

INCH-POUND

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SUPERSEDING
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MILITARY DETAILED SPECIFICATION

MARGARINE, CANNED

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

1. SCOPE

1.1 Scope. This specification covers the requirements for a vegetable-type margarine for use by the Armed Forces as an item of general issue and as a component of operational rations (see 6.1).

2. APPLICABLE DOCUMENTS

- * 2.1 Government documents. The following Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those in effect on the date of the solicitation.

U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Applicable provisions of the Federal Food, Drug and Cosmetic Act (21 CFR Parts 1-199).

(This document may be purchased from: Superintendent of Documents, ATTN: New Orders, P. O. Box 371954, Pittsburgh, PA 15250-7954. Credit Card (Mastercard or VISA) purchases may be made by calling the Superintendent of Documents on (202) 512-1803.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be of use in improving this document should be sent to: Commander, Defense Supply Center Philadelphia, ATTN: DSCP-HSL, 700 Robbins Ave., Philadelphia, PA 19111-5092 or fax (215) 737-2963, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8945

Distribution Statement A. Approved for public release; distribution is unlimited.

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U. S. DEPARTMENT OF AGRICULTURE (USDA)

Applicable Provisions of the Meat and Poultry Inspection Regulations (9 CFR Parts 200 to end).
Grading and Inspection, General Specifications for Approved Plants and Standards for Grades of
Dairy Products, Subpart B – General Specifications for Dairy Plants Approved for USDA
Inspection and Grading Service (7 CFR Part 58).

(These documents may be purchased from: Superintendent of Documents, ATTN: New
Orders, P. O. Box 371954, Pittsburgh, PA 15250-7954. Credit Card (Mastercard or VISA)
purchases may be made by calling the Superintendent of Documents on (202) 512-1803.)

U. S. Standards for Grades of Nonfat Dry Milk (Spray Process)
U.S. Standards for Dry Whey

(These documents may be purchased from: Dairy Standardization Branch, Dairy
Programs, Agricultural Marketing Service, U.S. Department of Agriculture, STOP 0230, 1400
Independence Ave., SW Washington, DC 20250-0230.)

U.S. Standards for Condition of Food Containers

(Copies of the United States Standards for Condition of Food Containers are available
from: Chairperson, Condition of Container Committee, U.S. Department of Agriculture, STOP
0243, 1400 Independence Ave., SW Washington, DC 20250-0243.)

DEFENSE SUPPLY CENTER PHILADELPHIA

DSCP Form 2997 Labeling of Metal Cans: For Subsistence Items

(Copies of DSCP Form 2997 are available from: Commander, Defense Supply Center
Philadelphia, ATTN: DSCP-HSL, 700 Robbins Ave., Philadelphia, PA 19111-5092.)

- * 2.2 Non-Government publications. The following documents form a part of this document to
the extent specified herein. Unless otherwise specified, the issues of the documents which are
DoD adopted are those listed in the issue of the DODISS specified in the solicitation. Unless
otherwise specified, the issues of documents not listed in the DODISS are the issues of the
documents cited in the solicitation.

THE UNITED STATES PHARMACOPOEIAL CONVENTION, INC.

Pharmacopoeia of the United States

(Copies of Pharmacopoeia of the United States are available from: United States
Pharmacopoeial Convention, 12601 Twinbrook Parkway, Rockville, MD 20852.)

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AMERICAN PUBLIC HEALTH ASSOCIATION

Standard Methods for the Examination of Dairy Products

(Copies of Standard Methods for the Examination of Dairy Products are available from: American Public Health Association, 1015 Fifteenth St., NW, Washington, DC 20005.)

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes

(Copies of ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes are available from: American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.)

ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS (AOAC)

Official Methods of Analysis of the Association of Official Analytical Chemists International

(Copies of Official Methods of Analysis of the Association of Official Analytical Chemists International may be obtained from: AOAC International, 481 North Frederick Avenue, Suite 500, Gaithersburg, MD 20877.)

AMERICAN OIL CHEMISTS' SOCIETY

Methods of the American Oil Chemists' Society

(Copies of Methods of the American Oil Chemists' Society may be obtained from: P.O. Box 3489, 1608 Broadmoor Drive, Champaign, IL 61826-3489.)

(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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Material. The material shall comply with 3.1.1 through 3.1.6.

- * 3.1.1 Milk. The raw milk or milk products used in the preparation of this product shall comply with all the quality requirements for No. 2 (or better) specified in the General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service. The milk shall be drawn from cows located in a Modified Accredited Area, or Accredited Free State, or an Accredited Free Herd for Tuberculosis as determined by USDA. In addition, the milk shall be drawn from cows located in states meeting Class B status or a Certified Free Herd, or in an area involved with the milk ring testing or blood testing program for Brucellosis under USDA, Animal and Plant Health Inspection Service, APHIS 91-1.
- * 3.1.2 Oils. Cottonseed oil and soybean and cottonseed blend shall be of good quality, properly refined, partially hydrogenated and deodorized. One or more of the additives such as, citric acid, isopropyl citrate or stearyl citrate may be incorporated into the oil. In addition, the cottonseed oil and soybean and cottonseed blend shall have a fat stability (AOM) of not less than 65 hours and a peroxide value of not more than 1.0 milliequivalents per 1000 grams of oil at time of formulation of the margarine and a solid fat index (SFI) and temperature range as follows. 1/ 2/

<u>Temperature</u>		<u>Solid Fat Index</u>
<u>°F</u>	<u>°C</u>	
50	10	22.0 to 26.0
70	21	18.0 to 22.0
92	33	13.5 to 16.5
104	40	9.5 to 12.5

3.1.3 Water. Water used shall meet drinking water standards approved by State or Federal regulatory agencies and shall have no undesirable flavors or odors.

3.1.4 Salt. Salt shall be refined, crystalline, free-flowing, evaporated sodium chloride and of the type commonly used in margarine. Iodized salt shall not be used.

3.1.5 Milk solids-not-fat. Milk solids-not-fat shall be obtained from pasteurized skim milk, nonfat dry milk, and/or dry whey. The nonfat dry milk shall be U.S. Extra Grade as defined in the U.S. Standards for Grades of Nonfat Dry Milk, and the dry whey shall be U.S. Extra Grade as defined in the U.S. Standards for Dry Whey. The nonfat dry milk and the dry whey shall be certified as Salmonella negative.

1/ Determined on the oil (tests run to completion and results reported to the nearest hour) not more than 96 hours prior to use in production of the margarine. Determination shall be made subsequent to addition of emulsifying and anti-oxidant materials as specified in 3.1.6.

2/ The SFI shall be performed prior to blending with any other ingredients.

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3.1.6 Optional ingredients. Other optional ingredients permitted in the Definitions and Standards of Identity for Margarine, Oleomargarine and limited to emulsifying and preservative agents (see 3.3.1), artificial flavoring substances in semblance of butter, color additives and vitamin D shall be used in the formulation.

3.2 Processing. The product shall be prepared from the materials specified in 3.1.1 through 3.1.6, and in accordance with the formulation necessary to meet the analytical requirements of 3.3.1. In addition, both sanitary methods and equipment (see 3.6) and operating procedures reflecting good commercial practice shall be used.

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

- a. The finished product shall have a uniform yellow color characteristic of colored commercial margarine.
- b. There shall be no foreign flavor such as rancid, tallowy or oxidized.
- c. The product shall have a firm compact body of good spreadability at 60° - 70°F (16° - 21°C), and shall not be crumbly, grainy, mealy, oily or visibly moist.
- d. The finished product shall have been processed in such a manner as to pass the cube test specified in 4.5.3 before release for shipment from the contractor's plant.

* 3.3.1 Analytical requirements. The analytical requirements shall be as follows:

- a. Fat – not less than 80.0 percent.
- b. Salt – not less than 2.5 nor more than 3.0 percent.
- c. Potassium sorbate – not less than 0.08 nor more than 0.10 percent. 1/
- d. Propyl gallate – not less than 45 nor more than 50 parts per million (ppm). 1/
- e. Butylated hydroxyanisole – not less than 70 nor more than 75 ppm. 1/
- f. Butylated hydroxytoluene – not less than 70 nor more than 75 ppm. 1/
- g. Calcium disodium EDTA – not less than 70 nor more than 75 ppm. 1/
- h. Milk solids-not-fat 2/ - not less than 8.5 percent of the percent of moisture in the finished product.
- i. *Coliform* – less than 10 per gram.

j. *E. coli* - negative

k. Yeast and mold – not more than 10 per gram.

l. Standard plate count – not more than 1,000 per gram.

1/ These tests shall be performed only when specified (see 6.2).

2/ Determine as follows:

$$\text{Milk solids-not-fat} = \frac{\text{Percent residue} - \text{percent salt} \times 100}{\text{Percent moisture}}$$

3.4 Temperature of holding, transportation, and delivery. When specified (see 6.2), the finished product shall be held below 45°F (7°C) until delivered.

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

* 3.6 Plant qualification. The product shall be produced in accordance with Title 21, Code of Federal Regulations, Part 110, “Current Good Manufacturing Practice in Manufacturing, Packing, or Holding of Human Food”, and the plant sanitation requirements of the appropriate government inspection agency.

4. QUALITY ASSURANCE PROVISIONS

4.1 Inspection. Sampling for inspection shall be performed in accordance with ASQC-Z1.4, except where otherwise indicated hereinafter.

4.1.1 Component and material inspection. Components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

* 4.1.1.1 Examination of cottonseed oil, soybean and cottonseed oil blend, salt, milk solids-non-fat and emulsifying agents. Determination of compliance of the above ingredients with requirements of 3.1, as concerns identity, shall be made by examination of labels, invoices, grade and salmonellae negative certificates or other valid documents. In addition, salt shall be examined for the condition requirement as concerns free flowing. The sample for examination shall be a 1 pound (0.45 kg) composite derived from five primary containers or all containers if less than five form a lot. Nonconformance to the free-flowing characteristic or

identity requirements shall be cause for rejection of the lot of finished product made therefrom, as applicable.

4.1.1.2 Examination of water. Water shall be examined to determine compliance with the requirement of 3.1.3 as concerns approval source, by examination of state and local health certificates. In addition, water shall be examined organoleptically to determine compliance with condition requirement. Nonconformance to an approval source or condition requirement shall be cause for rejection of the lot of finished product made therefrom, as applicable.

* 4.1.2 Testing of components. Testing of components described in this specification shall be as shown below. Results shall be applicable to the lot average. Nonconformance to one or more test requirements shall be cause for rejection of the lot.

4.1.2.1 Oil components: Cottonseed oil and soybean and cottonseed blend shall be tested for peroxide value, fat stability (A.O.M.), and solid fat index (SFI) as specified in 3.1.2.

4.1.2.2 Sampling: The sample for testing shall be an approximate 1 pound (0.45 kg) composite derived from five primary containers or all containers if less than five form a lot. All samples shall be labeled clearly with adhesive labels bearing the name of the margarine manufacturer, contract number, time and date of sampling, lot number of oil and source of oil. Samples shall be shipped to the laboratory in dry ice.

4.1.2.3 Test results: The test results for the peroxide value shall be reported to the nearest 0.1 milliequivalent per 1000 grams. The test results for fat stability (A.O.M.) and solid fat index (SFI) shall be reported as specified in 3.1.2.

4.1.3 Examination of finished product: The finished product shall be inspected for compliance with the requirements specified in 3.3 utilizing the double sampling plans indicated in ANSI/ASQC Z1.4 – 1993. The lot size shall be expressed in primary containers. The sample unit for examination of finished product shall be one pound (0.45 kg) from a primary container. The sample unit for net weight examination shall be one primary container. The inspection level shall be S-2 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 2.5 for minor defects. Examination shall be inaccordance with Table I.

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TABLE I. Product defects 1/

Category		Defect
<u>Major</u>	<u>Minor</u>	<u>Finished product</u>
151		Color not uniform yellow characteristic of colored commercial Margarine.
152		Foreign flavor, such as rancid, tallowy or oxidized.
153		Not firm compact body of good spreadability at 60° to 70°F (16 to 21°C).
154		Crumbly, grainy, mealy, oily or visually moist.
		<u>Weight</u>
	201	Net weight less than 5 pounds 14 ounces (2665 gms) for the (603 X 700) can, or less than 1 pound 7 ounces (652 gms) for the (401 X 411) can, as applicable. 2/

1/ The presence of foreign material for example, dirt, insect parts, hair, wood, glass, metal, or mold shall be cause for rejection of the lot.

2/ Report results to nearest 1/4 ounce (gram). Lot shall be rejected if sample data indicate lot average net weight less than 6 pounds (2722 gms), or the lot average net weight is less than 1 pound and 8 ounces (680 gms), as applicable.

- * 4.3.3.1 Examination of cans. Examination of filled and sealed cans shall be in accordance with the U.S. Standards for Condition of Food Containers.
- * 4.3.3.2 Examination of can labeling. Examination of can labeling shall be in accordance with the examination criteria contained in DSCP Form 2997.
- * 4.3.3.3 Examination for packing and shipping container. Examination of the filled and sealed shipping container shall be in accordance with the U.S. Standards for Condition of Food Containers.
- * 4.4 Sampling procedure and acceptance criteria for testing of finished product. The finished product shall be tested to determine conformance to 3.3 as concerns cube test and for analytical characteristics as specified in 3.3.1, in accordance with procedures referenced in 4.5. Lot size shall be expressed in terms of cans. The sample unit shall be one filled can that is

sealed and the sample size shall be the number of units indicated by inspection level S-1. The cube test shall be determined initially on the individual sample units and the analytical characteristics shall be performed on a composite sample derived from the sample units used to perform the cube test. Each result shall be reported to the same decimal place or unit as specified in the pertinent requirements. One or more test failures for analytical characteristics or cube test failure shall be cause for rejection of the lot.

4.5 Tests. Test procedures and controls which differ from those specified herein, may be used by the contractor if they provide a quality assurance equivalent to those specified. If the Government contracting officer determines that such procedures and controls do not provide, as a minimum, such quality assurance, the contractor will use the test procedures set forth herein. In case of dispute as to test results, the test methods specified herein will govern.

- * 4.5.1 Analytical testing. Analytical testing shall be in accordance with the methods from the publications listed below:

<u>Test</u>	<u>Method</u>
Fat	15.11 <u>1/</u>
Salt	15.11 <u>1/</u>
Moisture	15.11 <u>1/</u>
Peroxide value	Cd 8b-90 <u>2/</u>
Fat stability (active oxygen method)	Cd 12-57 <u>2/</u>
Propyl gallate	Ce 6-86 <u>2/</u>
Butylated hydroxyanisole	Ce 6-86 <u>2/</u>
Butylated hydroxytoluene	Ce 6-86 <u>2/</u>
Solid fat index	Cd 10-57 <u>2/</u>
<i>Coliform</i>	7.8 <u>1/</u>
Yeast and Mold	8.10 <u>1/</u>
Standard plate count	6.2 <u>1/</u>
<i>E. coli</i>	<u>1/</u>

1/ Standard Methods for the Examination of Dairy Products.

2/ Methods of the American Oil Chemists' Society.

4.5.2 Calcium Disodium EDTA test. The procedure for determination of calcium disodium EDTA shall be as follows:

Method of Analysis for Food Additive Calcium Disodium EDTA

1. Scope:

This method is applicable to the determination of calcium EDTA (the calcium chelate of the disodium salt of ethylenediamine tetraacetic acid) in a variety of food products.

2. Principle:

The sample is clarified by filtering after treating with barium carbonate and filter aid. The filtrate is treated with magnesium to remove interferences. Calcium EDTA is then determined in a filtered portion of the sample. In a strongly acidic solution, calcium EDTA reacts with zirconium, chelating an amount of zirconium equivalent to the calcium EDTA present. The excess zirconium is determined by its reaction with xylenol orange producing a red colored complex. The decrease in absorbance at 535 millimicrons is proportional to the calcium EDTA present.

3. Reagents:

- (a) Filter acid. Celite, J-M- analytical filter aid.
- (b) Barium carbonate. Reagent grade.
- (c) Hydrochloric acid, 5N. Dilute 417 ml of concentrated hydrochloric acid to one liter.
- (d) Magnesium chloride solution. Dissolve 200 grams of reagent grade magnesium chloride ($MgCl_2 \cdot 6H_2O$) in 800 ml of distilled water.
- (e) Ammonium hydroxide, concentrated reagent.
- (f) Phosphoric acid, dilute. Dilute 10 ml of 85% reagent phosphoric acid to one liter.
- (g) Hydroxylamine hydrochloride, approximately 10%. Dissolve 100 grams of hydroxylamine hydrochloride in water and dilute to one liter.
- (h) Calcium EDTA standard solution A. Dissolve 1.101 grams of the calcium EDTA di-hydrate in water and dilute to one liter. One ml is equivalent to one mg of calcium EDTA.

Determination of calcium EDTA

Calcium EDTA standard solution B. Dilute 25.0 ml of solution A (3h) to volume in a 500-ml volumetric flask.

Zirconyl chloride standard solution A. Dissolve 3.454 grams of zirconyl chloride octahydrate ($ZrOCl_2 \cdot 8H_2O$), in 100 ml of concentrated hydrochloric acid and dilute to one liter. Standardize the solution by the hydroxide procedure. One ml is approximately equivalent to one mg of zirconium.

Zirconium standard solution B. Dilute a volume of the zirconium standard A equal to 6 mg of zirconium and 20 ml of concentrated hydrochloric acid to one liter. Prepare fresh daily.

Xylenol orange reagent. Dissolve 1.00 gram of xylenol orange in anhydrous methanol and dilute to one liter with methanol.

4. Apparatus:

Beakers, 250-ml.
Buchner Funnel, 9 cm.
Filtering apparatus, bell-jar type.
Steam bath.
Hot plate
Volumetric flasks, 50-ml and 250-ml.
Pipets, various sizes.
Spectrophotometer, Beckman Model B or equivalent.
Absorption cells, Corex, 4.00-cm light path.
Filter paper, 9 cm Whatman No. 3 or equivalent.
Filtering crucible, 30-ml, fine porosity.

5. Preparation of standard curve:

- a. Add 4.0 ml of 5N hydrochloric acid, 5.0 ml of 10% hydroxylamine hydrochloride, 5.0 ml of zirconium standard solution B and 4.0 ml of xylenol orange reagent to each of six 50-ml volumetric flasks. Prepare a color blank containing all reagents except the zirconium. Dilute 34 ml of the calcium EDTA standard solution B to 500 ml with distilled water. Pipet into the previously prepared standard (equivalent to 0, 17, 34, 51, 68, and 85 micrograms of calcium EDTA), dilute to volume and mix well.
- b. Allow the standards to stand for 15 minutes for full color development. Zero the spectrophotometer on the color blank and read the absorbances of the standards at 535 millimicrons and a cell length of 4.0 cm.
- c. Plot the absorbance against the micrograms of calcium EDTA on ordinary coordinate paper.

6. Preparation of samples:

To insure homogeneity of samples, each sample of product under test should be transferred completely to a Waring blender and blended until no visible evidence of segregation exists. With products consisting of an oil and water mixture, sampling should be performed while the sample is still being stirred in the blending step. Exercise caution so that the pipet does not contact the rotating blades. After blending, unknowns are determined as given below in section 7 (sample recovery curve). Necessary corrections for a given food product blank are made (see section 10).

7. Sample recovery curve:

- a. Weigh 10.00 grams of sample into each of six 250-ml beakers, add 0, 5, 10, 12, 15, and 17 ml of calcium EDTA standard solution B from a buret. Dilute to 100 ml with distilled water.
- b. Add to each beaker 4.0 grams of filter aid and 2.0 grams of barium carbonate. Mix with a stirring rod and heat almost to boiling on a hot plate with continuous stirring.
- c. Transfer the samples to the steam bath and digest for one-half hour with stirring at 10 minute intervals.
- d. Remove the beakers from the steam bath, cool to room temperature in a cold water bath and filter on a Buchner funnel catching the filtrate in a clean beaker. (The filter should be prepared using a 9.0 cm Whatman No. 3 or equivalent paper and 2.0 grams of filter aid added as a slurry and pulled down under full vacuum). Wash the contents of the funnel by adding four successive 25-ml portions of water to the original beaker, policing down the sides with the first wash and pouring into the funnel.
- e. To the filtrate from 7d add 3.0 ml of 5N hydrochloric acid and 10 ml of magnesium chloride solution (3d). Adjust the resulting solution to a pH of 9.0 with concentrated ammonium hydroxide and add 0.5 ml in excess. Add 5.0 ml of phosphoric acid (3f) to the solution while stirring vigorously.
- f. Transfer the filtrate to a 250-ml volumetric flask, rinse the beaker with distilled water, transfer into the flask, make to volume and mix thoroughly.
- g. Filter 75-100 ml of the solutions, after allowing them to stand for at least one hour, through a dry fine porosity filtering crucible or a dry 42 Whatman filter paper. Discard the first 25 ml of filtrate collecting the remaining filtrate in a clean dry beaker.
- h. Prepare a 50-ml volumetric flask as in (5a) for each sample. Also prepare another 50-ml volumetric flask for each sample to be used as a color blank (do not add zirconium to the sample-color reagent blank). Pipet a 25.0 ml aliquot into the second prepared volumetric flasks to be used as a sample color reagent blank. Dilute each flask to volume and mix well. Proceed with the determination as in (5c). Determine the absorbance of each sample using its color blank as the reference standard. Read the micrograms of calcium EDTA from the standard curve.

Calculation of results:

$$\text{ppm calcium EDTA} = \frac{\text{micrograms of calcium EDTA found}}{\text{grams of sample} \times \text{aliquot}}$$

(NOTE: If small amounts of oil are present after the filtration and washing step, they may be ignored since they will be removed in the second filtration. Any slight turbidity [encountered after the filtration steps] is ignored since each sample is compensated for by its own reagent color blank.)

8. Recovery data:

The food products listed below have been analyzed by this method with the given recoveries obtained: (Reference: Food Additive Regulation, section 121.1017 and .1056, Food and Drug Administration.)

<u>Product</u>	<u>No. of Brands Tested</u>	<u>Average blank – (ppm)</u>	<u>Average percent recovery (corrected)</u>
Margarine	3	4	100
French dressing	3	6	95
Mayonnaise	3	1	94
Salad dressing	3	1	91

4.5.3 Cube test. Cube test shall be performed on a solid cube of margarine which has not been worked or molded. Procedure shall be as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation of sample. Temper an undisturbed can of product at a temperature of 70° F to 75° F (16 to 24° C) for a sufficient length of time (24) hours to condition the margarine so that a test specimen can be obtained. Remove the margarine from the can by cutting out both ends of the can and sliding the can from the margarine. Cut the margarine into longitudinal sections approximately 2-1/2 inches (64 mm) thick and remove a 1 inch (25 mm) cube of product for testing.

4.5.3.2 Determination. Place the cube in a shallow, flat-bottomed, petri dish and cover cube with an inverted 250 ml beaker. Hold sample in a 90° ± 2° F (32° C ± 1°C) incubator for period of 40 hours. After this treatment there shall be no evidence of change in original dimensions of the cube or of free oil leakage.

4.5.4 Potassium sorbate test. The procedure for determination of potassium sorbate shall be as follows:

Ultraviolet Method of Analysis for the Determination of Sorbic Acid or Potassium Sorbate
(or both) in Margarine

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This method is written for margarine containing from 0.05 to 0.20 percent by weight sorbic acid/potassium sorbate.

1. Reagents:

Standard sorbic acid solution – Dissolve 10 mg sorbic acid in isopropanol in a 100 ml volumetric flask and dilute to volume.

Isopropanol, spectral grade.

2. Calibration:

Introduce a weighed sample (20 grams) of control unsupplemented margarine into a Waring blender. Add 1 ml of N hydrochloric acid and 75 ml of isopropanol. Blend for about 30 seconds at high speed (until sample is homogeneously dispersed).

Filter the mixture through Whatman No. 41 filter paper and collect about 30 ml of filtrate.

Transfer 1 ml of filtrate to each of four 100-ml volumetric flasks. Add 0, 1.0, 2.0 or 3.0 ml of the sorbic acid solution to each flask. These standards will correspond, respectively, to 0, 0.0010, 0.0020 and 0.0030 grams per liter of sorbic acid in the final dilution. Dilute to volume with isopropanol.

Obtain the absorbance of the solution at 255 millimicrons in a 1-cm cell using isopropanol as the blank. Plot a graph of concentration of sorbic acid in grams per liter in the final dilution versus absorbance.

3. Sample determination:

The sample of margarine to be analyzed is treated as above except that no sorbic acid is added to the volumetric flasks. Refer absorbance for sample to standard curve for conversion to sorbic acid in grams per liter in the final dilution.

The sample data should be corrected by using a recovery factor. Percent recovery is obtained by adding a known amount of sorbic acid to the margarine and analyzing the sample as above.

4. Calculations:

Sorbic acid (percent by weight in margarine) = $C \times F \times 50$

C = concentration of sorbic acid in grams per liter in final dilution from calibration curve.

$$F = \text{recovery factor} = \frac{\text{grams theoretical of preservative}}{\text{grams found by analysis}}$$

For potassium sorbate, multiply the sorbic acid value by 1.34.

5. PACKAGING

- * 5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Technical information. The product is designed to withstand a temperature of 95° F (35° C) with slight, if any, oil separation, which makes it possible to use the product for field use or emergency mass feeding. Because of the military necessity for a higher melting point than is built into regular consumer margarine, this product will have a more waxy consistency in the mouth. However, when product is eaten on bread, melted on hot food, or used in cooking, this greater waxiness should not detract from its usefulness. When refrigeration facilities are available in the military supply line, it is strongly recommended that the product be held below 45° F (7° C) for the optimum retention of flavor.

- * 6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) When tests specified in 3.3.1 are required.
- (c) When finished product must be held below 45° F (7° C) until delivered (see 3.4).
- (d) Levels of packaging and packing required (see 5.1).

6.3 Changes from previous issue. The margins of this specification are marked with an asterisk (*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and suppliers are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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Custodians:

Army – GL
Navy - SA
Air Force – 35

Civil Agency Coordinating Activity:

USDA - FV

Review Activities:

Army – MD, QM
Navy - MC

Preparing Activity:

DLA - SS

(Project No. 8945-P047)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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3. DOCUMENT TITLE Margarine, Canned		
4. NATURE OF CHANGE <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>		
5. REASON FOR RECOMMENDATION		
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