.

Scope: Applicable to all crude and refined vegetable oils, marine oils and animal fats.

Apparatus

1. Oil sample bottles--115 or 230 mL (4 or 8 oz), or 250-mL Erlenmeyer flasks.

Reagents

1. Ethyl alcohol, 95% -- USSD formulas 30 and 3A are permitted (see Notes, 1). The alcohol must give a definite, distinct and sharp end point with phenolphthalein and must be neutralized with alkali to a faint, but permanent pink color just before using.
2. Phenolphthalein indicator solution--1% in 95% alcohol.
3. Sodium hydroxide solution--accurately standardized. See AOCS Specification H 12-52. See Table 1 for the appropriate normality of the sodium hydroxide solution, depending on the expected free fatty acid concentration range in the sample.

Procedure

1. Samples must be well mixed and entirely liquid before weighing; however, do not heat the sample more than 10 C over the melting point.

Table 1
Free fatty acid range, alcohol volume and strength of alkali[a]

FFA range (%)	Sample (g)	Alcohol (mL)	Strength of alkali
0.00 to 0.2	56.4 ± 0.2	50	0.1 N
0.2 to 1.0	28.2 ± 0.2	50	0.1 N
1.0 to 30.0	7.05 ± 0.05	75	0.25 N
30.0 to 50.0	7.05 ± 0.05	100	0.25 or 1.0 N
50.0 to 100	3.525 ± 0.001	100	1.0N

[a]FFA, free fatty acid; N, normality.

2. Use Table 1 to determine the sample weight for various ranges of fatty acids. Weigh the signated sample size into an oil sample bottle or Erlenmeyer flask (see Notes, 2).
3. Add the specified amount of hot neutralized alcohol and 2mL of indicator.
4. Titrate with standard sodium hydroxide, shaking vigorously until the appearance of the first permanent pink color of the same intensity as that of the neutralized alcohol before the addition of the sample. The color must persist for 30 seconds.

Calculations

1. The percentage of free fatty acids in most types of fats and oils is calculated as oleic acid, although in coconut and palm kernel oils it is fequently expressed as lauric acid and in palm oil in terms of palmitic acid.

(a) Free fatty acids as oleic, % = $\frac{\text{mL of alkali x N x 28.2}}{\text{wt of sample}}$

(b) Free fatty acids as lauric, % = $\frac{\text{mL of alkali x N x 20.0}}{\text{wt of sample}}$

(c) Free fatty acids as palmitic, % = $\frac{\text{mL of alkali x N x 25.6}}{\text{wt of sample}}$

2. The free fatty acids are frequently expressed in terms of acid value intead of percentage free fatty acids. The acid value is defined as the number of milligrams of KOH necessary to neutralize 1 g of sample. To convert percentage free fatty acids (as oleic) to acid value, multiply the percentage free fatty acids by 1.99.

Precision

Precision data for refined, bleached and deodorized oils are shown in Table 2. Precision data for crude oils are shown in Table 3.

Table 2

The average, expected between-laboratory variation (standard deviation of reproducibility, S_R) for the determination of free fatty acids in refined, bleached and deodorized oils[a]

Approximate FFA value (%)	0.01-0.05	0.05-0.1	0.1-1.0	1.0-2.0
S_R	0.007	0.010	0.046	0.073
RSD (CV, %)	33.93	12.73	9.90	4.75
R (95%) = 2.8 x S_R	0.02	0.03	0.13	0.20

[a]Values obtained from the AOCS Smalley Laboratory Proficiency Program.

Table 3

The average, expected between-laboratory variation (standard deviation of reproducibility,S_R) for the determination of free fatty acids in crude oils[a]

Approximate FFA value (%)	0.1-1.0	1.0-2.0
S_R	0.077	0.156
RSD (CV, %)	14.57	9.84
R (95%) = 2.8 x S_R	0.22	0.44

[a]Values obtained from the AOCS Smalley Laboratory Proficiency Program.

Notes

1. Isopropanol, 55%, may be used as an alternate solvent with crude and refined vegetable oils.
2. Cap bottle and shake vigorously for 1 min if oil has been blanketed with carbon dioxide gas.

References

See *J. Assoc. Off. Anal. Chem.* 59:658 (1976) regarding the ruggedness of this method.

Sec. 6. Refining Loss (A.0.C.S. Official Method Ca 9a-52, Revised 1990, Update 1995).

Definition: This method determines the loss of free fatty acids, oil and impurities when the sample is treated with alkali solutions under the specific conditions of the test.

Scope: Applicable to crude peanut oil, crude coconut oil, crude com oil, crude soybean oil (expeller and hydraulic), crude cottonseed oil (expeller and hydraulic), and crude sunflower oil.

A. Apparatus:

1. Balance, torsion type or equivalent, capacity 1,000 g. and sensitive to 0.1 g.
2. Balance weights, 0.1 to 500 g.
3. Refining cups, stainless steel, seamless or enameled iron with handle, 10 to 15 cm. (4 to 4.5 inches) diameter, 10 to 15 cm. (4 to 4.5 inches) deep, total capacity about 900 mL. Refining cups are available from A.0.C.S. Headquarters.
4. Refining apparatus, constructed according to A.0.C.S. Specifications and built on order by the Barrow-Agee Laboratories, Memphis, Tennessee.
   a. The bath may be constructed to hold 6, 12, 18 or 24 cups.
   b. The bath is provided with cup supports arranged so as to hold the cups in a fixed position.
   c. The bath is provided with drain and accommodations for heating must be such that the change from cold to hot temperature can be made in one minute. Separate baths may be used for the hot and cold water if desired.
   d. The bath is provided with mechanical stirring arrangement which will provide agitation for the samples at 70 +/- 5 rpm and 250 +/- 10 rpm.
   e. The water in the bath must be continually agitated to insure uniform temperature and the level of water in the bath must be as high as the level of oil and alkali within the refining cups.
   f. T-shaped paddles constructed of stainless steel or nickel plated copper or brass (heavily coated) with 2.5 x 9 cm. (1 x 3.5 incb) blades set at right angles to the shaft of the paddles are required for stirring the contents of the refining cups (see Figure 1).
   g. The cup supports should be rigid enough so that the bottom of each paddle is 63 mm. (0.25 inch) above the bottom of the refining cups at all times during the test and under all variations of loading.

h. The paddles are driven through gears by a motor of sufficient capacity to drive all paddles simultaneously at specified speeds under maximum load.

5. Cooling bath, air or water, of sufficient size and cooling capacity (for soybean oils).
6. Filter paper, 32 cm. (12.5 inch), Reeve Angel No. 871, Eaton & Ditieman No. 2V, or S&S No. 596.
7. Diatomaceous earth, Manville Hyflo Supercel, or equivalent.

B. Reagents:

1. Sodium hydroxide, 0.25 N, accurately standardized. See A.0.C.S. Specification H 12-52.
2. Sodium hydroxide (NaOH) solutions (see Notes, Caution). These must be of accurately known NaOH content, free from carbonate and other impurities, and prepared as follows:

   Add 750 g. of distilled water to 1000 g. of pure, dry, solid NaOH (see Notes, Caution). Heat on the steam bath with occasional stirring for at least 3 hours. Cool and allow to settle for 24 to 48 hours, keeping the vessel tightly covered to exclude carbon dioxide (CO2). During cooling, a portion of the NaOH which was dissolved in the hot solution will crystallize and precipitate. If the crystals do not separate, the solution was not supersaturated and may not be satisfactory. If properly prepared as described, the solution will contain no measurable quantity of carbonate or other impurities. Allow to settle until clear and then carefully decant. Filter through filter paper if the solution is not perfectly clear and protect from the air during filtration to prevent the absorption of $C0_2$. This solution is then diluted with previously boiled and cooled distilled water to the desired concentration (see Table 1). The actual strength of each solution used for the refining test must be determined by weighing and titrating with standard acid. Specific gravity or Baume (Bé) tests are not sufficiently accurate.

C. Preparation of Sample:

The sample container must be vigorously shaken and the sample thoroughly mixed in order to incorporate and uniformly distribute meal or other sediment. For most oils, heat to 20^0C. if the oil is cold; heat soybean oil to 50^0C. and coconut oil to 38^0C. until completely melted before shaking. Inspect the inside of the can to be sure that no sediment remains clinging to the sides or bottom. If any sediment is found, remove it completely (cut the can open if necessary) and incorporate thoroughly with the oil.

Note : The uniform incorporation and distribution of settlings and suspended matter are very significant in determining the accuracy of the final refining loss.

Table 1. Alkali concentration.

Actual NaOH	Permissible Variations

Nominal degrees Baumé at 15^0C	content by weight	Minimum	Maximum
	%	%	%
10	6.57	6.50	6.64
12	8.00	7.92	8.08
14	9.50	9.40	9.60
16	11.06	10.95	11.17
18	12.68	12.55	12.81
20	14.36	14.22	14.50
22	16.09	15.93	16.25
24	17.87	17.69	18.05
26	19.70	19.50	19.90
28	21.58	21.36	21.80
30	23.50	23.26	23.74

D. Determination of Free Fatty Acids:

Determine the free fatty acids as directed in A.0.C.S. Official Method Ca 5a-40, Reapproved 1977, 1993, Revised 1987, 1996.

E. Procedure:

1. Refer to Table 2, Tabular Statement of Refining Conditions, for specific details such as temperature, time intervals, etc.
   Note: Samples must not be allowed to come in contact with copper or brass, due to the effect of these metals on color.

2. Weigh 500 g. of thoroughly mixed sample into tared refining cup and allow to settle to permit the air to escape, remove any persisting foam before adjusting the final weight. Place in the refining machine, fill the water bath to the specified height and adjust the temperature of water and oil to the designated cold temperature (see Table 2, Tabular Statement of Refining Conditions).

3. Refer to Lye Requirements, Tables 3 through 3d, to determine the correct amount of alkali to be added and the number of cups to run, depending upon the kind and type of oil and free fatty acid content.
   Note: The percentages indicated in the tables are multiplied by 5 to obtain the actual weight to be added to each refining cup. The designated amounts may be weighed into 50 mL beakers and kept covered with watch glasses until ready to add to the sample. If beakers are used, compensation should be made for the lye which does not drain completely from the beakers.

4. With the agitators running at high speed, add the alkali to each cup, draining as completely and quickly as possible. Continue high speed agitation and maintain the

cold temperature within the required limits for the various oils as directed in Table 2.

Note: In the case of coconut oil, add 0.1 % dry sodium chloride (NaCl) for each 1.O% of free fatty acid present, before adding the alkali.

5. Change the agitation to slow speed and increase the bath to the hot temperature. This temperature change should be completed in about 1 minute. Continue the agitation as directed in Table 2, Tabular Statement of Refining Conditions. At the end of the stirring period, the oil sample must itself be at the specified temperature. Adjust the temperature of the water bath to obtain the correct final oil temperatures.

6. Discontinue agitation, remove paddles and return as much of the sample clinging to the paddles as possible. Hold the samples at the hot temperature for 1 hour. Decrease the bath to the cold temperature and hold for an additional 30 minutes. After the 30 minute holding time, drain the bath and allow the samples to remain at ambient temperature for at least 2 hours. Unless the oil has been maintained at the cold temperature (see Table 2), cool again to this temperature for 30 minutes before pouring off.

7. Weigh the cup and contents and deduct this weight from the total weight at the start to obtain the evaporation loss.

8. Decant the refined oil into another tared refining cup and drain the soap stock for 30 minutes by inverting the soap stock cup into the refined oil cup. If the soap stock is too soft to drain, allow the cup to stand and pour off oil several times. Any floating 'foots' (sediment) decanted with the oil is recovered and returned to the main body of soap stock. The oil may be poured through a small strainer to collect the foots providing the screen is such that the oil loss is negligible.

9. Weigh the soap stock immediately to prevent any moisture loss. Melt the soap stock in a water bath at 75^0 +/- 2^0C. without stirring for 30 minutes, and then cool in cold water (see Table 2, Tabular Statement of Refining Conditions) for 15 minutes or until thoroughly chilled. Decant all possible oil into a tared beaker and proceed as follows:

   a. All crude oils except soybean - repeat remelting until not more the 1.5 g. is removed and record the weight (to 0.1 g.) of all the oil obtained. If the oil is difficult to remove, due to soft soap stock or for any other reason, use a pipet.

   b. Crude soybean oils - repeat remelting until not more than 1.0 g. of oil is recovered on 2 successive remelts and record the weight (to 0.1 g.) of all the oil obtained. If the oil is difficult to remove, due to soft soap stock or for any other reason, use a pipet. Remelting should not be continued beyond the recovery of not more than 1.0 g, on successful remelts.

   Note: On degummed oils when refining produces a poorly coalescing and difficult to separate soap stock, carefully decant, as described in Procedure 8, to prevent loss of soap stock and to remove as much oil as possible. After the first melt, coagulate the soap stock by swirling the cup, without splashing, at 100 +/- 20 rpm, with a

simultaneous gentle rocking motion. Emulsification can occur if this is continued for too long a period or at too fast a rate. Make subsequent remelts as described.

10. Weigh the retained oil.
11. If a bleach test is required, filter the oil through one of the approved papers into a clean and dry container. The bleach test is determined on the filter sample as directed in A.0.C.S. Official Method, Cc 8a-52, Reapproved 1993, or Cc 8b-52.
12. For the determination of color it is essential that the filtered oil be absolutely clear. Add 0.5 g. of the diatomaceous earth (Apparatus, 7) per 300 g. of oil, mix for 2.5 minutes at 250 rpm +/- 10 at a temperature of 25^0C., and then filter through an approved paper into a clean and dry container. Determine the color of the filtered sample as directed in A.0.C.S. Official Method Cc 13b-45, Reapproved 1993, or Cc 13c-50, Reapproved 1993.

F. Calculations:

Calculate the refining loss by methods 1 and 2 and report the average of these results which should agree within 0.25%:

1. Refining loss, % = $\frac{\text{Weight of crude oil - weight of refined oil}}{5}$

2. Refining loss, % = $\frac{(A + B) - C}{5}$

Where:
A = weight of soap stock
B = evaporation loss
C = weight of alkali solution used. Include the weight of NaCl in the case of coconut oil.

G. Lye Requirements, Tables 3 through 3d:

1. The maximum amount of actual NaOH for hydraulic or hot pressed cottonseed oil, peanut oil, corn oil, and hydraulic and expeller soybean oil, is calculated by the following formula:

$$\text{Grams NaOH per 100 grams of oil} = \frac{\%\ \text{FFA}}{5.2} + 0.54$$

2. The maximum amount of actual NaOH for expeller or cold pressed cottonseed oil is calculated by the following formula:

$$\text{Grams NaOH per 100 grams of oil} = \frac{\%\ \text{FFA}}{4.365} + 0.77$$

3. The maximum weight of alkali solution required per 100 g. of sample is calculated by the following formula:

$$\frac{100\ A}{B}$$

Where:
A = maximum actual NaOH calculated as noted in items 1 and 2 of this section.
B = % NaOH of alkali solution to be used from Alkali Concentration table in Reagents, 2, Table 1.

4. Example: Given a sample of expeller cottonseed oil with a free fatty acid content of 2.2% and substituting in the formula in item 2, in this section:

$$\text{Maximum actual NaOH} = \frac{2.2}{4.365} + 0.77 = 1.27 \text{ g.}$$

Three refinings are required (Table 3, line 9):

(a) $\frac{1.27 \times 80}{11.06}$ = 9.2% of 16^0 Bé, or 46.0 g/500 g of sample

(b) $\frac{1.27 \times 80}{14.36}$ = 7.1% of 20^0 Bé, or 35.5 g/500 g of sample

(b) $\frac{1.27 \times 80}{14.36}$ = 8.9% of 20^0 Bé, or 44.5 g/500 g of sample

H. Notes:

Caution: Sodium hydroxide, like all alkalies, can burn skin, eyes, and respiratory tract severely. Wear heavy rubber gloves and face shield to protect against concentrated alkali liquids. Use effective fume removal device or gas mask to protect respiratory tract against alkali dusts or vapors. When working with extremely caustic materials like sodium hydroxide, always add pellets to water and not vice versa. Alkalies are extremely exothermic when mixed with water. Take precautions to contain the caustic solution in the event the mixing container breaks from the extreme heat generated.

Table 2. Tabular statement of refining conditions

	Cottonseed			Peanut	Soybean	Coconut	Corn
	Hydraulic	Expeller	Slow Break		Expeller and Hydraulic		
Refining:							
Temperature of cold bath, °C	20-24	20-24	20-24	20-24	20-24	30-35	20-24
rpm in cold bath, +/- 10	250	250	250	250	250	250	250
Time in cold bath, min	15	45	90	30	15	5	15
Temperature of hot bath, °C	63-67	63-67	63-67	63-67	63-67	50-53	63-67
rpm in hot bath, +/- 5	70	70	70	70	70	70	70
Time in hot bath,min	12	12	20	12	12	5	12
Final oil temperature, °C	60-65	60-65	60-65	60-65	60-65	45-50	60-65
Settling time in hot bath, min	60	60	60	60	60	60	60
Temperature of cooling bath,°C	20-24	20-24	20-24	20-24	5-10	26-30	20-24
Time in cooling bath,min	30	30	30	30	30	30	30
Additional settling time, minimum hrs	12	12	12	12	12	12	12
Chill soapstock,min	30	30	30	30	30	30	30
Drain soapstock, min	30	30	30	30	30	30	30
Clarification:							
Official clay, grams	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Temperature °C	25	25	25	25	25	25	25
rpm +/- 10	250	250	250	250	250	250	250
Time, min	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Remelting:							
Temperature of bath, °C	73-77	73-77	73-77	48-52	73-77	48-52	73-77
Agitation	None	None	None	None	None	None	None
Time in hot bath, min	30	30	30	30	30	30	30
Temperature of cooling bath,°C	20-24	20-24	20-24	20-24	5-10	26-30	ice water
Time in cooling bath, min	15 or until firm	15 or until firm	15 or until firm	15 or until firm	15 or until firm	15 or until firm	15 or until firm
Drain,min	15	15	15	15	15	15	15

Soybean

Table 3. Lye requirements - strength and number of refinings.

Oil	Type	FFA Range	No. of Refinings	Strength of Alkali Solutions Bé
Cottonseed	Hydraulic	0 to 1.5	2	80% of maximum of 12° 80%o of maximum of 14°
Cottonseed	Hydraulic	1.6 to 3.0	3	80% of maximum of 12° 80% of maximum of 16°
Cottonseed	Hydraulic	3.1 to 4.0	2	Maximum of 16° Maximum of 18°
Cottonseed	Hydraulic	4.1 to 5.0	2	Maximum of 16° Maximum of 20°
Cottonseed	Hydraulic	5.1 to 7.5	2	Maximum of 18° Maximum of 22°
Cottonseed	Hydraulic	7.6 to 10.0	2	Maximum of 20° Maximum of 24°
Cottonseed	Hydraulic	10.1 to 15.0	2	Maximum of 20° Maximum of 26°
Cottonseed	Hydraulic	15.1 to 20.0	2	Maximum of 22° Maximum of 28°
Cottonseed	Expeller	0 to 3.0	3	80% of maximum of 16° 80% of maximum of 20° Maximum of 20°
Cottonseed	Expeller	3.1 to 5.0	2	Maximum of 16° Maximum of 20°
Cottonseed	Expeller	5.1 to 10.0	2	Maximum of 20° Maximum of 26°
Cottonseed	Expeller	Above 10.0	2	Maximum of 20° Maximum of 30°
Peanut		0 to 3.0	3	60% of maximum of 12° 60% of maximum of 16° 80% of maximum of 16
Peanut		Above 3.0	3	60% of maximum of 16° 80% of maximum of 16° 80% of maximum of 20°
Soybean	Expeller & Hydraulic	All	2	66.6% of maximum of 12° Maximum of 12°
Corn		All	2	50% of maximum of 16° 66.6% of maximum of 16°
Coconut		All	1	(1.1 x % FFA) = grams of 20° caustic per 100 grams of oil

Table 3a. Weight of lye in grams per 100 of oil - hydraulic or hot pressed cottonseed oil.

FFA	Max. NaOH 80%	12° 80%	14° 80%
0.5	.51	6.4	5.4
0.6	.52	6.6	5.5
0.7	.54	6.7	5.7
0.8	.56	6.9	5.8
0.9	.57	7.1	6.0
1.0	.59	7.3	6.2
1.1	.60	7.5	6.3
1.2	.62	7.7	6.5
1.3	.63	7.9	6.6
1.4	.65	8.1	6.8
1.5	.66	8.3	7.0

FFA	Max. NaOH	12° 80%	16° 80%	16° Max.
1.6	.85	8.5	6.1	7.7
1.7	.87	8.7	6.3	7.8
1.8	.89	8.9	6.4	8.0
1.9	.91	9.1	6.5	8.2
2.0	.92	9.2	6.7	8.4
2.1	.94	9.4	6.8	8.5
2.2	.96	9.6	7.0	8.7
2.3	.98	9.8	7.1	8.9
2.4	1.00	10.0	7.2	9.1
2.5	1.02	10.2	7.4	9.2
2.6	1.04	10.4	7.5	9.4
2.7	1.06	10.6	7.7	9.6
2.8	1.08	10.8	7.8	9.7
2.9	1.10	11.0	7.9	9.9
3.0	1.12	11.2	8.1	10.1

FFA	Max. NaOH	14° Max.	18° Max.
3.1	1.14	12.0	9.0
3.2	1.16	12.2	9.1
3.3	1.18	12.4	9.3
3.4	1.19	12.6	9.4
3.5	1.21	12.8	9.6
3.6	1.23	13.0	9.7
3.7	1.25	13.2	9.9
3.8	1.27	13.4	10.0
3.9	1.29	13.6	10.2
4.0	1.31	13.8	10.3

FFA	Max. NaOH	16° Max.	20° Max.
4.1	1.33	12.0	9.2
4.2	1.35	12.2	9.4
4.3	1.37	12.4	9.5
4.4	1.39	12.5	9.7
4.5	1.41	12.7	9.8
4.6	1.42	12.9	9.9
4.7	1.44	13.1	10.1
4.8	1.46	13.2	10.2
4.9	1.48	13.4	10.3
5.0	1.50	13.6	10.5

FFA	Max. NaOH	18° Max.	22° Max.
5.1	1.52	12.0	9.5
5.2	1.54	12.1	9.6
5.3	1.56	12.3	9.7
5.4	1.58	12.4	9.8
5.5	1.60	12.6	9.9
5.6	1.62	12.8	10.0
5.7	1.64	12.9	10.2
5.8	1.66	13.1	10.3
5.9	1.68	13.2	10.4
6.0	1.69	13.4	10.5
6.1	1.71	13.5	10.6
6.2	1.73	13.7	10.9
6.3	1.75	13.8	10.9
6.4	1.77	14.0	11.0
6.5	1.79	14.1	11.1
6.6	1.81	14.3	11.2
6.7	1.83	14.4	11.4
6.8	1.85	14.6	11.5
6.9	1.87	14.7	11.6
7.0	1.89	14.9	11.7
7.1	1.91	15.0	11.8
7.2	1.92	15.2	12.0
7.3	1.94	15.3	12.1
7.4	1.96	15.5	12.2
7.5	1.98	15.6	12.3

FFA	Max. NaOH	20° Max.	24° Max.
7.6	2.00	13.9	11.2
7.7	2.02	14.1	11.3
7.8	2.04	14.2	11.4
7.9	2.06	14.3	11.5
8.0	2.08	14.5	11.6
8.1	2.10	14.6	11.7
8.2	2.12	14.7	11.8
8.3	2.14	14.9	12.0
8.4	2.16	15.0	12.1
8.5	2.17	15.1	12.2
8.6	2.19	15.3	12.3

FFA	Max. NaOH	20° Max.	24° Max.
8.7	2.21	15.4	12.4
8.8	2.23	15.5	12.5
8.9	2.25	15.7	12.6
9.0	2.27	15.8	12.7
9.1	2.29	15.9	12.8
9.2	2.31	16.1	12.9
9.3	2.33	16.2	13.0
9.4	2.35	16.3	13.1
9.5	2.37	16.5	13.2
9.6	2.39	16.6	13.4
9.7	2.40	16.8	13.5
9.8	2.42	16.9	13.6
9.9	2.44	17.0	13.7
10.0	2.46	17.2	13.8

FFA	Max NaOH	20° Max.	26° Max.
10.1	2.48	17.3	12.6
10.2	2.50	17.4	12.7
10.3	2.52	17.6	12.8
10.4	2.54	17.7	12.9
10.5	2.56	17.8	13.0
10.6	2.58	18.0	13.1
10.7	2.60	18.1	13.2
10.8	2.62	18.2	13.3
10.9	2.64	18.4	13.4
11.0	2.66	18.5	13.5
11.1	2.67	18.6	13.6
11.2	2.69	18.8	13.7
11.3	2.71	18.9	13.8
11.4	2.73	19.0	13.9
11.5	2.75	19.2	14.0
11.6	2.77	19.3	14.1
11.7	2.79	19.4	14.2
11.8	2.81	19.6	14.3
11.9	2.83	19.7	14.4
12.0	2.85	19.8	14.5
12.1	2.87	20.0	14.6
12.2	2.89	20.1	14.7
12.3	2.91	20.2	14.7
12.4	2.92	20.4	14.8
12.5	2.94	20.5	14.9
12.6	2.96	20.6	15.0
12.7	2.98	20.8	15.1
12.8	3.00	20.9	15.2
12.9	3.02	21.0	15.3
13.0	3.04	21.2	15.4
13.1	3.06	21.3	15.5
13.2	3.08	21.4	15.6
13.3	3.10	21.6	15.7
13.4	3.12	21.7	15.8
13.5	3.14	21.8	15.9
13.6	3.16	22.0	16.0
13.7	3.17	22.1	16.1
13.8	3.19	22.2	16.2
13.9	3.21	22.4	16.3
14.0	3.23	22.5	16.4
14.1	3.25	22.6	16.5
14.2	3.27	22.8	16.6
14.3	3.29	22.9	16.7

FFA	Max. NaOH	22° Max.	26° Max
14.4	3.31	23.0	16.8
14.5	3.33	23.2	16.9
14.6	3.35	23.3	17.0
14.7	3.37	23.4	17.1
14.8	3.39	23.6	17.2
14.9	3.41	23.7	17.3
15.0	3.42	23.8	17.4

FFA	Max. NaOH	22° Max.	28° Max.
15.1	3.44	21.4	16.0
15.2	3.46	21.5	16.0
15.3	3.48	21.6	16.1
15.4	3.50	21.8	16.2
15.5	3.52	21.9	16.3
15.6	3.54	22.0	16.4
15.7	3.56	22.1	16.5
15.8	3.58	22.2	16.6
15.9	3.60	22.4	16.7
16.0	3.62	22.5	16.8
16.1	3.64	22.6	16.8
16.2	3.66	22.7	16.9
16.3	3.67	22.8	17.0
16.4	3.69	23.0	17.1
16.5	3.71	23.1	17.2
16.6	3.73	23.2	17.3
16.7	3.75	23.3	17.4
16.8	3.77	23.4	17.5
16.9	3.79	23.6	17.6
17.0	3.81	23.7	17.7
17.1	3.83	23.8	17.7
17.2	3.85	23.9	17.8
17.3	3.87	24.0	17.9
17.4	3.89	24.2	18.0
17.5	3.91	24.3	18.1
17.6	3.92	24.4	18.2
17.7	3.94	24.5	18.3
17.8	3.96	24.6	18.4
17.9	3.98	24.8	18.5
18.0	4.00	24.9	18.5
18.1	4.02	25.0	18.6
18.2	4.04	25.1	18.7
18.3	4.06	25.2	18.8
18.4	4.08	25.3	18.9
18.5	4.10	25.5	19.0
18.6	4.12	25.6	19.1
18.7	4.14	25.7	19.2
18.8	4.16	25.8	19.3
18.9	4.17	25.9	19.3
19.0	4.19	26.1	19.4
19.1	4.21	26.2	19.5
19.2	4.23	26.3	19.6
19.3	4.25	26.4	19.7
19.4	4.27	26.5	19.8
19.5	4.29	26.7	19.9
19.6	4.31	26.8	20.0
19.7	4.33	26.9	20.1
19.8	4.35	27.0	20.1
19.9	4.37	27.1	20.2
20.0	4.39	27.3	20.3

Table 3b. Weight of lye in grams per 100 grams of oil - expeller or cold pressed cottonseed oil.

FFA	Max NaOH	16° 80%	20° 80%	20° Max
0.5	0.88	6.4	4.9	6.2
0.6	0.91	6.6	5.1	6.3
0.7	0.93	6.7	5.2	6.5
0.8	0.95	6.9	5.3	6.6
0.9	0.98	7.1	5.4	6.8
1.0	1.00	7.2	5.6	7.0
1.1	1.02	7.4	5.7	7.1
1.2	1.04	7.6	5.8	7.3
1.3	1.07	7.7	5.9	7.4
1.4	1.09	7.9	6.1	7.6
1.5	1.11	8.1	6.2	7.8
1.6	1.14	8.2	6.3	7.9
1.7	1.16	8.4	6.5	8.1
1.8	1.18	8.6	6.6	8.2
1.9	1.21	8.7	6.7	8.4
2.0	1.23	8.9	6.8	8.5
2.1	1.25	9.0	7.0	8.7
2.2	1.27	9.2	7.1	8.9
2.3	1.30	9.4	7.2	9.0
2.4	1.32	9.5	7.4	9.2
2.5	1.34	9.7	7.5	9.3
2.6	1.37	9.9	7.6	9.5
2.7	1.39	10.0	7.7	9.7
2.8	1.41	10.2	7.9	9.8
2.9	1.43	10.4	8.0	10.0
3.0	1.46	10.5	8.1	10.1

FFA	Max. NaOH	16° Max.	20° Max.
3.1	1.48	13.4	10.3
3.2	1.50	13.6	10.5
3.3	1.53	13.8	10.6
3.4	1.55	14.0	10.8
3.5	1.57	14.2	10.9
3.6	1.59	14.4	11.1
3.7	1.62	14.6	11.3
3.8	1.64	14.8	11.4
3.9	1.66	15.0	11.6
4.0	1.69	15.2	11.7
4.1	1.71	15.5	11.9
4.2	1.73	15.7	12.1
4.3	1.76	15.9	12.2
4.4	1.78	16.1	12.4
4.5	1.80	16.3	12.5
4.6	1.82	16.5	12.7
4.7	1.85	16.7	12.9
4.8	1.87	16.9	13.0
4.9	1.89	17.1	13.2
5.0	1.92	17.3	13.3

FFA	Max. NaOH	20° Max.	26° Max.
5.1	1.94	13.5	9.9
5.2	1.96	13.6	10.0
5.3	1.98	13.8	10.1
5.4	2.01	14.0	10.2
5.5	2.03	14.1	10.3
5.6	2.05	14.3	10.4
5.7	2.08	14.4	10.5
5.8	2.10	14.6	10.7
5.9	2.12	14.8	10.8
6.0	2.14	14.9	10.9
6.1	2.17	15.1	11.0
6.2	2.19	15.2	11.1
6.3	2.21	15.4	11.2
6.4	2.24	15.6	11.4
6.5	2.26	15.7	11.5
6.6	2.28	15.9	11.6
6.7	2.30	16.0	11.7
6.8	2.33	16.2	11.8
6.9	2.35	16.4	11.9
7.0	2.37	16.5	12.0
7.1	2.40	16.7	12.2
7.2	2.42	16.8	12.3
7.3	2.44	17.0	12.4
7.4	2.47	17.2	12.5
7.5	2.49	17.3	12.6
7.6	2.51	17.5	12.7
7.7	2.53	17.6	12.9
7.8	2.56	17.8	13.0
7.9	2.58	18.0	13.1
8.0	2.60	18.1	13.2
8.1	2.63	18.3	13.3
8.2	2.65	18.4	13.4
8.3	2.67	18.6	13.6
8.4	2.69	18.7	13.7
8.5	2.72	18.9	13.8
8.6	2.74	19.1	13.9
8.7	2.76	19.2	14.0
8.8	2.79	19.4	14.1
8.9	2.81	19.5	14.3
9.0	2.83	19.7	14.4
9.1	2.85	19.9	14.5
9.2	2.88	20.0	14.6
9.3	2.90	20.2	14.7
9.4	2.92	20.3	14.8
9.5	2.95	20.5	15.0
9.6	2.97	20.7	15.1
9.7	2.99	20.8	15.2
9.8	3.02	21.0	15.3
9.9	3.04	21.1	15.4
10.0	3.06	21.3	15.5

Table 3c. Weight of lye in grams per 100 grams of oil - peanut oil.

FFA	12° 60%	16° 60%	16° 80%	20° 80%
0.1	4.2	3.0	4.0	
0.2	4.3	3.1	4.2	
0.3	4.5	3.2	4.3	
0.4	4.6	3.3	4.5	
0.5	4.8	3.5	4.6	
0.6	4.9	3.6	4.7	
0.7	5.1	3.7	4.9	
0.8	5.2	3.8	5.0	
0.9	5.3	3.9	5.2	
1.0	5.5	4.0	5.3	
1.1	5.6	4.1	5.4	
1.2	5.8	4.2	5.6	
1.3	5.9	4.3	5.7	
1.4	6.1	4.4	5.9	
1.5	6.2	4.5	6.0	
1.6	6.4	4.6	6.1	
1.7	6.5	4.7	6.3	
1.8	6.6	4.8	6.4	
1.9	6.8	4.9	6.5	
2.0	6.9	5.0	6.7	
2.1	7.1	5.1	6.8	
2.2	7.2	5.2	7.0	
2.3	7.4	5.3	7.1	
2.4	7.5	5.4	7.2	
2.5	7.7	5.5	7.4	
2.6	7.8	5.6	7.5	
2.7	7.9	5.7	7.7	
2.8	8.1	5.9	7.8	
2.9	8.2	6.0	7.9	
3.0	8.4	6.1	8.1	
3.1		6.2	8.2	6.3
3.2		6.3	8.4	6.4
3.3		6.4	8.5	6.5
3.4		6.5	8.6	6.7
3.5		6.6	8.8	6.8
3.6		6.7	8.9	6.9
3.7		6.8	9.1	7.0
3.8		6.9	9.2	7.1
3.9		7.0	9.3	7.2
4.0		7.1	9.5	7.3
4.1		7.2	9.6	7.4
4.2		7.3	9.7	7.5
4.3		7.4	9.9	7.6
4.4		7.5	10.0	7.7
4.5		7.6	10.2	7.8
4.6		7.7	10.3	7.9
4.7		7.8	10.4	8.0
4.9		7.9	10.6	8.2
4.9		8.0	10.7	8.3
5.0		8.1	10.9	8.4

FFA	16° 60%	16° 80%	20° 80%
5.1	8.2	11.0	8.5
5.2	8.4	11.1	8.6
5.3	8.5	11.3	8.7
5.4	8.6	11.4	8.8
5.5	8.7	11.6	8.9
5.6	8.8	11.7	9.0
5.7	8.9	11.8	9.1
5.8	9.0	12.0	9.2
5.9	9.1	12.1	9.3
6.0	9.2	12.3	9.4
6.1	9.3	12.4	9.5
6.2	9.4	12.5	9.7
6.3	9.5	12.7	9.8
6.4	9.6	12.8	9.9
6.5	9.7	12.9	10.0
6.6	9.8	13.1	10.1
6.7	9.9	13.2	10.2
6.8	10.0	13.4	10.3
6.9	10.1	13.5	10.4
7.0	10.2	13.6	10.5
7.1	10.3	13.8	10.6
7.2	10.4	13.9	10.7
7.3	10.5	14.1	10.8
7.4	10.6	14.2	10.9
7.5	10.8	14.3	11.0
7.6	10.9	14.5	11.2
7.7	11.0	14.6	11.3
7.8	11.1	14.8	11.4
7.9	11.2	14.9	11.5
8.0	11.3	15.0	11.6
8.1	11.4	15.2	11.7
8.2	11.5	15.3	11.8
8.3	11.6	15.5	11.9
8.4	11.7	15.6	12.0
8.5	11.8	15.7	12.1
8.6	11.9	15.9	12.2
8.7	12.0	16.0	12.3
8.8	12.1	16.1	12.4
8.9	12.2	16.3	12.5
9.0	12.3	16.4	12.7
9.1	12.4	16.6	12.8
9.2	12.5	16.7	12.9
9.3	12.6	16.8	13.0
9.4	12.7	17.0	13.1
9.5	12.8	17.1	13.2
9.6	12.9	17.3	13.3
9.7	13.0	17.4	13.4
9.8	13.2	17.5	13.5
9.9	13.3	17.7	13.6
10.0	13.4	17.8	13.7

Table 3d. Weight of lye in grams per 100 grams of oil - expeller and hydraulic soybean oil.

FFA	12° Max	12° 66.6%
0.1	7.0	4.7
0.2	7.2	4.8
0.3	7.5	5.0
0.4	7.7	5.1
0.5	8.0	5.3
0.6	8.2	5.5
0.7	8.4	5.6
0.8	8.7	5.8
0.9	8.9	5.9
1.0	9.2	6.1
1.1	9.4	6.3
1.2	9.6	6.4
1.3	9.9	6.6
1.4	10.1	6.7
1.5	10.4	6.9
1.6	10.6	7.1
1.7	10.8	7.2
1.8	11.1	7.4
1.9	11.3	7.5
2.0	11.6	7.7
2.1	11.8	7.9
2.2	12.0	8.0
2.3	12.3	8.2
2.4	12.5	8.3
2.5	12.8	8.5
2.6	13.0	8.7
2.7	13.2	8.8
2.8	13.5	9.0
2.9	13.7	9.1
3.0	14.0	9.3
3.1	14.2	9.5
3.2	14.4	9.6
3.3	14.7	9.8
3.4	14.9	9.9
3.5	15.2	10.1
3.6	15.4	10.3
3.7	15.6	10.4
3.8	15.9	10.6
3.9	16.1	10.8
4.0	16.4	10.9
4.1	16.6	11.1
4.2	16.8	11.2
4.3	17.1	11.4
4.4	17.3	11.6
4.5	17.6	11.7
4.6	17.8	11.9
4.7	18.0	12.0
4.8	18.3	12.2
4.9	18.5	12.4
5.0	18.8	12.5

Sec. 7. Refining Loss-Extracted Oil (A.0.C.S. Official Method Ca 9e-52, Reapproved 1989).

Definition: This method determines the loss of free fatty acids, oil, and impurities when the sample is treated with alkali solutions under the specific conditions of the test.

Scope: Applicable to solvent extracted crude cottonseed oil, and to the reconstituted whole mixture of crude cottonseed oil from prepressing and subsequent solvent extraction of cottonseed. It is not applicable to crude cottonseed oil extracted from prepressed cake by solvent.

Note: All references in this method are to A.0.C.S. Official Method Ca 9a-52, updated 1995.

A. Apparatus, Supplies, and Solutions:

1. As described in Section A.
2. As described in Section B.

B. Procedure:

The general procedure for conducting the refining test on solvent extracted crude cottonseed oil and on the whole mixture of crude cottonseed oil from prepressing and subsequent solvent extraction of cottonseed is as directed in A.0.C.S. Official Method Ca 9a-52 for hydraulic cottonseed oil. Whether the slow breaking or the regular method is used will depend upon the type of oil as designated by the producer.

Sec. 8. Flash Point (A.0.C.S. Official Method Cc 9b-52, Revised 1990, Reapproved 1993). Modified Closed Cup Method, A.S.T.M. Designation D 93-80.

Definition: This method determines the temperature at which the sample will flash when a test flame is applied under the conditions specified for the test.

Scope: Applicable to animal, vegetable, and marine fats and oils. The fats and oils may or may not contain small amounts of volatile inflammable solvents. (See Notes, 3).

A. Apparatus:

1. Pensky-Martens closed cup flash test, A.S.T.M. Designation D 93-80. Either hand or motor stirring is allowable, but the latter is preferred. The specified low-range A.S.T.M. Pensky-Martens and high-range A.S.T.M. Pensky-Martens Centigrade and Fahrenheit thermometers are replaced by a single Centigrade or Fahrenheit thermometer as described below.
2 Thermometers, A.0.C.S. Specification H 10-55, Revised 1993, closed cup flash point thermometers.
3. Laboratory centrifuge, sling type of sufficient size to hold 120 mL bottles. Size No. 1 centrifuge, of International Equipment Co., has been found to be satisfactory for this purpose.

B. Reagents:

Anhydrous cupric sulfate (Cu_2CO_4), Reagent Grade.

C. Procedure:

1. To an adequately weighed amount of the oil (see Notes, 1) to be examined, add 5% anhydrous cupric sulfate if the moisture content of the sample exceeds 0.1 % (see Notes, 2). If the dehydration step is necessary, agitate the oil/cupric sulfate mixture vigorously for 1 minute in a closed container and allow to stand for 0.5 hr. Centrifuge until a sufficient amount of clear oil is obtained to make the flash point determination.
2. Fill the cup with the oil or fat sample so that the top of the meniscus is exactly at the filling line, place the lid on the cup and properly engage the locating devices. Insert the thermometer and suspend so that the bottom of the bulb is exactly 1 - 3/4 inches (4.45 cm) below the level of the rim of the cup, which corresponds to the level of the lower surface of the portion of the lid inside the rim.
3. Light the test flame and adjust so that it is the size of a bead approximately 5/32 inch (4 mm) in diameter.
4. Heat the sample so that the temperature increases not less than 5ºC. (9ºF.) nor more than 6ºC. (11ºF.) per minute. During the heating, adjust the stirring device at one to two revolutions per second.
5. At every 5ºC. (10ºF.) rise in temperature, discontinue stirring and apply the test flame by operating the device which controls the shutter and lowers the test flame into the shutter opening. Lower the test flame in 0.5 second and leave in a lowered position for 1 second, then quickly return to the raised or high position. As soon as the test flame has been returned to the high position, resume stirring.
6. The flash point is the temperature indicated on the thermometer at the time of the flame application that causes a distinct flash in the interior of the cup. The true flash must not be confused with the bluish halo that sometimes surrounds the test flame.

D. Notes:

1. If the fat is a solid at room temperature, it should be liquified by heating at a temperature not to exceed 5ºC. (10ºF.) over the melting point. The flash point determination will then start at this elevated temperature.
2. If dehydration is necessary it should be conducted on a liquified sample. The dehydration step with copper sulfate may be omitted if it is known that the moisture content of the oil to be tested is less than 0.1%. High moisture content causes excessive foaming, and extinction of the flame.
3. This method can be used for samples having flash points greater than 150ºC. In industrial applications, the temperature range is generally limited by the thermometer scale. Most compounds having a flash point greater than 200ºC. are categorized as such. This is primarily done to satisfy the DOT definition of non-combustible material.

RULE 405: Refined And Refined-Bleached Oils.

Chapter VII. Methods of Chemical Analysis

Sec. 1. Color-Wesson Method Using Color Glasses Calibrated in Accordance with the A.0.C.S.-Tintometer Color Scale. (A.0.C.S. Official Method Cc 13b- 45, Revised 1987, Corrected 1992, Reapproved 1993).

Definition: This method determines color by comparison with glasses of known color characteristics.

Scope: Applicable to all normal fats and oils, providing no turbidity is present in the sample.

A. Apparatus:

1. Colorimeter specifications - the instrument consists of a light-proof box with a dull black interior, illuminated by a 100-watt blue frosted electric light bulb. A block of magnesia is placed in the instrument at the proper angle to reflect the light from the electric bulb vertically upward through the color tube and color glasses. The block must be free from oil and dirt and positioned to give equal illumination to both sides of the viewing field.

   An eye piece finished with a dull black interior is fitted over (outside) the rectangular top of the tube holder so that the light passes through the color tube and color glasses. Eye pieces with split fields are *not* permitted.

   The tube holder (1 in. or 2.54 cm. i.d.) is fitted with 1 - 3/16 in. (30.2 cm.) i.d. rings at the bottom. One ring is to retain the color tube containing the oil sample, and the other is to permit an equal amount of light to reach the color glasses.
2. Colorimeters - the following colorimeters have been found to be acceptable for use in this method:
   a. The Wesson colorimeter.
   b. The Stevenson colorimeter conforms to the specifications noted in Apparatus, 1 for the Wizen Colorimeter and may be used in this method (see References, 1).
   c. The Lovibond Tintometer Model AF 710 (Notes, 1) conforms to the specifications noted in Apparatus, 1 and may be used in this method when operated according to the manufacturer's instructions. Any subsequent improved model(s), using the same optical principles as the AF710, may also be used in this method.
3. Color cabinet - the colorimeter is maintained in a booth or cabinet, not less than 40 in. wide x 30 in. deep (102 cm. wide x 76 cm deep). The booth or cabinet is closed so that no external light can enter. The inside of the booth is painted dull, neutral gray of Munsell value 4/.

   The booth or cabinet is indirectly illuminated by means of a bulb and fixture mounted 48 in. (122 cm.) above the colorimeter in such a way that no direct light rays strike the colorimeter or the eye of the observer. The level of illumination of the booth (at the top of the box of the colorimeter) should be not less than 1 nor more than 5 foot candles.

4. Color glasses - glasses must conform to the A.0.C.S.-Tintometer Color Scale, within tolerances as follows:

Value of glasses	Tolerances, +/-

0.1 to 0.9 red, inclusive	0.05
1.0 to 5.0 red, inclusive	0.10
6.0 to 10.0 red, inclusive	0.20
Above 10.0 red	4% of declared value

Glasses with valid calibrations to the N" Priest-Gibson Scale conform to the A.0.C.S. - Tintometer Color Scale. Glasses are supplied and guaranteed by the Tintometer Company (USA) and Tintometer, Ltd. (UK and Europe), to conform to the A.0.C.S. - Tintometer Color Scale. Such glasses are identified by the letter "T" engraved on the glass with the color value. Red glasses of the Lovibond Color Scale Series 200 do not conform.

Standard type glasses of the A.0.C.S. - Tintometer Color Scale are deposited with Tintometer, Ltd., Salisbury, England and the National Bureau of Standards.

The minimum standard set shall consist of the following numbers of red and yellow glasses:

Red*:	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	1.0	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0
	7.6	8.0	9.0	10.0	11.0	12.0	16.0	20.0	

Yellow:	1.0	2.0	3.0	5.0	10.0	20.0	35.0	50.0	70.0

*Glasses above 1.0 red need not have the exact value shown, but should cover the same range.

Note: Keep the color glasses clean and free from any oil film. Handle carefully and protect against scratches. It is especially important that every color glass used be clean at the time of use.

5. Color tubes:

a. Description - color tubes should be made of clear, colorless glass with a smooth, flat, polished bottom and have dimensions as follows: length, 154 mm.; overall inside diameter, 19 mm; outside diameter, 22 mm.

b. Markings - the color tubes should have two etched marks; one to indicate an oil column of 133.35 mm (5.25 in.), and another to indicate an oil column of 25.4 mm. (1 in.).

c. Suppliers - in the U.S.A., suppliers of these color tubes include Fisher Scientific and Wilkens-Anderson Co., Chicago, IL.

6. Filter Paper - filter paper with fine porosity such as Eaton & Dikeman no. 513, Whatman no. 13, Reeve-Angel no. 871, S&S no. 596, or equivalent.

B. Procedure:

1. Crude, raw and refined oil samples must be treated with 0.5 g. of diatomaceous earth (filter aid) per 300 g. of oil. Add the diatomaceous earth to the oil and agitate for 2.5 min. at 250 rpm at room temperature (or at no more than 10°C. above the melting point of the sample, if it is necessary to maintain the sample in the liquid state), and filter the sample through an appropriate filter paper (Apparatus, 6). Oils that have been bleached in the laboratory in accordance with A.0.C.S. Official Methods Cc 8a-52, Reapproved 1993, Cc 8b-52, Reapproved 1993, or Cc 8d-55 normally are

sufficiently clear for the color determination. Suspended material, even if of colloidal size, will cause light scattering. If the sample is not absolutely clear, threat with diatomaceous earth (filter aid) as noted, and filter before proceeding with the color determination.

2. Adjust the temperature of the sample to 25 - 35° C., and fill the color tube to the desired mark. If the sample is not completely liquid at 25 - 35°C., heat to a temperature of not more than 10° above the melting point of the sample.
3. Place the tube containing the sample in the colorimeter and place along side of it such red and yellow glasses (see paragraphs a-e immediately following the Notes, 2) as are necessary to match the color of the oil, observing the sample of the oil and the glasses through the eyepiece.

a. Crude and raw oil color - for crude oils of the coconut type, read the color using proper ratio of yellow to red listed below:

Up to 3.9 red use 6 yellow to 1 red
4.0 to 4.9 red use 25 yellow to 1 red
5.0 to 5.9 red use 30 yellow to 1 red
6.0 to 6.9 red use 35 yellow to 1 red
7.0 to 7.9 red use 40 yellow to 1 red
8.0 to 10.9 red use 50 yellow to 1 red
11.0 to 14.9 red use 70 yellow to 1 red
15.0 to 19.9 red use 100 yellow to 1 red
Above 20.0 red use 150 yellow to 1 red

If the above ratios fail to give a satisfactory match, this fact should be noted and a second reading made using the amount of yellow color required for a good match. Report both readings.

b. Raw inedible oils - for raw inedible oils (such as tallows, greases, fatty acids, etc.) use the ratios of yellow to red listed below:

Up to 3.5 red use 10 yellow to 1 red
3.5 to 5.0 red use 35 yellow to 1 red
Above 5.0 red use 70 yellow to 1 red

c. Dark oils - if the color of the oil or fat sample exceeds 40.0 red when using the regular 133.35 mm. column, fill another tube to the 25.4 mm. mark and read the color under the same conditions as described for the longer column. Report the height of the column used, because it is assumed that any color result in which the column height is not designated has been determined on a 133.35 mm. column.

d. Refined oils - for determining refined oil color, use only one yellow glass; 35 yellow for refined cottonseed and refined peanut oils, 70 yellow for refined soybean oil. Use not more than two red glasses up to and including 13.0 red, and not more than three red glasses above 13.0 red.

e. Refined and bleached oils - for refined and bleached oils, the ratios of yellow to red to be used in determining colors are as follows, except where trading rules specify the yellow and/or red to be used in classifying particular grades:

Cottonseed, peanut and corn oils -

Up to 3.5 red use 10 yellow to 1 red

Above 3.5 red use 35 yellow to 1 red

Coconut and palm kernel oils -

Up to 3.9 red use 6 yellow to 1 red

Above 3.9 red use 10 yellow to 1 red

Soybean oil -

Up to 3.5 red use 10 yellow to 1 red

Above 3.5 red use 70 yellow to 1 red

Tallows, greases, fatty acids, etc. -

Up to 3.5 red use 10 yellow to 1 red

3.5 to 5.0 red use 35 yellow to 1 red

Above 5.0 red use 70 yellow to 1 red

C. Reporting:

When any color result is reported, it is usually assumed that the column height of the oil on which the color of the sample was determined was 133.35 mm. (5.25 in.). Therefore, if the color of a sample is determined on a column of oil other than 133.35 mm. (5.25 in.), the height of the column must be reported with the color value.

D. Notes:

1. The U.S. supplier of the A.0.C.S. - Tensiometer apparatus is HF Scientific, Inc., 3170 Metro Parkway, Ft. Maoris, FL 33916-7597 USA, phone (813) 337-2116, FAX (813) 332-7643.
2. Some oils are at times subject to abnormalities in the composition of their pigment content, leading to off colors (or "hues") in the oils. The hues that occur usually cannot be matched, even approximately, using the fixed yellow or yellow-to-red ratios noted in this method. In such cases, if a standard combination is specified, report whether the oil is lighter or darker than the standard. If a standard combination is not specified, report the red and yellow glasses which most nearly match the color of the sample.

E. References:

1. *Oil and Soap* 13: 18 (1936).

Sec. 2. Color-Photometric (A.0.C.S. Official Method Cc 13c-50, Reapproved 1993).

Definition: This method designated the color of fats and oils.

Scope: Applicable to cottonseed, soybean, and peanut oils. See note.

A. Apparatus:

1. *Spectrophotometer*. A Spectrophotometer capable of adjustment to give the following readings on a standard nickel sulfate solution (A-3) at 25 to 30ºC., after setting the zero point and after adjusting the 100% transmittance point (0 absorbance) against CH_2Cl_2 in a cuvette having the specifications outlined in A-2 below:

Millimicrons	Transmittance
400	Less than 4.O%
460	26.2 +/- 2.O%
510	73.9 +/- 1.O%
550	54.8 +/- 1.O%
620	5.2 +/- 0.5%
670	1.1 +/- 0.5%
700	Less than 2.O%

2. *Matched glass cylindrical cuvettes.* Approximately 21.8 mm. inside diameter, outside diameter approximately 24.5 mm. All cuvettes to be used with a given instrument should be checked with CH_2Cl_2 and the nickel sulfate solution at 550 m and give within +/- 0.6% of the same transmittance. The cuvettes should be kept clean and free from scratches.
3. *Standardizing nickel sulfate solution.* Dissolve 200 g. of $NiSO_4$ $6H_20$ analytical reagent grade, in distilled water. Add 10 ml. of concentrated HCl. Dilute to exactly 1,000 ml. in a volumetric flask. The temperature of the solution should be between 25 and 30°C. The nickel content of the solution must fall between 4.40 and 4.46 g. of nickel per 100 ml. at 25 to 30°C.
4. *Filter paper*. Fine porosity such as E & D No. 513, Whatman No. 2V, Reeve-Angel No. 871, or S&S No. 596.

B. Reagents:

1. *Methylene chloride*. Redistilled if the transmittance differs from distilled water by 0.5% at 400 m.
2. A.0.C.S. official diatomaceous earth.

C. Calibration of the Spectrophotometer:

1. Turn on the spectrophotometer and allow at least 20 minutes' warm-up period before standardizing or making any measurements.
2. After the initial warm-up period, rotate both of the control knobs on top of the instrument counter-clockwise to their stop position. Adjust the galvanometer by means of the galvanometer adjustment or by sliding the scale so that an exact zero reading is obtained.
3. Set the wavelength dial to 460 m. Recheck the zero reading of the instrument, insert a cuvette filled with CH_2C1_2 in the instrument and set the 100% transmittance point exactly.
4. Fill a cuvette with the standardizing $NiSO_4$ solution and rad the transmittance of the solution. The reading must fall between 24.2 and 28.2.
5. In a like manner set the instrument at 550 m and read the $NiSO_4$. The reading must fall between 53.8 and 55.8.
6. If the 460 reading is above 26.2, the 550 reading should be above 54.8; if the 460 reading is below 16.1, the 550 reading should be below 54.8; otherwise adjust the wavelength knob underneath the instrument until both

readings are in the same direction above or below the median value established, but within the specific limits.

7. Set the instrument at 510 m, and read the $NiSO_4$ solution. The 510 reading must fall between 72.9 and 74.9.
8. Read the other specified values. All must fall within the limits set forth.

D. Procedure:

1. The refined oil sample must be treated with 0.5 g. of official diatomaceous earth per 300 g. of oil. Add the diatomaceous earth to the oil, and agitate for 2 - 1/2 minutes at 250 rpm at room temperature (or at 10-15° above the melting point of the fat if necessary) and filter.

   Samples other than refined oil must be absolutely clear. Suspended material, even if colloidal size, will cause light scattering. If the sample is not absolutely clear, filter through a specified paper at a temperature at least 10° above the melting point of fat. If not perfectly clear, treat with official diatomaceous earth as outlined above.
2. Adjust the temperature of the oil to 25 - 30°C., fill the cuvette using a sufficient amount of oil to ensure a full column in the light beam.
3. Place the filled cuvette in the instrument and read the absorbance to the nearest 0.001 at 460, 550, 620, and 670 m.

E. Calculations:

Photometric color = $1.29\ A_{460} + 69.7\ A_{550} + 41.2\ A_{620} - 56.4\ A_{670}$

A is for absorbance.

Special instrument scales for reading the four factors involved directly may be used.

F. Note:

1. The color of other fats and oils which have not as yet been studied can probably be designated by this method.

Sec. 3. Flavor and Odor of Refined oil.

"Sweet in Flavor" is interpreted as the natural flavor of refined cottonseed or peanut oil produced from sound seed or nuts and free from contamination other than a faint earthy flavor. It shall be expressed as an opinion only.

Sec. 4. Bleaching Test (A.0.C.S. Official Method Cc 8a-52, Corrected 1977, Reapproved 1993).

Definition: This method determines the color of the sample after treatment with a specified bleaching earth under the conditions of this test.

Scope: Applicable to refined cottonseed oil.

A. Apparatus:

1. Balances
   a. For the oil, torsion type or equivalent, capacity 1000 g. and sensitive to 0. 1 g.
   b. For the clay, balance sensitive to 0.05 g.

2. Balance weights, 0.01 g. to 500 g.
3. Refining cups, stainless steel or unchipped enameled iron, seamless, with handle, 4 to 4.5 inches in diameter, 4 to 4.5 inches deep, total capacity ca 900 ml.
4. Bleaching apparatus, which may be similar in design and construction to the Refining Apparatus (A.0.C.S. Official Method Ca 9a-52, Updated 1995). The essential features of the bleaching apparatus are:
   a. T-shaped paddles constructed of stainless steel, with 0.5 x 3.5 inch blade. The blade must be fitted to the shaft in such a way that oil or grime cannot accumulate in a crack or space between the two parts.
   b. The paddles are driven at 250 +/- 10 rpm by any convenient means.
   c. A heat source is required which will permit heating the samples to 120ºC. in 5 minutes +/- 1 minute and maintain them at not less than 115ºC. Gas heat is recommended.
   d. The support for the cups must be so arranged that they will not rotate or change position during the test, and the agitator shaft must be centered, with the bottom of paddle at a distance of 0.25 inches above the bottom of the cup. The design of this support shall also be such that the area at which heat is applied is essentially the entire bottom surface of the cup. The concentration of intense heat within small portions of this area must be avoided.
   e. Thermometer clamps arranged so that a thermometer is held rigidly with the bulb completely immersed in the oil while agitating, but without interfering with the motion of the paddle.
5. Official Natural Bleaching Earth tested and approved by the designated Committee of the American Oil Chemists' Society. A fresh supply must be obtained from the Office of the Secretary of the Society, 1608 Broadmoor Dr., Champaign, IL 61826, August 1, of each year.
6. Filter paper, 32 cm. (12.5 inch), E & D No. 513, Reeve-Angel No. 871, Whitman No. 2V, or S & S No. 596. Folded filter papers are optional. Eaton and Dikeman No. 617 or Reeve-Angel No. 230 filter papers may be used to filter the refined oil for use in running the bleach test. The purpose is to speed up the filtering rate. The use of these two "fast" filter papers is not permitted when the refined oil sample is to be used directly for color determination.
7. Colorimeter, color glasses, and color tubes as specified in A.0.C.S. Official Method Cc 13b-45, Reapproved 1993, or spectrophotometer specified in Method Cc 13c-50, Reapproved 1993.
8. Laboratory thermometer, 0 to 150ºC., calibrated for 3 inch immersion.
9. Funnels. Stemless and seamless, of aluminum, stainless steel, or gloss (60º cone with 5 to 6 inch top diameter and 3/8 to 1/2 inch hole).

B. Procedure:

1. Filter the oil as directed in A.0.C.S. Official Method Ca 9a-52, Updated 1995, Section 1, paragraph 11. Eaton and Dikeman No. 617 or Reeve-Angel No. 230 filter papers may be used to filter the refined oil for use in running the bleach test. The purpose is to speed up the filtering rate. The use of these two "fast" filter papers is

not permitted when the refined oil sample is to be used directly for color determination.

2. Weigh 300 g. of sample into the refining cup. Add official Natural Bleaching Earth in the amount specified on the label of the can.
3. Commence stirring at 250 +/- 10 rpm and heat immediately to 120°C. +/- 2°, requiring 5 minutes +/- 1 minute. Continue stirring at the same rate for 5 minutes. Do not allow the temperature of sample to drop below 115°C. during this period even if reheating is necessary.
4. Promptly pour all the oil and earth onto a dry filter paper. Allow a minimum of 60 ml. of oil to pass. Then collect a sufficient amount for the color reading.
5. Determine the color as directed in A.0.C.S. Method Cc 13b-45, Reapproved 1993, or Method Cc 13c-50.

Sec. 5. Cold Test. (A.0.C.S. Official Method Cc 11-53, Reapproved 1993).

Definition: This method measures the resistance of the sample to crystallization and is commonly used as an index of the winterizing or similar stearin removing processes.

Scope: Applicable to all normal, refined and dry, animal and vegetable oils.

A. Apparatus:

1. Oil sample bottles, 115 ml. (4 oz.). These must be completely clean and dry.
2. Chipped ice and water bath at 0°C. Prepare by filling a container (pail or bucket - 4 to 6 lb. capacity) with finely chopped ice. Add cold water sufficient to fill to the top of the sample bottle when it is immersed.

B. Procedure:

1. Filter a sufficient quantity of sample (200 to 300 ml.) through a filter paper and then heat the filtered portion. Stir the sample while heating and remove from the heat source immediately when the temperature reaches 130°C. (see Note 1).
2. Fill an oil sample bottle completely full with the sample and insert a cork tightly. Adjust to 25°C. in a water bath and then seal with paraffin.
3. Immerse the bottle containing the sample in the ice and water bath so that the entire bottle is covered with the water and ice.
4. Replenish the ice as often as is necessary to keep the bath solidly packed, otherwise the bath temperature will not remain at 0°C. as specified. This temperature is essential.
5. At the end of 5.5 hours, remove the bottle from the bath and examine closely for fat crystals or cloudiness. Do not mistake small and finely dispersed air bubbles for fat crystals. To pass the test the sample must be clear, limpid, and brilliant (see Note 2).

C. Notes:

1. The purpose of the preliminary heat treatment is to remove traces of moisture and to destroy any crystal nuclei which may be present. Either will interfere with the test, causing cloudiness or premature crystallization.

2. If it is desired, the test may be contained by re-examination of the sample at hourly intervals after the first 5.5 hour examination. However, in doing this, the sample should be returned to the bath as promptly as possible after each inspection so that the temperature will not increase by any significant amount.

Sec. 6. Free Fatty Acids (A.O.C.S. Official Method Ca 5a-40, Reapproved 1977, 1993, Revised 1987, 1996).

See Rule 404, Section 3.

Sec. 7. Moisture And Volatile Matter.

See Rule 404, Section 2.

RULE 406: Soapstock And Acidulated Soapstock.

Sec. 1. Preservation of Samples.

To prevent fermentation and consequent chemical decomposition in samples of raw soapstock which are not intended for immediate analysis, add 0.1% of oil of cassia and thoroughly mix with such samples upon drawing.

Sec.2. Total Fatty Acids-Oxidized Fatty Acids (A.0.C.S. Official Method G 3-53, Revised 1987, Reapproved 1993).

Wet Extraction Method

Definition: In this method, the Procedure for Total Fatty Acid Determination determines the total fatty acids in the sample, whether present as neutral or saponfield oil. Any unsaponifiable fatty matter in the sample will be included. The Procedure for Oxidized Acid Determination in this method determines petroleum ether insoluble material, but diethyl ether soluble material. These materials are commonly referred to as oxidized fatty acids.

Scope: Applicable to raw and acidulated soap stock except from coconut, palm kernel and similar lauric-type oils.

A. Apparatus:

1. Glass-stoppered cylinder, 250 mL.
2. Erlenmeyer flask, 300 mL.
3. Filter paper, Reeve-Angel No. 230, Eaton and Dikeman No. 617, or equivalent.
4. Beaker, 400 mL.
5. Glass-stoppered separatory funnel, 500 mL.

6. Soxhlet flasks, 250 mL.

B. Reagents:

1. Alcoholic potassium hydroxide (see Notes, Caution), 50 g. of solid KOH in 1 liter of 95% ethanol. U.S.S.D. formulas 30 and 3A permitted.
2. Hydrochloric acid (1:1) (see Notes, Caution). Mix one volume of HCI (sp. gr. 1.19) with one volume of distilled water.
3. Methyl orange indicator solution, 0.1 % in distilled water.
4. Petroleum ether, A.0.C.S. Specification H 2-41, Reapproved 1993 (see Notes, Caution).
5. Diethyl ether, A.C.S. grade (see Notes, Caution).

C. Procedure for Total Fatty Acid Determination:

1. Mix the sample thoroughly and weigh immediately.
2. Weigh 8 to 10 g. of raw soap stock (4 to 5 g. of acidulated soap stock) into a 300 mL Erlenmeyer flask or 400 mL beaker (see Notes, 1). Add 50 mL of alcoholic alkali, cover with a watch glass, and heat on a water bath to saponify (see Notes,2). Agitate frequently and heat for at least 30 minutes or until saponification is complete.
3. Remove the watch glass and continue heating on a water bath with occasional agitation to evaporate the alcohol. To avoid oxidation, do not evaporate beyond a paste. If necessary, add a small amount of water when most of the alcohol has evaporated.
4. Add 100 mL of distilled water and heat until the soap has completely dissolved. Wash the contents into a glass-stoppered cylinder with hot distilled water, taking care not to exceed a total volume of 130 mL in the cylinder.
5. Add 3 to 5 drops of indicator and neutralize with dilute HCI to a pink methyl orange end point. Then add 1 mL of excess acid. Rotate the cylinder gently to mix the contents.
6. Cool to at least 35ºC. and add 125 mL of petroleum ether. The fatty acids do not need to have separated completely before adding the ether. Stopper the cylinder, shake gently and allow to stand until the petroleum ether layer separates.
7. Siphon the petroleum ether layer into a 500 mL separatory funnel, making sure that as little as possible of the insoluble matter which gathers at the ether-water interface is carried over into the separatory funnel. If any appreciable amount of insoluble matter does siphon over into the separatory funnel, it will usually settle to the bottom and can be drained back into the extraction cylinder. Make at least 4 more similar extractions, using 25 to 30 mL of petroleum ether each time and shaking the cylinder vigorously for 30 seconds with each extraction. Extractions should be continued until the petroleum ether layer is practically colorless. Save the acid water in the extraction cylinder if oxidized fatty acids are to be determined (as noted in the next Procedure).
8. Dilute the combined extracts with petroleum ether to 450 mL and mix thoroughly by gently shaking the separatoiy funnel.
9. Filter the diluted petroleum ether on a water bath as necessary to permit collection of all the extracts and subsequent washings. Wash the filter paper thoroughly with

about 75 mL of petroleum ether, taking care to remove the yellow ring of fatty acids which usually forms near the upper edge of the filter paper. This is best accomplished by washing the paper while its upper edge is lifted away from the filtering funnel with a small spatula or tweezers.

10. Evaporate the petroleum ether on a water bath under a gentle stream of clean dry air. Finally, dry the fatty acids in an air oven at 105° +/- 2°C. for 30 minutes. Cool in a desiccator to ambient temperature and weigh. Repeat until constant weight is attained. Constant weight is attained when the loss or gain in weight does not exceed 0.l% in successive 30 minute drying periods. This is the weight of total fatty acids.

D. Procedure for Oxidized Acid Determination:

1. Add 25 to 30 mL of diethyl ether to contents of the cylinder after step 7 for total fatty acids, stopper, shake gently and allow to stand until the diethyl ether layer separates.
2. Siphon the diethyl ether layer through the same filter paper used previously, into another tared 250 mL Soxhlet flask which has been dried and cooled in a desiccator. Make at least 4 similar extractions using 25 to 30 mL of diethyl ether each time, and shaking the cylinder vigorously for 30 seconds with each extraction. The last diethyl ether extract should be practically colorless.
3. Filter all extracts through the same filter paper and finally wash this filter paper thoroughly with diethyl ether to recover all of the oxidized acids.
4. Evaporate the diethyl ether in a fume hood on a water bath under a gentle stream of clean, dry nitrogen. Finally, dry the oxidized fatty acids in an air oven at 105° +/- 2°C. for 30 minutes. Cool in a desiccator to ambient temperature and weigh. Repeat until constant weight is attained. Constant weight does not exceed 0.1% in successive 30 minute drying periods. This is the weight of oxidized fatty acids.

E. Calculations:

1. Total Fatty Acids, % = $\frac{\text{Weight of total fatty acids x 100}}{\text{Weight of sample}}$

2. Oxidized Fatty Acids, % = $\frac{\text{Weight of oxidized fatty acids x 100}}{\text{Weight of sample}}$

F. Notes:

Caution - When working with extremely caustic materials like potassium hydroxide, always add pellets to water and not vice versa. Alkalies are extremely exothermic when mixed with water. Take precautions to contain the caustic solution in the event the mixing container breaks from the extreme heat generated.

When diluting acids, always add acid to water unless otherwise directed in a method. Keep acids off skin and protect eyes when working with acids. If acids come in contact with skin or eyes, wash immediately with large amounts of water.

Petroleum ether is extremely flammable. Avoid static electricity. The explosive limits in air are 1 to 6%. A fume hood should be used at all times when using petroleum ether.

Diethyl ether is highly flammable and is a severe fire and explosion hazard when exposed to heat or flame. It is a central nervous system depressant by inhalation and skin absorption. It will form explosive peroxides upon exposure to light. Handle empty containers, particularly those from which ether has evaporated, with extreme caution. Explosive limits in are 1.85 to 48%. The -V is 400 ppm in air. A fume hood should be used at all times when using diethyl ether.

Numbered Notes

1. On raw soapstock it is advisable to weigh the sample into the beaker or Erlenmeyer flask from a weighing bottle because this material loses moisture rapidly. Because a 400 mL beaker is bulky to weigh on an analytical balance it is advisable to weigh both raw and acidulated samples from a weighing bottle when a beaker is used.
2. Fifty mL of 95% ethanol and 2 to 3 g. of solid KOH may be used instead of the alcoholic solution, if desired.

RULE 407: Crude Sunflower Oil.

Sec. 1. Chemists' Reports. Chemists' reports for settlement must show the following data: Free Fatty Acids, to tenths of one per cent. (Rule 404, Sec. 4). Moisture and Volatile Matter (Rule 404, Sec. 2, A.0.C.S. Official Method Ca 2b-38, Reapproved 1993).

Insoluble Impurities (Rule 404, Sec. 3, A.0.C.S. Official Method Ca 3a-46).

Neutral Oil Loss-A.0.C.S. Official Method Ca 9F-57, Reapproved 1993.

Refined and bleached color-A.0.C.S. Official Method Cc 8e-63, Reapproved 1993.

RULE 408: All Other Tests.

Chapter VII. Methods of Chemical Analysis

For tests not covered by the preceding "Methods of Analysis," use the official methods of the American Oil Chemists' Society, if applicable; or, if no such method is applicable, use the methods of the Association of Official Analytical Chemists.

CHAPTER VIII. COTTONSEED OIL EXPORT RULES

Article 1. Identification and Administration

RULE E-1: Definitions of Words and Terms.

Sec. 1. Wherever used in these rules, the term "NCPA" shall mean the National Cottonseed Products Association, Inc.

Sec. 2. The words "these rules" shall mean the Cottonseed Oil Export Rules of the National Cottonseed Products Association, as distinguished from the NCPA Trading Rules.

Sec. 3. The term "Secretary" means the Secretary of the National Cottonseed Products Association, Inc.

RULE E-2: Export Committee.

An Export Committee on Cottonseed Oil, to be appointed by the President with approval of the Board of Directors, is hereby established. It shall be the responsibility of this Committee to discharge the duties imposed upon it by these export rules.

RULE E-3: Arbitration.

All disputes and controversies arising out of contracts made under these export rules shall be settled by arbitration, as provided in the Export Arbitration Rules for Cottonseed Oil which are contained in Section IX hereof.

Article 2. Official Contract Form

RULE E-4: Contract Form.

The following form of contract is recognized as Official by the National Cottonseed Products Association for the export of cottonseed oil in bulk and in drums and, unless otherwise specified therein, shall be considered the contract entered into by parties trading under these export rules.

Official Export Contract for Cottonseed Oil

1. Seller	13. Price Basis
2.	14.
3. Buyer	15. Terms
4.	16.
5. Commodity and Grade	17.
6.	18.
7. Packing	19. Special Conditions
8.	20.
9. Quantity	21.
10.	22.
11. Shipment	23.
12.	

Chapter VIII. Cottonseed Oil Export Rules

Except as otherwise specified herein, each applicable provision of the rules of the National Cottonseed Products Association relating to cottonseed oil shall be considered part of this contract. The provisions of this contract shall be construed as the rights of the parties determined in accordance with the laws of the State of New York and of the United States of America.

The parties hereto agree that any and all disputes, controversies or claims arising out of or related to this contract or the claimed breach thereof shall be settled by arbitration in accordance with the Export Rules of the National Cottonseed Products Association and that judgment upon any award rendered by the arbitrators may be entered in any court having jurisdiction thereof. Written demand for such arbitration shall be made, by the buyer, within thirty (30) calendar days after the vessel carrying the commodity contracted for has arrived in its port of discharge and, by the seller, within thirty (30) days after he receives written notice from the buyer that delivery is unsatisfactory. Failure to demand arbitration within the prescribed time limits shall be deemed a waiver of the provisions of this paragraph.

Article 3. Grade and Quality

RULE E-5: Crude Cottonseed Oil.

Crude cottonseed oil shall be traded on the basis of NCPA Rule 146, with settlement to be made in accordance with NCPA Rule 201.

RULE E-6: Prime Bleachable Summer Yellow Oil (PBSY).

PBSY shall be produced from fair, average quality crude cottonseed oil. Contract quality shall be as described in NCPA Rule 162 with the following exceptions:

(a) It may contain moisture and volatile matter no higher than 0.20% but seller shall pay buyer an allowance of 0.05% of the contract price for each 0.01% of moisture and volatile matter in excess of 0.10%; and

(b) When bleached in the laboratory in accordance with NCPA Rule 405, Sec, 4 color may not exceed AOCS 2.7 and seller shall pay buyer an allowance of 0.25% of the contract price for each 0.1 in excess of AOCS 2.5.

RULE E-7: Cottonseed Cooking Oil (Fully Refined Cottonseed Oil).

Cottonseed cooking oil shall be pure cottonseed oil produce from fair, average quality crude cottonseed oil from which essentially all of the free fatty acids and non-oil substances have been removed by chemical treatment and mechanical or physical separation. It shall meet the following specifications:

(a) *Clarity*. No cold test shall be required but the oil shall be clear and brilliant at 85 degrees Fahrenheit.

(b) *Color*, as determined under Rule 405, Sec. 1, shall not exceed 35.0 yellow and 4.0 red, except that color in excess of 4.0 red shall not be rejectable if seller pays buyer 1/20 of 1.0% of the contract price for each 0.1 of such excess.

(c) *Flavor* shall be bland.

(d) *Free Fatty Acid* (as oleic), determined under NCPA Rule 405, Sec. 6, shall not exceed 0.05%.

(e) *Moisture and Volatile Matter*, as determined under NCPA Rule 404, Sec. 2, shall not exceed 0.10%.

(f) *Unsaponifiable Matter*, as determined by AOCS Method Ca 6a-40, Reapproved 1993, shall not exceed 1.5%.

(g) *Initial Peroxide Value* shall be determined by AOCS Method Cd 8-53 and it shall not exceed 2.0 meg/kg at time of loading ship or filling drums. Seller shall allow buyer 50 cents per metric ton for each 0.10 meg/kg in excess of 1.0 meg/kg.

(h) *The Fat Stability* after eight (8) hours, as determined by AOCS Tentative Method Cd 12-57, Reapproved 1993, shall not exceed 62 meg/kg with the following allowances to be paid by seller to buyer:

Not exceeding 35	0.0
36-50 meg/kg	0.125 cents per lb.
51-62 meg/kg	0.250 cents per lb.

(i) Oil shall be deodorized and, during the cooling stage of deodorization, 0.005% of citric acid or 0.006% of monoisopropyl citrate shall be added.

RULE E-8: Cottonseed Salad Oil (Fully Refined Cottonseed Oil).

Cottonseed salad oil shall be pure cottonseed oil produced from fair, average quality crude cottonseed oil from which essentially all of the free fatty acids and non-oil substances have been removed by chemical treatment and mechanical or physical separation.

(a) Cottonseed salad oil will stand a cold test of 5 - 1/2 hours (AOCS Official Method Cc 11-53, Reapproved 1993).

(b) Color, as determined under Rule 405, Sec. 1, shall not exceed 35.0 yellow and 4.0 red, except that color in excess of 4.0 red shall not be rejectable if seller pays buyer 1/20 of 1% of the contract price for each 0.1 of such excess.

(c) Flavor shall be bland.

(d) Free Fatty Acid (as oleic), determined under NCPA Rule 405, Sec. 6, shall not exceed 0.05%.

(e) Moisture and Volatile Matter, as determined under NCPA Rule 404, Sec. 2, shall not exceed 0.10%.

(f) Unsaponifiable Matter, as determined by AOCS Method Ca a-40, Reapproved 1993, shall not exceed 1.5%.

(g) Initial Peroxide Value shall be determined by AOCS Method Cd 8-53 and it shall not exceed 2.0 meg/kg at time of loading ship or filling drums. Seller shall allow buyer 50 cents per metric ton for each 0.10 meg/kg in excess of 1.0 meg/kg.

(h) The Fat Stability after eight (8) hours, as determined by AOCS Tentative Method Cd 12-57, Reapproved 1993, shall not exceed 62 meg/kg with the following allowances to be paid by seller to buyer:

Not exceeding 35	0.0
36-50 meg/kg	0.125 cents per lb.
51-62 meg/kg	0.250 cents per lb.

(i) Oil shall be deodorized and, during the cooling stages of deodorization, 0.005% of critic acid or 0.006% of monoisopropyl citrate shall be added.

Article 4. Quantities and Quantity Tolerances

RULE E-9: Quantitative Terms.

The terms "short ton", "metric ton" and "long ton" shall be understood to mean 2,000 lbs., 2,204.6 lbs. and 2,240 lbs., respectively.

RULE E-10: Ship's Tanks.

Ship's tanks shall be understood to mean any and all tanks and/or compartments, within a vessel, that are suitable for shipping oil in bulk.

RULE E-11: Quantity Tolerance.

On CIF and C&F contracts, a variation of 5% above or below the quantity specified in the contract is recognized and permissible as a custom of the trade. On FOB steamer contracts, a variation of 2% above or below the quantity specified in the contract, at seller's option, is recognized as permissible. If a contract states a quantity followed by the notation "min/max," the acceptable variation will be one (1) metric ton over or under the stated quantity. If the quantity shipped differs by more than the permissible variation, buyer may not reject but seller shall make an allowance for the entire difference above or below contract quantity in amount agreed to by buyer and seller. If not agreed upon such allowance shall be fixed by arbitration as provided in these Rules.

If a contract states a variation above or below the quantity specified in the contract at buyer's option, buyer shall specify the quantity to be loaded at the time of vessel nomination.

Article 5. Shipment

RULE E-12: Shipping Terms and Periods.

Sec. 1. The term "first half" of a named month shall mean the period from the first through the fifteenth day of that month, both inclusive; and the term "second half" of a named month shall mean the period from the sixteenth through the last day of said month.

Sec. 2. The terms "early or beginning", "middle" and "end" or "late" shall mean, respectively, the first through the tenth day, the eleventh through the twentieth day and the twenty-first day through the last day of the month, each inclusive.

RULE E-13: Dates of Shipment.

Sec. 1. Time of shipment shall be as specified in the contract. In the absence of evidence to the contrary, the on board date of bill of lading shall be proof of date of shipment. In the event of non-shipment under a contract providing for "name steamer" or "name steamer or substitute", seller shall be considered to have met the shipping terms of the contract if he furnishes proof of freight contract engagement and/or charter party therefor and also proof that the goods were available in contact quantity and quality in time for shipment from designated port. In such event, shipment shall be made by the next available vessel.

Sec. 2. The period herein specified, within which bills of lading must be dated, may include an additional period of not more than eight (8) days, if desired by the shipper, provided he notifies buyer by telegraph, sent no later than the business day following the last day of the originally scheduled shipment period, of his intention to claim additional days. Such notice shall be passed on by other sellers or their buyers promptly after receipt.

Said notice need not state the number of additional days claimed by the seller and he may ship at any time within eight (8) additional days.

The seller shall make the buyer an allowance based upon the number of days by which the originally specified shipping period is exceeded, as follows:

1, 2, 3 or 4 days	-	1/2 of 1% of the F.0.B. price
5 or 6 days	-	1% of the F.0.B. price
7 or 8 days	-	1-1/2% of the F.0.B. price

Any such allowance shall be deducted from the contract price in the invoice.

If, after giving notice to buyer as provided above, the seller fails to make shipment within eight (8) days, the contract shall be construed as calling for shipment during the originally specified period plus eight (8) days at contract price less 1-1/2%; and any settlement for default shall be calculated on that basis.

Sec. 3. If shipment within the contract period is impossible on contracts in which the seller is required to provide the freight, seller shall promptly advise buyer of that fact, together with the reason therefor. If called for, seller must produce proof to justify his claim for extension or cancellation. If, on F.0.B. vessel contract, buyer cannot furnish a ship, the buyer may request a transfer to a barge or to another tank located at the facility that the seller has declared for loading. However, under no circumstances is the seller obligated to effect a transfer before first receiving funds for the value of the oil being transferred. The seller is not obligated to effect an in store transfer before the last day of the contract period or after the lapse of the required preadvice time period, whichever comes last.

Sec. 4. For F.0..B. Vessel Contracts buyer shall give seller vessel nomination(s), either by telex and/or TWX and/or cablegram, which shall include as accurately as possible the estimated date of arrival of the vessel(s) and vessel(s) name(s). The nomination(s) shall be given at least 14 calendar days in advance of the said estimated date of arrival, and these 14 days shall commence to run on the business day following the date of receipt of the nomination(s) by the seller. For the purpose of this Rule the business day expires at 3:00 p.m. (1500 hours) New York time.

Buyer will be allowed two vessel substitutions, provided the substituting vessels are of approximately the same size and expected arrival at port of loading. If the expected time of arrival of the substituting vessel is earlier than the vessel originally nominated the seller shall be entitled to 14 days of vessel nomination. If the expected time of arrival of the substituting vessel is later than the vessel originally nominated the buyer is to provide seller a minimum of five days notice of vessel substitution along with the adjusted vessel ETA. Without specific consent of the seller, no substitution of vessel will be allowed within five (5) days of loading date of vessel initially nominated or vessel substituted whichever is later. The vessel substitute must not be earlier than the vessel initially nominated nor later than the end of the contract period, except as provided below. In the case of an optional loading port in the Gulf, i.e. New Orleans or Houston seller's option declarable upon vessel nomination, seller shall declare the port of loading immediately upon receipt of such vessel nomination.

If, on F.0.B. vessel contracts, buyer fails to present a vessel ready for loading by the last day of the specified shipping period, or fails to nominate a vessel so as to preserve the required notification period stated in the contract, that period shall be deemed extended for

an additional period not exceeding eight (8) days, if so desired by buyer. In such case, seller must deliver the goods onto buyer's vessel within such additional eight (8) days and buyer shall pay seller a premium, based upon the number of days by which the originally specified shipping period is extended, as follows:

1, 2, 3 or 4 days	-	1/2 of 1% of the F.0.B. price
5 or 6 days	-	1% of the F.0.B. price
7 or 8 days	-	1-1/2% of the F.0.B. price

Any such allowance shall be added to the contract price in the invoice.

If the buyer notifies the seller on or before the last day of the original shipping period of his intention to present his vessel for loading within such additional eight (8) days and fails to do so, the contract shall be construed as calling for shipment during the originally specified shipping period plus eight (8) days at contract price plus 1 - 1/2%; and any settlement for default shall be calculated on that basis.

RULE E-14: Each Shipment A Separate Contract.

Each shipment shall be deemed a separate contract and adjustments as to weight and quality shall be made accordingly. All contracts involving more than one shipment shall be construed to be divisible and not entire, so that default or error as to one or more shipments shall not affect the remainder of the contract.

Article 6. Default

RULE E-15: Default By Seller.

Should seller be in default on a contract, buyer shall have the right to buy in the open market, goods of the kind, quality and description specified in the contract. If such right is exercised, said purchase must be made within seven (7) calendar days after buyer becomes aware of default (cf. Rule E-22) and after he has notified seller by telegraph of his intention to buy. The seller shall reimburse the buyer in the amount of any direct market loss.

If seller is dissatisfied with the price of the covering purchase or if buyer's right to cover the defaulted contract is not exercised as provided in these rules, then the matter of any damages shall be settled by arbitration. Damages shall be measured by the difference between the contract price and the fair market value of the contract commodity on the day the defaulted contract is covered, plus freight, insurance and other applicable costs.

RULE E-16: Default By Buyer.

Should buyer be in default of contract, seller shall have the right to sell in the open market, goods of the kind, quantity, quality and description specified in the defaulted contract. If such right is exercised, said sale must be made within seven (7) calendar days after seller becomes aware of default and after he has notified the buyer by telegraph of his intention to sell. The buyer shall reimburse the seller in the amount of any direct market loss.

If buyer is dissatisfied with the price of the covering sale or if seller's right to cover the defaulted contract is not exercised as provided in these rules, then the matter of any damages shall be settled by arbitration. Damages shall be measured by the difference between the contract price and the fair market value of the contract commodity on the day the defaulted contract is covered, plus freight, insurance and other applicable costs.

RULE E-17: Suspended Payments, Bankruptcy, Insolvency.

Should either party to a contract suspend payments, admit bankruptcy or commit an act of insolvency, the other party need not await maturity of the contract or any unfulfilled portion thereof to take appropriate action; but may, after giving one business day's notice by telegraph, resell or repurchase an appropriate quantity of the contract material and thereby earn the right to recover any direct market loss incurred.

Seller reserves the right to alter the terms of payment if in his judgment the financial responsibility of the Buyer does not warrant shipment on terms originally stated in contract.

RULE E-18: Profit As A Result of Default.

If there is a profit in any covering purchase, covering sale, resale or repurchase as provided for in Section VI, the party making such covering purchase, covering sale, resale or repurchase shall be entitled to keep such profit.

RULE E-19: Washouts, Closeouts or Defaults.

Washouts and closeouts, in connection with defaults, shall be of contract quantity without regard to tolerances that may be specified in the contract or elsewhere in these rules. If a minimum and maximum quantity is specified, the mean thereof shall govern.

RULE E-20: Force Majeure.

Sec. 1. If war, hostilities and/or blockade should prevent shipment during the contract period, the contract or any unfulfilled portion thereof shall be cancelled.

Sec. 2. Should shipment be delayed by fire, strike, lockout, riot, revolution or any restrictions imposed by any governmental authority with jurisdiction over the territory where the port or ports of shipment or destination, named in the contract, is or are located, or by any cause comprehended in the term "force majeure," other than those named in Sec. 1 of this rule, the time of shipment shall be extended by thirty (30) calendar days beyond the termination of the event preventing shipment; but such extension shall not exceed two (2) months. If shipment is not possible within these two (2) months, the contract shall be considered cancelled.

Chapter VIII. Cottonseed Oil Export Rules

Article 7. Bills of Lading, Notices, Charges, Insurance

RULE E-21: Bills of Lading.

When seller is responsible for obtaining bills of lading, he shall deliver to the buyer bills issued in accordance with the terms and conditions set forth in the "charter party" or, at seller's option, in the "berth term oil booking agreement" and either type of bill shall be accepted by the buyer. An exact copy of the charter party or booking arrangement shall be attached to the bill of lading, except on an F.0.B. or F.A.S. sale.

RULE E-22: Notice of Shipment.

Sec. 1. No later than seven (7) days after date of ocean bill of lading, seller shall send telegraphic notice of shipment to buyer or to buyer's representative. Such notice shall contain the name of the vessel, date of the bill of lading, the quantity shipped and the loading port. Intermediate contracting parties shall immediately forward this notice to the buyer.

Sec. 2. Time periods provided in these rules shall be understood to be exclusive of Saturdays, Sundays and legal holidays. Shipments and deliveries, however, must be executed in accordance with the rules applicable thereto.

RULE E-23: Freight Arrangements.

Sec. 1. When seller arranges for ocean freight space, he may advise the buyer of the name of the vessel, its ports of loading and its expected departure dates; however, such declaration shall not be deemed to modify the terms of the contract.

Sec. 2. Upon demand at any time subsequent to date of shipment, seller shall immediately notify buyer of conditions of affreightment related to and affecting loading and discharge and/or any other conditions not specified in the bill of lading.

RULE E-24: Expenses Chargeable to Seller and Buyer.

Sec. 1. On F.0.B. vessel contracts, seller shall pay all charge except dockage, incurred in placing the goods on board the vessel designated and provided by or for the buyer on the date or within the period fixed. The normal charges are based upon a minimum parcel size of 500 metric tons and a straight set of documents. Any additional charges incurred because of a smaller than minimum parcel being loaded to a vessel, barge or land tank or because of special document instructions will be for the account of the buyer. Such charges shall include wharfage, if any, and expenses for pumping the goods on board. "On board" shall mean over the ship's rail.

Sec. 2. On F.A.S. vessel contracts, seller shall pay all charge incurred in placing the goods alongside vessel; however, seller shall only be obligated to deliver cargo to one (1) location designated by vessel's agent. If cargo must subsequently be moved under ship's tackle, any resulting expense shall be for account of buyer.

Sec. 3. Seller shall pay bank charges for collection of documents. When the contract provides for landed weights, seller shall pay the costs for determining them.

Sec. 4. On C. & F. and C.I.F. contracts, buyer shall receive goods upon arrival at destination and shall handle and pay for all subsequent movement thereof. Buyer shall take delivery of goods from the vessel in accordance with terms of the bill of lading and

shall pay all costs of landing at named port of destination; including any duties, taxes and other expenses.

RULE E-25: Insurance.

Sec. 1. On C.I.F. sales, basis delivered weights, seller shall provide insurance coverage on institute cargo clauses (WA) average payable irrespective of percentages, including the risk of contamination.

On C.I.F. sales, basis delivered weights, buyer shall return to seller original certificate of insurance together with other supporting documents, when requesting settlement for differences between shipped and outturn weights.

Sec. 2. On C.I.F. sales basis shipped weights final, seller shall provide insurance on bulk oil clause conditions covering all and every risk and all damage and loss, however caused, including contamination from the time the oil leaves the shore tanks or containers at point of shipment by any conveyance by land or water until safely delivered, subject however to the following:

a) To pay average irrespective of percentage.

b) To pay actual shortage or loss in weight and/or leakage. Underwriters to be liable only for the excess of 1/2% trade ullage of contents of each tank, which shall be deducted in all settlements.

c) Warranted free of claims for rancidity or inherent vice.

Sec. 3. Seller shall insure goods against war risk on usual underwriters conditions in force and generally obtainable on date of vessel's sailing from each loading port for which a bill or bills of lading are issued. Any war risk premium in excess of 1/2 of 1% shall be for account of and payable by buyers at time of presentation of documents.

Sec. 4. Certificates shall be issued for a value calculated at minimum of 105% of C.I.F. value.

Sec. 5. On C.I.F. deliveries or shipped weight sales, seller shall furnish buyer with original policy or original negotiable insurance certificate covering the goods shipped. All claims shall be payable in the currency stipulated on the insurance certificate and shall be payable in the United States of America.

Sec. 6. On F.0.B. and/or C. & F. sales, buyer shall provide seller with evidence of insurance covering buyers/sellers, as their interest may appear, at least five (5) days prior to vessel's sailing.

Article 8. Survey, Weighing, Sampling and Analysis

RULE E-26: Official Weighers and Inspectors.

Survey, sampling, and weighing shall be performed by official weighers and inspectors of the National Cottonseed Products Association or others specified in NCPA Rule 66. If the contracting parties cannot agree, each of them may, at his own expense, appoint his own surveyor.

RULE E-27: Survey-Inspection of Vessel's Tanks.

Sec. 1. Tank and heating coils, if present, shall be dry and completely free of any previous cargo, loose scale or rust.

Sec. 2. Tanks must withstand a 3 psi, 30-minute air test. Coils if any, must be tested under a minimum of 80 psi steam pressure. If there are double bottoms beneath the tanks, they must be tested using a head of fuel oil or water, equivalent to the height of the tank. If the vessel is unable to conduct the above tests, a certificate guaranteeing tightness must be given to the surveyor by the Master prior to the loading of any cargo.

Sec. 3. Tightness and cleanliness of pipelines, valves and pumps are the responsibility of the vessel.

RULE E-28: Determination of Weights.

Sec. 1. Scales. When used, scales shall bear a certificate of approval issued by a recognized authority and dated not more than one (1) year prior to date of weighing. Weighing shall be performed by or under the direct supervision of an official Association weigher and inspector or by others specified in NCPA Rule 66.

Sec. 2. Tank Cars and Tank Wagons.

(a) All tank cars and tank wagons shall be weighed, first loaded and then unloaded, on the same scale at port of shipment.

(b) Prior to weighing, tank cars and tank wagons shall be made reasonably free of snow, ice and other foreign substances; or a suitable allowance shall be jointly assessed and shown as a deduction.

(c) All tank cars shall be weighed free, uncoupled and centered on the scale; all weight-bearing wheels shall be on the scale platform; and approach and live rails shall not be in contact with each other. No double or split weighing shall be acceptable.

Sec. 3. Drum Shipments.

(a) If drums are uniform in size and gauge, an average tare weight shall be established by weighing at least 10% of the empty drums.

(b) If various types of drums are used, a tare weight must be established for each additional drum.

(c) Scales for drum weighing shall be checked periodically with test weights, in the same weight range as that of the full drums.

(d) Weight shall be marked on drums at the time of weighing, using a fast-color paint or marking device.

Sec. 4. Storage Tanks.

(a) All storage tanks shall be calibrated by a recognized official calibration company. The certified gauge charts must show a tank height from a specific gauge point at all openings in the tank where gauges are to be taken. Calibration charts must be available to the surveyor at all times.

(b) Each tank shall have been calibrated by a qualified tank scrapper within the last three years; or an acceptable check on calibration as detailed as ASTM D-1220, paragraph 16, shall have been performed within the same period.

Sec. 5. Storage Tank Gauging Procedure.

(a) Standard gauging tapes must be used and checked for accuracy.

(b) All gauging shall be performed jointly by the surveyor and a representative of the warehouse or plant, each using his own equipment. Deviations between gaugers must not be more than 1/8 inch and both gauges shall be averaged.

(c) All gauge records shall show gauge height, innage and outage. Any difference between the gauge height shown on the calibration chart and that actually obtained must be noted and all parties so advised.

(d) Temperatures shall be taken by a calibrated cup thermometer that can be accurately read to 1°F. Temperatures must be obtained from at least two (2) gauge holes on tanks having four (4) such holes and from four (4) gauge holes on tanks having eight (8) such holes. Temperatures shall be taken from opposite sides of the tank.

(e) Temperatures must be taken three (3) feet from the bottom, at the middle and three (3) feet below the surface of the oil. If there is wide variation in these readings, intermediate readings must be taken.

Sec. 6. Specific Gravity Determination.

(a) A standardized pycnometer shall be used to determine specific gravities at the temperature of the oil in the storage tank.

(b) Specific gravities may run at temperature over temperature (T/T), temperature over 77°F (T/77°F), or temperature over 60°F (T/60°F). The specific gravity shall then be converted to pounds per gallon, using the standard pounds per gallon of water applicable to each temperature.

Sec. 7. Shore Pipelines and Pumps.

(a) The terminal or plant is responsible for the adequacy of all equipment used in loading the vessel; however, the surveyor shall, so far as practicable, inspect all such equipment.

(b) All take-offs from the line to be used in the loading operation must be blanked or sealed closed. Loading lines must be pigged or blown with air before and after loading, in the presence of the surveyor.

RULE E-29: Sampling.

Sec. 1. Storage Tanks.

(a) If oil is uniform, samples of equal size must be obtained from the tank at one foot intervals and composited.

(b) If oil is not uniform, a representative proportionate sample shall be drawn and composited.

Sec. 2. Vessel's Tanks.

(a) Immediately after loading, a representative sample shall be drawn from the vessel's entire depth of the oil, using accepted sampling techniques.

(b) The official sample shall be based on a weighted composite sample of oil drawn from all tanks used for a specific shipment.

(c) If more than one tank is used for a shipment of oil and an analysis is made of each tank, the quality of the shipment shall be based on the analysis of the weighted composite sample only, and not on the analysis of any individual tank.

(d) Samplers used must be of the Bacon Bomb or Curtis and Tompkins types.

(e) When more than one (1) shipper supplies oil for a co- mingled shipment, a representative sample of each shipper's material must be secured prior to comingling.

(f) Two (2) sealed representative samples must be left on board the ship, one for the consignee and one for the vessel. If more than one surveyor is in attendance, all

samples must be jointly sealed. A receipt for the samples must be obtained from the ship.

(g) Upon completion of loading and in the presence of a ship's officer, the surveyor shall record temperatures and ullages of the contents of each tank loaded. Such information, together with the ship's draft and list, shall be shown in the report of loading.

RULE E-30: Analysis.

(a) Analysis shall be made in accordance with methods set forth in Chapter VII of the NCPA Trading Rules. If no applicable method is contained in said Chapter, analysis shall conform to that approved by the American Oil Chemists' Society and in effect on the date of the contract.

(b) Chemical analysis shall be performed by an Official Chemist of the National Cottonseed Products Association or by one mutually acceptable to buyer and seller.

(c) If the analysis indicates that the commodity does not meet contract specifications, a second analysis of the official sample shall be performed by another Official Chemist of the National Cottonseed Products Association not previously involved.

(d) If the two above analyses do not agree, a referee chemist, acceptable to all parties, shall analyze the material and the mean of the two analyses coming closest together shall determine quality. If the parties concerned can not agree on the third chemist, the Secretary of the National Cottonseed Products Association shall make the selection.

Article 9. Arbitration

RULE E-40: Agreement To Arbitrate.

Sec. 1. Whenever parties enter into a contract under NCPA Cottonseed Oil Export Rules, they shall be deemed to have agreed to submit to arbitration any dispute(s), arising out of such a contract, which cannot be amicably resolved.

Sec. 2. Parties to a cottonseed oil export contract, which contains general arbitration clause, are also eligible to initiate arbitration under these rules. In such cases, both parties shall advise the Association Secretary in writing of their willingness to arbitrate and to bide by the arbitrators' award.

Sec. 3. When parties to a dispute agree to arbitrate under these rules and an arbitration is initiated hereunder, said parties agree that the NCPA Secretary shall act as administrator of the arbitration. Should the Secretary, for any reason, be unable to serve in this capacity, the Association president shall appoint a substitute with the authority to carry out all responsibilities assigned to the Secretary.

RULE E-41: Arbitrators.

Sec. 1. The Export Committee on Cottonseed Oil shall establish and maintain a panel of Arbitrators, the members of which shall be appointed by the President. The panel shall consist primarily of members of the Association who are active in the export trade and such additional members as the President considers desirable. No person shall serve as an arbitrator in any dispute in which he has a financial or personal interest, direct or indirect.

The principals in a dispute may, at their option, waive such disqualification by so notifying the Secretary in writing.

Sec. 2. Arbitrations shall be conducted before a board of three arbitrators who shall be chosen from the panel of arbitrators or the Export Committee or both.

RULE E-42: Initiation of Arbitration.

Any party to a contract made under these export rules or any party to an export contract for cottonseed oil containing a general arbitration clause, if the parties have agreed in writing to arbitrate under said rules, may commence an arbitration as follows:

(a) By giving written notice to the other party of intention (demand) to arbitrate. In addition to the name and address of the party upon whom demand is made, the notice shall contain (1) the date and other identification of the contract and the complete text of the arbitration clause, if other than Rule E-3; (2) a brief but specific statement of the dispute(s) to be arbitrated, the amount claimed, if any, and other relief sought; (3) a request of the other party to comply with the arbitration agreement; and the signature and address of the person authorized to act for the party giving the notice.

(b) Two (2) copies of the notice described in (a) above, together with two (2) copies of the contract or such parts thereof including the arbitration provisions, as related to the dispute, and the appropriate fee, as provided in Rule E-52, shall be filed with the Secretary. The Secretary shall promptly notify the other party of such filing.

(c) The party upon whom demand for arbitration is made may, if he so desires, file an answering statement in duplicate with the Secretary within seven (7) days after receiving the Secretary's notice provided in (b) above. If he does so, he shall send a copy of his answer to the other party. If no answer is filed within the stated time limit, it will be assumed that the claim is denied. Failure to file an answer shall not, however, operate to delay the arbitration.

(d) Parties to a dispute arising out of a contract, such as described above, may also initiate an arbitration by filing with the Secretary two (2) copies of a written agreement to arbitrate under these rules. Said agreement, signed by both parties, shall contain a statement of the matter in dispute, the amount of money involved, if any, and the remedy sought, together with the appropriate fee as provided by Rule E-52.

(e) If, in any way dispute where arbitration has been demanded, the defendant fails or refuses to respond as required to the Secretary, the complainant may demand an ex parte arbitration. Such demand shall be made by letter or telegram addressed to the Secretary. Upon receipt of such demand, the Secretary shall notify the defendant that demand for ex parte arbitration has been made. If the defendant fails to respond as required to the Secretary, the Secretary shall refer the matter to an arbitration committee of the complainant's selection. He shall by telegram notify the defendant of the selection. The designated committee will proceed with the arbitration and its decision will be binding on all contestants involved. Any documents filed with the Secretary by the defendant before the case is heard may be considered by the committee if it so desires. Costs of the arbitration will be charged to the complainant

but the committee shall, if it decides in the complainant's favor, add such costs to the award.

RULE E-43: Amendment of Claim.

If, after a claim and answer, if any, have been filed, either party desires to make any new or different claim, he shall so notify the Secretary in writing and shall mail a copy of said notice to the other party in the dispute. The latter shall have seven (7) days from the date of such mailing to file an answer with the Secretary. After appointment of the arbitrators, however, no new or different claim may be submitted to them except with their consent.

RULE E-44: Site of Arbitration.

Unless the arbitrators and the parties to a dispute agree on another U.S. location, arbitrations shall be held in New York, New York.

RULE E-45: Appointment of Arbitrators.

Sec. 1. Immediately after the initiation of an arbitration, as provided in Rule E-42, the Secretary shall submit, to each party to the dispute, an identical list of names of persons eligible to serve as arbitrators. Each party shall have fourteen (14) days from the date of such mailing to examine the list, to cross off any names to which he objects, to number the remaining names in the order of his preference and to return the list to the Secretary.

Sec. 2. If either party fails to return the list within the time specified, all persons named thereon shall be deemed acceptable to said party or parties. From the persons approved by both parties and in accordance with mutual preference, if any, the Secretary shall invite arbitrators to serve. If any so invited decline or are unable to serve or if for any other reason, appointment can not be made from the disputants' selections, the Secretary shall have authority to make appointments from the list.

Sec. 3. The Secretary shall notify each arbitrator of his appointment and the arbitrator shall, within five (5) days, advise the Secretary of his acceptance or rejection.

Sec. 4. When notified of appointment, each arbitrator must inform the Secretary of any circumstances that might create a presumption of bias or in any way disqualify him as an impartial arbitrator. Upon receipt of any such information, the Secretary must immediately disclose it to the disputants. If the latter are willing to proceed under the circumstances disclosed they shall within five (5) days so advise the Secretary in writing. If either party declines to waive the presumptive disqualification, a vacancy shall exist.

Sec. 5. If any arbitrator should resign, die, withdraw, refuse or be unable or disqualified to perform the duties of his office, the Secretary shall, on proof satisfactory to him, declare the office vacant and shall proceed to fill such vacancy in accordance with Sections 1 and 2 of this Rule. If a hearing shall have begun prior to the occurrence of a vacancy, the matter shall be reheard, unless the principals agree otherwise.

RULE E-46: Oral Hearing.

Sec. 1. The arbitrators shall fix the time and place of each hearing which shall be held within three (3) weeks of their appointment and shall immediately notify the Secretary of their decision. At least ten (10) days prior to the date fixed, the Secretary shall notify each

party of the time and place of said hearing, The principals may, by mutual agreement, waive the time specified for such notice or modify the terms thereof; but final decision shall rest with the arbitrators.

Sec. 2. Any party to an arbitration may be represented by counsel. A party intending such representation shall notify the other party of the name and address of said counsel and shall file copy of such notice with the Secretary at least three (3) days prior to the date set for the hearing at which counsel will first appear. If the initiation of an arbitration is made by counsel or if the reply of a party is made by counsel, such notice is deemed to have been given.

Sec. 3. Upon request of one or both parties, the Secretary shall arrange for a stenographic record of the testimony. Unless otherwise directed by the arbitrators, the cost of such record and all transcripts thereof shall be paid equally by all parties ordering copies.

Sec. 4. The Secretary shall arrange for the services of an interpreter when needed. The parties shall deposit the estimated cost of such service with the Secretary.

Sec. 5. Persons having a direct interest in an arbitration are entitled to attend hearings. The arbitrators may determine the propriety of attendance by other parties and shall have the power to require the retirement of any witness or witnesses during testimony by others.

Sec. 6. Upon request and for good cause shown by any party to the proceeding, or upon their own initiative, the arbitrators may take one or more adjournments; when all parties agree thereto, an adjournment shall be taken.

Sec. 7. Before proceeding with the first hearing or with examination of the file, as provided in Sec. 9 of this Rule and in Rule E-47, each arbitrator shall take an oath of office administered by the Secretary. The arbitrators may, at their discretion, require witnesses to testify under oath administered by any qualified person; if required by law or demanded by either party, they must do so.

Sec. 8. All decisions of the arbitrators shall be by majority vote. Unless otherwise required by the arbitration agreement or the law, the award shall also be made by majority vote.

Sec. 9. A hearing shall be opened by the filing of the oaths of the arbitrators and by recording the place, time and date, the presence of the arbitrators, parties and counsel, if any, and by the receipt by the arbitrators of the submission or statement of claim and answer, if any. The arbitrators may, at the beginning of the hearing, request statements clarifying the issues involved.

The complaining party or his counsel shall then present his claim and proofs and his witnesses. When offered by either party, exhibits may be received in evidence. When so received, they shall be numbered and made part of the record. A list of the names and addresses of all witnesses shall be placed in the record. AlI persons who testify shall be subject to questioning or other examination by opposing party, his counsel and the arbitrators. The arbitrators may, at their discretion, vary this procedure but shall afford full and equal opportunity to all parties to present any relevant material and proofs.

Sec. 10. An arbitration may proceed in the absence of any party who, after due notice, fails to appear or to obtain an adjournment. An award shall not be made solely on the default of a party. The arbitrators shall require the other party to submit such evidence as they consider necessary for the making of an award.

Sec. 11. The parties may offer such evidence as they desire and shall produce such additional evidence as the arbitrators deem necessary to an understanding and determination of the dispute. If authorized by law to do so, the arbitrators may subpoena witnesses or documents, on their own initiative or the request of either party.

The arbitrators shall decide the relevancy and materiality of the evidence offered; and conformity to legal rules of evidence shall not be necessary. AlI evidence shall be taken in the presence of all arbitrators and of all parties to the proceeding, except any party who is absent in default or has waived his right to be present.

Sec. 12. The arbitrators may but are not required to receive and consider evidence in the form of affidavits. They may give that evidence only such weight as they consider appropriate, after consideration of any objections that may be made to its admission. All documents not filed with the arbitrators at the hearing but which the parties, at the hearing or subsequently, agree shall be submitted shall be filed with the Secretary for transmission to the arbitrators. All parties shall be given an opportunity to examine such documents.

Sec. 13. Whenever the arbitrators deem it necessary to make an inspection or investigation, they shall direct the Secretary to inform the parties of their intention and the time and place thereof. Any party or his representative or counsel who so desires may be present at such inspection and investigation. If any party is not present, the arbitrators shall make a verbal or written report to such absentee(s) and afford him an opportunity to comment or give testimony relating thereto.

Sec. 14. Before closing a hearing, the arbitrators shall inquire of all parties whether they have any further evidence or witnesses to present. Upon receiving negative replies, the arbitrators shall declare the hearing closed, and shall record the time thereof. If either party desires to file briefs or to submit documents identified as exhibits during the hearing, the arbitrators shall fix a date within which such material may be filed.

Sec. 15. The hearings may be reopened by the arbitrators on their own motion or upon the request of any party, for good cause shown, before the award is made.

RULE E-47: Procedure Other Than Oral Hearing.

Sec. 1. By written agreement, the parties may submit their dispute to arbitration by other than oral hearing. The arbitration shall be conducted in accordance with these rules.

Sec. 2. If no method is specified by the parties, the Secretary shall notify each party to submit to him in writing the party's contentions, including a statement of facts duly sworn to, together with such other supporting evidence as may be pertinent. Such statements and proofs may be accompanied by written arguments or briefs. All such material shall be submitted within seven (7) days after receipt of the Secretary's notice and in the number of copies the Secretary may request.

The Secretary shall promptly transmit to each party a copy of the other party's statement and evidence. Each party, in turn, may reply. Failure of any party to reply within seven (7) days after receipt of such documents shall be considered a waiver of the right to reply.

Sec. 3. The Secretary shall transmit to the duly appointed arbitrators copies of all materials submitted to him under Section 2 of this Rule. The arbitrators shall have ten (10) days from the date they receive these documents within which to request either or both parties to produce additional evidence. The Secretary shall transmit this request to the

party or parties involved and they shall have seven (7) days from the receipt of such notice to submit the requested information to the Secretary who shall provide each party with a copy of the material furnished by the other party. Each party may reply but failure to do so within seven (7) days after receipt of the material from the Secretary shall be considered a waiver of that right.

Sec. 4. When the foregoing time limits have elapsed, the Secretary shall forward any additional requested evidence and replies to the arbitrators who shall meet at the earliest practicable date, consider all evidence and make the award.

RULE E-48: Waiver of Objections.

Any party who proceeds with an arbitration, after receiving knowledge that any provision of these Rules has not been complied with and who fails to state in writing his objection thereto, shall be deemed to have waived his right to object.

RULE E-49: Extensions of Time.

By mutual agreement, the parties to an arbitration may, for good cause, modify the time limits provided in these Rules. The arbitrators, also, for good cause, may extend the time limits except that requiring the prompt rendering of the award. The arbitrators must notify the parties of any such extension and the reason therefor.

Chapter VIII. Cottonseed Oil Export Rules

RULE E-50: Service of Notices.

Each party to a submission or other agreement providing for arbitration under these Rules shall be deemed to have agreed or shall agree that any papers, notices or process necessary or proper for the initiation or continuation of such arbitration and for any court action in connection therewith or for the entry of judgment on any award made thereunder may be served upon such party (a) by certified mail addressed to the party or his attorney at his last known address or (b) by personal service within or without the State wherein the arbitration is to be held, whether such party be within or without the United States of America; provided, that reasonable opportunity to be, heard shall be granted to every such party.

RULE E-51: The Award.

Sec. 1. The arbitrators shall render their award promptly and, in any event, within thirty (30) days after all evidence permitted by these Rules has been received.

Sec. 2. The award shall be in writing and shall be signed by each of the arbitrators. It shall be executed in the manner required by law.

Sec. 3. The arbitrators may grant any remedy or relief which they deem just and equitable within the scope of the agreement between the parties, including but not limited to specific performance of the contract. In their award, the arbitrators shall assess the arbitration fees and expenses as provided in Rules E-46 and E-52. They may assess such charges in favor of any party and shall assess any administrative fees or expenses in favor of NCPA.

Sec. 4. If the parties settle their dispute during the course of an arbitration, the arbitrators may set forth the terms of such a settlement in an award. Such a settlement shall not relieve the parties to the dispute of their obligation to pay costs actually incurred.

Sec. 5. The parties shall accept as legal delivery of the award (a) the Secretary's dispatch of the award or a true copy thereof via certified mail to the parties or their attorneys at their last known addresses; (b) personal service; or (c) the filing in any manner prescribed by law.

Sec. 6. Upon written request, the Secretary shall furnish to any party, at the latter's expense, certified copies of any papers in his or the arbitrators' possession that may be required in judicial proceedings related to the arbitration.

Sec. 7. For the purpose of closing the record, the Secretary may request either party to notify NCPA of compliance with the award.

RULE E-52: Deposits, Expenses and Fees.

Sec. 1. NCPA may require the parties to an arbitration to deposit in advance such sums of money, including the arbitrators' expenses, as it deems necessary to defray the expenses of the arbitration. When the arbitration is concluded, the Secretary shall render an accounting to the parties and return to them any unexpended balance, subject to the award.

Sec. 2. The expenses of witnesses shall be paid by the party producing such witnesses. The expenses of a stenographic record and an interpreter shall be paid as provided in Rule E-46, Sections 3 and 4.

All other expenses including the expenses of any witness or the cost of any evidence produced at the direct request of the arbitrators, shall be borne equally by the parties to the

dispute, unless they otherwise agree or unless the arbitrators in their award assess such expenses or any part thereof against any specified party or parties, as provided in Rule E-51.

The arbitrators shall award to NCPA any expenses advanced or paid by it and any fees due and remaining unpaid by any party responsible therefor.

Sec. 3. Arrangements for arbitrators' expenses shall be made through NCPA and not directly by the parties to the dispute.

RULE E-53: Interpretation and Application of the Rules.

The arbitrators shall interpret and apply these export rules as written. Any differences of opinion shall be decided by a majority vote of the arbitrators who may at all times call on the Secretary for assistance and advice in reaching their decision.

Article 10. Amendments

RULE E-60: Amendment Procedure.

These export rules shall be amended in the same manner as is provided in Article II, Section 1, of the Association's By-Laws for amendment of the NCPA Trading Rules.

CHAPTER IX. SUNFLOWER SEED

Article 1. Grade and Quality

RULE S-1: Prime Sunflower Seed, Oilseed Varieties.

Prime Sunflower seed of oilseed varieties shall contain not less than 40% oil, not more than 10% moisture, not more than 1.8% free fatty acid in the oil in the seed and 0% foreign matter. They shall be free of off flavor and odor as well as field or heat damage.

Article 2. Adjustments and Variations

RULE S-2: Sunflower Seed Settlements.

Sec. 1. Representative sample of seed will be taken as received and promptly forwarded to approved laboratory for grade and analysis. Oil, ammonia and moisture will be reported on a cleaned seed basis.

Sec. 2. Buyer shall credit seller at the rate of 0.15% of the contract price for each 0.1% oil content above 40.0% and shall deduct 0.15% of the contract price for each 0.1% oil below 40.0%.

Sec. 3. Dockage.

(a) Sunflower seed containing over 10% moisture but not over 12% moisture shall have weight adjusted to 10% on a 1 for 1 basis. Sunflower seed over 12% moisture shall be sample grade and shall be rejectable.

(b) Foreign matter between 0.0% and 8.0% shall be calculated and rounded to the nearest 0.1% and shall be deducted on a 1 for 1 basis.

Sunflower seed containing more than 8.0% foreign matter shall be subject to rejection or to negotiated settlement.

Sec. 4. Free Fatty Acid in oil in seed above 1.8% and not exceeding 3.0% shall be charged for excess above 1.8% at the rate of 0.l% of the selling price for each 0.l%. Sunflower seed containing over 3.0% FFA in seed shall be sample grade and subject to rejection.

Sec. 5. Sunflower seed having off flavor or odor, or field or heat damage, shall be sample grade and subject to rejection.

Article 3. Sampling

RULE S-3: Sunflower Seed Sampling.

Sec. 1. Samples shall be taken in accordance with A.0.C.S. method Ai 1-80, Reapproved 1993.

CHAPTER X. CRUDE SUNFLOWER OIL

Article 1. Grade and Quality

RULE S-4: Crude Sunflower Oil.

Crude Sunflower oil shall be pure sunflower oil produced from American grown sunflower seed by either mechanical or solvent process and conforming to standard specifications as listed in Rule S-5

RULE S-5: Prime Crude Sunflower Oil.

Prime Crude Sunflower oil shall contain:

Not more than 3.0% Free Fatty Acid.
Not more than 5.0% moisture and volatile matter.
Neutral oil loss not exceeding 7.5%.
Flash point not lower than 250F.
Refined and bleached color shall be no darker than A.0.C.S. 2.5 red.

Article 2. Adjustments and Variations

RULE S-6: Crude Oil Settlements.

Sec 1. Buyer shall credit seller at the rate of 0.1% of the contract price for each 0.1% free fatty acid below 2.0%; seller shall pay buyer at the rate of 0.l% of the contract price for each 0.1% in excess of 2.0%, but not exceeding 3.0% free fatty acid.

Sec 2. Buyer shall pay seller for loss at the rate of 1% of the contract price for each 1% loss under 5% and seller shall pay buyer at the rate of 1% of the contract price above 5%. Loss to be calculated fractionally throughout.

Sec. 3. When refined and bleached color is in excess of A.0.C.S 2.5 red, the oil is rejectable and settlement shall be made by negotiations between buyer and seller.

Sec. 4. Unless otherwise agreed, other terms of this contract shall be in accordance with the applicable provisions of the Trading Rules of the National Cottonseed Products Association.

Note: Crude oil settlement shall be made using either Sec. 1 or Sec. 2 and Sec. 3 combined.

CHAPTER XI. SUNFLOWER MEAL AND HULLS

Article 1. Grade and Quality

RULE S-7: Sunflower Meal

Sunflower meal is the product obtained by grinding flakes after removal of most of the oil by mechanical or solvent process. The percentage protein and process of manufacture shall be designated at the time of sale.

RULE S-8: Sunflower Hulls.

Sunflower hulls consist of the outer covering of sunflower seed and shall be reasonably free of foreign substances.

Article 2. Adjustments and Variations

RULE S-9: Meal and Hull Settlements.

Sec. 1. No claim for deficiency in protein or combined protein and fat shall be made by the buyer unless deficiency shall exceed 1/2 unit of protein, or 1/2 unit of combined protein and fat, if sold that way. If a contract carries a separate fat guarantee no claim for fat deficiency shall be made unless the deficiency exceeds two-tenths of one per cent.

Sec. 2. Meal, sized cake, pellets, screening or flakes, not coming up in analysis to contract grade, shall be a good delivery if within 1-1/4 unit of the protein, or 1-1/4 units of combined protein and fat, if sold that way, specified in the contract. Settlement price shall be reduced in such proportion as the deficiency bears to the guarantee. If a contract carries a separate fat guarantee, the product shall be a good delivery, with respect to the fat content if within five-tenths of one percent of the fat specified in the contract. Settlement price shall be reduced by the three-tenths of one per cent of fat deficiency.

Sec 3. Reductions in price made according to #1 and 2, above shall be based upon the contract price minus cheapest published tariff freight in cases of c.a.f. or delivered contracts, and on contract price in cases of f.o.b. or basis f.o.b. contracts.

Sec. 4. Unless otherwise agreed, other terms of the contract shall be in accordance with the applicable provisions of the Trading Rules of the National Cottonseed Products Association.

CHAPTER XII. PEANUT MEAL AND HULLS

Article 1. Grade and Quality

RULE P- 1: Peanut Meal.

Peanut Meal is a ground product of the shelled peanuts, composed principally of the kernels, with such portion of the hull, or fiber, and oil, as may be left in the ordinary course of manufacture by a mechanical or solvent extraction process. If solvent extracted, it must be so designated.

RULE P-2: Peanut Meal and Hulls.

Peanut Meal and Hulls is ground peanut meal whether mechanically or solvent extracted, which contains a small amount of peanut hull residue or to which peanut hulls have been added. If the peanut meal is solvent extracted, it must be so designated.

RULE P-3: Peanut Hulls.

Peanut Hulls consist of the outer hull or the peanut shell.

RULE P-4: Other Contract Terms.

Unless otherwise agreed other terms of the contract shall be in accordance with the applicable provisions of the Trading Rules of the National Cottonseed Products Association.

CHAPTER XIII. FEED GRADE COTTONSEED

Article 1. Definitions of Words and Terms

RULE F- 1: Applicability.

Feed grade cottonseed is that intended for feeding to livestock. Unless otherwise specified, all rules in Chapter XIII shall apply to feed grade cottonseed, either before or after mechanical removal of linters.

RULE F-2: A Contract.

Unless otherwise specified, contracts shall be expressed as a specific number of tons as defined in Rule 25. Contracts covering more than one carload or truckload shall be construed as divisible and not entire, so that default, in quantity or quality, on one or more cars or trucks shall be treated as a separate contract for purposes of quality determination.

Nothing in the Rule shall prevent buyer and seller from agreeing to average out weights on contracts involving shipments over more than one month or to more than one consignee.

RULE F-3: A Conveyance.

Except in cases where the railroad tariff specifies a higher minimum weight, a car of Feed Grade Cottonseed shall be 60 tons. If gondola cars are used, a gondola of Feed Grade Cottonseed shall be 85 tons unless otherwise stated.

Barges: A standard barge shall be 1,100 tons unless otherwise stated.

Trucks: A truck shall be 23 tons unless otherwise stated.

Settlements for overweights and underweights shall be made in accordance to Rule F-7.

Article 2. Grade and Quality

RULE F-4: Prime Feed Grade Cottonseed.

Prime Feed Grade Cottonseed shall meet the following criteria: Foreign substances shall not exceed 2 percent. Moisture shall not exceed 13 percent. Free fatty acids in the oil shall not exceed 3 percent. Crude protein and crude fat (dry matter basis) will be at least 34 percent when the separate totals for each are combined.

Cottonseed of the Pima variety or other varieties of long staple cotton containing 3 percent or less residual lint on seed after ginning, or admixtures containing such seed must be identified as such at the time of sale.

RULE F-5: Delinted Prime Feed Grade Cottonseed.

Delinted prime feed grade cottonseed shall be mechanically delinted. Lint on seed shall not exceed 5 percent. Foreign substances shall not exceed 1 percent. Moisture shall not exceed 13 percent. Free fatty acids in oil shall not exceed 3 percent. Crude protein and crude fat (dry matter basis) will be at least 37-1/2 percent when the separate totals for each are combined.

RULE F-6: Feed Grade Cottonseed, Off Quality.

Feed Grade Cottonseed, off quality, are those that do not meet the specifications of Rule F-4.

Article 3. Adjustments and Variations

RULE F-7: Quantity Variations.

If a contract for feed grade cottonseed is for one carload or less, a variation of 10 percent above or below contract quantity shall constitute a good delivery as to weight. If the contract is for a quantity in excess of one carload, a variation of 5 percent above or below contract quantity shall constitute a good delivery, provided 5 percent does not exceed 5 tons.

Settlement for overweights or underweights shall be made in accordance with Rule 41.

RULE F-8: Settlements.

Sec. 1. No claims for deficiency in combined protein and fat shall be made by the buyer unless such deficiency shall exceed 1/2 unit of combined protein and fat.

Sec. 2. A good delivery is, if within l - 1/2 units of guaranteed combined protein and fat and within 2 units of guaranteed moisture.

Sec. 3. Settlement prices shall be reduced in such proportion as the deficiency bears to the guarantee, with the exception of free fatty acids in the oil. Reductions for excess free fatty acids in the oil shall be computed as follows:

1. Above 3 percent, but below 6 percent, the factor shall be 1/4 of 1 percent for each 1 percent in excess of 3 percent, fractions in proportion.

2. 6 percent and above; the factor shall be 1/2 of 1 percent for each 1 percent in excess of 3 percent, fractions in proportion.

Sec. 4. Reductions in price made according to Sections 1, 2 and 3 of this Rule shall be based on the contract price minus cheapest published tariff freight in cases of c.a.f. or delivered contracts, and on the contract price in cases of f.o.b. or basis f.o.b. contracts.

Sec. 5. If a product is sold on sample, the permissible variations in analysis and in other quality factors shall be in accordance with this Rule and Rule F-9, unless otherwise specified in the contract.

RULE F-9: Variation in Value.

Where all or any portion of a shipment of a product equals 90 percent or more of contract value, on the basis of quality, buyer shall accept delivery at an allowance to be agreed upon or fixed by arbitration. If the value of a product does not equal 90 percent or more of contract value, the buyer may reject. Value under this Rule shall be determined as the basis of contract price. The variation permitted in this Rule is exclusive of that permitted under Rule F-8 and a product may be rejected under that Rule even though it equals 90 percent or more of contract value.

Article 4. Performance of Contract

RULE F-10: Default in Acceptance or Delivery.

If seller delivers feed grade cottonseed in the quantity and of the quality contracted for, within the shipping period (s) specified in the contract, and buyer fails or refuses to accept any portion of such cottonseed, the seller may treat such portion as breached by buyer and, if he elects to do so, he shall proceed in accordance with Rules 50, 51, 52 and 53. Such action by the seller shall not affect the balance of a contract which shall remain in full force and effect.

If seller fails to deliver cottonseed in the manner specified in the contract, the buyer may treat the contract as breached by the seller and, if he elects to do so, he shall proceed in accordance with Rules 50, 51, 52 and 53.

RULE F- 11: Shipping Instructions.

Sec. 1. Specified or Scattered Shipments. In the case of contracts for delivery on a basis other than quick, immediate or prompt, either buyer or seller may, at the time the contract is made or at least five (5) days prior to the beginning of the contract delivery period, furnish the other contracting party with a shipping schedule. Unless such a schedule is rejected in writing by either contracting party at least two (2) days prior to first shipping date, it shall be considered part of the contract. If the contracting parties cannot agree on such a schedule or if no schedule is furnished by either party, it shall be understood that shipments will be made on a scattered basis as defined in Rule 28.

Sec. 2. Equipment Requirements and Complete Instructions. Where shipments are to be made on a scattered or specified basis, the buyer shall furnish the seller with equipment requirements at least seven (7) days prior to scheduled shipments. If, at the time of loading, shipping instructions have not been furnished in accordance with the terms of the contract, the shipper may load a box car (or a hopper car in the case of delinted cottonseed). At least one day prior to scheduled shipment, buyer must furnish complete shipping instructions which shall permit seller to ship in an orderly manner and to complete shipment according to schedule and within the contract period.

If buyer requires seller to provide railroad owned equipment, so long as proof is available that the seller ordered the railroad owned equipment in a timely manner, the seller shall not be responsible if equipment fails to arrive as ordered by schedule, thus the seller shall not be held responsible for failure of providing loaded cars to the buyer.

Sec. 3. Other Shipments. When contracts call for quick or immediate shipment, buyer shall furnish shipping instructions within 24 hours of date of contract. When sold for prompt shipment, buyer shall furnish such instructions within 5 days of date of contract.

Sec. 4. Failure or Refusal to Furnish Instructions. Failure or refusal by the buyer to furnish shipping instructions, as required by this Rule, shall give the seller the options, during the contract period or within five (5) days after expiration thereof, (1) to load car or cars on schedule and to place same on track, notifying buyer and railroad that all charges are for buyer's account; or (2) to treat as breached by the buyer all or any part of the contract for which such instructions have not been furnished. If seller elects the latter option, he must proceed as provided in Rules 50, 51, 52 and 53.

Sec. 5. Extension of Contract. Nothing in this Rule shall prevent buyer and seller from agreeing to extend a contract beyond its expiration date. The terms of such an extension shall be exchanged in writing within five (5) days after the contract's expiration date; and the five (5) day period, referred to in Sec. 4, shall apply at the end of the extension period.

RULE F-12: Shipment.

Sec. 1. One or More Months. When a shipping schedule has been established under Rule F-11, seller must begin shipment in accordance with such schedule and must complete shipments within the contract period(s), unless (1) seller has ordered and received railroad assurance of available car or cars; (2) railroad fails to furnish such cars on schedule; and (3) seller has notified buyer of the delay.

Sec. 2. Failure or Refusal to Ship. If seller fails or refuses to ship in accordance with Sec. I of this Rule or within such period or periods as may be specified in the contract, buyer shall have the option to treat as breached any part of the contract not shipped on schedule. If buyer elects to do so, he must, within five (5) days after failure of seller to ship on schedule, proceed as provided in Rules 50, 51, 52 and 53.

Sec. 3. Extension of Contract. Nothing in this Rule shall prevent buyer and seller from agreeing to extend a contract beyond its expiration date. The terms of such an extension shall be exchanged in writing within five (5) days after the original expiration date; and a five (5) day period as described in Sec. 2, shall apply at the end of the extension period.

RULE F-13: Notice of Shortage in Weight.

In the case of rail shipment, if the gross weight, taken in accordance with these Rules, indicates a shortage exceeding 1,000 pounds, buyer must immediately so notify seller by telegram, stating seal numbers and whether or not seals are intact. Seller shall have 48 hours in which to examine the case and the cars shall be held without breaking seals or unloading during such period.

To secure the benefit of this Rule, seller must, within 5 business hours after receipt of notice of discrepancy, notify buyer by telegram of his intention.

RULE F-14: Shipper's Official Weights.

If the shipper, with his invoice, furnishes an official weight certificate signed by one of the parties described in Rule 66, the weight shown on that certificate shall govern settlement.

RULE F-15: Rejection.

Sec. 1. If all or any portion of a shipment is not equal to contract quality, within the tolerances permitted in Rules F-8 and F-9, the buyer may reject, and Rule 69 shall apply. If he does so, he must so advise the seller by telegram within 48 hours after arrival of shipment at destination.

Sec. 2. If seller is notified of rejection, he shall have the privilege of replacement with a product of contract quality provided, within 48 hours of receipt of rejection notice, he informs buyer of his intention to do so. All replacements shall be for immediate shipment as defined in Rule 28.

Each replacement shall be made from the original point of shipment or from any point if shipper equalizes freight and transit privileges. Only one replacement is permitted.

Sec. 3. Whether or not seller exercises his privilege of replacement, he must, within 48 hours after receipt of rejection notice, repay to buyer all amounts paid out by the buyer on account of the rejected product. If seller declines to replace or make the refund herein required, buyer must, to preserve a claim, proceed as provided in Rules 50, 51, 52 and 53.

Sec. 4. If buyer unloads a shipment of a product which he claims to be of rejectable quality, thereby making it impossible for seller to obtain an official sample, settlement shall be made on the basis of shipper's analysis at point of origin.

Article 5. Claims

RULE F-16: Period for Filing Claims.

All claims shall be made by the buyer within 30 days after the arrival at first destination.

RULE F-17: Basis for Claims.

All weight claims shall be supported by a weight certificate, as provided in Rule 70, showing weight of each car or truck and date of arrival at destination. Claims for quality shall be based upon each carload or truckload. All quality claims shall be supported by an official analysis.

OFFICIAL CHEMISTS

2012-2013

LEGEND

Group No. 1 Analysis and grading of cottonseed.

Group No. 2 Analysis and grading of cottonseed or peanut cake and meal.

Group No. 3 Analysis and grading of crude oil, refined oil and soapstock.

Group No. 4 Determination of cellulose yield.

LOUISIANA

New Orleans 70123	(2-3)	Paul Thionville, Thionville Laboratories 5440 Pepsi Street
New Orleans 70123	(2-3)	Boyce H. Butler, Thionville Laboratories 5440 Pepsi Street

SOUTH CAROLINA

Columbia 29201	(1-2)	Frank M. Hahn, Hahn Laboratories 1111 Flora St.

TENNESSEE

Memphis 38101	(1-2-3-4)	Donald E. Britton, Mid-Continent Laboratories, Inc., 1279 Jackson Ave.

A listing of chemist's approved by the American Oil Chemists' Society is available at www.aocs.org/labservices

OFFICIAL WEIGHERS AND INSECTORS

2012-2013

ALABAMA

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Office: P.O. Box 617, Saraland, AL 36571

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Dothan, Enterprise, Eufaula and Mobile

ARKANSAS

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Helena and Pine Bluff

CALIFORNIA

Cullen Maritime Services, Inc.
Head Office: 465 Forty Sixth St., Richmond, CA 94805
Branch Office: 2126 East Seventh St., Long Beach, CA 90804
Deputies at: Richmond and Long Beach

Intertek Agri Services / Intertek Caleb Brett
Head Office: 160 East Jame Drive, #200, St. Rose, LA 70087
State Offices: 1941 Freeman Ave., #A, Signal Hill, CA 90755
6050 Egret Court, Benicia, CA 94510
Deputies at: Los Angeles, Long Beach, San Diego, Stockton, Richmond and San Francisco

SGS North America, Inc.
Head Office:1025 Harbor Ave., Memphis, TN 38113
State Offices: 22934 Lockness Ave., Torrance, CA 90501
4134 Lakeside Dr., Richmond, CA 94806

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Los Angeles and San Francisco

FLORIDA

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Office: 4951 East Adamo Drive, #210, Tampa, FL 33605

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Graceville and Pensacola

GEORGIA

Hahn Laboratories
Head Office: P.O. Box 1177, Columbia, S.C. 29202
Deputies at: Savannah

K-Testing Laboratory, Inc.
Head Office: 365 South Main St., Memphis, TN 38103
Deputy at: Dawson

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Office: P.O. Box 1504, Savannah, GA 31402

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Camilla, Dawson and Savannah

ILLINOIS

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Office: 16130 Van Druen Rd., South Holland, IL 60473

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Chicago

LOUISIANA

Intertek Agri Services / Intertek Caleb Brett
Head Office: 160 East James Drive, #200, St. Rose, LA 70087
State Offices: 160 East James Dr., #200 St. Rose, LA 700

Mid-Continent Laboratories, Inc.
Head Office: P.O. Box 1521, Memphis, TN 38101
Deputies at: Natchitoches and Opelousas

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Offices: P.O. Box 1328, Kenner, LA 70063
151 James Drive West, St. Rose, LA 70087

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Avondale, Baton Rouge, Good Hope, Gretna, Harvey, Lake Charles, Marrero, New Orleans, St. Rose, Reserve and Westwego

MARYLAND

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Office: 1622 South Clinton St., Baltimore, MD 21224

MISSISSIPPI

Mid-Continent Laboratories, Inc.
Head Office: P.O. Box 1521, Memphis, TN 38101
State Office: P.O. Box 2551, Jackson, MS 39207
Deputies at: Jackson, Jonestown, Port Gibson and Carrolton

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputies at: Greenville and Jackson

NEW JERSEY

SGS North America, Inc.
Head Office:1025 Harbor Ave., Memphis, TN 38113
State Office: 20 Lafayette St., Carteret, NJ 07008
Deputy at: Bridgeport

NORTH CAROLINA

Hahn Laboratories
Head Office: P.O. Box 1177, Columbia, SC 29202
Deputies at: Charlotte and Maxton

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Raleigh

OKLAHOMA

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Oklahoma City

SOUTH CAROLINA

Hahn Laboratories
Head Office: P.O. Box 1177, Columbia, SC 29202
Deputies at: Bishopville, Columbia and Darlington

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Charleston

TENNESSEE

K-Testing Laboratory, Inc.
Head Office: 365 South Main St., Memphis, TN 38103
Deputies at: Memphis

Mid-Continent Laboratories, Inc.
Head Office: P.O. Box 1521, Memphis, TN 38101-1521
Deputies at: Memphis

SGS North America, Inc.
Head Office:1025 Harbor Ave., Memphis, TN 38113
State Office: 1025 Harbor Ave., Memphis, TN 38113

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Memphis

TEXAS

Intertek Agri Services / Intertek Caleb Brett
Head Office:160 East James Drive, #200, St. Rose, LA 70087
State Office: 3741 Red Bluff Rd., #105, Pasadena, TX 77503

SGS North America, Inc.
Head Office: 1025 Harbor Ave., Memphis, TN 38113
State Offices: 1201 W. 8th at Georgia Ave., Deer Park, TX 77536
925 Corn Products Rd., Corpus Christi, TX 78409

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
State Office: 316 West San Augustine, San Augustine Office Park,
Deer Park, TX 77536-4145

VIRGINIA

Thionville Laboratories, Inc.
Head Office: P.O. Box 23687, New Orleans, LA 70183-0687
Deputy at: Norfolk

WASHINGTON

Cullen Maritime Services, Inc.
Head Office: 465 Forty Sixth St., Richmond, CA 94805
Branch Office: 662 N.W. Fifty Second Street, Seattle, WA 98107
Deputy at: Seatt

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