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TECHNICAL REPORT
73-33-FL

MICROBIOLOGICAL REQUIREMENTS AND METHODOLOGY FOR FOOD IN MILITARY AND FEDERAL SPECIFICATIONS

Compiled and Edited
by
Edmund M. Powers

Approved for public release;
distribution unlimited.

January 1973

UNITED STATES ARMY
NATICK LABORATORIES
Natick, Massachusetts 01760

Food Laboratory
FL-174

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This volume is a compilation of the microbiological criteria and analytical methods taken from military and federal food specifications. Compilation of these microbiological requirements was accomplished to serve as a quick reference and guide to military and industrial testing laboratories and to make them easily obtainable and accessible to the general public. The microbiological requirements presented herein are current and are as presented in the specifications.

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Series: FL-174

Food Laboratory
U. S. Army Natick Laboratories
Natick, Massachusetts 01760

FOREWORD

This volume is a compilation of the microbiological criteria and analytical methods taken from military and federal food specifications. Compilation of these microbiological requirements was accomplished to serve as a quick reference and guide to military and industrial testing laboratories and to make them easily obtainable and accessible to the general public. The microbiological requirements presented herein are current and are as presented in the specifications. However revision of some specifications, such as those for the Long Range Patrol rations, is currently underway and they will be included in subsequent editions of this volume.

Since all sections of the specifications not relevant to microbiology were omitted from this volume the original specification should be consulted for information regarding quality assurance, inspection, sampling, packaging, chemical analysis, storage and material requirements. A list of available Military Sanitary Standards for food producing plants is included in the appendix as additional reference material.

Specifications and sanitary standards may be obtained from the U. S. Naval Publications and Forms Center, NPFC Code 1032, 5801 Tabor Avenue, Philadelphia, PA 19120.

This work was supported by Project No. 728012.12, Production Engineering.

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INTRODUCTION

Microbiological specifications of Military and Federal Agencies prescribe the maximum acceptable number of microorganisms or of specific types of microorganisms, as determined by prescribed methods, in a food purchased by an agency for its own use. These specifications are used by food manufacturers, procurement agencies, and testing laboratories to determine compliance with military and federal requirements for food items and improve the food supply by standardizing the quality and assuring the safety of the food. As stated by Frazier (1967) the chief purposes of microbiological specifications are to give assurance (1) that foods will not be responsible for the spread of infectious disease, or for food poisoning; (2) that the foods consist of high quality materials that have not deteriorated or become unduly contaminated during processing, packaging, storage and handling; (3) that filth has not been introduced into the food; and (4) that the foods have the keeping quality expected of the product.

Of the approximately 600 military and federal food specifications, 59 contain microbiological requirements. Compilation of these requirements, exclusive of other requirements in the specifications, was accomplished to provide a convenient document which can serve as a single reference for determining at a glance the current microbiological requirements for various potentially hazardous foods. This document can be easily updated periodically as requirements in specifications are added, deleted or revised in accordance with new knowledge and modern technology.

Attempts are being made to standardize methodology and criteria in military and federal specifications so that the best possible method is used to isolate a specific organism or group of organisms. In addition indices are chosen which are either hazardous to health or indicators of poor sanitary practices. It is recognized that specifications must be attainable under conditions of good commercial practice. Whenever possible microbiological requirements in military and federal specifications are based on research data or information gathered from surveys of foods purchased by military or federal agencies. Specifications are also written so that they are easily administered and technically feasible.

The microbiological criteria and methods presented in this volume are not necessarily those recommended by the editor. They are merely presented as they exist in military and federal specifications. However, editorial license was exercised in organizing the material and to standardize the terminology in the different specifications. For example, "microbiological" was used instead of "bacteriological," "examination" instead of "analysis," "coliforms" instead of "coliform count" and the symbol "≤" in place of "not more than." Paragraph numbers in the original specification were retained for easy reference between this document and the original specification. The specification number appears on the top right hand corner of each page and the specifications are arranged alphabetically.

Since sanitary standards for food plants are important in attaining microbiological requirements for food products a list of Military Sanitary Standards was included in the Appendix as additional reference material.

9 September 1969
SUPERSEDING
MIL-B-43344(GL)
24 June 1965

MILITARY SPECIFICATION

BEEF, COOKED, DEHYDRATED

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

1. SCOPE

1.1 This specification covers cooked, freeze-dehydrated beef for use by the Armed Forces as a component of operational rations.

3.4 Finished product.

3.4.3 Microbiological requirements.

Standard plate count	≤ 150,000 per gram
Coliforms	≤ 40 per gram

4.5.2.6 Microbiological examination. - Unless otherwise specified, microbiological examination of the product shall be made in accordance with the following methods from Standard Methods for Examination of Dairy Products of the American Public Health Association, except that samples shall be prepared for examination as specified in 4.5.2.7.

Test	Material	Method
Standard plate count	Appropriate dilution of product	Agar plate method. Incubation at 32°C. for 72 hours
Coliform plate count	Appropriate dilution of product	

4.5.2.7 Using aseptic precautions, open can and with a sterile spoon transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile 99 ml. buffered water dilution blank. Shake the diluted sample rapidly at least 50 times through an arc of one foot in order to insure homogeneity.

4.5.2.8 Items consisting of more than one ingredient shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as described in 4.5.2.7.

1973
SUPERSEDING
MIL-B-43404A
22 December 1969

MILITARY SPECIFICATION

BEEF STEW, DEHYDRATED, COOKED

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

1. SCOPE

1.1 This specification covers cooked, dehydrated beef stew for use by the Armed Forces as a component of operational rations.

3.6 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at 35° ± 1 C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at 45.5° ± 0.2°C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

1973
SUPERSEDING
MIL-B-43750
12 August 1971

MILITARY SPECIFICATION

BEEF WITH RICE, COOKED, DEHYDRATED

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

1. SCOPE

1.1 This specification covers cooked, dehydrated beef with rice for use by the Armed Forces as a component of operational rations.

3.6 Finished dehydrated product.-

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000 per gram
E. coli	Negative per gram

4.5.3 Microbiological testing. Microbiological testing of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at $35^{\circ} \pm 1$ C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at $45.5^{\circ} \pm 0.2^{\circ}$C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

C-B-801G

November 18, 1970
SUPERSEDING
Int. Fed. Spec. C-B-00801F
(Army-GL) September 29, 1967
and Fed. Spec. C-B-801E
April 19, 1960

FEDERAL SPECIFICATION

BUTTER

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 This specification covers the requirements for butter for use by agencies of the Federal Government.

3.4 Finished product. The finished butter shall comply with the requirements cited in the following publication: "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service; Section: Supplemental Specifications for Plants Manufacturing, Processing and Packaging Butter and Related Products (section 58.345)".

4.4.5 Microbiological requirements. The following microbiological requirements for butter were taken from the reference cited in 3.4:

Proteolytic count	≤ 100 per gram
Lipolytic count	≤ 100 per gram
Yeast and mold count	≤ 20 per gram
Coliforms	≤ 10 per gram

4.5.2 Microbiological examination. Microbiological examination shall be made in accordance with the following procedures from Standard Methods for the Examination of Dairy Products.

Coliform Count	Microbiological Methods for Butter	Coliform (Desoxycholate Lactose Agar)
Yeast and Mold Count	Microbiological Methods for Butter	Yeast and Mold
Proteolytic Count	Microbiological Methods for Butter	Proteolytic Count

C-B-816F

August 6, 1970
SUPERSEDING
Int. Fed. Spec. C-B-00816E
(AGR-C&MS)

FEDERAL SPECIFICATION

BUTTERMILK, FLUID AND MILK, WHOLE, FRESH, CULTURED

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 This specification covers the requirements for pasteurized cultured buttermilk and cultured milk for use by all Federal agencies.

3.1 Materials.

3.1.1.1 Microbiological requirements. The milk shall comply with the following standard plate count requirements.

Prior to commingling	≤ 100,000 per ml
Prior to pasteurization	≤ 300,000 per ml

3.3 Finished product.

3.3.3 Microbiological requirements.

Coliforms	≤ 10 per ml

4.4.2 Microbiological examination. Unless otherwise specified, microbiological examination, shall be made in accordance with the methods described in Standard Methods for the Examination of Dairy Products. The procedures shall be those specified therein for coliform test with solid media at 32°C.

C-B-825a

July 20, 1965
SUPERSEDING
Int. Fed. Spec. C-B-00825 (Army-GL)
February 28, 1963

FEDERAL SPECIFICATION

BUTTERMILK SOLIDS; DRY; CULTURED AND UNCULTURED

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for dry buttermilk solids; cultured and uncultured for the use of Federal agencies.

1.2 Classification.

1.2.1 Types and numbers. The product covered by this specification shall be of the following types and numbers as specified (see 6.2)

Type I - From sweet cream butter milk
No. 1 - Low acid (see 3.4.3)
No. 2 - High acid (see 3.4.3)

Type II - From fresh cultured skim milk

3.1 Material.

3.1.1 Bacterial and sediment quality of the raw milk from individual producers. The raw milk from individual producers, to be used in the production of the product under this specification, shall meet the requirements as defined in the Minimum Specifications for Approved Plants, Manufacturing, Processing and Packaging Dairy Products. Raw milk procured for military use shall comply with the bacterial and sediment requirements defined in MIL-STD-671.

3.4 Finished product.

Microbiological requirements

	Type I		Type II
	No. 1	No. 2	
Standard Plate Count per gram	≤ 50,000	≤ 300,000	≤ 300,000
Coliforms per gram	90		

4.3.2.2 Microbiological examination. Microbiological examination of the finished product shall be in accordance with the following methods from Standard Methods for the Examination of Dairy Products; Chapter; Concentrated Milk and Cultured Products; Section, Dry Milk:

Test	Method
Bacterial estimate (as standard plate count)	Agar plate
Coliform count	Coliform group (Coliform test with solid media using desoxycholate lactose agar

INTERIM AMENDMENT

TO

FEDERAL SPECIFICATION

CHEESE, COTTAGE

This interim amendment was developed by the U. S. Army Natick Laboratories (GL), Natick, Massachusetts, 01760, based on currently available technical information. It is recommended that Federal Agencies use it is procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized Federal Agencies to use this interim amendment as a valid exception to Federal Specification C-C-281E dated July 30, 1970.

1.0 SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for cottage cheese for use by all Federal Agencies.

1.2 Classification.

1.2.1 Types and styles. Cottage cheese covered by this specification shall be of the following types and styles as specified (see 6.2):

Type I - Cottage cheese (plain curd).

Small curd style - 1/4 inch curd size or less (cut with 1/4 inch knife).
Large curd style - 3/8 inch curd size or larger (cut with knives over 1/4 inch).

Type II - Creamed cottage cheese (plain curd with added cream or milk and cream mixture).

Small curd style - 1/4 inch curd size or less (cut with 1/4 inch knife).
Large curd style - 3/8 inch curd size or larger (cut with knives over 1/4 inch.

Type III - Creamed cottage cheese with fruits, nuts, chives, or other vegetables.

Small curd style - 1/4 inch curd size or less (cut with 1/4 Inch knife).
Large curd style - 3/8 inch curd size or larger (cut with knives over 1/4 inch).
Fruits, nuts, chives, or other vegetables as specified (see 6.2).

1.2.2 Classes. Cottage cheese covered by this specification shall be of the following classes:

Class A - (See 3.1.1.1)

Class B - (See 3.1.1.2)

3.3 Finished product (Types I, II and III).

3.3.4 Microbiological requirements

Coliforms 1/	≤ 10 per gram
Yeast and Mold (combined count)	≤ 10 per gram
Psychrophiles	≤ 100 per gram

1/ This requirement is applicable to three out of the last five consecutive samples tested. Testing is to commence within 72 hours after packaging in final consumer package. In no case shall any nonconforming sample exceed 20 per gram. All samples shall be held below 40 F until tested but shall not be frozen.

4.4.2 Microbiological examination. Microbiological examination shall be made in accordance with the following methods described in Standard Methods for the Examination of Dairy Products:

Test	Chapter	Procedure
Coliform estimate	Microbiological Methods for Cheese and other Cultured Products	Test for Coliform Group 1/

Yeast and Mold	Same	Yeast and Mold Count
Psychrophiles	Same	Psychrophilic Bacterial Count

1/ The coliform standard for cottage cheese shall not apply.

MILITARY SPECIFICATION

CHEESE, PROCESSED AMERICAN, DEHYDRATED

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

1. SCOPE

1.1 This specification covers sharp dehydrated, American, processed, cheese for use by the Armed Forces as an item of general use.

3.4 Finished product.

3.4.2 Microbiological requirements.

Standard plate count	≤ 50,000 per gram
Coliforms	≤ 90 per gram

4.5.2 Microbiological examination. - Microbiological examination shall be made in accordance with the following methods published in Standard Methods for the Examination of Dairy Products, chapter: Microbiological Methods for Cheese and Other Cultured Products, Section: Procedure for Cheese other than cottage cheese.

Test	Method
Standard plate count	Agar plate
Coliform count	Coliform group (using Desoxycholate Lactose Agar)

LP/P DES 12-70
27 March 1970

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

CHICKEN A LA KING, COOKED, FROZEN

The use of this document in procurement is restricted to the specific purpose for which it was originally furnished.

1. SCOPE

1.1 This purchase description covers prepared frozen Chicken A La King in aluminum trays to be used by the Armed Forces as an item of general issue in kitchesn where freezer facilities are available.

3.6 Finished product.

3.6.3 Microbiological requirements.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
Salmonella	negative per 25 grams
E. coli	negative per gram

4.5.2.2 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.5 of Military Specification MIL-M-0013966D (GL), Meal Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association Publications:

Recommended Methods for Microbiological Examination of Foods

Standard Methods for Examination of Dairy Products

4.5.2.8 Salmonella procedure. The procedure for salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

30 March 1973
SUPERSEDING
MIL-C-0043135C
7 November 1969

MILITARY SPECIFICATION

CHICKEN AND CHICKEN PRODUCTS

COOKED, DEHYDRATED

This limited coordination Military Specification has been prepared by the U.S. Army Natick Laboratories, Natick, Massachusetts 01760, based on currently available technical information, but it has not been approved for promulgation as a coordinated revision of Military Specification MIL-C-43135A. It is subject to modification. However, pending its promulgation as a coordinated Military Specification, it may be used in procurement.

1. SCOPE

1.1 This specification covers cooked, freeze dehydrated chicken and chicken products for use by the Armed Forces as a component of operational rations.

3.5 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the procuct shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, of Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. Coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at $35^{\circ} \pm 1$ C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at $45.5^{\circ} \pm 0.2$ C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

CHICKEN CACCIATORE, COOKED, FROZEN

The use of this document is restricted to the specific purpose for which it was originally furnished.

1. SCOPE

1.1 This purchase description covers the components and packaging and packing requirements for frozen convenience packaged Chicken Cacciatore for use by the Armed Forces in kitchens where freezer facilities are available.

3.6 Finished Product.

3.6.2 Microbiological requirements.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Negative per gram
Salmonella	Negative per 25 grams

4.5.3 Microbiological examination. Microbiological examination shall be performed, according to the procedures described in 4.5.1.1 through 4.5.1.5 of Military specification MIL-M-001396D, Meal, Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association Publications:

Recommended Methods for Microbiological Examination of Foods
Standard Methods for Examination of Water and Waste Water
Standard Methods for Examination of Dairy Products

4.5.3.6 Salmonella procedure. The procedure for Salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

1973
SUPERSEDING
MIL-C-43289A
4 September 1969

MILITARY SPECIFICATION

CHICKEN WITH RICE, DEHYDRATED, COOKED

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

1. SCOPE

1.1 This specification covers cooked, freeze-dried chicken and rice for use by the Armed Forces as a component of operational rations.

3.6 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.2 E. coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at 35° ± 1°C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each positive LST tube displaying gas into a tempered EC broth fermentation.

tube. Conduct EC test at 45.5°C ± 0.2°C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

MILITARY SPECIFICATION

CHILI CON CARNE, COOKED, DEHYDRATED

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

1. SCOPE

1.1 This specification covers cooked, dehydrated chili con carne for use by the Armed Forces as a component of operational rations.

3.5 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000 per gram
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at 35° ± 1°C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at 45.5° ± 0.2°C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

C-C-678a

June 26, 1963
SUPERSEDING
Int. Fed. Spec. C-C-00678
(AGR-AMS)
November 17, 1961

FEDERAL SPECIFICATION

CREAMS, SOUR; CULTURED

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1.0 SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for preparation and packaging of pasteurized sour cream for use by agencies of the Federal Government.

1.2 Classification.

1.2.1 Types, classes, and numbers. Sour cream covered by this specification shall be of the following types, classes, and numbers as specified (see 6.2):

Type I. Plain (18.0 percent milkfat, minimum)
No. 1 (see 3.1.1 and 3.3.2)
No. 2 (see 3.1.1.2 and 3.3.2)

Type II. Modified (18.0 percent milkfat, minimum, with added milk solids-not-fat).

Class A. (without added artificial flavor and/or citric acid).
No. 1 (see 3.1.1.1 and 3.3.2)
No. 2 (see 3.1.1.2 and 3.3.2)

Class B. (with added artificial flavor and/or citric acid) (see 3.1.2.4, 3.1.2.5)

No. 1 (see 3.1.1.1 and 3.3.2)
No. 2 (see 3.1.1.2 and 3.3.2)

3.1 Material. The material components shall comply with the following microbiological requirements.

3.1.1.1 No. 1 both types. The raw milk, at no time between receiving and pasteurizing shall have a standard plate count or direct microscopic clump count which exceeds 400,000 per milliliter as determined on the basis of a logarithmic average of four consecutive samples.

3.1.1.2 No. 2, both types. In no event shall the raw milk have a standard plate count or direct microscopic clump count exceeding a logarithmic average of 1,000,000 per ml., for four consecutive samples immediately prior to pasteurization and the standard plate count or direct microscopic clump count of the cream shall not exceed a logarithmic average of 2,000,000 per ml. for four consecutive samples immediately prior to pasteurization.

3.1.2.1 Nonfat dry milk and concentrated milk, both classes. The nonfat dry milk or concentrated milk (whole or skim) used to increase the solids of type II product shall be prepared from milk conforming to the requirements of 3.1.1.1 and 3.1.1.2 whichever is applicable, depending upon the quality (No.) of the finished product specified in the contract.

The concentrated fluid milk, at the time of use, shall be fresh, sweet, pleasing in flavor and shall be free from undesirable flavors and odors. The standard plate count of the product shall not exceed 30,000 per milliliter for No. 1, both types, or 50,000 per milliliter for No. 2, both types, between the time of pasteurization and use, the count being dependent on the quality of the cream to which it will be added.

3.3 Finished product.

3.3.2 Microbiological requirements.

Coliforms	≤ 10 per gram
Yeast and molds	≤ 10 per gram

In more than one sample of the last four consecutive samples, each sample to be taken on separate days.

4.3.2 Microbiological and sediment examination. Microbiological examination and sediment examination shall be made in accordance with the following methods described in Standard Methods for the Examination of Dairy Products:

Test	Chapter	Method
Material:		
Bacterial estimate (as standard plate count)	Agar Plate Method	Agar Plate
Direct Microscopic Clump Count[1]	Direct Microscopic Method, Section: Bacterial Clump Count	Clump Count
Methylene Blue Test[1]	Reduction Methods	Methylene Blue Reduction Method
Sediment	Sediment in Fluid Milk	Off-Bottom or Mixed Sample Method
Finished Product:		
Coliform Count	Concentrated and Cultured Milks, Section: Cultured Milks and Cream	Coliform Test with solid media using Desoxycholate Lactose Agar
Yeast and Mold Count	Concentrated and Cultured Milks, Section: Cultured Milks and Cream	Potato Glucose Agar

[1] In instances where the methylene blue reductase test or the direct microscopic test are used, and the results are not in substantial agreement with the standard plate count, the results of the standard plate count shall be the basis for determining compliance with bacterial requirements in this specification.

MILITARY SPECIFICATION

CREAM SUBSTITUTE, DRY OR LIQUID, NON-DAIRY

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers non-dairy cream substitute products, both dry and liquid, for use by the Armed Forces and other authorized Federal agencies.

1.2 Classification. - Cream substitute shall be of the following type

Type I - Dry
Type II - Liquid

3.2 Finished product.

3.2.2 Microbiological requirements:

Standard plate count	≤ 20,000 per gram (or ml)
Coliforms	≤ 10 per gram (or ml)

4.5.2.2 Microbiological examination - Microbiological examination shall be made in accordance with the following methods published in Standard Methods for the Examination of Dairy Products.

Test	Chapter	Method
Standard Plate Count (Type I)	1/	Agar Plate Method
Standard Plate Count (Type II)	2/	Agar Plate Method

Coliform Count (Type I)	1/	Coliform Group in Dry Milk (Desoxycholate Lactose Agar)
Coliform Count (Type II)	3/	Coliform Bacteria (Desoxycholate Lactose Agar)

1/ Chapter: Microbiological Methods of Concentrated Milk and Dry Milk.

2/ Chapter: Agar Plate Method.

3/ Chapter: Coliform Bacteria.

C-E-230C

November 16, 1970
SUPERSEDING
Int. Fed. Spec. C-E-00230B
(AGR-C&MS)
August 28, 1962 and
Fed. Spec. C-E-230A

FEDERAL SPECIFICATION

EGG AND EGG PRODUCTS, FROZEN

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers frozen whole eggs, egg white, egg yolks, sugar yolks, and salt yolks.

1.2 Classification.

1.2.1 Types, kinds, and classes. The product shall be of the following types, kinds, and classes, as specified (see 6.1):

Types:

I - The storage time prior to delivery shall not exceed 365 days from date of production.

II - Shall be produced subsequent to award of contract.

Kinds:

a - Frozen whole egg, table grade (type II, class 1 only).

b - Frozen whole eggs.

c - Frozen egg white.

d - Frozen egg yolk.

e - Frozen sugared yolk.

f - Frozen salted yolk

Classes:

1 - Shall meet the requirements of 3.3.

2 - Shall be wholesome and shall possess a clean and bland odor as determined by organoleptic examination (not applicable for Military procurement).

3.3 Finished product.

3.3.2 Microbiological requirements.

Item	Test	Frozen table grade whole eggs	Frozen whole eggs	Frozen white	Frozen yolk	Frozen sugar yolk	Frozen salt yolk
5	Standard plate count per gram	≤ 20,000	≤ 50,000	≤ 50,000	≤ 50,000	≤ 50,000	≤ 50,000
6	Yeast and mold count per gram	≤ 50	≤ 50	≤ 50	≤ 50	≤ 50	≤ 50
7	Salmonellae test 1/	Neg	Neg	Neg	Neg	Neg	Neg

1/ Samples for microbiological examination shall arrive at the Government Laboratory in a solidly frozen condition and held in such condition until tested.

4.2.9 Sampling procedure and acceptance criteria for testing of finished products. The finished product shall be tested for total plate count, yeast and mold count and Salmonella as specified in 3.3.2. Procedures for testing shall be in accordance with 4.3.2. Test requirements for Salmonella, total plate count and yeast and mold count shall be on a unit basis. The sample unit for Salmonella, total plate count and yeast and mold count shall be an 8 ounce sample derived aseptically from 1 primary container. Lot size shall be expressed in terms of the sample unit. The sample size shall be the number of cans indicated by inspection level S-1. Samples of liquid egg product(s) sent to any Government laboratory for bacteriological or analytical testing shall be frozen solid prior to shipment and shall be in a solid frozen

state when received at the laboratory. Salmonella shall be reported on a pass or fail basis. Microbiological counts shall be reported in accordance with Recommended Methods for the Microbiological Examination of Foods of the American Public Health Association. Nonconformance to one or more test requirements shall be cause for rejection of the lot.

4.3.2 Microbiological examination. The total plate count and the yeast and mold count shall be determined in accordance with the following methods from Recommended Methods for the Microbiological Examination of Foods, Chapter: Egg and Egg Products, Section: Frozen Eggs:

Item	Test	Method
1	Total count	Total count
2	Yeast and mold count	Yeast and mold

4.3.2.1 Salmonella shall be determined in accordance with the USDA procedure as outlined in USDA Laboratory Methods for Egg Products, Consumer and Marketing Service.

MILITARY SPECIFICATION

EGG MIX, DEHYDRATED

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

1. SCOPE

1.1 This specification covers a dehydrated egg mix for use by the Armed Forces as an item of general issue and as a component of operational rations (see 6.1).

3.1 Material.

Microbiological requirements

1. The standard plate count of the raw liquid whole egg during the period of use shall not exceed 1,000,000 microorganisms per gram (g). The egg samples drawn for the bacteriological determination shall be obtained directly from the refrigerated raw egg supply source as drawn from each holding tank before blending. (see 3.1.1).

2. Milk solids non-fat shall be obtained from either of the following sources:

(a) High-heat concentrated skim milk which shall comply with the following requirements:

1.	Standard plate count	≤ 20,000 per gram
2.	Coliforms	≤ 50 per gram

(b) U. S. High Heat, U. S. Extra Grade, nonfat dry milk shall meet the requirements of the United States Standards for Grades of Nonfat Dry Milk (Spray process), shall be be Salmonellae negative, and shall not be over 90 days old at time of use. In addition, a USDA certificate shall accompany each lot and shall certify to the requirements specified above.

3.1.1 Samples of raw liquid whole eggs, concentrated high-heat skim milk and vegetable oil, sent to any Government approved laboratory for bacteriological or analytical testing, as applicable, shall be frozen solid promptly and maintained in the frozen state prior to shipment and when received at the laboratory.

3.4 Finished product.

Microbiological requirements.

Standard plate count	≤ 25,000 per gram
Coliforms	≤ 10 per gram
Salmonella	Negative per 25 gram

4.5.1.1 Microbiological examination. Microbiological examination shall be made in accordance with the methods from the following publications:

Test	Source	Method
Liquid eggs - Standard plate count	1/ (a)	Total count
Concentrated skim milk:		
Standard plate count	2/	Agar plate
Coliform count	2/	Coliform group (use desoxycholate lactose agar)
Finished product:		
Standard plate count	1/ (b)	Total count
Coliform count	1/ (c)	Solid media (use desoxycholate lactose agar)
Salmonellae	3/	

1/ Recommended Methods for the Microbiological Examination of Foods.

(a) Chapter: Eggs and Egg Products;
Section: Liquid Eggs.

(b) Chapter: Eggs and Egg Products;
Section: Dried Eggs

(c) Chapter: Sanitation Indexes; Section: Detection and Enumeration of the Coliform Group; Sub-section: Enumeration of Coliform Group.

2/ Standard Methods for the Examination of Dairy Products, Chapter: Microbiological Methods for Concentrated Milk and Dry Milk.

3/ USDA Laboratory Methods for Egg Products, Consumer and Marketing Service PY Notice No. 171.

1973
SUPERSEDING
MIL-E-43749
4 August 1971

MILITARY SPECIFICATION

ESCALLOPED POTATOES WITH PORK, COOKED, DEHYDRATED

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

1. SCOPE

1.1 This specification covers cooked, dehydrated escalloped potatoes with pork for use by Armed Forces as a component of operational rations.

3.6 Finished dehydrated product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000 per gram
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. coli. Transfer 1 ml of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at 35° ± 1 C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop transfer a loopful of broth from each

positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at 45.5 C ± 0.2 C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

9 November 1971
SUPERSEDING
MIL-F-35100A
25 January 1967

MILITARY SPECIFICATION

FLAVORED DAIRY DRINK, DRY, CHOCOLATE-COFFEE FLAVORED

This specification is mandatory for use by all Departmtnes and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers a dry, fat-containing, chocolate-coffee flavored milk product which is readily dispersible in cold water, and is intended for use by the Armed Forces as a component of operational rations (see 6.1).

3.3 Finished product.

Microbiological requirements

Standard plate count	≤ 20,000 per gram
Coliforms	≤ 10 per gram
Salmonella	Negative per 100 grams

4.5.3 Microbiological and sediment examination. Microbiological and sediment examination shall be made in accordance with the following methods from American Public Health Association, Inc., publication entitled "Standard Methods for the Examination of Dairy Products" (except as noted):

Test	Source and method
Standard plate count	Agar plate method (32°C)
Coliform count	Coliform Bacteria (32°C) using Desoxycholate Lactose Agar

4.5.3.1 Salmonella. - Salmonella test shall be determined by the procedure outlined in the Bacteriological Analytical Manual of the U. S. Department of Health, Education and Welfare, Federal Food and Drug Administration.

MILITARY SPECIFICATION

FLAVORED MILK, STERILIZED; CHOCOLATE

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

1. SCOPE

1.1 This specification covers sterilized chocolate-flavored milk for use by the Armed Forces as an item of general issue for limited use (see 6.1).

3.2 Material. - The material components shall comply with the items in Table I.

TABLE I. - Components

Item	Requirement
1	Milk shall be drawn from cows in herds complying with the animal health requirements in section 8 of the latest edition of the Grade "A" Pasteurized Milk Ordinance - 1965 Recommendations of the U. S. Public Health Service. The raw milk shall be normal in appearance and odor and the direct microscopic clump count shall not exceed 2,000,000 per milliliter (ml) immediately prior to start of processing. The sediment shall not exceed 1.5 milligrams (mgs) per pint as specified in the USDA Sediment Standard 7 CFR 58.2728 when tested in accordance with 4.5.2.
2	Skim milk, condensed skim milk or cream used for standardization shall be prepared from fresh raw whole milk meeting the requirements of item 1, above.
3	Nonfat dry milk shall comply with the commodity requirements for type I, style B of MIL-M-35052.

3.4 Finished product. The finished product shall be incubated according to 4.5.3 and there shall be no swells, leakers, springers, or flippers.

4.5.2 Microbiological and sediment examination. Microbiological and sediment examination shall be made in accordance with the following procedures from Standard Methods for the Examination of Dairy Products.

Test	Source	Method
Direct Microscopic Clump Count	Chapter: Direct Microscopic Method	Direct Microscopic Clump Count
Sediment	Sediment in Fluid Milk	1/

1/ Milk in cans shall be tested by the off-the-bottom method. For bulk milk in tanks a mixed one-pint sample shall be used.

4.5.3 Sterility incubation test. - The filled and sealed primary container shall be incubated at a temperature of 90°F to 95°F for 7 days and then examined for compliance with 3.4.

IP/DES S-14-9

1 August 1969

SUPERSEDING

IP/DES S-17-7

(GL)

INTERIM PURCHASE DESCRIPTION

FOOD PACKET, LONG RANGE PATROL

1. SCOPE

1.1 This purchase description covers the components and packaging and packing requirements for food packets to be used by the Armed Forces for subsisting personnel when organized kitchens are not available.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this purchase description to the extent specified herein:

SPECIFICATIONS

Federal

N-M-51	- Macaroni, Spaghetti and Vermicelli
EE-M-101	- Match, Safety; and Match, Non-Safety (Strike Anywhere).
EE-P-600	- Poultry Seasoning, Ground
EE-S-631	- Spices, Ground and Whole
RR-S-366	- Sieve, Test
UU-P-556	- Paper, Toilet
PP-C-248	- Chickens, Chilled and Frozen (Ready-to-Cook)
HHH-C-575	- Coffee, Instant
JJJ-O-533	- Onions, Dehydrated
JJJ-S-791	- Sugar, Refined and Brown, Beet or Cane
PPP-B-26	- Bags, Plastic Polyethylene
PPP-B-636	- Box, Fiberboard
PPP-T-60	- Tape, Pressure-Sensitive Adhesive, Waterproof, for Packaging and Sealing.
PPP-C-843	- Cushioning Wrapper Material Cellulosic
L-P-378	- Plastic Sheet and Strip, Polyolefin

Military

MIL-B-131 - Barrier Material, Water-Vapor Proof, Flexible
MIL-C-3031 - Cocoa Beverage Powder.
MIL-S-3271 - Soup and Gravy Base, Beef Flavored
MIL-C-3394 - Chili Power Seasoning
MIL-F-3897 - Fruitcake Bar
MIL-C-10928 - Candy and Chocolate Confections
MIL-G-35008 - Garlic, Dehydrated
MIL-S-35022 - Soup and Gravy Base, Chicken Flavored
MIL-S-35032 - Milk, Nonfat, Dry
MIL-C-35053 - Cheese, American, Processed, Dehydrated
MIL-S-35056 - Soup, Instant, Cream of Potato and Cream of Onion
MIL-C-35074 - Corn Flake Bar, Survival Type
MIL-L-35078 - Loads, Unit, Preparation of Nonperishable Subsistence In
MIL-S-35083 - Starch, Pre-gelatinized, Edible.
MIL-R-35084 - Rice, Instant
MIL-B-43165 - Bags, Polyethylene
MIL-C-43338 - Cream Substitute, Dry, Non-Dairy
MIL-S-676 - Spoon, Knife, Fork, Picnic, Plastic for Rations
I/P DES S-25-7 - Stimulator, Interdental

3.6 Finished dehydrated components.

3.6.3 Microbiological requirements.

Standard plate count	≤ 200,000 per gram
Coliforms	≤ 40 per gram

4.5.2 Microbiological examination. Microbiological examination of the product shall be made in accordance with paragraphs 3.01-3.36, 6.12, and 6.18 of Standard Methods for the Examination of Dairy Products, 11th Edition (1960), except that samples shall be prepared for examination as specified in 4.5.2.1.

4.5.2.1 Using aseptic precautions, open container and, with a sterile spoon, transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile, 99-ml. buffered water dilution bland. Shake the diluted sample rapidly at least 50 times, through an arc of one foot, in order to insure homogeneity.

4.5.2.2 Items consisting of more than one ingredient shall be prepared for chemical and bacteriological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pick up. A representative sample shall then be removed and handled as described in 4.5.2.1.

4.5.2.3 Standard plate counts. Duplicate plates shall be inoculated with 2 ml. of the appropriate dilutions and poured with milk protein hydrolysate glucose agar. Incubation shall be at 32 C for 72 hours. Report as standard plate count per gram of product.

4.5.2.4 Coliform plate counts. Duplicate plates shall be inoculated with 2 ml. portions of the 1:20 dilutions.

1973
SUPERSEDING
MIL-H-43224A
31 March 1970

MILITARY SPECIFICATION

HASH, BEEF, DEHYDRATED

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

1. SCOPE

1.1 This specification covers cooked, dehydrated, beef hash for use by the Armed Forces as a component of operational rations.

3.6 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000 per gram
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. Coli. Transfer 1 ml of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at 35° ± 1 C for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each

positive LST tube displaying gas into a tempered EC broth fermentation tube. Conduct EC test at $45.5^{\circ} \pm 0.2^{\circ}C$ as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

MIL-I-35027B
27 January 1969
SUPERSEDING
MIL-I-35027A
13 August 1963

MILITARY SPECIFICATION

ICE CREAM, ICE MILK, AND SHERBET, IMITATION; ICES AND NOVELTIES

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for water ice and frozen ice bar confection and for imitation ice cream, ice milk, fruit sherbet and frozen fudge bar confection containing edible fats of a non-dairy origin which are intended for use by the Armed Forces as items of limited use (see 6.1).

1.2 Classification.

1.2.1 Types and kinds. - Frozen desserts covered by this specification shall be of the following types and styles as specified.

Type I - Imitation Ice Cream

(a) Natural vanilla only.
(b) Vanilla and artificial vanilla flavor, natural predominating.
(c) Artificial vanilla.

Type II - Imitation Ice Cream; flavored with chocolate, fruit, nuts or other bulky flavors.

(a) Natural flavors only.
(b) Natural and artificial flavors, natural predominating.
(c) Artificial flavors.

Type III - Imitation Ice Milk.

(a) Natural flavors only
(b) Natural and artificial flavors, natural predominating.
(c) Artificial flavors.

Type IV - Imitation Fruit Sherbet

Type V - Water Ices

Type VI - Novelties

Kind 1 - Frozen Ice Bar Confection
Kind 2 - Frozen Fudge Bar Confection

3.1 Material.

3.1.1 Milk. - Raw milk used in the preparation of the non-fat milk products used in the preparation of frozen desserts described in this specification shall be obtained from cows in herds accredited as tuberculosis-free and certified brucellosis free by the U. S. Department of Agriculture (U.S.D.A.) or herds that have passed an annual tuberculosis test and meet U.S.D.A. requirements for an individually certivied herd, or from cows in herds located in (1) a Modified Accredited Tuberculosis Area: and (2) either (a) a Certified Brucellosis-free Area, or (b) a Modified Certified Brucellosis Area; or (3) an area in the process of being accredited or certified by the U.S.D.A. In addition, the milk shall be normal in appearance; practically free from colostrum and have a clean, sweet odor. It shall be subject to inspection by the procuring agency or duly authorized representative. The bacterial estimate at the time of processing, shall not exceed 3,000,000 per milliliter (ml.) when determined by the standard plate count or direct microscopic clump count or alternatively methylene blue shall be decolorized in not less than 2.5 hours or resazurin reduced to Munsell color standard 5p 7/4 in not less than 1.5 hours. The sediment content when determined on a mixed sample shall not exceed 1.5 milligrams (mg.) per pint.

3.1.2 Skimmed milk, concentrated skimmed milk and non-fat dry milk. - Skimmed milk, concentrated skimmed milk and nonfat dry milk shall be derived from raw whole milk meeting the requirements of 3.1.1. In addition, at the time of use nonfat dry milk shall meet the requirements for Extra Grade as defined in the U. S. Standards for Grades of Nonfat Dry Milk.

3.3 Finished product.

Microbiological Requirements

Product	Standard Plate Count	Coliforms
Type I	≤ 50,000 per gram	≤ 20 per gram
Type II	≤ 50,000 per gram	≤ 20 per gram
Type III	≤ 50,000 per gram	≤ 20 per gram

Type IV	≤ 50,000 per gram	≤ 10 per gram
Type V	≤ 10,000 per gram	-
Frozen fudge bar	≤ 50,000 per gram	≤ 20 per gram

4.5.2 Microbiological examination. Microbiological examination shall be made in accordance with the following methods from Standard Methods for the Examination of Dairy Products.

Test	Source and Method
Standard Plate Count	Agar Plate Method
Coliform count	Coliform Bacteria
Direct Microscopic Clump Count	Direct Microscopic Method
Methylene Blue Reduction	Reduction Methods
Resazurin Reduction	Reduction Methods
Sediment	Sediment in Fluid Milk

MILITARY SPECIFICATION

ICE CREAM MIXES, REGULAR AND IMITATION, DEHYDRATED

This limited coordination Military Specification has been prepared by the U. S. Army Natick Laboratories, Natick, Mass., 01760, based upon currently available technical information, but it has not been approved for promulgation as a coordinated revision of Military Specification MIL-I-705C. It is subject to modification. However, pending the promulgation as a coordinated Military Specification, it may be used in procurement.

1. SCOPE AND CLASSIFICATION

1.1 Scope. - This specification covers non-perishable ice cream and imitation ice cream mixes for use by the Armed Forces as items of general use (see 6.1).

1.2 Classification. -

Type I - Regular (containing milk fat)
Type II - Imitation (containing no milk fat)

Style A - Containing only coconut fat
Style B - Containing vegetable or animal fat or combinations thereof, other than coconut fat and milk fat.

3.2 Material. -

3.2.1 Raw whole milk. - Raw milk shall be obtained from cows in herds accredited as tuberculosis-free and certified brucellosis-free by the U. S. Department of Agriculture (U.S.D.A.) or herds that have passed an annual tuberculosis test and meet U.S.D.A. requirements for an individually certified herd or from cows in herds located in (1) a Modified Accredited Tuberculosis Area and (2) either (a) a Certified Brucellosis-free Area, or (b) a Modified Certified Brucellosis Area; or (3) an area in the process of being accredited or certified by the U.S.D.A. In addition, the milk shall be normal in appearance; practically free from colostrum and have a clean sweet odor. It shall be subject to inspection by the procuring

agency or duly authorized representative. The bacterial estimate at the time of processing shall not exceed 3,000,000 per milliliter (ml.) when determined by the standard plate count or direct microscopic clump count alternatively, methylene blue shall be decolorized in not less than 2 1/2 hours or resazurin reduced to Munsell color standard p 7/4 in not less than 1 1/2 hours. The sediment content, when determined on a mixed sample shall not exceed 1.5 milligrams (mg.) per pint.

3.2.2 Skimmed milk, concentrated skimmed milk, and concentrated whole milk. - Skimmed milk, concentrated skimmed milk, and concentrated whole milk shall be prepared from raw whole milk conforming to the requirements of 3.2.1.

3.2.3 Cream, plastic cream, churned fat, anhydrous milk fat, and butteroil. - Cream, plastic cream, churned fat, anhydrous milk fat, and butteroil shall be prepared from raw whole milk conforming to the requirements of 3.2.1.

3.2.4 Nonfat dry milk. - Nonfat dry milk shall comply with the U. S. Standards for Grades of Nonfat Dry Milk (spray process) for Extra Grade, low heat powder.

3.4 Finished product.

3.4.4 Microbiological requirements.

Standard plate count	≤ 30,000 per gram
Coliforms	≤ 10 per gram
Yeast and mold (combined count)	≤ 20 per gram
Salmonella test	Negative per 25 grams

4.5.2.2 Microbiological examination. - Microbiological examination shall be performed in accordance with the following methods from Standard Methods for the Examination of Dairy Products except as noted.

Test	Chapter	Method
Standard Plate Count	Agar Plate Method	Agar Plate
Direct Microscopic Clump Count	Direct Microscopic Method	Direct Microscopic Clump Count
Methylene Blue	Reduction Methods	Methylene Blue Reduction Method

Resazurin Reduction	Reduction Methods	Resazurin Reduction Method
Coliform Count	Coliform Bacteria	Coliform Bacteria (Desoxycholate lactose agar)
Yeast and Mold Count	Microbiological Methods for Butter	Yeast and Mold count
<u>Finished Product</u>		
Standard plate count	Microbiological Methods for Concentrated Milk and Dry Milk	Agar Plate
Coliform Count	Loc. cit.	Coliform Group (Desoxycholate Lactose agar)
Yeast and Mold Count	Loc. cit.	Yeast and Mold Count
Salmonella test	1/	

1/ U. S. Department of Health, Education and Welfare, Bacteriological Analytical Manual, Section 14.7

EE-I-116B
INTERIM AMENDMENT-4 (Army-GL)

December 14, 1971
SUPERSEDING
Int. Amendment-3 (Army-GL)
June 8, 1971

INTERIM AMENDMENT

TO

FEDERAL SPECIFICATION

ICE CREAM; SHERBETS AND ICES

This Interim Amendment was developed by the U. S. Army Natick Laboratories (GL), Natick, Mass., 01760, based on currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized Federal agencies to use this Interim Amendment as a valid exception to Federal Specification EE-I-116B, dated May 29, 1953.

1. CLASSIFICATION

1.1 Types - The products covered by this specification shall be of the following types, as specified (see 6.1):

Type I - Ice Cream; plain

(a) 12 percent milk fat
(b) 10 percent milk fat

Type II - Ice cream with chocolate, fruit, nuts, or bulky flavors

(a) 10 percent milk fat
(b) 8 percent milk fat

Type III - Sherbets

Type IV - Water Ices

1.1.1 Classes. When designated b the procuring agency, type I and II finished products shall meet the minimum weight requirements as stated by class designation in the following table. Where no class requirement is designated, class 1 shall be acceptable.

Class	Weight per gallon (lbs)	Food solids per gallon (lbs)
1	4.5	1.6
2	4.9	1.7
3	5.1	1.8
4	5.4	1.9

3.4.1 Finished product.

Microbiological requirements

	Type I, II, III	Type IV
Standard plate count	≤ 50,000 per gram	≤ 10,000 per gram
Coliforms	≤ 10 per gram	≤ 10 per gram

4.4.3 Microbiological examination. - Microbiological examination shall be determined in accordance with the following methods published in Standard Methods for the Examination of Dairy Products; chapter: Ice Cream and Related Frozen Products:

Test	Method
Standard plate count	Agar plate (use incubation temperature of 32°C)
Coliform	Coliform test using Desoxycholate Lactose Agar or Violet Red Bile Agar

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

MACARONI AND CHEESE, COOKED, FROZEN

The use of this document in procurement is restricted to the specific purpose for which it was orignially furnished.

1. SCOPE.

1.1 This purchase description covers the components and packaging and packing requirements for frozen convenience packaged Macaroni and Cheese for use by the Armed Forces in kitchens where freezer facilities are available.

3.6 Finished product.

3.6.2 Microbiological requirements.

Standard plate count	≤ 100,000 per gram
Total coliform	≤ 100 per gram
E. coli	negative per gram
Salmonella	negative per 25 grams

4.5.2 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.5 of Military Specification MIL-M-0013966D (GL), Meal, Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association publications:

Recommended Methods for Microbiological Examination of Foods
Standard Methods for Examination of Water and Waste Water
Standard Methods for Examination of Dairy Products

4.5.2.5 Salmonella procedure. The procedure for Salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

MILITARY SPECIFICATION

MACARONI, INSTANT

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

1. SCOPE

1.1 This specification covers a heat-processed macaroni produce for use by the Armed Forces as a component of operational rations. The heat-processed macaroni is prepared for use by the consumer by the addition of hot (near boiling) water.

3.4 Microbiological requirements.

Standard plate count	≤ 50,000 per gram
Coliforms	≤ 10 per gram

4.5.2 Microbiological examination. - Microbiological examination shall be performed according to the procedures described in 4.5.2.1 through 4.5.2.3. For background, analyst is referred to the following American Public Health Association Publication: Standard Method for the Examination of Dairy Products, 11th Edition, 1960, pages 47-79.

4.5.2.1 Sample preparation. - Using aseptic precautions, open container and with a sterile spoon, transfer about 20 grams of the product into a tared sterile blender jar with cap. Add enough buffered (M/15 PO_4, pH 7) water to make a 1:20 dilution. Let stand for 15 minutes. Blend for 3 minutes. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile 99 ml. buffered dilution blank. Prepare a 1:2000 dilution using the 1:200 dilution and following the above procedure.

4.5.2.2 For the standard plate count. - Reshake thoroughly the consecutive decimal dilutions. Transfer from each dilution a 2 ml. aliquot into duplicate Petri-plates and add an appropriate quantity of tryptone glucose extract agar, cooled to a constant temperature of about 45 C. Mix

inoculum with medium thoroughly and allow to solidify. Invert and incubate for 72 hours at 32 C. Count all plates having counts between 30 and 300 colonies. Correct for the dilution factor. Report the geometrical average of the duplicate plates as the total microbial count per gram component. A total count greater than 50,000 per gram shall constitute rejection.

4.5.2.3 For the total coliform count. - From the 1:20 dilution transfer immediately 2 ml. aliquots into 5 Petri-plates and add an appropriate quantity of Violet Red Bile (VRB) agar, freshly prepared and cooled to a constant temperature of about 45 C. Thoroughly mix the inoculum with medium and allow to solidify. Overlay with an additional 3-5 ml. portion of the agar to minimize surface and spreader type growth. As soon as the agar is solidified, invert plates and incubate for 18-24 hours at 35 C. Count the typical (dark red) colonies at least 0.5 mm in diameter. A total count on all 5 plates greater than 5 constitutes rejection since 10 coliform per gram is the maximum allowed.

INTERIM AMENDMENT
TO
FEDERAL SPECIFICATION
MALTED MILK

This interim amendment was developed by the U. S. Army Natick Laboratories (GL), Natick, Mass. 01760, based on currently available technical information. It is recommended that Federal Agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized Federal Agencies to use this interim amendment as a valid exception to Federal Specification C-M-50A dated March 9, 1966.

1.0 SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for the preparation and packaging of dry malted milk for use by agencies of the Federal Government.

1.2 Classification. Dry malted milk covered by this specification shall be of the following types and classes, as specified (see 6.3):

1.2.1 Type.

I - Natural flavored malted milk
II - Chocolate flavored malted milk.

1.2.2 Class.

1 - Instantized
2 - Conventional
3 - Tablet

3.3 Finished product (Types I and II).

3.3.2 Microbiological requirements.

Standard plate count	≤ 30,000 per gram
Coliforms	≤ 10 per gram

4.3.2 Microbiological examination.

4.3.2.2 Finished product. Microbiological examination of the finished product, if required by purchaser (see 6.3) shall be made in accordance with the following methods from Standard Methods for the Examination of Dairy Products, Cahpter: Concentrated Milk and Cultured Product, section: Dry Milk:

Test	Method
Bacterial estimate (as standard plate count)	Agar plate
Coliform count	Coliform Group (Coliform test-solid media using desoxycholate lactose agar)

MILITARY SPECIFICATION

MEAL, PRECOOKED, FROZEN

This limited coordination Military specification has been prepared by the US Army Natick Laboratories based on currently available technical information, but it has not been approved for promulgation as a coordinated revision of Military Specification MIL-M-13966. It is subject to modification.

1. SCOPE

1.1 This specification covers precooked frozen meals for use by the Armed Forces for in-flight feeding.

3.5 Finished product.

3.5.5 Microbiological requirements.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Negative per gram

4.5.1 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.5. For background information the analyst is referred to the following American Public Health Association publications:

Recommended Methods for the Microbiological Examination of Foods.
Standard Methods for the Examination of Water and Waste Water.
Standard Methods for the Examination of Dairy Products.

4.5.1.1 Sample preparation. Samples shall be kept completely frozen at all times prior to laboratory analysis. Holding time prior to analysis should be kept to a minimum. Proper microbiological technique must be established prior to analysis and maintained throughout.

4.5.1.1.1 Place frozen meal in a refrigerator at 2 C to 5 C for one to three hours to temper. Remove the foil cover and aseptically cut or chip representative sections of each component into 1-inch blocks. Aseptically transfer approximately equal weights of each component, totaling about 100 grams altogether, into a sterile, tared blender jar with screw cap. Weigh. Calculate wieght of sample. Measure sterile, distilled water into a sterile graduated cylinder, enough to equal 4 times the weight of the sample (1:5 dil.). Aseptically add about half of this to the blender jar. Blend for 1 minute. Add remainder of water and blend for two additional minutes. Prepare a 1:10 dilution by pipetting 50 ml. of the 1:5 suspension into a sterile, 50 ml. buffered water blend (M/15 PO_4, pH 7 $\pm$ 0.2) contained in a regular 6-ounce dilution bottle. Shake the diluted suspension thoroughly to assure homogeneity.

4.5.1.2 <u>For the total coliform count</u>. From the 1:10 dilution immediately transfer a 2 ml. aliquot into each of 5 Petri-plates and add an appropriate quantity of Violet Red Bile (VRB) agar, freshly prepared and cooled to a constant temperature of about 45 C. Thoroughly mix the inoculum with medium and allow to solidify. Overlayer with an additional 3-5 ml. portion of the agar to minimize surface and spreader type growth. As soon as the agar is solidified, invert plates and incubate for 18-24 hours at 35 C. Count the typical (dark red) colonies at least 0.5 mm. in diameter. A total count on all 5 plates greater than 100 constitutes rejection.

Table XVI - Number of coliform colonies to be transferred from VRB agar plates into E.C. medium 1/

Total number of coliform organisms on plates	Total colonies picked for E.C. transfer	Total number of coliform organisms on plates	Total colonies picked for E.C. transfer
5-7	1	55-56	29
8	2	57-58	
9	3		
10	4	59-60	31
11-12	5	61-62	32
13-14	6	63-64	33
15	7	65-66	34
16-17	8	67	35
18-19	9	68-69	36
20-21	10	70-71	37
22-23	11	72-73	38
24-25	12	74-75	39
26	13	76-77	40
27-28	14	78-79	41
29-30	15	80	42
31-32	16	81-82	43
33-34	17	83-84	44
35-36	18	85-86	45
37-38	19	87-88	46
39	20	89-90	47
40-41	21	91-92	48
42-43	22	93	49
44-45	23	94-95	50
46-47	24	96-97	51
48-49	25	98-99	52
50-51	26	100	53
52	27		
53-54	28		

1/ Derived from a hypergeometric distribution applied to sampling from a finite population without replacement.

4.5.1.3 For the standard plate count. Proceed immediately after pour-plating for total colifrosm. Reshake thoroughly the 1:10 diluted suspension. Prepare consecutive decimal dilutions of 1:100 and 1:1,000 by adding 11 ml. to 99 ml. buffered water blanks. Transfer 1 ml. aliquots from each of the last two dilutions (1:100 and 1:1,000 into duplicate Petri-plates, and add an appropriate quantity of Plate Count Agar (tryptone glucose yeast extract agar), cooled to a constant temperature of about 45 C. Mix inoculum with medium thoroughly and allow to solidify. Invert and incubate for 72 hours at 32 C. Count plates and calculate total counts as prescribed in Standard Methods for Examination of Dairy Products. A total count greater than 100,000 per gram constitutes rejection.

4.5.1.4 For the E. coli count. According to the procedure prescribed in 4.5.1.2, a coliform count greater than 100 constitutes rejection and further testing for E. coli is not required. When the total coliform count is from 5 to 100 inclusive further testing for E. coli shall be performed. The number of colonies picked for examination shall be determined by reference to table XVII. From each of the selected colonies, subculture into 2 fermentation tubes of E. C. broth and incubate at 45.5 C $\pm$ 0.2 C for 24 hours. Incubation at 45.5 C $\pm$ 0.2 C must be undertaken in a constant temperature water bath with the temperature monitored by a Bureau of Standard or calibrated thermometer. Any positive E. C. broth tube will constitute rejection of the product.

MILITARY SPECIFICATION

MEAT BALLS AND MEAT-BALL PRODUCTS, COOKED, DEHYDRATED

This amendment forms a part of Military Specification MIL-M-43506 dated 23 June 1967 and is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers cooked, freeze-dehydrated meat balls and meat-ball products, for use by the Armed Forces as a component of operational rations.

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

Type

I - Meat Balls
II - Meat balls with brown gravy
III - Meat balls with beans and tomato gravy

Finished product (Types I, II, III)

3.9 Microbiological requirements.

Standard plate count	≤ 150,000 per gram
Coliforms	≤ 40 per gram

4.5.2 Microbiological examination. - Microbiological examination of the product shall be made in accordance with paragraphs 3.01-3.36, 6.12 and 6.18 of the Standard Methods for the Examination of Dairy Products, 11th Edition (1960), except as specified in 4.5.2.1 through 4.5.2.4.

4.5.2.1 Using aseptic technique, open container with a sterile spoon transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare

a 1:200 dilution by transferring 11 ml. of the 1:20 dilution into a sterile, 99-ml buffered water dilution blank. Further serial dilutions as required may be prepared by adding 11 ml. of prepared dilution to 99 ml. of diluent. Shake the diluted sample rapidly at least 50 times, through an arc of one foot, in order to insure homogeneity.

4.5.2.2 Items consisting of more than one ingredient shall be prepared for chemical and bacteriological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pick up. A representative sample shall then be removed and handled as described in 4.5.2.1.

4.5.2.3 Standard plate counts. Duplicate plates shall be inoculated with 2 ml. of the appropriate dilutions and poured with milk protein hydrolysate glucose agar. Incubation shall be at 32 C. for 72 hours. Report as standard plate count per gram of product.

4.5.2.4 Coliform plate counts. Duplicate plates shall be inoculated with 2 ml. portions of the 1:20 dilutions.

FEDERAL SPECIFICATION

MILK AND MILK PRODUCTS, FRESH, FLUID, CONCENTRATED, AND FROZEN

This specification was approved by the commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 This specification covers the requirements of all listed fresh and frozen fluid milk and milk products.

1.2 Classification.

1.2.1 Types, classes and forms. The products covered by this specification shall be of the following types, classes and forms, as specified (see 6.1):

Type I - Milk, whole, fresh

Class 1 - Pasteurized, homogenized
Class 2 - Pasteurized

Type II - Cream, and half-and-half, fresh.

Class 1 - Pasteurized heavy whipping cream (minimum 36.0 percent milk fat)

Class 2 - Pasteurized light whipping cream (minimum 30.0 percent milk fat but less than 36.0)

Class 3 - Pasteurized homogenized table cream, light cream or coffee cream, (minimum 18.0 percent milk fat)

Class 4 - Pasteurized homogenized half-and-half (minimum 10.5 percent milkfat and 18.0 percent total solids)

Type III - Milk, skimmed and lowfat, fresh (see 3.2.3 Note on homogenization requirements).

Class 1 - Pasteurized skimmed milk (plain).

Class 2 - Pasteurized skimmed milk (nonfat milk solids added).

Class 3 - Pasteurized lowfat milk (plain)

Class 4 - Pasteurized lowfat milk (nonfat milk solids added).

Class 5 - Pasteurized 2.0 percent milkfat (plain).

Class 6 - Pasteurized 2.0 percent milkfat (nonfat milk solids added).

Type IV - Milk, frozen, pasteurized, homogenized

Class 1 - Plain

Class 2 - Stabilized

Type V - Milk, concentrated, whole or skimmed, fresh, or frozen

Class 1 - Concentrated whole milk
Class 2 - Concentrated skim milk

Type VI - Flavored milk (chocolate) and flavored dairy drink (chocolate)

Class 1 - Chocolate flavored milk, pasteurized (minimum 3.25 percent milkfat).

Form A - Plain
Form B - Nonfat milk solids added

Class 2 - Chocolate flavored lowfat milk, or chocolate flavored drink pasteurized (minimum 0.50 percent milkfat, maximum 2.0 percent milkfat).

Form A - Plain
Form B - Nonfat milk solids added

Class 3 - Chocolate flavored skimmed milk, or chocolate flavored drink, pasteurized (maximum 0.50 percent milkfat)

Form A - Plain
Form B - Nonfat milk solids added.

Type VII - Eggnog, pasteurized, fresh

Class 1 - Standard (minimum 6.00 percent milkfat).

Class 2 - Premium (minimum 8.0 percent milkfat).

3.1 Materials.

3.1.1.1 Microbiological requirements. (Standard plate count) Individual producer raw milk shall not exceed 100,000 per ml. prior to commingling with other producer milk, or after commingling, the raw milk supply shall not exceed 300,000 per ml. prior to pasteurization.

3.1.3 Plain frozen egg yolks and frozen sugared egg yolk. These egg products shall have been prepared under the continuous inspection of the U. S. Department of Agriculture and shall be identified by appropriate labelling or marking with the USDA Inspection Shield and shall be certified as having been laboratory tested and found to be negative for Salmonellae by the U. S. Department of Agriculture. In addition, the following microbiological requirements shall apply:

	Frozen yolk 1/	Frozen sugared yolk 1/
Standard plate count	≤ 25,000 per gram	≤ 25,000 per gram
Yeast and mold	≤ 50 per gram	≤ 50 per gram

1/ Prepare sample for testing in accordance with Recommended Methods for Microbiological Examination of Foods; Chapter: Egg Products; Section: Frozen Eggs. The temperature of frozen egg products on receipt shall not be more than 5°F. and there shall be no evidence of thawing and refreezing. At the time of use there shall be no abnormal odor.

3.3 Finished product (all types)

3.3.3 Microbiological requirements (up to the time and point of delivery)

Standard plate count	≤ 20,000 per ml (g)
Coliforms	≤ 10 per ml (g)

4.5.2 Microbiological examination. Unless otherwise specified, bacteriological examination shall be made in accordance with the methods described in Standard Methods for the Examination of Dairy Products. The procedures shall be those specified therein for:

(a) Standard plate count at 32 C.
(b) Simplified methods for viable counts of raw milk at 32 C.
(c) Coliform test with solid media at 32 C.

6.4 Supersession data. This specification includes the requirements of Federal Specifications C-M-00381J dated 28 Oct 1970, C-C-671F, dated July 1, 1970, C-M-390C dated March 4, 1971, C-F-001392 dated September 8, 1967 and Military Specifications MIL-M-3576C dated 24 December 1969, MIL-M-1050E dated 19 December 1969 and MIL-M-3579 dated 17 June 1966. It also includes the requirements of type I of Limited Production Purchase Description LP/P DES 31-69 dated 10 July 1969.

MILITARY SPECIFICATION

MILK CONCENTRATE, WHOLE, STERILIZED

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

1. SCOPE

1.1 This specification covers sterilized, 3:1 concentrated whole milk for use by the Armed Forces as an item of general issue on a limited basis (see 6.1).

3.2 Materials.

Microbiological requirement.

1 Milk shall be obtained from cows in herds complying with the animal health requirements in section 8 of the latest edition of the Grade "A" Pasteurized Milk Ordinance of the U. S. Public Health Service (USPHS). The raw milk shall be normal in appearance and odor. The direct microscopic clump count at time of use shall not exceed 2,000,000 per milliliter (ml.), and the sediment shall not exceed 0.5 milligrams (mg.) per pint.

2 Skimmed milk, concentrated skimmed milk, and cream used for standardization shall be obtained from plant separated raw milk complying with item 1 above.

3.4 Finished product.

Microbiological requirement

The finished product shall be sterile as evidenced by the fact that when the filled and sealed containers are incubated in accordance with 4.5.2 there is no evidence of swells, leakers, springers or flippers in the containers. The concentrated product shall have a body and texture that is fluid and uniform in appearance, free from gelation, coagulation, ropiness (e.g., thread-like strings), lumps, clots, granulation (e.g., thread-like strings), lumps, clots, granulation (e.g., hardened particles of curd, flocculation

(e.g., flakes or fragments of coagulated milk protein in suspension), charred particles (e.g., dark flakes or particles of burned milk), sediment 1/ (e.g., precipitated milk solids in bottom of container), can lining material, sealing compound and foreign material. In addition, the product shall be free from such odors and flavors as putrid, sour, cheesy, fruity, sulfide and others considered to be abnormal.

4.3.3.5 Examination of incubation time and temperature. Examination shall be made to determine compliance with incubation time and temperature specified in 4.5.2. Incubation time and temperature records shall be maintained. Nonconformance to one or both of the above referenced requirement(s), reflected by actual examination or by records, shall be cause for rejection of the lot.

4.5.1 Microbiological examination and sediment analyses. Microbiological and sediment analyses shall be made in accordance with "Standard Methods for the Examination of Dairy Products."

Direct microscopic clump count	Direct Microscopic Method	Direct Microscopic clump count
Sediment	Sediment in fluid Milk	Mixed Sample

4.5.2 Sterility test. The sterility test shall be conducted by incubating samples of the product at 90° to 95°F. for 7 days and examining for conformity to the requirements of table III.

15 August 1968
SUPERSEDING
MIL-M-35082A
3 September 1965

MILITARY SPECIFICATION

MILK (PLAIN OR CHOCOLATE FLAVORED), CREAM HALF AND HALF, FILLED AND CHEESE, COTTAGE, CREAMED AND FILLED

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

1. SCOPE AND CLASSIFICATION.

1.1 Scope. This specification covers milk (plain or chocolate flavored) cream or half-and-half filled and cheese, cottage, creamed and filled for use by the Armed Forces, as a perishable item, when authorized for general issue is lieu of fresh, recombined, reconstituted, or blended milk, cream, or half-and-half and creamed cottage cheese.

1.2 Classification. The finished product shall be of the following types and styles, as specified (see 6.2):

Type I - Milk, whole

Style A - Plain
Style B - Chocolate flavored

Type II - Milk skim or low fat

Style A - Skim milk, not fortified
Style B - Skim milk, fortified (with MSNF)
Style C - Low fat milk, not fortified
Style D - Low fat milk, fortified (with NSNF)
Style E - Low fat milk, chocolate flavored

Type III - Cream Half and Half

Style A - Table cream
Style B - Half and half

Type IV - Cottage cheese

3.3 Finished product.

3.3.3 Microbiological requirements. The standard plate count for Type I and II (except chocolate) and Type III shall not exceed 20,000 bacteria per ml. in 2 of the last 4 consecutive samples, taken on separate days. In addition, at no time after pasteurization and until time of delivery, shall the coliform count exceed 10 per ml. in more than two samples in each series of 4, each sample to be taken on a separate day. Type IV product shall meet the requirements for type II, class B product of C-C-281 except that the cream dressing shall comply with the requirements for half-and-half (type III, style B) of this specification.

4.5.2 Microbiological examination (all types). Microbiological examination shall be made in accordance with the following methods as published in Standard Methods for the Examination of Dairy Products:

Test	Chapter	Method
Standard plate count	Agar plate	--
Coliform count	Coliform bacteria	Coliform test using Desoxycholate Lactose Agar

C-M-00371E (AGR-C&MS)
August 18, 1971
INTERIM REVISION OF
Fed. Spec. C-M-371D
May 13, 1966

INTERIM FEDERAL SPECIFICATION

MILK, EVAPORATED

This Interim Federal Specification was developed by the U. S. Department of Agriculture, Consumer and Marketing Service, Dairy Division, Washington, DC 20250, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized the use of this Interim Federal Specification as a valid exception to Federal Specification C-M-371D, dated May 13, 1966.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for evaporated milk for use by all Federal agencies.

1.2 Classification. Evaporated milk covered by this specification shall be of the following types, as specified (see 6.2):

Types:

I - Evaporated milk
II - Evaporated milk, vitamin D content increased

3. REQUIREMENTS

3.1 Materials

3.1.1 Milk. The raw milk for processing shall be drawn from cows in herds located in a modified accredited area, or from cows in herds fully accredited as tuberculosis-free by the U. S. Department of Agriculture and from cows in herds located in a modified, certified area or from cows in herds certified brucellosis-free by the U. S. Department of Agriculture, or in the process of being accredited or certified. The milk shall be the lacteal secretion practically free from colostrum, obtained by the complete milking of one or more healthy cows, and shall be wholesome, fresh, sweet, normal in appearance and odor, and shall be subject to inspection by the procuring agency or duly authorized representative.

3.1.1.1 Microbiological requirements

Bacterial estimate	Direct microscopic clump count or standard plate count	Methylene blue decolorized in	Resazurin reduction time 1/
No. 1 2/	Not over 500,000 per ml.	Not less than 4 1/2 hours	Not less than 2 1/2 hours
No. 2 2/	Not over 3,000,000 per ml.	Not less than 2 1/2 hours	Not less than 1 1/2 hours
Undergrade 3/	Over 3,000,000 per ml.	Less than 2 1/2 hours	Less than 1 1/2 hours

1/ To Munsell color standard 5 P 7/4
2/ Acceptable without qualification.
3/ Acceptable for a period not exceeding 4 weeks.

3.2 Processing. All incoming milk, unless processed within 2 hours, shall be cooled immediately to 45 F or lower until start of processing. The evaporated milk shall be sealed in cans and processed by heat or heat treated and canned aseptically to prevent bacterial spoilage. The cans processed by heat shall be cooled to 100°F. or lower immediately after processing except that the 6-3/4 or 8 pound cans shall be cooled to 100°F. or lower immediately after processing and further cooled to 100°F before packing.

3.3 Finished product.

Microbiological requirements. Products heat treated prior to aseptic canning shall be incubated and examined for swellers and leakers in accordance with section 4.2.9.4.1, Tables V and VI of the specification.

4.3.2 Microbiological examination. Microbiological examination shall be made in accordance with the following procedures from Standard Methods for the Examination of Dairy Products.

Test	Method	Chapter
Direct Microscopic Clump Count (DMCC)	DMCC	Direct Microscopic Method
Standard Plate Count	Agar Plate	Agar Plate Method
Methylene Blue Reduction	Methylene Blue	Reduction Method
Resazurin Reduction	Resazurin	Reduction Method

4.3.5 Incubation test. The filled and sealed cans shall be incubated at 32°C. and at 55°C. for seven days and examined for the defects listed in table V.

4.3.6 Leakage test. The filled and sealed can shall be submerged in water, contained in a dessicator or other suitable container, while maintaining a vacuum of 10 inches of mercury (atmospheric pressure 29.9 inches) for at least 30 seconds. A leak is indicated by a steady progression of bubbles from the can. Isolated bubbles caused by entrapped air are not considered leakage.

4.3.7 Sediment and bacteriological examination of raw milk. Sediment and bacteriological examination of raw milk shall be in accordance with 3.1.

MILITARY SPECIFICATION

MILK FAT (FOR RECOMBINED MILK AND OTHER MANUFACTURED DIARY PRODUCTS)

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers pasteurized milk fat for use as a partial or total source of fat in recombined milk and other manufactured dairy products (see 6.1):

1.2 Classification

Type I - Plastic cream
Type II - Churned fat

3.4 Finished product.

3.4.1 Microbiological requirements. (Types I and II)

Standard plate count	≤ 5000 per gram
Coliforms	≤ 10 per gram
Yeast and mold	≤ 30 per gram

4.5.1.2 Microbiological examination. Microbiological examination shall be made in accordance with the following methods as published in the Standard Methods for the Examination of Dairy Products:

Test	Method
Standard Plate Count 1/	Agar Plate Method
Coliform 1/	Coliform Bacteria (use Desoxycholate Lactose Agar)
Yeast and Mold 1/	Yeast and Mold Count

1/ Samples of the finished product shall be prepared as specified for the Microbiological Methods for Butter.

C-M-003050B (Army-GL)

June 8, 1972

INTERIM REVISION OF
Fed. Spec. C-M-350A
January 10, 1962
(see 6.8)

INTERIM FEDERAL SPECIFICATION

MILK, NONFAT, DRY

This Interim Federal Specification was developed by the US Army Natick Laboratories (GL), Natick, Mass. 01760, based upon currently available technical information. It is recommended that Federal Agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized the use of this Interim Federal Specification as a valid exception to Federal Specification C-M-350A, dated January 10, 1962.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for nonfat dry milk.

1.2 Classification.

1.2.2 Types and classes. Nonfat dry milk covered by this specification shall be of the following types and classes, as specified (see 6.1):

Type I - Spray Process (conventional):

Style A - High heat
Style B - Medium heat
Style C - Low heat

Type II - Spray process (instantized):

Style B - Medium heat
Style C - Low heat
Class 1 - Not fortified with vitamins
Class 2 - Fortified with vitamins A, ascorbic acid, thiamine, B6 (see 6.2)

Type III - Roller process

Style A - High heat

3.3 Finished product.

Microbiological requirements (Types I, II and III)

Standard plate count	≤ 50,000/gram
Salmonella	Neg per 100 grams

4.5.2.2 Microbiological examination. In accordance with referenced procedures in the applicable U. S. Standards for Grades of Nonfat Dry Milk (Spray, Instant and Roller Process), the Standard Plate Count shall be made for the purpose of meeting U. S. Extra Grade requirements. In addition, Salmonella test procedures shall be conducted as outlined in the Official Methods of Analysis of the Association of Official Analytical Chemists.

6.8 Supersession data. This specification includes the requirements of Military Specification MIL-M-0035052E (GL), dated 11 June 1971, and MIL-M-35052C, dated 28 December 1966.

MILITARY SPECIFICATION

MILK: MILK, SKIM: HALF AND HALF: OR CREAM: RECONSTITUTED, OR RECOMBINED

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. - This specification covers pasteurized, reconstituted or recombined milk, half and half; or cream for use by the Armed Forces, when authorized, and as an item of general issue in lieu of fresh milk, half and half; or cream (see 6.1).

(Note: For purpose of this specification, the term "Reconstituted" shall denote products to which only water is added to bring nonfat dry milk or dry whole milk, for example, back to the original standard for fluid products. Recombined milk shall be made by combining the component parts of milk (e.g., milk fat, nonfat dry milk and water) to meet the proper standard.

1.2 Classification. - The finished product shall be of the following types and styles, as specified (see 6.2):

Type I - Milk, skimmed, or low-fat, pasteurized

- Style A - Plain skimmed milk
- Style B - Fortified skimmed milk
- Style C - Plain low fat milk
- Style D - Fortified low fat milk

Type II - Milk, whole, pasteurized

Type III - Half-and-half, or cream, pasteurized

- Style A - Half-and-half (minimum 11.5 percent milk fat and 19.0 percent total solids).
- Style B - Table cream (minimum 18.0 percent milk fat).

3.3 Finished product.

3.3.3 Microbiological requirements.

Standard plate count	≤ 20,000 per ml.
Coliforms	≤ 10 per ml

4.5.2 Microbiological examination - Microbiological examination shall be made in accordance with the following methods as published in Standard Methods for the Examination of Dairy Products:

Item		Method
1	Standard plate count	Agar plate
2	Coliform count	Coliform bacteria (Desoxycholate Lactose Agar)

MILITARY SPECIFICATION

MILK, STERILIZED, WHOLE

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers sterilized whole milk for use by the Armed Forces as an item of general issue on a limited basis (see 6.1).

1.2 Classification. The product shall be processed in accordance with the following methods, as specified (see 6.2):

Method 1 - High-temperature-short-time sterilized, aseptically canned (see 3.3).

Method 2 - In-can sterilized, end-over-end continuous agitation (see 3.3).

Method 3 - In-can sterilized, high-temperature-short-time (see 3.3).

3.2 Material. The material components shall comply with table I.

TABLE I. - Components

Item	Requirement
1	Raw milk shall be obtained from cows in herds accredited as tuberculosis-free and certified brucellosis-free by the U. S. Department of Agriculture, or herds that have passed an annual tuberculosis test and meet USDA requirements for an individually certified herd, or from cows in herds located in (1) a Modified Accredited Tuberculosis Area; and (2) either (a) Certified Brucellosis-free Area, or (b) a Modified Certified Brucellosis Area; or (3) an area in the process of being accredited or certified by the USDA. In addition, the milk shall be normal in appearance; practically free from colostrum and have a clean,

sweet odor. It shall be subject to inspection by the procuring agency or duly authorized representative. The bacterial estimate at time of processing, shall not exceed 300,000 per milliliter (ml) when determined by the standard plate count or direct microscopic clump count.

2 Skim milk, condensed skim milk or cream used for standardization shall be prepared from fresh, raw, whole milk meeting the requirements of table I, item 1, and shall be sweet and clean.

3.4 Finished product. The finished product shall be incubated according to 4.5.3. There shall be no swellers, leakers, springers or flippers.

4.5.2 Microbiological examination. Microbiological estimate of the raw milk shall be made in accordance with Standard Methods for the Examination of Dairy Products; Chapter: Direct Microscopic Method and Reduction Method.

4.5.3 Incubation test. The filled and sealed primary container shall be incubated at a temperature of 90° to 95°F. for 7 days and then tested for compliance with 3.4.

C-M-355a
January 10, 1962
SUPERSEDING
Int. Fed. Spec. C-M-00355
(AGR-AMS)
February 18, 1960 and
Fed. Spec. C-M-351c (in part)
January 1, 1943

FEDERAL SPECIFICATION

MILK, WHOLE, DRY

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers dry whole milks for the use of Federal agencies (see 6.1).

1.2 Classification

1.2.1 Types and grades. Dry whole milks shall be of the following types and grades, as specified (see 6.2):

Type I - Conventional

Premium grade
Extra grade

Type II - Instantized

Premium grade
Extra grade

3.3 Finished product.

3.3.3 Microbiological requirements.

	Premium grade	Extra grade
Standard plate count	≤ 30,000 per gram	≤ 50,000 per gram
Direct microscopic clump	≤ 40 million/gram	≤ 75 million/gram
Coliforms	≤ 90 per gram	≤ 90 per gram

4.3.2 Microbiological examination. Microbiological examination shall be made in accordance with Standard Methods for the Examination of Dairy Products as shown in Methods of Laboratory Analyses for Dry Whole Milk, Nonfat Dry Molk, Dry Buttermilk, and Dry Whey. (see 2.2).

Test	Method
Direct microscopic clump count	Levowitz-Weber Single Solution Stain or North's Aniline Methylene Blue*
Standard plate count	Agar plate
Coliform	Solid media

*In case of a dispute the Aniline Methylene Blue method will be final.

MIL-M-43241
AMENDMENT-4

11 December 1967
SUPERSEDING
Amendment-3
12 June 1967

MILITARY SPECIFICATION

MILK, FILLED, DRY, PLAIN OR CHOCOLATE, FORTIFIED

This amendment forms a part of Military Specification MIL-M-43241, dated 29 June 1964, and is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers fortified, dry (powdered), filled milk, plain and chocolate, for limited use by the Armed Forces, when authorized, as a non-perishable item (see 6.1).

1.2 Classification. The product shall be of the following types, as specified (see 6.2):

Type I - Milk, filled, fortified, plain, dry (powdered).

Type II - Milk, filled, fortified, chocolate, dry (powdered).

3.2 Material.

3.2.1 Milk. Milk shall be obtained from cows in herds complying with the animal health requirements of the latest edition of the U. S. ordinance as applied by appropriate state or local authority. At the time of use, the milk shall be normal in appearance and odor; the standard plate count or direct microscopic clump count shall not exceed 2,000,000 per milliliter (ml.); and the sediment shall not exceed 0.5 milligrams (mg.) per pint of milk.

3.6 Finished product. (types I and II)

3.6.2 Microbiological requirements.

Standard plate count	≤ 30,000 per gram
Coliforms	≤ 90 per gram
Salmonella test	Negative per 25 grams

4.6.2 Microbiological examination. Microbiological examination shall be made in accordance with one of the following methods from Standard Methods for the Examination of Dairy Products:

Test	Source		Method
Raw milk:			
Standard plate count	Chapter:	Agar Plate Method	
Direct microscopic clump count	Chapter:	Direct Microscopic Method	
Methylene blue	Chapter:	Reduction Methods	Methylene Blue Reduction
Resazurin			Resazurin Reduction
Finished product:	Chapter:	Concentrated Milk and Cultured	
	Sections:	Dry Milk	
Standard plate count			Agar Plate
Coliform			Coliform Group (Coliform Test with Solid Media using Desoxycholate Lactose Agar)

4.6.2.1 Salmonella. The salmonella test shall be conducted in accordance with the method outlined for salmonella in "USDA Laboratory Methods for Egg Products; Consumer and Marketing Service; PY Notice No. 150."

PP-O-00956F (Army-GL)
September 30, 1970
INTERIM REVISION OF
Fed. Spec. PP-O-956e
June 29, 1966

INTERIM

FEDERAL SPECIFICATION

OYSTERS, FRESH (CHILLED) AND FROZEN: SHUCKED

This Interim Federal Specification was developed by the U. S. Army Natick Laboratories, Natick, Mass. 01760, based on currently available technical information. It is recommended that Federal Agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized Federal Agencies to use this Interim Federal Specification as a valid exception to Federal Specification PP-O-956e dated June 29, 1966.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for the method of preparation and of packaging fresh and frozen raw shucked oyster meats.

1.2 Classification. The oysters shall be of the following types, classes, sizes, and count ranges, as specified:

1.2.1 Types.

Type I - Fresh (chilled)
Type II - Frozen
Type III - Frozen (IQF)

3.1 Type I - Fresh raw oysters

3.1.1.1 Microbiological requirements. Military procurement. Fresh raw oysters shall conform to the standard of satisfactory as defined on page 27, Appendix A, Part I of the U. S. Public Health Service Manual No. 33, (total aerobic plate count shall not exceed 500,000 per gram; the most probable number of fecal coliforms shall not exceed 230 per 100 grams of chilled or frozen product). The determination that the fresh raw oysters are satis-

factory shall be made twice in each calendar month. Fresh raw oysters shall have a pH of not less than 6.0 at destination at time of delivery.

3.2 Type II - Frozen raw oysters.

3.2.1 Microbiological requirements. The frozen raw oyster meats shall meet all the requirements of 3.1.1.1. The oyster meats shall be placed in a freezer equipped with suitable means of freezing and shall be frozen solid to an internal oyster temperature of 0 F or lower within 24 hours from the time of shucking and maintained at 0 F or lower until time of delivery. Frozen oyster meats furnished under this specification shall not be accepted if they have been frozen more than 180 days at the time of delivery calculated from the time the oysters were initially frozen.

3.3 Type III: Frozen raw oysters (IQF)

3.3.1 Microbiological requirements. Type III frozen raw oyster meats shall be prepared from fresh raw oysters that have been shucked under controlled conditions in conformance to the best commercial practice. The fresh raw lyster meats shall meet all the requirements of 3.1.1 and 3.1.1.1. The product shall be in excellent condition at time of delivery and shall exhibit no evidence of thawing or refreezing. Frozen oyster meats furnished under this specification shall not be accepted if they have been frozen more than 180 days at time of delivery calculated from the time the oysters were initially frozen.

4.3.4 Microbiological examination (for military procurement).

4.3.4.1 Sampling procedure. The following laboratory sampling procedure shall be followed:

(a) Sampling shall be done at the terminal point in the packing line immediately prior to placing the oysters into the freezer.

(b) Sample size shall be not less than 200 g. of meats and liquor; placed aseptically in a sealed sterile container, and held at a temperature not greater than 35 F.

(c) Samples to be subjected to laboratory testing within 48 hours from time of initial collection may be maintained in a chilled state providing that they are held at temperatures not exceeding 35 F. Samples not to be

subjected to laboratory analyses within 48 hours shall be placed in a 0 F or below freezer and maintained in a frozen condition until delivered to the laboratory.

(d) The samples shall be taken randomly according to acceptable statistical methods.

4.3.4.2 Preparation of sample.

(a) Weigh the sample to the nearest gram in a tared, sterile, blender container, and add an equal amount, by weight of sterile chilled buffered dilution water.

(b) Disintegrate the sample for 60 to 90 seconds in a waring-type blender at about 14,000 revolutions per minute.

(c) If the blended mixture has too heavy a consistency for pipetting, add two more parts of diluent.

4.3.4.3 Total aerobic plate count. Total aerobic plate count shall be made in accordance with Recommended Procedures for the Bacteriological examination of Sea Waters and Shellfish.

4.3.4.4 Fecal coliform count. Fecal coliform count shall be made as follows:

(a) Into each of five fermentation tubes containing lauryl tryptose broth, inoculate 2 ml. of the 1:2 dilution of the shellfish sample (equivalent to 1 g. of shellfish per tube). If a 1:4 dilution is used, the analyst should adjust for this dilution factor.

(b) Inoculate five tubes with 1 ml. of a 1:10 dilution of the shellfish sample (equivalent to 0.1 g. of shellfish per tube).

(c) Inoculate five tubes with 1 ml. of a 1:100 dilution of the shellfish sample (equivalent to 0.01 g. of shellfish per tube).

(d) Incubate the fermentation tubes at 35 C. Examine them at the end of 24 hours and if no gas has formed, examine them again at the end of the 48 hours.

(e) All gas-positive tubes at the end of 24 and 48 hours shall be subjected to the following test:

1. Transfer a loopful (loop not less than 3 mm in diameter) of the positive LTB culture into a fermentation tube containing Escherichia coli (EC) medium.

2. Incubate for 24 hours in a water bath at 44.5 C ± 0.2 C. The temperature of incubation shall be monitored by a Bureau of STandards calibrated thermometer.

3. From the confirmed positive-negative data, derive the most probable number from the standard MPN table as listed in the Standard Methods for the Examination of Dairy Products.

Z-P-00196C (Army-GL)
AMENDMENT-3

September 15, 1970
SUPERSEDING
Amendment-2 (Army-GL)
22 July 1969

AMENDMENT

FEDERAL SPECIFICATION

PEANUT BUTTER

This amendment was developed by the U. S. Army Natick Laboratories (GL), Natick, Mass., 01760, based on currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized Federal agencies to use this amendment as a valid exception to Federal Specification Z-P-00196c, dated April 16, 1968.

1. SCOPE AND CLASSIFICATION.

1.1 Scope. This specification covers types and classes of commercial peanut butter available for use by agencies of the Federal Government.

1.2 Classification.

1.2.1 Texture, types and grades. Peanut butter covered by this specification shall be of the following textures, types and grades as described in the U. S. Standards for Grades of Peanut Butter, except as modified in this specification.

Textures

I Smooth
II Medium
III Chunky or crunchy

Types
I Stabilized
II Non-stabilized

Grades

I "U.S. Grade A" or ("U.S. Fancy")
II "U.S. Grade C" or ("U.S. Standard").

3.2 Finished product

Microbiological requirements

Aflatoxin	Negative

Microbiological examination

4.2.8.5.1 Test for aflatoxin. A one pound composite sample, derived from the number of primary containers indicated by inspection level S-2, shall be tested for aflatoxin in accordance with 4.3.2. Lot size shall be expressed in terms of primary containers. The presence of aflatoxin shall be cause for rejection of the lot.

4.3.2 Chemical test for aflatoxin. The test for aflatoxin shall be made using approved FDA methods. The tests shall be conducted by the Processed Products Standardization and Inspection Branch, Fruits & Vegetables Division, Consumer Marketing Service, United States Department of Agriculture.

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

PORK AND BEEF CHOP SUEY, COOKED, FROZEN

The use of this document in procurement is restricted to the specific purpose for which it was originally furnished.

1. SCOPE

1.1 This purchase description covers requirements for prepared pork and beef chop suey in aluminum trays used by the Armed Forces as an item of general issue in kitchens where freezer facilities are available.

3.6 Finished product.

3.6.2 Microbiological requirement.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Negative per gram
Salmonella	Negative per 25 grams

4.5.2 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.4 of Military Specification MIL-M-0013966D (GL), Meal Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association Publications:

Recommended Methods for Microbiological Examination of Foods
Standard Methods for Examination of Dairy Products

4.5.2.8 Salmonella procedure. The procedure for salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

LP/P DES 27-70

9 June 1970

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

PORK, LOIN, SLICED, WITH GRAVY, COOKED, FROZEN

The use of this document in procurement is restricted to the specific purpose for which it was originally furnished.

1. SCOPE

1.1 This purchase description covers prepared frozen sliced pork loin with gravy in aluminum trays used by the Armed Forces as an item of general issue in kitchens where freezer facilities are available.

3.6 Finished product.

3.6.2 Microbiological requirements.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Neg by test
Salmonella	Neg by test

4.5.3 Microbiological examination. General procedures and methods shall be in accordance with Recommended Methods for the Microbiological Examination of Foods of the American Public Health Association.

MIL-P-43383A
30 September 1969
SUPERSEDING
MIL-P-43383
23 November 1965

MILITARY SPECIFICATION

PORK SAUSAGE, DEHYDRATED: PATTIES AND LINKS, COOKED

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

1. SCOPE

1.1 Scope. This specification covers requirements for freeze-dehydrated pork sausage for use by the Armed Forces as a component of operational rations.

1.2 Classification. The dehydrated pork sausage shall be of the following types and styles, as specified (see 6.1):

Type I - Patties
Type II - Links

Style 1 - Plain
Style 2 - With cream gravy

3.4 Finished product.

3.4.3 Microbiological requirements.

Standard plate count	≤ 200,000 per gram
Coliforms	≤ 40 per gram

3.5 The pork sausage and final product shall be prepared only in plants operating under inspection of PFID of the USDA. The product shall be handled and delivered under the same sanitary conditions that govern the handling and movements of similar products within and between establishments operated under USDA inspection, in accordance with Regulations Governing the Meat Inspection of the USDA.

4.5.2.5 Microbiological examination. Microbiological examination of the product shall be made in accordance with directions for dilution and plating in the Standard Methods for the Examination of Dairy Products except that samples shall be prepared for examination as specified in 4.5.2.6.

4.5.2.6 The product shall be prepared by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. Use aseptic precautions and a sterile spoon to transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) of sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile, 99 ml. buffered water dilution blank. Shake the diluted sample rapidly at least 50 times through an arc of one foot in order to insure homogeneity.

4.5.2.7 Standard plate counts. Duplicate plates shall be inoculated with 2 ml. of the appropriate dilutions and poured with plate count agar. Incubation shall be at 32 C for 72 hours. Report as standard plate count per gram of product.

4.5.2.8 Coliform plate counts. Duplicate plates shall be inoculated with 2 ml. portions of the 1:20 dilution.

MILITARY SPECIFICATION

PORK SLICES, DEHYDRATED, COOKED

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

1. SCOPE

1.1 This specification covers cooked, freeze-dehydrated sliced pork for use by the Armed Forces as a component of operational rations.

3.3.4 Finished product.

3.3.4.3 Microbiological requirements.

Standard plate count	≤ 110,000 per gram
Coliforms	≤ 20 per gram

4.5.2.3 Microbiological examination. Microbiological examination of the product shall be made in accordance with the methods published in Standard Methods for the Examination of Dairy Products of the American Public Health Association, except that samples shall be prepared for examination as specified in 4.5.2.3.1.

Test	Material	Method
Standard plate count	Appropriate dilution of product	Agar plate method, incubation at 32°C for 72 hrs.
Coliform plate count	Appropriate dilution of product	Coliform test with solid media.

4.5.3.1 Using aseptic precautions, open container and with a sterile spoon transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution.

Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 ml. suspension into a sterile, 99 ml. buffered water dilution blank. Shake the diluted sample rapidly at least 50 times, through an arc of 1 foot, in order to insure homogeneity. Plate the following: 2 ml. of a 1:20; 2 ml. of a 1:200 and 2 ml. of a 1:2000 dilution. Plate all dilutions in duplicate. For the coliform test plate 2 ml. of the 1:20 dilution in duplicate.

MILITARY SPECIFICATION

POTATO AND CHEESE BAR, DEHYDRATED, SURVIVAL TYPE

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

1. SCOPE

1.1 This specification covers potato and cheese flavored survival-type bars for use by the Armed Forces as a component of the general-purpose survival food packet.

3.4 Finished product.

Microbiological requirements

Salmonella	negative in 25 grams

Microbiological examination

4.5.2.2 Salmonella procedure. The procedure for salmonellae shall be conducted as outlined in FDA Bacteriological Analytical Manual.

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

SHRIMP CREOLE, COOKED, FROZEN

The use of this document is restricted to the specific purpose for which it was originally furnished.

1. Scope

1.1 This purchase description covers requirements for prepared shrimp creole in aluminum trays used by the Armed Forces as an item of general issue in kitchens where freezer facilities are available.

3.6 Finished product

3.6.2 Microbiological requirement.

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Neg by test
Salmonella	Neg by test

4.5.4 Microbiological examination. General procedures and methods shall be in accordance with Recommended Methods for the Microbiological Examination of Foods of the American Public Health Association.

PP-S-315c

July 16, 1962
SUPERSEDING
Int. Fed. Spec. PP-S-00315b
(F&WS)
April 6, 1961

FEDERAL SPECIFICATION

SHRIMP, FROZEN, RAW, BREADED

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for species, forms, classes, types, subtypes, coating content range, sizes, grades, methods of preparation, and packagingof frozen, raw, breaded shrimp consisting of a minimum of four segments. The term "shrimp" as used in this specification, unless otherwise indicated, refers to the headless, peeled, and deveined shrimp.

1.2 Classification.

1.2.1 Species. Breaded shrimp shall be prepared from the regular commercial species of shrimp in any combination with the exception of the sea bob (Xiphopenaeus Kryoeri).

Finished product.

3.4 Microbiological requirements (When specified by 6.1)

Standard plate count	≤ 500,000 per gram
Coliforms (MPN)	≤ 50 per gram

4.3.2 Microbiological examination. Unless otherwise specified, bacteriological analyses shall be made in accordance with the methods of the Association of Official Agricultural Chemists and the Standard Methods for the Examination of Water and Sewage. For the plate count use Association of Official Agricultural Chemists' method for eggs and egg products, with tryptone glucose yeast agar and incubating the plates at 35 C. For incidence

of coliform bacteria use Association of Official Agricultural Chemists' method for eggs and egg products following procedures for biochemical reactions recommended in the Standard Methods for the Examination of Water and Sewage. Preparation of the sample shall be as follows:

Place 100 grams of frozen shrimp in a dry, sterile blender jar and add equal amounts of cool sterile water. Blend for three minutes to obtain a uniform suspension of sample. Use this 1 to 1 dilution as the sample and proceed in accordance with the methods of the Association of Official Agricultural Chemists.

MIL-S-43275B

1973

SUPERSEDING
MIL-S-43275A
18 September 1969

MILITARY SPECIFICATION

SPAGHETTI WITH MEAT SAUCE, DEHYDRATED, COOKED

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

1. SCOPE

1.1 This specification covers cooked, freeze-dried spaghetti with meat sauce for use by the Armed Forces as a component of operational rations.

3.6 Finished product.

3.6.3 Microbiological requirements.

Aerobic plate count	≤ 75,000 per gram
E. coli	Negative per gram

4.5.3 Microbiological examination. Microbiological examination of the product shall be made, as applicable, in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Microbiological Methods: Section: Examination of Frozen, Chilled, Precooked, or Prepared Foods - Official First Action, except as specified in 4.5.3.1 and 4.5.3.2.

4.5.3.1 Preparation and dilution of the Food Homogenate. The finished product shall be prepared for chemical and microbiological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pickup. A representative sample shall then be removed and handled as specified in 4.5.3.1.1 and as described in 4.5.3.2.

4.5.3.1.1 Following addition of the diluent to the dry product, allow to stand for 15 minutes before blending. Continue as directed by AOAC.

4.5.3.2 E. Coli. Transfer 1 ml. of the 1:10 dilution prepared in 4.5.3.1 into each of 10 tubes of Lauryl Sulfate Tryptose (LST) broth. Incubate LST tubes at $35^{\circ} \pm 1C$ for 48 ± 2 hrs. Examine tubes for gas formation at 24 and 48 hour intervals. With a 3 mm loop, transfer a loopful of broth from each

positive LST tube displaying gas into a tempered EC broth germentation tube. Conduct EC test at $45.5^{\circ} \pm 0.2$ C as directed by the AOAC. EC tubes displaying gas production are considered positive for fecal coliforms. A single EC positive culture shall constitute rejection when confirmed to be E. coli types I (++--) or II (-+--) by the IMVIC testing procedure, using above referenced AOAC procedure.

MILITARY STANDARD

BACTERIAL STANDARDS FOR STARCHES, FLOURS, CEREALS, ALIMENTARY PASTES, DRY MILKS, AND SUGARS USED IN THE PREPARATION OF CANNED FOODS FOR THE ARMED FORCES

1. SCOPE

1.1 Purpose. Contamination by certain thermophilic organisms in starches, flours, cereals, alimentary pastes, dry milks, and sugars may cause spoilage when introduced as ingredients in the preparation of canned food products, especially when such canned products are stored at temperatures of from 98 F to 130 F. These organisms in the spore state are often highly heat resistant and may survive the heat processing to which canned products are subjected commercially. In order to minimize the possibility of spoilage due to such organisms, these standards have been adopted. In applying these standards to a specified ingredient of canned foods for the Armed Forces, considerations have been given to the following factors: (a) the proportion of the ingredient in the product; (b) the degree of heat processing consistent with the desired levels of stability, nutrition and palatability; and (c) the inherent nature of the canned product.

1.2 Coverage. These standards define the maximum permissible limits of contamination by thermophilic organisms in starches, flours, cereals, alimentary pastes, dry milks, and sugars used as ingredients in the preparation of canned foods for the Armed Forces and specify the methods to be used for examining these products to determine the presence of such organisms. The term alimentary pastes refers to such ingredients as spaghetti, macaroni and noodles. These standards do not apply to brown sugars or unrefined sirups.

5. Microbiological requirements.

5.1 Maximum permissible contamination.

5.1.1 Total aerobic thermophilic spore count. For five samples examined, no one sample shall contain more than 150 spores per 10 grams of sample and the average of the five samples shall not be greater than 125 spores per 10 grams of sample.

5.1.2 Flat sour spores. For five samples examined, no one sample shall contain more than 75 spores per 10 grams of sample, and the average of the five samples shall not be greater than 50 spores per 10 grams of sample.

5.1.3 Thermophilic anaerobic spores not producing hydrogen sulfide. These shall not be present in more than three of five samples nor in any one sample to the extent of more than four of the six tubes.

5.1.4 Thermophilic anaerobic spores producing hydrogen sulfide. These shall not be present in more than two of five samples nor in any one sample to the extent of more than five spores per ten grams. This is equivalent to two colonies in six inoculated tubes.

Microbiological examination

5.5 Examination of starches, flours, cereals, and alimentary pastes.

5.5.2 Preparation of samples for analysis. Samples shall be prepared for analysis in accordance with 5.5.2.1 or 5.5.3.3, as applicable.

5.5.2.1 Starches and flours. Place 20 grams of sample in a dry, sterile, 250-ml., wide mouth dilution bottle or Erlenmeyer flask marked to indicate a voluem of 100 ml. and containing a few (10 to 20) glass beads. Add sterile, cool water to the 100-ml mark with intermittent shaking. Shake well to obtain a uniform suspension in water. Proceed with the analysis as directed in 5.5.3.

5.5.2.2 Cereals and alimentary pastes. Place 50 grams of well mixed sample in a dry, sterile blender jar, and add 200 ml. of cool, sterile water. Blend for 3 minutes to obtain a uniform suspension of sample. Proceed with the analysis as directed in 5.5.3. For calculation purposes, consider that the total volume of the blended sample is equivalent to 250 ml. and that 10 ml. represents 2 grams of the original sample.

5.5.3 Determination of total aerobic thermophilic spore count. Procedure shall be as follows - Pipette 10 ml. of the sample suspension into a flask containing 100 ml. dextrose tryptone agar at a temperature of 55 to 60 C. Use large bore pipettes and keep the suspension under constant agitation during the pipetting operation. After the sample has been added to the dextrose tryptone agar, swirl the flask in boiling water for a period of 3 minutes. Place the flask in the autoclave and heat at 5 pounds per square inch steam pressure for 10 minutes. After autoclaving, the flask shall be gently agitated in running water while cooling. Violent agitation will incorporate air bubbles in the medium which may subsequently interfere with the reading of the plates. When the agar mixture is cooled to approximately 45 C., distribute the entire contents equally into 5 petri plates and allow them to harden; then proceed as directed in 5.5.3.1.

5.5.3.1 Invert plates and incubate plates at 55 C. In order to prevent drying of the agar, the incubator shall be humidified. Make readings in 24 and 48 hours and regard the higher colony count in the calculations. The combined count from the five plates represents the number of spores in two grams of the original sample. Multiply this count by five in order to express results in terms of spores per 10 grams of sample.

5.5.4 Determination of flat sour spores. The flat sour spore count shall be made from the same set of petri dishes used for the determination specified in 5.5.3. Appearance of these bacterial colonies is described in 5.5.4.1

5.5.4.1 Flat sour colonies are characteristic. The colony is round, measures from two to five millimeters in diameter, presents a typical opaque central "spot," and by reason of acid production in the presence of the indicator, is usually surrounded by a yellow halo in a field of purple. This halo may be insignificant, or missing, where certain low acid producing types are concerned or where the plate is so thickly seeded that the entire plate takes on a yellow tinge. The typical sub surface colonies are rather compact and may approach the "pinpoint" condition. When there is doubt as to the identity of the sub surface colonies, a decision can usually be made by observing the nature of the surface colonies. If the surface colonies indicate a reasonable purity of flora, it is safe for practical purposes to assume that the sub surface colonies have been formed by similar bacterial groups. It is emphasized that where the plate is heavily seeded, there may be loss of accuracy as regards counts, and colony structure and size may be atypical. Where plates are so heavily seeded as to make counting impracticable, it is sufficient to note that the sample is obviously below standard. At times the nature of the sub-surface colonies is in question. Whether they are flat

sour colonies may often be determined by transferring (by the streak method) from the colonies to other agar plates. Their surface characteristics may then be noted. Calculation of the count shall be made as specified in 5.5.3.1.

5.5.5 Determination of thermophilic anaerobes not producing hydrogen sulfide. Procedure shall be as follows: Using the unheated suspension of sample prepared in accordance with 5.5.2, divide 20 ml. approximately equally among six freshly exhausted liver broth tubes and gelatinize with heat as described in 5.5.5.1. Stratify the tubes with about 1-inch of either melted sterile vaspar or plain 2 percent agar. Vaspar may be added before or after the inoculated tubes are heated and cooled; plain 2 percent agar, if used, shall be added immediately after cooling the heat treated tubes. To maintain an even suspension in the heated tubes during gelatinization, it is necessary to agitate the tubes at frequent intervals in accordance with the treatment described in 5.5.5.1.

5.5.5.1 Spin or agitate tubes as follows - spin 3 tubes at a time, in the hands, just after the addition of the unheated sample suspension. Then place the tubes in the water bath. (see 5.4). The water in the bath shall be boiling at the time of introduction of the inoculated tubes into the bath. After the tubes have been placed in the boiling water bath, the individual tubes are then spun with the fingers. After all the tubes are in the boiling water bath, they are spun with the spinners described in 5.4, three of four times during the first five minutes. Continue the heating for ten additional minutes, then place in cold water to solidify. Proceed in accordance with 5.5.5.2.

5.5.5.2 Preheat the tubes at 55 C in a water bath, and incubate at 55 C for 48 hours. Under the conditions stated, thermophilic anaerobes are manifested through the lifting of the vaspar of the agar seal caused by gas formation in the tubes. At times of a "cheesy" odor is noted. The method is considered suitable as a qualitative test but quantitatively it provides only a means of estimation. The results cannot be expressed in terms of numbers of spores per unit weight of sample. Report thermophilic anaerobes not producing hydrogen sulfide as a fraction, with the number of tubes positive as the numerator and the total number of tubes examined as the denominator, e.g., 0/6, 3/6, 6/6, etc.

5.5.6 Determination of thermophilic anaerobes producing hydrogen sulfide. Procedure shall be as follows - using the unheated suspension of sample prepared in accordance with 5.5.2, divide 20 ml. approximately equally among six tubes of melted sulfite agar. Spin or agitate these tubes before heating and during the heating period as described in 5.5.5.1. Place in cold water to harden the agar. Proceed in accordance with 5.5.6.1.

5.5.6.1 Preheat the tubes to 55 C. in a water bath and incubate at 55 C., for 48 hours. In sulfite agar, the sulfite spoilage organisms are detected through the formation of characteristic blackened spherical areas. Due to the solubility of hydrogen sulfide and its fixation by the iron, no gas is noted. Certain of thermophilic anaerobes not producing H_2S (methods for the detection of which are specified in 5.5.5) give rise to relatively large amounts of hydrogen which splits the agar and reduces the sulfite, thereby causing general blackening of the medium. This condition, however, is readily distinguishable from the restricted blackened areas mentioned previously. The blackened areas may be counted to obtain quantitative results and the total count multiplied by 2.5 so that results are expressed on a 10-gram basis.

5.6 Examination of sugars and dry milks.

5.6.2 Preparation of samples for analysis. Samples shall be prepared for analysis as follows - Place 20 grams of sample in a dry, sterile, 250-ml., wide mouth dilution bottle or Erlenmeyer flask marked to indicate a volume of 100 ml. containing a few (10 to 20) glass beads. Add sterile water to the 100-ml. mark with intermittent shaking. Bring rapidly to a boil and boil for 5 minutes. Replace evaporation with sterile water.

5.6.3 Determination of total aerobic thermophilic spore count. Procedure shall be as follows - Into each of five petri dishes pipette 2 ml. of the boiled sample solution. Prepare well mixed spore plates using dextrose tryptone agar and allow agar to harden to a maximum degree. Incubate the plates at 55 C for 36 to 48 hours. In order to prevent drying of the agar, the incubator shall be humidified. The combined count from the five plates represents the numbers of spores in two grams of the original sample. Multiply this count by five in order to express results in terms of number of spores per 10 grams of sugar or dry milk.

5.6.4 Determination of flat sour spores. The flat sour spore count shall be made from the same set of petri dishes used for the determination specified in 5.6.3. Appearance of these bacterial colonies is described in 5.5.4.1.

5.6.5 Determination of thermophilic anaerobes not producing hydrogen sulfide. Procedure shall be as follows - Using the heated sample solution prepared in accordance with 5.6.2, divide 20 ml. approximately equally among six tubes of freshly exhausted liver broth and stratify the medium with about 1 inch of vaspar or plain 2 percent agar. Proceed as directed in 5.5.5.2.

5.6.6. Determination of thermophilic anaerobes producing hydrogen sulfide. Procedure shall be as follows - Using the heated sample solution prepared in accordance with 5.6.2, divide 20 ml. approximately equally among six tubes of melted sulfite agar. Place in cold water to harden the agar, and proceed as specified in 5.5.6.1.

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

FOR

SWISS STEAK WITH GRAVY, COOKED, FROZEN

The use of this document in procurement is restricted to the specific purpose for which it was originally furnished.

1. SCOPE

1.1 This purchase description covers the components and packaging and packing requirements for frozen convenience packaged Swiss Steak with Gravy for use by the Armed Forces kitchens where freezer facilities are available.

3.6 Finished product.

3.6.2 Microbiological requirements

Standard plate count	≤ 100,000 per gram
Coliforms	≤ 100 per gram
E. coli	Negative per gram
Salmonella	Negative per 25 grams

4.5.4 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.5 of Military Specification MIL-M-0013966D (GL), Meal, Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association Publications:

Recommended Methods for Microbiological Examination of Foods
Standard Methods for Examination of Waste and Waste Water
Standard Methods for Examination of Dairy Products

Salmonella procedure. The procedure for Salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

11 March 1970
SUPERSEDING
MIL-T-35038B
27 July 1973

MILITARY SPECIFICATION

TOPPING, DESSERT AND BAKERY PRODUCTS, DEHYDRATED (POWDERED)

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

1. SCOPE.

1.1 This specification covers dehydrated (powdered) topping for desserts and bakery products for use by the Armed Forces as an item of general issue (see 6.1).

3.4 Finished product requirements.

Microbiological requirements

Standard plate count	≤ 10,000 per gram
Coliforms	≤ 10 per gram
Salmonellae	negative per 25 grams

4.5.2 Microbiological examination. - Microbiological examination shall be made in accordance with the following methods in Standard Methods for the Examination of Dairy Products unless otherwise specified:

Item	Test	Method
1	Standard plate count	Agar plate method
2	Coliform count	Coliform Bacteria using Desoxycholate Lactose Agar
3	Salmonellae	1/

1/ Salmonellae test procedures shall be conducted as outlined in the Section on Salmonella of the Bacteriological Analytical Manual of the U. S. Department of Health, Education and Welfare, Food and Drug Administration.

MIL-T-35024A
AMENDMENT-4

30 June 1970
SUPERSEDING
Amendment-3
19 October 1966

MILITARY SPECIFICATION

TOPPING, DESSERT AND BAKERY PRODUCTS, FROZEN

This amendment forms a part of Military Specification MIL-T-35024A, dated 23 March 1964, and is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a frozen topping for desserts and bakery goods for use by the Armed Forces as a perishable item for general issue (see 6.1).

1.2 Classification. Frozen dessert and bakery topping covered by this specification shall be of the following types, as specified (see 6.2):

Type I - With nonfat milk solids
Type II - Without nonfat milk solids.

3.4 Finished product (types I and II).

3.4.2 Microbiological requirements.

Standard plate count	≤ 30,000 per gram
Coliforms	≤ 10 per gram

4.5.2 Microbiological examination. Microbiological examination shall be made in accordance with the following methods published in Standard Methods for the Examination of Dairy Products of the American Public Health Association:

Test	Chapter	Method
Bacterial estimate (as standard plate count)	Agar Plate Method	
Coliform count	Coliform Bacteria	Coliform test with solid media using desoxycholate lactose agar

MILITARY SPECIFICATION

TUNA, DEHYDRATED, COOKED

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. - This specification covers freeze-dehydrated tuna fish for use by Armed Forces as a component of operational rations.

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

Color 1 - white tuna
Color 2 - light tuna

Finished product

3.4.3 Microbiological requirements. (after packaging)

Standard plate count	≤ 200,000 per gram
Coliform	≤ 40 per gram

4.5.2 Microbiological examination. - Microbiological examination of the product shall be made in accordance with paragraphs 3.01 - 3.36, 6.12 and 6.18 of Standard Methods for the Examination of Dairy Products, except as specified in 4.5.2.1 through 4.5.2.3.

4.5.2.1 Using aseptic precautions, open container and, with a sterile spoon, transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile 99 ml. buffered water dilution blank. Further serial dilutions as required may be prepared by adding 11 ml. of prepared dilution to 99 ml. of diluent. Shake the diluted sample rapidly at least 50 times, through an arc of one foot, in order to insure homogeneity.

4.5.2.2 Standard plate counts. - Duplicate plates shall be inoculated with 2 ml. of the appropriate dilutions and poured with milk protein hydrolysate glucose agar. Incubation shall be at 32 C for 72 hours. Report as standard plate count per gram of product.

4.5.2.3 Coliform plate counts. - Duplicate plates shall be inoculated with 2 ml. portions of the 1:20 dilutions.

MILITARY SPECIFICATION

TURKEY, DEHYDRATED, COOKED

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. - This specification covers cooked, diced, freeze-dehydrated turkey for use by the Armed Forces as a component of operational rations.

1.2 Classification. - The dehydrated turkey shall be of the following types and classes, as specified (see 6.1):

Type I White meat
Type II - White and dark meat

Style a - 1/2 inch dice
Style b - 1 inch dice

3.4 Finished product.

3.4.3 Microbiological requirements.

Standard plate count	≤ 200,000 per gram
Coliforms	≤ 40 per gram

4.5.2 Microbiological examination. - Microbiological examination of the product shall be made in accordance with paragraphs 3.01-3.36, 6.12 and 6.18 of Standard Methods for the Examination of Dairy Products, except as specified in 4.5.2.1 through 4.5.2.4.

4.5.2.1 Using aseptic precautions, open container and, with a sterile spoon, transfer 20 grams of the product into a tared sterile blender jar. Measure 380 milliliters (ml.) sterile distilled water into a sterile graduated cylinder and add to the material in the blender jar. Let stand for approximately 15 minutes. Blend for 3 minutes. This is a 1:20 dilution. Prepare a 1:200 dilution by transferring 11 ml. of the 1:20 suspension into a sterile, 99 ml. buffered water dilution blank. Further

serial dilutions as required may be prepared by adding 11 ml. of prepared dilution to 99 ml. of diluent. Shake the diluted sample rapidly at least 50 times, through an arc of one foot, in order to insure homogeneity.

4.5.2.2 Items consisting of more than one ingredient shall be prepared for chemical and bacteriological testing by being adequately comminuted, care being taken to avoid contamination of product and moisture pick up. A representative sample shall then be removed and handled as described in 4.5.2.1.

4.5.2.3 Standard plate counts. - Duplicate plates shall be inoculated with 2 ml. of the appropriate dilutions and poured with milk protein hydrolysate glucose agar. Incubation shall be at 32 C for 72 hours. Report as standard plate count per gram of product.

4.5.2.4 Coliform plate counts. - Duplicate plates shall be inoculated with 2 ml. portions of the 1:20 dilutions.

(GL)

LIMITED PRODUCTION PURCHASE DESCRIPTION

TURKEY WITH GRAVY, COOKED, FROZEN

1. SCOPE

1.1 This purchase description covers the components and packaging and packing requirements for frozen convenience packaged turkey with gravy to be used by the Armed Forces in kitchens where freezer facilities are available as an item of general issue.

3.6 Finished product.

3.6.2 Microbiological requirement.

Standard plate count	≤ 100,000 per gram
Total coliform	≤ 100 per gram
Salmonella	Negative per 25 grams
E. coli	Negative per gram

4.5.2.2 Microbiological examination. Microbiological examination shall be performed according to the procedures described in 4.5.1.1 through 4.5.1.5 of Military Specification, MIL-M-0013966D (GL), Meal Precooked, Frozen. For background information the analyst is referred to the following American Public Health Association Publications:

Recommended Methods for Microbiological Examination of Foods

Standard Methods for Examination of Dairy Products.

4.5.2.8 Salmonella procedure. The procedure for Salmonella shall be conducted as outlined in USDA Microbiological Laboratory Guide Book.

EE-Y-131D
April 14, 1970
SUPERSEDING
Fed. Spec. EE-Y-131C
May 1, 1963

FEDERAL SPECIFICATION

YEAST, BAKERS

This specification was approved by the Commissioner, Federal Supply Service General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers two types of edible yeast for use by Federal agencies, compressed yeast for domestic use only, and active dry yeast for domestic and overseas use.

1.2 Classification.

1.2.1 Types. The yeast shall be of the following types, as specified (see 6.1).

Type I Compressed yeast
Type II - Active dry yeast

3. Microbiological requirements.

3.1 Material. The yeast shall be pure cultures of bakers' yeast (Saccharomyces cerevisiae) which have been grown in a wort of molasses, grain, or other suitable material fortified with other necessary nutrients.

3.2 Type I. Compressed yeast shall have a firm consistency and smooth springy texture. It shall break with a sharp edge fracture. It shall be light cream in color and shall have a characteristic yeast odor and taste. Microscopic examination (see 4.3.2) shall show a clean field of well developed cells, substantially free from wild yeast and foreign organisms. The moisture content shall not exceed 73 percent.

Rope spore count $\leq$ 100 per gram

3.3 Type II. Active dry yeast shall be a particulate product. The moisture content shall be not more than 8.5 percent.

Rope spore count ≤ 200 per gram

3.3.1 Standard active dry yeast. A stock of the standard active dry yeast is to be maintained by the designated laboratory. 1/ A new standard is to be prepared from a fresh supply of yeast every 12 months. The manufacturers of active dry yeast are to be supplied with fresh standards on or about October 1 of each year. The manufacturers are to notify the designated laboratory on or before August 15 of each year as to the estimated number of samples they will need for the 12-month period. Check-baking tests will be performed on the standards every 3 months by the designated laboratory. The results of these bakes are to be compared with the results of the bakes done when the standard was freshly prepared. If any significant deterioration is detected, the manufacturers are to be notified and a new standard prepared. The standard is to consist of a composite of commercially produced active dry yeast of high quality. The standard maintained at the designated laboratory laboratory shall be packed under vacuum or in nitrogen, in cans, and shall be stored at 40°F. (± 5°F.).

4.3.2 Microbiological examination.

4.3.2.1 Rope spore count. The rope spore count shall be made according to the method of Hoffman, Schweitzer, and Dalby, Control of Rope in Bread, Industrial and Engineering Chemistry, Vol. 29, No. 4 (April 1937), page 464, except that the time of heating the nutrient broth after inoculation shall be calculated from the timeethe temperature of the broth reaches 100°C.

4.3.2.2 Yeast cells. Direct microscopical examination of a fresh sample of yeast prepared to provide a concentration of approximately 150-200 yeast cells per field when examined at a magnification of about 450.

1/ Designated laboratory shall be Food Laboratory, U. S. Army Natick Labs., Natick, Mass. 01760

REFERENCES

1. American Public Health Association. 1962. Recommended procedures for the bacteriological examination of sea water and shellfish. APHA, 1790 Broadway, New York 19, N. Y.

2. American Public Health Association. 1966. Recommended methods for the microbiological examination of foods, 2nd edition, APHA, 1790 Broadway, New York 19, N. Y.

3. American Public Health Association. 1967. Standard methods for the examination of dairy products, 12th edition. APHA, 1790 Broadway, New York 19, N. Y.

4. American Public Health Association. 1971. Standard methods for the examination of water and waste water, 13th edition, APHA, 1790 Broadway, New York, N. Y.

5. Association of Official Analytical Chemists. 1970. Official methods of analysis, 11th ed. Association of Official Analytical Chemists, Washington, D. C.

6. Food and Drug Administration. 1969. Bacteriological analytical manual. Public Health Service, Consumer Protection and Environmental Health Service, Washington, D. C.

7. Frazier, W. C. 1967. Food microbiology. McGraw-Hill Book Company, New York, N. Y.

8. U. S. Department of Agriculture. 1968. Methods of laboratory analyses for dry whole milk, nonfat dry milk, dry buttermilk and dry whey. Dairy Division Agricultural Marketing Service, U.S.D.A., Washington, D. C.

9. U. S. Department of Agriculture. 1969. Microbiology laboratory guidebook. Laboratory Branch, Technical Services Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

10. U. S. Department of Agriculture. Laboratory methods for eggs and egg products. Poultry Division, Agricultural and Marketing Service, USDA, Washington, D. C. 20250.

Appendix: List of Military Sanitary Standards

1. MIL-STD-1105A, Sanitary Standards for Bakeries.

2. MIL-STD-1482, Sanitary Standards for Butter(and Related Products) Plants.

3. MIL-STD-1162, Sanitary Standards for Cheese and Cheese Products Plants.

4. MIL-STD-175B, Sanitary Standards for Equipment and Methods for the Handling of Milk and Milk Products in Bulk Milk Dispensing Operations.

5. MIL-STD-1483, Sanitary Standards for Fish Plants.

6. MIL-STD-668A, Sanitary Standards for Food Plants.

7. MIL-STD-1155, Sanitary Standards for Frozen Desserts Plants.

8. MIL-STD-1481, Sanitary Standards for Meat Processing Plants in Overseas areas

9. MIL-STD-671, Sanitary Standards for Milk Evaporating and Drying Plants.

10. MIL-STD-667A, Sanitary Standards for Shell Egg Plants.

11. MIL-STD-1156, Sanitary Standards for Soft Drink Plants.

[1]Sanitary Standards may be obtained from the U.S. Naval Publications and Forms Center, NPFC Code 1032, 5801 Tabor Avenue, Philadelphia, PA 19120

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