

MIL-F-35081E
31 December 1984
MIL-F-35081D
30 June 1976

MILITARY SPECIFICATION

FAT, HYDROGENATED, VEGETABLE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers hydrogenated vegetable fat to be used in the manufacture of filled milk, imitation cream, imitation half and half, imitation ice cream, imitation ice milk and other imitation dairy products, for use by the Department of Defense when authorized (see 6.4).

1.2 Classification. The product shall be of the following styles, as specified (see 6.1):

Styles:

- A - Uncolored
- B - Color added

2. APPLICABLE DOCUMENTS

2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on date of invitation bids or request for proposal, form a part of this document to the extent specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research and Development Center, Natick, MA 01760-5014 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8945

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SPECIFICATIONS

FEDERAL

PPP-D-729 - Drums, Shipping and Storage, Steel,
55-Gallon

STANDARDS

FEDERAL

FED-STD-595 - Colors

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection
by Attributes
MIL-STD-129 - Marking for Shipment and Storage

(Copies of documents required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

OTHER GOVERNMENT DOCUMENTS

U.S. DEPARTMENT OF AGRICULTURE

United States Standards for Condition of Food Containers

(Application for copies should be addressed to Director, Market Research and Development Division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington, DC 20250.)

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Federal Food, Drug, and Cosmetic Act and Regulations Promulgated
Thereunder (21 CFR Parts 1-199)

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 Other publications. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS (AOAC)

Official Methods of Analysis of the Association of Official Analytical Chemists

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(Application for copies should be addressed to the Association of Official Analytical Chemists, 1111 North 19th Street, Suite 210, Arlington, VA 22209.)

AMERICAN OIL CHEMISTS' SOCIETY

Official and Tentative Methods

(Application for copies should be addressed to the American Oil Chemists' Society, 508 South Sixth Street, Champaign, IL 61820.)

ASSOCIATION OF VITAMIN CHEMISTS METHODS OF VITAMIN ASSAY

(Application for copies should be addressed to the Interscience Publishers, a Division of John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10016.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence.

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article inspection (see 4.4, 6.1 and 6.2).

3.2 Ingredients. All ingredients shall be clean, sound, wholesome, and free from foreign material, evidence of rodent or insect infestation, extraneous material, off-odors, off-flavors, and off-colors.

3.2.1 Vegetable fat, edible. Edible vegetable fat shall be a refined, blended, hydrogenated and deodorized vegetable oil or a combination of vegetable oils.

3.2.2 Emulsifiers, vitamin A, color additives, antioxidants and heavy metal scavengers. Any emulsifier, vitamin A source, color additive, antioxidant or heavy metal scavenger used shall be in compliance with 3.6 and shall be used in accordance with good manufacturing practices.

3.3 Processing. The hydrogenated vegetable fat shall contain an emulsifier or emulsifiers and vitamin A acetate or vitamin A palmitate. The use of antioxidants and heavy metal scavengers is optional and they may be added singly or in combination to the vegetable fat. In addition, the style B product shall be colored with beta carotene.

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3.4 Finished product. The finished product shall comply with the following requirements:

- a. There shall be no foreign material such as, but not limited to dirt, insect, insect parts, hair, wood, paper, paint, glass, or metal.
- b. The product shall have a bland flavor and shall not have any foreign flavor or odor such as rancid, oxidized, grassy, soapy, beany, turpentine, or fishy.
- c. The product shall not melt when held at a temperature of 90°F for 24 hours.
- d. The product shall be free from speckles, streakiness, or a mottled appearance.
- e. The body of the product shall be firm, showing a waxy, close-knit texture and characteristic plasticity at 70° to 80°F. In addition the product shall be free from crumbliness, mealiness, graininess, and greasiness (the appearance of having been melted and ... resolidified).
- f. The product shall have a monoglyceride content of not less than 1.8 percent (calculated as alpha monostearin).
- g. The product shall have a free fatty acid content of not more than 0.15 percent (calculated as oleic acid).
- h. The product shall have a vitamin A content of not less than 32,000 International Units (I.U.) per pound. 1/
- i. The product shall have an iodine value of not more than 80.
- j. The product shall have a peroxide value of not more than 1.0 milliequivalent of peroxide per kilogram (meq/kg) of fat.
- k. The product shall have a moisture content of not more than 0.05 percent.
- l. The product shall have a fat stability (active oxygen method) of not less than 100 hours.
- m. The product shall have a solid fat index of:

45	minimum	at	50°F
7	maximum	at	92°F
2	maximum	at	105°F

n. The product color shall be as follows:

Style A - Not darker than Chip No. 17855 of FED-STD-595.

Style B - Not lighter than Chip No. 23793 nor darker than
Chip No. 23655 of FED-STD-595.

1/ Or an amount to insure a level of not less than 2000 I.U. of vitamin A per quart of recombined filled milk, testing approximately 3.5 percent fat.

3.5 Plant qualification. The finished product shall be produced, processed and packaged under the supervision of the Fresh Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service, US Department of Agriculture, Washington, DC 20250.

3.6 Federal Food, Drug, and Cosmetic Act. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder.

4. QUALITY ASSURANCE PROVISIONS

4.1 Contractor's responsibility. Inspection and acceptance by the USDA shall not relieve the contractor of obligation and responsibility to deliver a product complying with all the requirements of this document. The contractor shall assure compliance prior to submitting the product to the USDA for any inspection.

4.2 Inspection and acceptance service. Product acceptability shall be determined by the USDA. The USDA will determine the degree of acceptance service necessary to assure compliance with the requirements of this document. The cost of grading and acceptance services performed by the USDA involving inspection, official documentation, and related services shall be borne by the contractor.

4.3 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.4 First article inspection. When a first article is required (see 6.1), it shall be inspected in accordance with the quality assurance provisions of this document and evaluated for overall appearance and palatability. Any failure to conform to the quality assurance provisions of this document or any appearance or palatability failure shall be cause for rejection of the first article.

4.5 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

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4.5.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.5.1.1 Ingredient examination. Conformance of ingredients to identity and condition requirements shall be determined by examination of pertinent labels, markings, U.S. Grade certificates, invoices, certificates of analysis, or other valid documents. In addition, each ingredient shall be examined organoleptically as necessary to determine conformance to the condition requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient lot or of any involved product.

4.5.2 In-process inspection. In-process examination shall be performed to determine conformance to the preparation and processing, sealing, and packing requirements. Any nonconformance revealed by actual examination or by review of records of time, temperature, and formulation or other valid documents shall be cause for rejection of the involved product.

4.5.3 Net weight examination. The containers of product shall be examined for net weight. Any individual container having a net weight more than 1 percent under specified weight shall be scored as a minor defect. The lot size shall be expressed in units of primary containers. The sample unit shall be one container of product. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5. In addition, the lot shall be rejected if the sample average net weight is less than specified. Net weight shall be reported to the nearest 4 ounces for 55-gallon drums.

4.5.4 Product examination. The finished product shall be examined for the defects listed in table I. The lot size shall be expressed in containers. The sample unit shall be the contents of one filled and sealed container. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects.

TABLE I. Product defects 1/

Category	Defect
<u>Major</u>	
151	Evidence of melting (when held at 90°F for 24 hours).
152	Not a bland flavor.
153	Color not as specified.
154	Not free from speckles, streakiness or mottled appearance.

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TABLE I. Product defects 1/ (cont'd)

Category	Defects
155	Body of product not firm.
156	Body of product not a waxy close-knit texture.
157	Not a characteristic plasticity (see subparagraph e of 3.4).
158	Not free from crumbliness, mealiness, graininess or greasiness (appearance of having been melted and resolidified).

1/ The presence of any foreign material (e.g., glass, dirt, insect parts, hair, wood, metal, etc.) or foreign odor or flavor (e.g., rancid, oxidized, grassy, soapy, beany, turpentine, etc.) shall be cause for rejection of the lot.

4.5.5 Product testing. The product shall be tested for the characteristics specified in table II. The lot size shall be expressed in units of primary containers. The sample shall be a 2-pound composite derived from the number of primary containers indicated by inspection level S-2. Any test failure shall be cause for rejection of the lot.

TABLE II. Product tests

Characteristic	Requirement paragraph	Test method	Result reported
Alpha-monoglyceride content	3.4 f	Cd 11-57 1/	0.1 percent
Free fatty acid content	3.4 g	Ca 5a-40 1/	0.01 percent
Vitamin A content	3.4 h	2/	100 I.U./lb.
Iodine value	3.4 i	Cd 1-25 1/	1 unit
Peroxide value	3.4 j	Cd 8-53 1/	0.1 meq/kg
Moisture content	3.4 k	Ca 2e-55 1/	0.01 percent

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TABLE II. Product tests (cont'd)

Characteristic	Requirement paragraph	Test method	Result reported
Fat stability (AOM)	3.4 l	Cd 12-57 <u>1/</u>	Pass or fail
Solid fat index	3.4 m	Cd 10-57 <u>1/</u>	1 index no.
Color	3.4 n	<u>3/</u>	Pass or fail

1/ Official and Tentative Methods of the American Oil Chemists' Society, Section C, Commercial Fats and Oils.

2/ Ultraviolet Absorption Method of the Methods of the Vitamin Assay of the Association of Vitamin Chemists.

3/ The unmelted product shall be transferred into a shallow Petri dish, the surface leveled off flat and smooth with a straight-edged object, such as a spatula, then placed on a flat surface in front of window exposing light from the Northern sky, or under an equivalent source of artificial illumination. Visual comparison with Federal Standard color chips specified in 3.4 n shall be made under these conditions.

4.5.6 Shipping container examination. Shipping containers shall be examined for defects in assembly, closure and reinforcement and the following additional defects shall apply:

Major

Marking missing, incorrect, or illegible
Liner missing

Minor

Liner not fully protecting product for 55-gallon drums only
Marked net weight not within limits specified for 55-gallon drums

5. PACKAGING

5.1 Packing. Packing shall be level A, B or C as specified (see 6.1).

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5.1.1 Levels A and B. Four hundred to 450 pounds of product, depending on the density of the product shall be packed in a 55-gallon capacity metal drum fabricated and closed in accordance with type IV of PPP-D-729. The drum shall be provided with an inner food quality liner or lining that will not affect nor be affected by the product.

5.1.2 Level C. The product shall be packed in a container that complies with Uniform Freight Classification or National Motor Freight Classification as applicable. The container shall be provided with an inner food quality liner or lining that will not affect nor be affected by the product.

5.2 Marking. Shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Ordering data. Acquisition documents should specify the following:

- a. Title, number and date of this document.
- b. Style of product required (see 1.2).
- c. When a first article is required for inspection and approval (see 3.1, 4.4 and 6.2).
- d. Level of packing required (see 5.1).

6.2 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should include specific instructions in all acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.3 Appropriate level of pack. Based on conditions known or expected to be encountered during shipment, handling, and storage of the specific item being procured, the contracting officer should select the appropriate level of pack in accordance with the criteria established in AR 700-15/NAVSUPINST 4030.28/AFR 71-6/MCO 4030.33A/DLAR 4145.7.

6.4 Intended use of product and technical information. The product is intended to be used as the fat ingredient in filled milk or filled milk products authorized in areas outside the limits of the Continental United States or where its manufacture and sale is not prohibited by law and where a sufficient supply of fresh milk or milk products from authorized sources is not available. Major advantages of this product over milk fat is that refrigeration for shipment and storage of the fat prior to use is not necessary. This may be of considerable importance for small overseas garrisons where the supply lines are long, deliveries are irregular and infrequent, and where refrigeration for storage of ingredients is scarce. Even though refrigeration for shipping and storage is not required, the product should be stored in a cool area for longer shelf life.

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6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - GL
Navy - SA
Air Force - 50

Preparing activity:

Army - GL
Project No. 8945-0073

Review activities:

Army - MD, TS
Navy - MC, MS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)***1. DOCUMENT NUMBER**

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2. DOCUMENT TITLE

Fat, Hydrogenated, Vegetable

3a. NAME OF SUBMITTING ORGANIZATION**4. TYPE OF ORGANIZATION (Mark one)**☐

VENDOR

☐

USER

☐

MANUFACTURER

☐

OTHER (Specify): _____

3b. ADDRESS (Street, City, State, ZIP Code)**5. PROBLEM AREAS****a. Paragraph Number and Wording:****b. Recommended Wording:****c. Reason/Rationale for Recommendation:****6. REMARKS****7a. NAME OF SUBMITTER (Last, First, MI) - Optional****7b. WORK TELEPHONE NUMBER (Include Area Code) - Optional****8. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional****9. DATE OF SUBMISSION (YYMMDD)**