

INCH POUND

MIL-DTL-32221A  
21 September 2009  
SUPERSEDING  
MIL-DTL-32221  
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## DETAIL SPECIFICATION

### FILLED BAKERY ITEM, SHELF STABLE, FOR OPERATIONAL RATIONS

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

#### 1. SCOPE

1.1 Scope. This specification covers a shelf stable filled bakery item in a flexible pouch intended for use by the Department of Defense as a component of operational rations.

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

1.2.1 Types. The types are as follows:

- Type I - Filled French toast
- Type II - Cinnamon bun
- Type III - Apple turnover
- Type IV - Blueberry turnover
- Type V - Cherry turnover

Comments, suggestions, or questions on this document should be addressed to: US Army Research, Development & Engineering Command, Natick Soldier Research, Development and Engineering Center, RDNS-CFF, 15 Kansas Street, Natick, MA 01760-5018 or emailed to [ray.valvano@us.army.mil](mailto:ray.valvano@us.army.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

AMSC N/A

FSC 8920

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### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

#### 2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. None.

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

#### U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder  
(21 CFR Parts 1-199)

(Copies of this document are available online at [www.gpoaccess.gov/nara](http://www.gpoaccess.gov/nara) or from the Superintendent of Documents, ATTN: New Orders, P.O. Box 371954, Pittsburgh, PA 15250-7954.)

#### U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Primary Drinking Water Regulations

(Copies of this document are available online at [www.epa.gov](http://www.epa.gov) or from the Office of Drinking Water, Environmental Protection Agency, WH550D, 401 M Street, SW, Washington, DC 20460.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

#### AOAC INTERNATIONAL

Official Methods of Analysis (OMA) of the AOAC International

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(Copies of this document are available from [www.aoac.org](http://www.aoac.org) or AOAC International, 481 North Frederick Avenue, Suite 500, Gaithersburg, MD 20877)

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC)

Approved Methods of the American Association of Cereal Chemists

(Copies of this document are available from [www.aaccnet.org](http://www.aaccnet.org) or American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

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

(Copies of this document are available from [www.asq.org](http://www.asq.org) or ASQ, 600 North Plankinton Ave., Milwaukee, WI 53203.)

NATIONAL ACADEMY OF SCIENCES

Food Chemicals Codex

(Copies of this document are available from [www.nap.edu](http://www.nap.edu) or National Academy Press, 2101 Constitution Avenue, N.W. Washington, DC 20418.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Product standard. When specified (see 6.1), a sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with 4.2. The approved sample shall serve as the product standard. Should the contractor at any time plan to, or actually produce the product using different raw material or process methodologies from the approved product standard, which result in a product non comparable to the product standard, the contractor shall arrange for a new or alternate FA or PDM approval. In any event, all product produced must meet all requirements of this document including product standard comparability.

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

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off-colors. All ingredients shall meet and be in accordance with good commercial manufacturing practices.

3.2.1 Ingredients for bread.

3.2.1.1 Flour. The flour shall be matured, bleached, enriched, hard wheat flour, which will produce a product in compliance with 3.5. Alternatively, unenriched flour may be used provided the equivalent enrichments required in the Code of Federal Regulations (CFR) for Standard of Identity for Enriched Flour (21 CFR Part 137.165) are added at the time of production of the finished product. The flour used for preparation of the dough shall have a protein content of not less than 12.5 percent. Amylolytic enzyme activity, as determined by the “falling number” method shall not be less than 225. Flour not meeting protein requirements but otherwise in compliance may be supplemented with vital wheat gluten to the required protein level.

3.2.1.2 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

3.2.1.3 Shortening. The shortening shall be refined, hydrogenated vegetable oil or a combination of refined, hydrogenated vegetable oils which are commonly used by the baking industry and shall have a stability of not less than 100 hours as determined by the active oxygen method (AOM) or a free fatty acid content of less than or equal to 0.04. Shortening used for greasing dough trough, dough pieces, or baking molds shall conform to the above requirements.

3.2.1.4 Maple flakes. For Type I, the maple flakes should have a flake size of 10.0 by 4.0 by 1.9 mm. Flakes shall have a medium brown color and an aroma and flavor characteristic of maple (see 6.2.1).

3.2.1.5 Cinnamon flakes. For Type I, II, and III cinnamon flakes should have a flake size of 10.0 by 4.0 by 1.9 mm. Flakes shall have a medium to dark brown color and an aroma and flavor characteristic of cinnamon (see 6.2.2).

3.2.1.6 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.1.7 Yeast, instant dry. Yeast shall be active dry baker’s yeast instant dry. Compressed yeast shall not be used.

3.2.1.8 Salt. Salt shall be iodized, white, refined sodium chloride with or without anti-caking agents.

3.2.1.9 Emulsifier. The emulsifier shall be sucrose fatty acid esters complying with the 21 CFR Part 172.859 and shall be limited to sucrose ester stearate having a Hydrophilic-Lipophilic Balance (HLB) number of approximately sixteen.

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3.2.1.10 French toast flavor. For Type I, the flavor shall be an off white colored powder with the characteristic aroma and flavor of caramel and French toast (see 6.2.3).

3.2.1.11 Gum arabic. Gum arabic shall comply with the Food Chemicals Codex and shall have been produced from a solution of gum arabic which has been spray dried.

3.2.1.12 Calcium sulfate. Calcium sulfate shall comply with the Food Chemicals Codex.

3.2.1.13 Xanthan gum. Xanthan gum shall comply with the Food Chemicals Codex.

3.2.1.14 Sorbic acid, encapsulated. Encapsulated sorbic acid shall comply with the Food Chemicals Codex. The encapsulated sorbic acid shall consist of  $70 \pm 2$  percent sorbic acid and  $30 \pm 2$  percent vegetable oil. The vegetable oil shall have a melting point of 141°F to 147°F (61°C to 64°C) (see 6.2.4).

3.2.1.15 FD&C Yellow #5 Alum Lake. The lake shall be a yellow, water insoluble pigment made by absorbing FD&C Yellow #5 dye on a substrate of Alumina. The pure dye range shall be 35 to 42 percent (see 6.2.5).

3.2.1.16 Vital wheat gluten. Vital wheat gluten shall have a protein content (N x 5.7) of not less than 71.0 percent and a moisture content of not more than 6.5 percent.

3.2.1.17 Oxidizer/conditioner/mix reducer. For Type II, the oxidizer/conditioner/mix reducer shall be Im-Prove 200 or equal complying with the Food Chemicals Codex (see 6.2.13).

3.2.1.18 Sugar, white, granulated. For Type II, sugar shall be white, refined, granulated cane or beet sugar, or a combination thereof.

3.2.1.19 Butter flavor. For Type II, the butter flavor shall be a yellow powder with a creamy artificial butter profile (see 6.2.14).

3.2.1.20 Blueberry flavor. For Type IV, the flavor shall be white colored powder with the characteristic aroma and flavor of blueberry (see 6.2.15).

3.2.1.21 Blueberry flakes. For Type IV, the blueberry flakes shall have a flake size of 10.0 by 4.0 by 1.9 mm. Flakes shall not have any blue color but shall be white to off white and shall have the aroma and flavor characteristic of blueberry. (see 6.2.16).

3.2.1.22 Strawberry mini flakes. For Type V, strawberry flakes shall have a flake size of 10.0 by 4.0 by 1.9 mm. Flakes shall have a medium red color and shall have the aroma and flavor characteristic of strawberry (see 6.2.17).

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3.2.2 Ingredients for fillings. The following are suggested ingredients.

3.2.2.1.1 High fructose corn syrup. The syrup shall be a high conversion corn syrup that is enzymatically derived and isomerized to produce a saccharide composition which consists primarily of dextrose (50 percent) and fructose (42 percent). The syrup shall have a pH of 3.3 to 4.3, shall be 71 percent total solids and 29 percent moisture (see 6.2.6).

3.2.2.1.2 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

3.2.2.1.3 Crystalline dextrose. The dextrose shall be of regular granulation and comply with the requirements of Standards of Identity for Dextrose Monohydrate (21 CFR Part 168.111). The dextrose shall be 91.5 percent total solids, with a dextrose equivalent (DE) score not less than 99.5 (see 6.2.7).

3.2.2.1.4 Imitation maple syrup. For Type I, the imitation maple syrup shall possess a flavor and color characteristic of real maple syrup. The syrup shall be manufactured in accordance with the Standard of Identity for Table Syrup, (21 CFR Part 168.180). The syrup shall have a minimum 65 percent Brix solids.

3.2.2.1.5 Corn syrup. The corn syrup shall comply with 21 CFR Part 184.1865 as corn syrup Generally Recognized as Safe (GRAS). The corn syrup shall be 80 percent total solids, have a pH of 4.5 to 5.2 and a DE score of 41 to 45 (see 6.2.8).

3.2.2.1.6 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.2.1.7 Tapioca starch. The starch shall be a pregelatinized, modified starch derived from tapioca. The starch shall be a white to off-white powder with 10 percent maximum moisture (see 6.2.9).

3.2.2.1.8 Waxy maize starch. The starch shall be a cold water swelling modified food starch derived from waxy maize. The starch shall be white to off-white with 10 percent maximum moisture (see 6.2.10).

3.2.2.1.9 Imitation maple flavor. For Type I, the flavor shall have the aroma and flavor of maple (see 6.2.11).

3.2.2.1.10 Gum blend. The gum blend (acting as a moisture migration inhibitor) shall be Kelgum or equal to, which is a proprietary blend of xanthan gum and locust bean gum, suitable for use in food preparations. The ingredients of the gum blend shall comply with the Food Chemicals Codex. The gum shall exhibit stability over a pH range of 3.5 to 7.0 (see 6.2.12).

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3.2.2.1.11 Dried infused apples. For Type III, the apples shall have a moisture content of 11 percent  $\pm$  3 percent. The apples shall be a light golden color and the aroma and flavor shall be sweetened dried apples without any off flavor (see 6.2.18).

3.2.2.1.12 Apple concentrate. For Type III and V, the apple juice concentrate shall have a Brix of  $70^{\circ} \pm 1^{\circ}$  and a pH of 3.2 to 4.2. The apple concentrate shall have the aroma and flavor characteristic of the whole fruit. (see 6.2.19).

3.2.2.1.13 Vanilla extract. For Type III, the vanilla extract shall meet the Standard of Identity requirements listed in the 21 CFR Volume 2, Part 169, Section 169.175. The extract shall be dark brown in color and shall have the aroma and flavor characteristic of vanilla beans.

3.2.2.1.14 Apple flavor. For Type III, the apple flavor shall be a yellow/brown viscous liquid, pourable at room temperature. The flavor and aroma shall be sweetly spicy, predominated by cinnamon with backnotes of nutmeg and allspice (see 6.2.20).

3.2.2.1.15 Ground cinnamon. For Type III, the cinnamon shall be a medium to dark brown granular powder with the aroma and flavor of whole cinnamon sticks.

3.2.2.1.16 Infused dried cultivated blueberries. For Type IV, the blueberries shall have a moisture content range of 6 to 14 percent. The blueberries shall have a dark blue color and a flavor of sweetened dried blueberries without any off notes (see 6.2.21).

3.2.2.1.17 Infused dried cranberries, blueberry flavored. For Type IV, the cranberries shall have a moisture content range of 12 to 16 percent. The color shall have a deep blue appearance and the flavor and aroma shall have the characteristics of fruity blueberry with no off odors or flavors (see 6.2.22).

3.2.2.1.18 Blueberry juice concentrate. For Type IV, the blueberry juice concentrate shall be a blend of fruit juice concentrates and natural flavor formulated to match the color and flavor characteristics of blueberry juice concentrate. The Brix shall be  $65^{\circ} \pm 1^{\circ}$  Brix and the pH shall be 2.8 to 3.6. The color shall be dark blue and the aroma and flavor of natural blueberry (see 6.2.23).

3.2.2.1.19 Blueberry flavor. For Type IV, the blueberry flavor shall be artificial blueberry. The flavor shall be in liquid form and have the aroma and flavor characteristics of blueberry (see 6.2.24).

3.2.2.1.20 Natural blue coloring agent. For Type IV, the natural blue coloring agent shall be a dark red liquid containing vegetable juice, citric acid and sodium benzoate. The pH shall be 2.0 to 3.5. The natural coloring agent must meet the specifications outlined in the 21 CFR Parts 70 - 82 (see 6.2.25).

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3.2.2.1.21 Infused dried red tart cherries. For Type V, the cherries shall be whole or julienne sliced (1/8 inch thick). The moisture content range shall be 7 to 11 percent. The color shall be cherry red and the flavor shall be a sweetened dried cherry (see 6.2.26).

3.2.2.1.22 Infused dried cranberries, cherry flavored. For Type V, the cranberries shall have a moisture content range of 12 to 16 percent. The color shall have a red appearance. The flavor and aroma shall be characteristic cherry flavor with no off flavor or aromas (see 6.2.27).

3.2.2.1.23 Cherry juice concentrate. For Type V, the cherry concentrate shall have a Brix of  $68^{\circ} \pm 1^{\circ}$  and pH of 3.0 to 3.4. Color should be medium to dark red. The flavor and aroma shall be red sour cherry (see 6.2.28).

3.2.2.1.24 Cherry flavor. For Type V, the flavor shall be artificial cherry flavor in liquid form with the aroma and flavor characteristics of cherry (see 6.2.29).

3.2.2.1.25 Artificial red coloring agent. For Type V, the artificial color shall be red (see 6.2.30).

### 3.3 Preparation and processing.

#### 3.3.1 Preparation of bread.

3.3.1.1 Preparation of type I, filled French toast dough. The bread shall be formulated from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
Flour <u>1/</u>	46.6
Water <u>1/</u>	25.2
Shortening	7.8
Maple flakes	6.0
Cinnamon flakes	4.7
Glycerol	4.6
Yeast (instant dry only) <u>1/</u>	1.8
Salt	1.1
Emulsifier	0.7
French toast flavor	0.5
Gum arabic	0.5
Calcium sulfate	0.2
Xanthan gum	0.2
Sorbic acid, encapsulated	0.09
FD&C Yellow #5 Alum Lake	0.01

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1/ The percent by weight of flour, water and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

The bread shall be manufactured by the straight dough method. The following procedure has been shown to produce product meeting the end item requirements:

- a. Begin with lowest mixing speed.
- b. Mix all dry ingredients except flavor flakes.
- c. Add shortening and mix to crumble consistency.
- d. Add water and mix until incorporated.
- e. Add glycerol and mix until dough forms ball.
- f. Increase speed and continue mixing until dough develops.
- g. Add the maple and cinnamon flakes at the last stage of dough development.
- h. Chill dough sufficiently that it will sheet into pieces that will meet end item requirements.

3.3.1.2 Preparation of type II, cinnamon bun dough. The bread shall be formulated from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
Flour <u>1/</u>	47.5
Water <u>1/</u>	25.8
Shortening	8.2
Glycerol	6.0
Cinnamon flakes	4.7
Yeast (instant dry only) <u>1/</u>	1.9
Sugar	1.9
Salt	1.2
Emulsifier	0.9
Oxidizer/conditioner/mix reducer	0.5
Gum arabic	0.5
Vital wheat gluten	0.3
Calcium sulfate	0.24
Xanthan gum	0.23
Sorbic acid, encapsulated	0.09
Butter flavor	0.03
FD&C Yellow #5 Alum Lake	0.01

1/ The percent by weight of flour, water and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

The bread shall be manufactured by the straight dough method. The following procedure has been shown to produce product meeting the end item requirements:

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- a. Begin with lowest mixing speed.
- b. Mix all dry ingredients except flavor flakes.
- c. Add shortening and mix to crumble consistency.
- d. Add water and mix until incorporated.
- e. Add glycerol and mix until dough forms ball.
- f. Add the cinnamon flakes.
- g. Increase speed and continue mixing until dough develops.
- h. Chill dough sufficiently that it will sheet into pieces that will meet end item requirements.

3.3.1.3 Preparation for Type III, apple turnover dough. The bread shall be formulated from the following ingredients in the proportions specified:

<u>Ingredients</u>	<u>Percent by weight</u>
Flour, bread <u>1/</u>	46.9
Water <u>1/</u>	29.1
Shortening	7.9
Cinnamon flakes	6.6
Glycerol	4.7
Yeast (instant dry only) <u>1/</u>	1.9
Salt	1.2
Emulsifier	0.7
Gum arabic	0.5
Calcium sulfate	0.2
Xanthan gum	0.2
Sorbic acid, encapsulated	0.09
FD&C Yellow #5 Alum Lake	0.01

1/ The percent by weight of flour, water and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

The bread shall be manufactured by the straight dough method. The following procedure has been shown to produce product meeting the end item requirements:

- a. Begin with lowest mixing speed.
- b. Mix all dry ingredients except flavor flakes.
- c. Add shortening and mix to crumble consistency.
- d. Add water and mix until incorporated.
- e. Add glycerol and mix until dough forms ball.
- f. Increase speed and continue mixing until dough develops.
- g. Add cinnamon flakes at last dough development stage. Time to develop varies on batch size and mixer.

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h. Chill dough sufficiently that it will sheet into pieces that will meet end item requirements.

3.3.1.4 Preparation for Type IV, blueberry turnover dough. The bread shall be formulated from the following ingredients in the proportions specified:

<u>Ingredients</u>	<u>Percent by weight</u>
Flour, bread <u>1/</u>	47.6
Water <u>1/</u>	29.6
Shortening	8.0
Blueberry flakes	5.0
Glycerol	4.7
Yeast (instant dry only) <u>1/</u>	1.9
Salt	1.2
Emulsifier	0.8
Gum arabic	0.5
Blueberry flavor	0.2
Calcium sulfate	0.2
Xanthan gum	0.2
Sorbic acid, encapsulated	0.09
FD&C Yellow #5 Alum Lake	0.01

1/ The percent by weight of flour, water and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

The bread shall be manufactured by the straight dough method. The following procedure has been shown to produce product meeting the end item requirements:

- a. Begin with lowest mixing speed.
- b. Mix all dry ingredients except flavor flakes.
- c. Add shortening and mix to crumble consistency.
- d. Add water and mix until incorporated.
- e. Add glycerol and mix until dough forms ball.
- f. Increase speed and continue mixing until dough develops.
- g. Add blueberry flakes at last dough development stage. Time to develop varies on batch size and mixer.
- h. Chill dough sufficiently that it will sheet into pieces that will meet end item requirements.

3.3.1.5 Preparation for Type V, cherry turnover dough. The bread shall be formulated from the following ingredients in the proportions specified:

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<u>Ingredients</u>	<u>Percent by weight</u>
Flour, bread <u>1/</u>	47.7
Water <u>1/</u>	29.6
Shortening	8.0
Strawberry flakes	5.0
Glycerol	4.7
Yeast (instant dry only) <u>1/</u>	1.9
Salt	1.2
Emulsifier	0.8
Gum arabic	0.5
Calcium sulfate	0.2
Xanthan gum	0.2
Sorbic acid, encapsulated	0.1
FD&C Yellow #5 Alum Lake	0.01

1/ The percent by weight of flour, water and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

The bread shall be manufactured by the straight dough method. The following procedure has been shown to produce product meeting the end item requirements:

- a. Begin with lowest mixing speed.
- b. Mix all dry ingredients except flavor flakes.
- c. Add shortening and mix to crumble consistency.
- d. Add water and mix until incorporated.
- e. Add glycerol and mix until dough forms ball.
- f. Increase speed and continue mixing until dough develops.
- g. Add strawberry flakes at last dough development stage. Time to develop varies on batch size and mixer.
- h. Chill dough sufficiently that it will sheet into pieces that will meet end item requirements.

### 3.3.2 Preparation of fillings.

a. The following filling formulas and ingredients have been successfully made at U.S. Army Natick Soldier Center and a commercial manufacturer to produce end items meeting the requirements. Ingredient suppliers and available specific ingredients may change (companies bought out, part numbers change, ingredients no longer supplied, etc.). The following filling formulations are recommendations and have been proven successful.

b. All filling mixtures shall be cooled at room temperature and not refrigerated. The fillings shall be used in the final product or frozen within 60 days. If frozen, the fillings shall be held at 0°F (-18°C) or below for not more than 180 days. A Certificate of Conformance (CoC) will be

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required. The filling mixture water activity shall not exceed 0.84. A Certificate of Analysis (CoA) will be required.

3.3.2.1 Preparation of type I filling. The maple filling may be formulated and prepared from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
High fructose corn syrup	32.7
Water	23.4
Crystalline dextrose	14.0
Imitation maple syrup	9.5
Corn syrup	9.3
Glycerol	4.7
Tapioca starch	2.8
Waxy maize starch	2.8
Imitation maple flavor	0.77
Moisture migration inhibitor	0.03

The following procedural steps have been shown to produce end items meeting the requirements:

- a. Premix starches, gum and dextrose to eliminate clumping.
- b. Mix syrups to blend completely.
- c. Add dry ingredients to syrup mixture slowly, stirring constantly.
- d. Mix in flavor and water.
- e. Heat mixture, add glycerol after mixture reaches at least 100°F (38°C).
- f. Cook filling mixture to reduce water activity to target 0.84. Cook down temperature should target 190°F (87°C).

3.3.2.2 Preparation of type II filling. The cinnamon filling may be formulated and prepared from the following ingredients in the proportions specified:

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Ingredients	Percent by Weight
High fructose corn syrup	36.3
Water	23.4
Crystalline dextrose	14.0
Corn syrup	12.0
Glycerol	5.0
Ground cinnamon	3.3
Tapioca starch	2.5
Waxy maize starch	2.5
Imitation vanilla flavor	0.97
Moisture migration inhibitor	0.03

The following procedural steps have been shown to produce end items meeting the requirements:

- a. Premix starches, gum and dextrose to eliminate clumping.
- b. Mix syrups to blend completely.
- c. Add dry ingredients to syrup mixture slowly, stirring constantly.
- d. Mix in flavor and water.
- e. Heat mixture, add glycerol after the mixture reaches at least 100°F (38°C).
- f. Cook filling mixture to reduce water activity. Temperature should not exceed 190°F (87°C).

3.3.2.3 Preparation of type III filling. The apple filling may be formulated and prepared from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
High fructose corn syrup	21.0
Water	20.9
Dried infused apple	20.9
Apple concentrate	11.0
Crystalline dextrose	10.7
Corn syrup	7.1
Glycerol	3.6
Tapioca starch	2.1
Waxy maize starch	2.1
Vanilla extract	0.56
Moisture migration inhibitor	0.02
Ground cinnamon	0.01
Apple flavor	0.01

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The following procedural steps have been shown to produce end items meeting the requirements:

- a. Premix starches, gum and dextrose to eliminate clumping.
- b. Mix syrups and apple concentrate to blend completely.
- c. Add dry ingredients to syrup mixture slowly, stirring constantly.
- d. Mix in flavor and water.
- e. Heat mixture, add glycerol after the mixture reaches at least 100°F (38°C).
- f. Cook filling mixture to reduce water activity. Temperature shall not exceed 190°F (87°C).
- g. Prior to adding the dried apple cubes and cinnamon, the water activity of the gel matrix should target 0.84.
- h. Stir in dried apples and cinnamon.

3.3.2.4 Preparation of type IV filling. The blueberry filling may be formulated and prepared from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
High fructose corn syrup	21.1
Water	20.9
Blueberry Juice concentrate	11.1
Crystalline dextrose	10.7
Infused dried cultivated blueberries	10.5
Infused dried cranberries, blueberry flavored	10.5
Corn syrup	7.1
Glycerol	3.6
Tapioca starch	2.14
Waxy maize starch	2.14
Blueberry flavor	0.19
Moisture migration inhibitor	0.02
Natural blue coloring agent <u>1/</u>	0.01

The following procedural steps have been shown to produce end items meeting the requirements:

- a. Premix starches, gum and dextrose to eliminate clumping.
- b. Mix syrups and fruit concentrate to blend completely.
- c. Add dry ingredients to syrup mixture slowly, stirring constantly.
- d. Mix in flavor and water.
- e. Heat mixture, add glycerol after the mixture reaches at least 100°F (38°C).
- f. Cook filling mixture to reduce water activity. Temperature shall not exceed 190°F (87°C).
- g. Prior to adding the dried blueberry flavor infused dried cranberries and blueberry flavored infused dried blueberries, the water activity of the gel matrix should target 0.84.

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h. Stir in dried blueberry flavor infused cranberries and dried blueberries.

1/ Artificial blueberry color over extended storage durations leads to undesirable, non-characteristic color green color changes to the blueberry.

3.3.2.4 Preparation of type V filling. The cherry filling may be formulated and prepared from the following ingredients in the proportions specified:

<u>Ingredient</u>	<u>Percent by weight</u>
High fructose corn syrup	20.1
Water	19.9
Infused dried red tart cherries	14.9
Crystalline dextrose	10.2
Infused dried cranberries, cherry flavored	10.0
Corn syrup	6.8
Apple concentrate	5.4
Cherry juice concentrate	5.1
Glycerol	3.4
Tapioca starch	2.03
Waxy maize starch	2.03
Cherry flavor	0.11
Moisture migration inhibitor	0.02
Artificial red coloring agent	0.01

The following procedural steps have been shown to produce end items meeting the requirements:

- a. Premix starches, gum and dextrose to eliminate clumping.
- b. Mix syrups and fruit concentrate to blend completely.
- c. Add dry ingredients to syrup mixture slowly, stirring constantly.
- d. Mix in flavor and water.
- e. Heat mixture, add glycerol after the mixture reaches at least 100°F (38°C).
- f. Cook filling mixture to reduce water activity. Temperature shall not exceed 190°F (87°C).
- g. Prior to adding the infused dried cranberries, cherry flavored and infused dried red tart cherries, the water activity of the gel matrix should target 0.84.
- h. Stir in dried cherry flavor infused cranberries and dried infused cherries.

### 3.3.3 Preparation of filled bakery item.

3.3.3.1 Sheeting and filling. The chilled dough shall be sheeted into pieces of sufficient weight and filled to ensure compliance with finished product net weight requirements.

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3.3.3.2 Forming.

3.3.3.2.1 Type I. For type I, the filling weight shall be a minimum 1.1 ounces (31.2 grams). The formed product made with a dough weight of 3.0 ounces (85.0 grams) and filling weight of 1.1 ounces (31.2 grams) and a final product weight of 4.1 ounces (116.2 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.3.2.2 Type II. For type II, the filling weight shall be a minimum 0.8 ounces (22.7 grams). The formed product made with a dough weight of 3.3 ounces (93.6 grams) and filling weight of 0.8 ounces (22.7 grams) and a final product weight of 4.1 ounces (116.2 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.3.2.3 Types III, IV and V. For type III, IV and V, the filling weight shall be a minimum 1.3 ounces (38 grams). The formed product made with a dough weight of 2.3 ounces (63 grams) and filling weight of 1.3 ounces (38 grams) and a final product weight of 3.6 ounces (101 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.3.3 Proofing. The formed product shall be proofed at 90°F to 100°F (32°C to 38°C) and 75 to 100 percent relative humidity (RH) for 40 to 70 minutes. Fluctuations due to opening and closing of proof box doors are acceptable as long as end item requirements are met.

3.3.3.4 Baking. The proofed product shall be fully baked to a minimum internal temperature of 180°F (82°C) and until the exterior is a uniform medium golden brown.

3.4 Packaging methods. A continuous method shall be used. One unit of a filled bakery item and one oxygen scavenger shall be placed into the pouch. The internal temperature of the product shall be not less than 80°F (27°C) or greater than 120°F (49°C).

3.4.1 Oxygen scavenger. The oxygen scavenger shall be FDA approved as suitable for use with food. The oxygen scavenger shall be resistant to the migration of oil, moisture and scavenger components (see 6.3).

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

- a. There shall be no foreign materials such as, but not limited to dirt, insect parts, hair, wood, glass, metal or mold.
- b. There shall be no foreign odors or flavors such as, but not limited to burnt, scorched, moldy, rancid, sour or stale.
- c. There shall be no foreign color to the product.

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- d. For type I and II, no individual pouch shall contain less than 3.5 ounces (99 grams). For type III, IV, and V no individual pouch shall contain less than 3.1 ounces (88 grams).
- e. Each pouch shall contain one intact unit of filled bakery item and one oxygen scavenger.
- f. The water activity for any individual pouch shall not be greater than 0.86 when measured at 77°F (25°C).
- g. The oxygen content of the filled and sealed pouches shall not exceed 0.30 percent after 48 hours from time of sealing.
- h. For Type I, the pH shall not exceed 5.6. For Type II, III, IV, and V the pH shall not exceed 5.2.
- i. The texture of the bread shall not be excessively dry and crumbly or excessively moist and gummy.
- j. The bread shall be slightly dense and have a uniform cell structure.
- k. The bread shall show no evidence of compression streaks.
- l. The crust color shall be uniform medium golden brown.
- m. There shall be no evidence of excessive flour dusting.
- n. The filling shall not be excessively thin or runny.
- o. The filled bakery items shall not have filling leakage through the bread portion of the product.
- p. The type I product shall have a sweet maple and French toast odor and flavor.
- q. For type I, the crust shall contain visible dark brown flavor flakes.
- r. The type II, product shall have a sweet cinnamon odor and flavor.
- s. For type II and III, the crust shall contain visible dark brown cinnamon flakes.
- t. For type III, the product shall have a sweet cooked apple pie odor and flavor and shall have visible fruit pieces through out the tan to pale yellow colored gel matrix.

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- u. For type IV, the product shall have a sweet blueberry odor and flavor and shall have visible fruit pieces through out the dark blue to purple colored gel matrix.
- v. For type V, the product shall have a sweet, slightly tart cherry odor and flavor and shall have visible fruit pieces through out the cherry red colored gel matrix.
- w. For type V, the crust shall contain visible dark pink to red fruit flakes.
- x. For types I and II, the product shall be in a square or rectangular shape.
- y. For types III, IV, and V, the product shall be in a half circle shape.

3.5.1 Overall appearance and palatability. The finished product shall be equal to or better than the approved product standard sample (see 6.1) in palatability and overall appearance.

3.6 Plant qualifications. The product shall be prepared, processed and packaged in establishments meeting the requirements of 21 CFR Part 110 “Current Good Manufacturing Practice in Manufacturing, Processing, Packaging, or Holding of Human Food”, and the plant sanitation requirements of the appropriate Government inspection agency.

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

#### 4. VERIFICATION

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

- a. Product standard inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 Product standard inspection. The first article or product demonstration model shall be inspected in accordance with the provisions of this specification and evaluated for overall appearance and palatability. Any failure to conform to the requirements or any appearance or palatability failure shall be cause for rejection of the lot. The approved product standard shall be used for periodic review evaluations. All food components that are inspected by the USDA shall be subject to periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

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US Army Research, Development and Engineering Command  
Natick Soldier Research, Development and Engineering Center  
RDNS-CFF  
15 Kansas Street  
Natick, MA 01760-5018

One lot shall be randomly selected during each calendar month of production. Six (6) sample units of each item produced shall be randomly selected from that one production lot. The six (6) sample units shall be shipped to Natick within five working days from the end of the production month and upon completion of all USDA inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

4.2.1 Product examination. The filled and sealed pouches shall be conditioned to 70°F to 80°F (21°C to 27°C) and examined for the defects listed in table I. The lot size shall be expressed in pouches. The sample unit shall be the contents of one pouch. Utilizing the double sampling plans indicated in ANSI/ASQ Z1.4, the inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for minor defects.

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TABLE I. Product defects. 1/ 2/

<u>Category</u>		<u>Defect</u>
<u>Major</u>	<u>Minor</u>	
101		Product not type as specified.
102		Pouch does not contain one intact filled bakery item or does not contain one intact oxygen scavenger.
103		Tear or hole or open seal in oxygen scavenger.
104		Leakage of filling from the bread portion of the product. 3/
105		Bread texture excessively dry or crumbly or excessively moist or gummy.
	201	Bread shows evidence of compression streaks.
	202	Crust color not medium golden brown.
	203	Crust shows excessive dusting of flour.
	204	Bread texture not slightly dense or not a uniform cell structure.
	205	Filling excessively thin or runny.
	206	Product shape not as specified.
		<u>Type I</u>
106		Product does not have a sweet maple or French toast odor or flavor.
	207	Crust contains no visible dark brown flavor flakes.
		<u>Type II</u>
107		Product does not have sweet cinnamon odor or flavor.
	208	Crust contains no visible dark brown cinnamon flakes.
		<u>Type III</u>
108		Product does not have a sweet cooked apple pie odor or flavor.

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TABLE I. Product defects. 1/ 2/ continued

<u>Category</u>		<u>Defect</u>
<u>Major</u>	<u>Minor</u>	
	209	Crust contains no visible dark brown cinnamon flakes.
	210	Product does not have visible fruit pieces through out the tan to pale yellow colored gel matrix.
		<u>Type IV</u>
109		Product does not have a sweet blueberry odor or flavor.
	211	Product does not have visible fruit pieces through out the dark blue to purple colored gel matrix.
		<u>Type V</u>
110		Product does not have a sweet, slightly tart cherry odor or flavor.
	212	Crust contains no visible dark pink to red fruit flakes.
	213	Product does not have visible fruit pieces through out the cherry red colored gel matrix.
		<u>Net weight</u>
	214	For Types I and II, net weight of an individual pouch less than 3.5 ounces (99 grams). <u>4/</u>
	215	For Types III, IV, and V, net weight of an individual pouch less than 3.1 ounces (88 grams). <u>4/</u>

1/ Presence of any foreign materials for example, dirt, insect parts, hair, wood, glass, metal or mold, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale or foreign color shall be cause for rejection of the lot.

2/ Product not equal to or better than the approved product standard in palatability or overall appearance shall be cause for rejection of the lot (see 3.5.1).

3/ Filling leaking from an opening less than 1/2 inch is acceptable.

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4/ The net weight of the filled and sealed pouches shall be determined by weighing each sample on a suitable scale tared with a representative empty pouch and one oxygen scavenger. Results shall be reported to the nearest 0.1 ounce or to the nearest 1 gram.

4.3 Conformance inspection. Conformance inspection shall include the examinations of 4.2.1, 4.3.1, 4.3.2, and the tests of 4.4.1 through 4.4.3.

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

4.3.2 Ingredient and component examination. Conformance of ingredients and components to identity, condition, and other requirements specified in 3.2 shall be certified by the ingredient supplier or ingredient manufacturer, and compliance shall be verified by examination of pertinent labels, markings, US Grade Certificates, certificates of analyses, or other such valid documents acceptable to the inspection agency. If necessary, each ingredient shall be examined organoleptically or inspected according to generally recognized test methods such as the standard methods described in the Official Methods of Analysis (OMA) of the Association of Official Analytical Chemists and in the Approved Methods of the American Association of Cereal Chemists, to determine conformance to the requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient or component lot or of any involved product.

4.4 Tests. A Certificate of Conformance (CoC) for filling storage time and temperature is required (see 3.3.2). A Certificate of Analysis (CoA) for the filling mixture water activity is required (see 3.3.2).

4.4.1 Water activity ( $A_w$ ) testing. Eight filled and sealed pouches shall be selected at random from one production lot. Water activity shall be determined not less than 4 days but not more than 14 days after baking to allow moisture equilibration in the product. The pouched product shall be individually tested for  $A_w$  in accordance with the Official Methods of Analysis of the AOAC method 978.18, using an electric hygrometer system self temperature controlled at 77°F (25°C) or an equivalent instrument. Each individual sample unit shall be ground prior to  $A_w$  analysis. The results of each  $A_w$  determination shall be reported to the nearest 0.01. Any test result not conforming to the  $A_w$  requirement in 3.5 shall be classified as a critical defect and the lot shall be rejected.

4.4.2 Oxygen content testing. Eight filled and sealed pouches shall be randomly selected from one production lot and individually tested for oxygen content. Testing shall be accomplished after the filled and sealed pouches have been allowed to equilibrate at room temperature for not less than 48 hours from the time of sealing. Test results shall be reported to

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the nearest 0.01 percent. Any test result not conforming to the oxygen content requirement in 3.5 shall be classified as a major defect and shall be cause for rejection of the lot.

4.4.3 Analytical. The sample to be analyzed shall be a composite of eight filled and sealed pouches which have been selected at random from the lot. The composite sample shall be prepared and analyzed in accordance with the following Official Methods of Analysis (OMA) of AOAC International.

<u>Test</u>	<u>Method Number</u>
pH	981.12

Test results of pH value shall be reported to the nearest 0.1. Government verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the pH requirement in 3.5 shall be cause for rejection of the lot.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.1). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type of product required (see 1.2).
- c. When other than first article or product demonstration model is required (see 3.1).
- d. Provisions for approved product standard samples (see 3.5.1).
- e. Packaging requirements (see 5.1).

6.2 Ingredient information.

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6.2.1 Maple flakes. SensoryEffects Maple NT - 2471 mini flakes manufactured by Loders Croklaan, 24708 West Durkee Rd, Channahon, IL 60410 meets the requirements of 3.2.1.4 and performs satisfactorily in this product.

6.2.2 Cinnamon flakes. SensoryEffects Cinnamon NT – 20259 mini flakes manufactured by Loders Croklaan, 24708 West Durkee Rd, Channahon, IL 60410 meets the requirements of 3.2.1.5 and performs satisfactorily in this product.

6.2.3 French toast flavor. Michaelok Artificial French Toast Flavor # 1466 manufactured by David Michael & Co, 10801 Decatur Road, Philadelphia, PA 19154 meets the requirements of 3.2.1.10 and performs satisfactorily in this product.

6.2.4 Sorbic acid, encapsulated. Encapsulated sorbic acid manufactured by Balchem Corporation, Slate Hill, NY 10973 meets the requirements of 3.2.1.14 and performs satisfactorily in this product.

6.2.5 FD&C Yellow #5 Alum Lake. No. 09609 FD&C Yellow #5 Alum Lake 35 to 42 percent manufactured by Sensient Colors, 2526 Baldwin Street, St. Louis, MO 63106 meets the requirements of 3.2.1.15 and performs satisfactorily in this product.

6.2.6 High fructose corn syrup. Staley IsoSweet 100 High Fructose Corn Syrup manufactured by A. E. Staley MFG. Co, 2200 East Eldorado, Decatur, IL 62521 meets the requirements of 3.2.2.1.1 and performs satisfactorily in this product.

6.2.7 Crystalline dextrose. Staleydex 333 dextrose manufactured by A. E. Staley MFG. Co., 2200 East Eldorado Decatur, IL 62525 meets the requirements of 3.2.2.1.3 and performs satisfactorily in this product.

6.2.8 Corn syrup. Staley 1300 Corn syrup manufactured by A. E. Staley MFG. Co, 2200 East Eldorado Decatur, IL 62521 meets the requirements of 3.2.2.1.5 and performs satisfactorily in this product.

6.2.9 Tapioca starch. National 104 manufactured by National Starch and Chemical Company, 10 FINDERNE AVENUE, BRIDGEWATER, NJ 08807 meets the requirements of 3.2.2.1.7 and performs satisfactorily in this product.

6.2.10 Waxy maize starch. Ultra Tex 4 manufactured by National Starch and Chemical Company, 10 FINDERNE AVENUE, BRIDGEWATER, NJ 08807 meets the requirements of 3.2.2.1.8 and performs satisfactorily in this product.

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6.2.11 Imitation maple flavor. Imitation Maple Flavor (industrial product code # FB2072) manufactured by McCormick and Company, 226 Schilling Circle, Hunt Valley, MD 21031 meets the requirements of 3.2.2.1.9 and performs satisfactorily in this product.

6.2.12 Gum blend. Kelgum Xanthan Gum Blend is a proprietary blend, manufactured by CP Kelco, 311 S. Wacker Drive, Suite 3700, Chicago, IL 60606. This ingredient meets the requirements of 3.2.2.1.10 and performs satisfactorily in this product.

6.2.13 Oxidizer/conditioner/mix reducer. Im-Prove 200 manufactured by CARAVAN, Totowa, NJ 07512, meets the requirements of 3.2.1.17 and performs satisfactorily in this product.

6.2.14 Butter flavor. Butter flavor 4425-28 manufactured by Edlong, Elk Grove Village, IL 60007 meets the requirements of 3.2.13 and performs satisfactorily in this product.

6.2.15 Blueberry flavor. Blueberry flavor number 3535 manufactured by David Michael & Co., Inc., 10801 Decatur Road, Philadelphia, PA 19154 meets the requirements of 3.2.1.20 and performs satisfactorily in this product.

6.2.16 Blueberry flakes. Mini No Color Blueberry Chips manufactured by SensoryEffects, 24 North Clinton Street, Defiance, OH 43512 meets the requirements of 3.2.1.21 and performs satisfactorily in this product.

6.2.17 Strawberry mini flakes. Strawberry mini flakes product number 01489 manufactured by SensoryEffects, 24 North Clinton Street, Defiance, OH 43512 meets the requirements of 3.2.1.22 and performs satisfactorily in this product.

6.2.18 Dried infused apples. Infused Dried Julienne Sliced Apple (UPC - P02050), or Infused Dried Apple Bits (UPC - P02033): manufactured by Graceland Fruit, Inc., 1123 Main Street, Frankfort MI 49635 meets the requirements of 3.2.2.1.11 and performs satisfactorily in this product.

6.2.19 Apple concentrate. Apple concentrate number 210102 manufactured by Northwest Naturals, 11805 North Creek Parkway South, Suite A-104, Bothell, WA 98011 meets the requirements of 3.2.2.1.12 and performs satisfactorily in this product.

6.2.20 Apple flavor. Apple Pie Spice Aquaresin™ number 22-19-207 manufactured by KALSEC, 3713 West Main Street, Kalamazoo, MI 49006 meets the requirements of 3.2.2.1.14 and performs satisfactorily in this product.

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6.2.21 Infused dried cultivated blueberries. Infused dried cultivated blueberries with UPC - P01174 manufactured by Graceland Fruit, Inc., 1123 Main Street, Frankfort MI 49635 meets the requirements of 3.2.2.1.16 and performs satisfactorily in this product.

6.2.22 Infused dried cranberries, blueberry flavored. Blueberry Infused Cranberries UPC - 94672 manufactured by Ocean Spray Cranberries Ingredient Technology Group, 1 Ocean Spray Drive, Lakeville/Middleboro, MA 02349 meets the requirements of 3.2.2.1.17 and performs satisfactorily in this product.

6.2.23 Blueberry juice concentrate. Blueberry juice concentrate with other natural flavors product number 220606 manufactured by Northwest Naturals, 11805 North Creek Parkway South, Suite A-104, Bothell, WA 98011 meets the requirements of 3.2.2.1.18 and performs satisfactorily in this product.

6.2.24 Blueberry flavor. Blueberry flavor number FAHH546 manufactured by Wild Flavors, 1261 Pacific Avenue, Erlanger, KY 41018 meets the requirements of 3.2.2.1.19 and performs satisfactorily in this product.

6.2.25 Natural blue coloring agent. Antho-Vegetable Juice Blue number 03847, manufactured by Sensient Food Colors, 2515 North Jefferson Street, St. Louis MO 63106 meets the requirements of 3.2.2.1.20 and performs satisfactorily in this product.

6.2.26 Infused dried red tart cherries. Infused dried julienne sliced red tart cherry UPC – P01224 manufactured by Graceland Fruit, Inc., 1123 Main Street, Frankfort MI 49635 meets the requirements of 3.2.2.1.21 and performs satisfactorily in this product.

6.2.27 Infused dried cranberries, cherry flavored. Cherry Infused Cranberries UPC - 94591 manufactured by Ocean Spray Cranberries Ingredient Technology Group, 1 Ocean Spray Drive, Lakeville/Middleboro, MA 02349 meets the requirements of 3.2.2.1.22 and performs satisfactorily in this product.

6.2.28 Cherry juice concentrate. Cherry juice concentrate number 221249 manufactured by Northwest Naturals, 11805 North Creek Parkway South, Suite A-104, Bothell, WA 98011 meets the requirements of 3.2.2.1.23 and performs satisfactorily in this product.

6.2.29 Cherry flavor. Cherry Flavor number FAGM610 manufactured by Wild Flavors, 1261 Pacific Avenue, Erlanger, KY 41018 meets the requirements of 3.2.2.1.24 and performs satisfactorily in this product.

6.2.30 Artificial red coloring agent. Wild Cherry Red Shade manufactured by Sensient Food Colors, 2515 North Jefferson Street, St. Louis MO 63106 meets the requirements of 3.2.2.1.25 and performs satisfactorily in this product.

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6.3 Oxygen scavenger. Oxygen scavenger suitable for the purpose may be obtained from the Multiform Desiccants, Inc., Buffalo, NY 14224. Other approved oxygen scavengers may be used.

6.4 Shelf life. This specification covers items where shelf life is a consideration. Specific shelf-life requirements should be specified in the contract or purchase order. The shelf-life codes are contained in the Federal Logistics Information System Total Item Record. Additive information for shelf-life management may be obtained from DoD 4140.27-M; Shelf-life Management Manual, or the designated shelf-life Points of Contact (POC). The POC should be contacted in the following order: (1) the Inventory Control Points (ICPs), and (2) the DoD Service and Agency administrators for the DoD Shelf-Life Program. Appropriate POCs for the DoD Shelf-Life Program can be contacted through the DoD Shelf-Life Management website: <http://www.shelflife.hq.dla.mil/>.

6.5 Subject term (key word) listing.

Combat field feeding  
Pouch bread

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:

Army - GL  
Navy - SA  
Air Force – 35

Preparing activity:

Army - GL  
(Project 8920-2009-001)

Review activities:

Army - MD, QM  
Navy - MC  
DLA - SS

Civil agency:

USDA - FV

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.