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SUPERSEDING
PCR-F-001
11 May 2007

SECTION C

This document covers shelf stable FIRST STRIKE bars packaged in a flexible pouch for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-F-001A, FIRST STRIKE BARS, SHELF STABLE

Flavors.

Flavor I - Chocolate
Flavor II - Apple-Cinnamon
Flavor III - Cran-Raspberry
Flavor V - Mocha

Styles.

Style A - Regular
Style B - Mini

Types.

Type I - Barrier pouch
Type II - Commercial package

C-2 PRODUCT REQUIREMENTS

A. Product standard. A sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with the tests and inspections of Section E of this Product Contract Requirements (PCR) document. 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 noncomparable to the product standard, the contractor shall submit a replacement FA or PDM for approval. In any event, all product produced must meet all requirements of this document including product standard comparability.

B. Shelf life. The packaged product shall meet the minimum shelf life requirement of 36 months at 80ºF.

C. Appearance.

(1) General. The finished product shall have a smooth to slightly rough glossy exterior and a dense or slightly porous interior structure. The finished product shall be free from foreign materials.

(2) Flavor I. The Chocolate bar shall be a dark brown color and shall contain small intact pieces of light and dark tan colored crisped cereal grains distributed throughout.

(3) Flavor II. The Apple-Cinnamon bar shall be a golden tan color and shall contain small intact pieces of light and dark tan colored crisped cereal grains distributed throughout.

(4) Flavor III. The Cran-Raspberry bar shall be a medium pink to red color and shall contain small intact pieces of light tan colored crisped cereal grains and distinct pieces of dried cranberries distributed throughout.

(5) Flavor V. The Mocha bar shall be a medium brown color and shall contain small intact pieces of light and dark tan colored crisped cereal grains distributed throughout.

D. Odor and flavor. The packaged food shall exhibit a mild grain aftertaste. The packaged food shall be free from foreign odors and flavors.

(1) Flavor I. The Chocolate bar shall have a sweet, baking chocolate odor and flavor.

(2) Flavor II. The Apple-Cinnamon bar shall have a sweet, apple, cinnamon and nutmeg odor and flavor.

(3) Flavor III. The Cran-Raspberry bar shall have a sweet, cranberry and raspberry odor and flavor.

(4) Flavor V. The Mocha bar shall have a sweet, chocolate and coffee odor and flavor. The bar shall exhibit a slightly bitter aftertaste.

E. Texture. The bar shall be chewy and slightly soft, with crispy pieces of cereal grain.

F. Dimensions.

(1) Style A. Dimensions shall be not greater than 5-1/4 inches long by 2-1/4 inches wide (133 mm long by 57 mm wide).

(2) Style B. Dimensions shall be not greater than 3-1/2 inches long by 2-1/4 inches wide (89 mm long by 57 mm wide).

G. Net weight.

(1) Style A. The net weight of an individual bar shall be not less than 2.3 ounces (65 grams).

(2) Style B. The net weight of an individual bar shall be not less than 1.2 ounces (35 grams).

H. Palatability and overall appearance. The finished product shall be equal to or better than the approved product standard in palatability and overall appearance.

I. Analytical requirements.

(1) Water activity. The water activity (a_w) shall be not greater than 0.55 when measured at 77ºF (25ºC).

(2) Vitamins and minerals (all flavors). The finished packaged product shall contain not less than the following amounts:

Vitamins and minerals	Units	Per 100 grams
Vitamin C (encapsulated)	mg	32.00
Vitamin E	mg	7.65
Thiamin	mg	0.5
Riboflavin	mg	0.52
Niacin	mg NE	5.8
Vitamin B6	mg	0.61
Folate	ug	153.00
Vitamin B12	ug	0.61
Vitamin D3	ug	1.53
Vitamin K	ug	60.00
Zinc	mg	3.44

J. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall not be greater than 25,000 Colony Forming Units (CFU) per gram in four of five samples and not greater than 50,000 CFU per gram in any individual sample.

(2) Yeast and mold. The yeast and mold count (combined) shall not exceed 100 CFU per gram.

(3) *Escherichia coli (E. coli)* count. *E. coli* shall have less than 10 CFU per gram or less than 3 Most Probable Number (MPN) per gram, where findings indicate zero colonies CFU per plate or zero tubes producing gas for MPN.

(4) *Salmonella*. The product shall be *Salmonella* negative for each of five pouches tested per production lot.

K. Product formulation and ingredients. The following formulations shall be used. Ingredient suppliers and available specific ingredients may change (companies bought out, part numbers change, ingredients no longer supplied, etc.). Any changes in formulations and ingredients shall be pre-approved by Combat Capabilities Development Command-Soldier Center (FCDD-SCC-EMR).

(1) Flavor I, Chocolate.

Ingredients	Percent by weight
Corn syrup (DE 42)	19.200
Date plum or plum/date/grape fruit paste 1/	14.000
Crisp rice cereal, tiny, round 2/	10.000
Nutty rice cereal 2/	10.000
Crystalline fructose	9.000
Maltodextrin (DE 15)	8.600
Palm oil	8.300
High roast African liquor (Reo liquor chocolate wafers) 3/	7.200
Dextrose monohydrate powder	5.000
Cocoa powder, Red Dutch (10-12 percent fat)	3.000
Whey protein concentrate (nominal 80 percent protein)	2.700
Glycerin USP or food grade	1.900
Lecithin (dry powder)	0.500
Vanilla powder	0.415

Vitamin premix 4/	0.167
Ascorbyl palmitate	0.015
Mixed tocopherols	0.003

NOTE: The corn syrup and the maltodextrin percentages may be adjusted to ease processing and control end item texture. No other percentage adjustments shall be made.

1/ "Fructose, glycerin, date, plum, prep, (40 percent Fructose)" or "Plum/Date/Grape Fruit Paste Fat Replacer" from Mariani Packing Co., 500 Crocker Dr., Vacaville, CA 95688.

2/ "Nutty rice 13811" and "Crisp rice 200" from Pacific Grain Products Inc., P.O. Box 2060, Woodland, CA 95776.

3/ "H365" Wilbur® Chocolate from Cargill Cocoa & Chocolate North America.

4/ Vitamin premix shall include vitamin C (encapsulated), vitamin E, thiamin (encapsulated), riboflavin, niacin, vitamin B6 (encapsulated), folate, vitamin B12, vitamin D, vitamin K and zinc and shall be made to ensure compliance with requirements as stated in C-2, I.(2).

(2) Flavor II, Apple-Cinnamon.

Ingredients	Percent by weight
Corn syrup (DE 42)	20.000
Crisp rice cereal 1/	15.000
Date plum or plum/date/grape fruit paste 2/	14.600
Maltodextrin (DE 15)	10.000
Crystalline fructose	10.000
Palm oil	8.070
Apple powder, low moisture 20 mesh 3/	6.000
Crisp corn cereal 1/	5.000
Whey protein concentrate (nominal 80 percent protein)	3.500
Rice bran concentrate 4/	3.000
Glycerin USP or food grade	2.380
Canola oil	2.000
Lecithin (dry powder)	0.250
Vitamin premix 5/	0.167
Ascorbyl palmitate	0.015
Apple pie spice 6/	0.015
Mixed tocopherols	0.003

NOTE: The corn syrup and the maltodextrin percentages may be adjusted to ease processing and control end item texture. No other percentage adjustments shall be made.

1/ "Crisp rice 20005" and "Crisp corn #20002" from Pacific Grain Products Inc., P.O. Box 2060, Woodland, CA 95776.

2/ "Fructose, glycerin, date, plum, prep, (40 percent Fructose)" or "Plum/Date/Grape Fruit Paste Fat Replacer" from Mariani Packing Co., 500 Crocker Dr., Vacaville, CA 95688.

3/ "Apple powder 20 mesh unsulphured" from Tree Top, P.O. Box 24B, Selah, WA 98942.

4/ "Rice X Stabilized Rice Bran (Regular)" from Nutracea, Phoenix, AZ 85018.

5/ Vitamin premix shall include vitamin C (encapsulated), vitamin E, thiamin (encapsulated), riboflavin, niacin, vitamin B6 (encapsulated), folate, vitamin B12, vitamin D, vitamin K and zinc and shall be made to ensure compliance with requirements as stated in C-2, I.(2).

6/ "827658-B" from Kalsec, 3713 West Main, Kalamazoo, MI 49005-0511.

(3) Flavor III, Cran-Raspberry.

Ingredients	Percent by weight
Raspberry filling 1/	20.000
Maltodextrin (DE 15)	16.761
Corn syrup (DE 42)	14.000
Dried cranberries (Craisins or equivalent) 1/8 inch 2/	11.000
Crisp corn cereal 3/	9.000
Apple nuggets 4/	8.000
Palm oil	6.900
Whey protein concentrate (nominal 80 percent protein)	3.500
Apple powder, low moisture 20 mesh 5/	3.000
Rice bran concentrate 6/	3.000
Glycerin USP or food grade	2.500
Crystalline fructose	1.000
Raspberry natural/artificial flavor	0.900
Lecithin (dry powder)	0.250
Vitamin premix 7/	0.167
Ascorbyl palmitate	0.015

Wild cherry red (95.4 percent Red #40; 0.06 percent Blue #1)	0.004
Mixed tocopherols	0.003

NOTE: The corn syrup and the maltodextrin percentages may be adjusted to ease processing and control end item texture. No other percentage adjustments shall be made.

1/ "Raspberry filling #1015 " from Golden Select Foods Co., 5743 Smithway St. Building 305, City of Commerce, CA 90040.

2/ "Craisins" or equivalent 1/8 inch Diced or Double Diced" from Ocean Spray Cranberries, Ocean Spray Drive, Lakeville-Middleboro, MA 02349.

3/ "Crisp corn #20002" from Pacific Grain Products Inc., P.O. Box 2060, Woodland, CA 95776.

4/ "Apple nuggets (raspberry colored and flavored 4 mesh #128)" from Tree Top, P.O. Box 24B, Selah, WA 98942.

5/ "Apple powder 20 mesh unsulphured" from Tree Top, P.O. Box 24B, Selah, WA 98942.

6/ "Rice X Stabilized Rice Bran (Regular)" from Nutracea, Phoenix, AZ 85018.

7/ Vitamin premix shall include vitamin C (encapsulated), vitamin E, thiamin (encapsulated), riboflavin, niacin, vitamin B6 (encapsulated), folate, vitamin B12, vitamin D, vitamin K and zinc and shall be made to ensure compliance with requirements as stated in C-2, I(2).

(4) Flavor V, Mocha.

Ingredients	Percent by weight
Corn syrup (DE 42)	17.707
Date plum or plum/date/grape fruit paste 1/	16.517
Crisp rice cereal, tiny, round 2/	10.000
Crisp rice cereal 2/	10.000
Maltodextrin (DE 15)	9.176
Sugar (sucrose)	9.000
Palm oil	7.300
High roast African liquor (Reo liquor chocolate wafers) 3/	5.100
Spray dried cream powder (72 percent butter fat)	5.000

Maltodextrin (DE 5)	4.000
Glycerin USP or food grade	1.900
Whey protein concentrate (nominal 80 percent protein)	1.500
Coffee, freeze dried instant crystals (caffeinated)	1.500
Vanilla powder	0.415
Anhydrous caffeine (powdered food grade)	0.280
Lecithin (dry powder)	0.250
Vitamin premix 4/	0.167
Coffee flavor 5/	0.150
Titanium dioxide USP (water dispersible)	0.020
Ascorbyl palmitate	0.015
Mixed tocopherols	0.003

NOTE: The corn syrup and the maltodextrin percentages may be adjusted to ease processing and control end item texture. No other percentage adjustments shall be made.

1/ "Fructose, glycerin, date, plum, prep, (40 percent Fructose)" or "Plum/Date/Grape Fruit Paste Fat Replacer" from Mariani Packing Co., 500 Crocker Dr., Vacaville, CA 95688.

2/ "Crisp rice 200" and "Crisp rice 20005" from Pacific Grain Products Inc., P.O. Box 2060, Woodland, CA 95776.

3/ "H365" Wilbur® Chocolate from Cargill Cocoa & Chocolate North America.

4/ Vitamin premix shall include vitamin C (encapsulated), vitamin E, thiamin (encapsulated), riboflavin, niacin, vitamin B6 (encapsulated), folate, vitamin B12, vitamin D, vitamin K and zinc and shall be made to ensure compliance with requirements as stated in C-2, I(2).

5/ "Coffee Flavor DF-588-435-9 N&A" Givaudan Flavors Corporation, 1199 Edison Drive, Cincinnati, OH 45216, Phone: 513-948-3587

L. Preparation and processing (General for all flavors.) The following preparation and processes were used at the CCDC-SC for processing the FIRST STRIKE Bars. Industrial preparation, processing and equipment may be used to produce product of same quality as produced at CCDC-SC.

(1) Liquid mix. The liquid mix may be prepared as follows using a steam-jacketed kettle equipped with swept surface agitator.

a. Add corn syrup and glycerin; heat to 180°F (82°C).

b. Add fat, and where required chocolate liquor, lecithin, mixed tocopherols, ascorbyl palmitate; mix until fat and liquor is melted. Allow the product temperature to drop to 140°F (60°C).

c. Add date plum or plum/date/grape fruit paste, or raspberry filling, colors, and flavors as applicable. Mix thoroughly 5-10 minutes or until uniformly mixed and maintain temperature at 140°F (60°C).

d. Maintain product under low agitation and a temperature not to exceed 140°F (60°C). Temperature may be lowered using cold water in kettle jacket if necessary to obtain suitable viscosity of final dough for extrusion.

e. The liquid mix is drawn according to dough batch size. The liquid mix may be held in kettle under low agitation up to 4 hours.

(2) Dough Mixing. The dough mixing may be prepared as follows using an 80 quart Hobart mixer with standard paddle.

a. Add liquid mix and mix 30 seconds on setting #3 (medium high speed: 183 revolutions per minute (RPM)).

b. When applicable, add raspberry and apple nuggets. Mix one minute on setting #1 (low speed 55 RPM).

c. When applicable, add cereal crisps and sweetened dried cranberries cut 1/8 inch diced or double diced. Mix one minute on setting of #1 or until crisps are wetted.

d. Add vitamin premix. Mix one minute on setting #1.

e. Add rest of dry ingredients and mix on setting #1 for 2 to 4 minutes or until mix appears homogeneous.

NOTE: Caution needs to be taken throughout the mixing process to minimize breaking up of the crisps.

(3) Bar forming. The bar may be formed as follows using a Hosokawa BEPEX GmhH Model F 97 265 – 266. Other types of bar forming such as: sheeting and/or slab forming equipment are also acceptable.

a. Product shall be extruded through a nozzle or sheeted/formed and cut to produce a bar with nominal dimensions as stated in C-2, F.

b. Finished product is cooled to less than 90°F (32°C) prior to handling and packaging.

SECTION D

D-1 PACKAGING

A. Type I. One bar or one commercially packaged bar shall be packed in a preformed or form-fill-seal barrier pouch as described below.

(1) Preformed pouch.

a. Pouch material. The preformed pouch shall be fabricated from 0.002 inch thick ionomer or polyethylene film laminated or extrusion coated to 0.00035 inch thick aluminum foil which is then laminated to 0.0005 inch thick polyester. The three plies shall be laminated with the polyester on the exterior of the pouch. Tolerances for thickness of plastic films shall be plus or minus 20 percent and tolerance for the foil layer shall be plus or minus 10 percent. The material shall show no evidence of delamination, degradation, or foreign odor when heat sealed or fabricated into pouches. The material shall be suitably formulated for food packaging and shall not impart an odor or flavor to the product. The complete exterior surface of the pouch shall be uniformly colored and shall conform to number 20219, 30219, 30227, 30279, 30313, 30324, or 30450 of SAE AMS-STD-595, Colors Used in Government Procurement.

b. Pouch construction. For style A, the pouch shall be a flat style preformed pouch having inside dimensions of 2-7/8 inches wide by 7 inches long (± 1/8 inch in each dimension). For style B, the pouch shall be a flat style preformed pouch having inside dimensions of 2-7/8 inches wide by 5 inches long (± 1/8 inch in each dimension). The pouch shall be made by heat sealing three edges with 3/8 inch (-1/8 inch, +3/16 inch) wide seals. The side and bottom seals shall have an average seal strength of not less than 6 pounds per inch of width and no individual specimen shall have a seal strength of less than 5 pounds per inch of width. Alternatively, the pouch shall exhibit no rupture or seal separation greater than

1/16 inch or seal separation that reduces the effective closure seal width to less than 1/16 inch when tested for internal pressure resistance. A tear nick, notch, or serrations shall be provided to facilitate opening. A 1/8 inch wide lip may be incorporated at the open end of the pouch.

c. Pouch filling and sealing. One bar or one commercially packaged bar shall be inserted into the pouch. The filled pouch shall be sealed. The closure seal width shall be a minimum of 1/8 inch. The closure seal shall be free of foldover wrinkles or entrapped matter that reduces the effective closure seal width to less than 1/16 inch. Seals shall be free of impression or design on the seal surface that would conceal or impair visual detection of seal defects. The average seal strength of the closure seal shall be not less than 6 pounds per inch of width and no individual specimen shall have a seal strength of less than 5 pounds per inch of width. Alternatively, the filled and sealed pouch shall exhibit no rupture or seal separation greater than 1/16 inch or seal separation that reduces the effective closure seal width to less than 1/16 inch when tested for internal pressure resistance.

(2) Horizontal form-fill-seal pouches.

a. Pouch material. The horizontal form-fill-seal pouch shall consist of a formed tray-shaped body with a flat sheet, heat sealable cover or a tray-shaped body with a tray-shaped heat sealable cover. The tray-shaped body and the tray-shaped cover shall be fabricated from a 3-ply flexible laminate barrier material consisting of, from outside to inside, 0.0009 inch thick oriented polypropylene bonded to 0.0007 inch thick aluminum foil with 10 pounds per ream pigmented polyethylene or adhesive and bonding the opposite side of the aluminum foil to 0.003 inch thick ionomer or a blend of not less than 50 percent linear low density polyethylene and polyethylene. The linear low density polyethylene portion of the blend shall be the copolymer of ethylene and octene-1 having a melt index range of 0.8 to 1.2 g/10 minutes in accordance with ASTM D1238, Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer and a density range of 0.918 to 0.922 g/cc in accordance with ASTM D1505, Standard Test Method for Density of Plastics by Density-Gradient Technique. Alternatively, 0.0005 inch thick polyester may be used in place of the oriented polypropylene as the outer ply of the laminate. The flat sheet cover shall be made of the same 3-ply laminate as specified for the tray-shaped body except the aluminum foil thickness may be 0.00035 inch. Tolerances for thickness of plastic films shall be plus or minus 20 percent and tolerance for the foil layer shall be plus or minus 10 percent. The color requirements of the exterior (oriented polypropylene or polyester side) of the laminate shall be as specified in D-1,A(1)a. The material shall show no evidence of delamination, degradation, or foreign odor when heat sealed or fabricated into pouches. The material shall be suitably formulated for food packaging and shall not impart any odor or flavor to the product.

b. Pouch construction. The tray-shaped body and the tray-shaped cover shall be formed by drawing the flexible laminate material into an appropriately shaped cavity. The flat cover shall be in the form of a flat sheet of the barrier material taken from roll stock. One bar or one commercially packaged bar shall be placed into the tray-shaped body of the pouch. Pouch closure shall be effected by heat sealing together the cover and body along the entire pouch perimeter. The closure seal width shall be a minimum of 1/8 inch. The closure seal shall have an average seal strength of not less than 6 pounds per inch of width and no individual specimen shall have a seal strength of less than 5 pounds per inch of width. Alternatively, the filled and sealed pouch shall exhibit no rupture or seal separation greater than 1/16 inch or seal separation that reduces the effective closure seal width to less than 1/16 inch when tested for internal pressure resistance. The maximum outside dimensions of the sealed pouch shall be 3-1/2 inches wide by 7 inches long for style A and 4-1/2 inches wide by 6 inches long for style B. A tear nick, notch or serrations shall be provided to facilitate opening of the filled and sealed pouch. The sealed pouch shall not show any evidence of material degradation, aluminum stress cracking, delamination or foreign odor. Heat seals shall be free of entrapped matter that reduces the effective closure seal width to less than 1/16 inch. Seals shall be free of impression or design on the seal surface that would conceal or impair visual detection of seal defects.

B. Type II. One bar shall be commercially packaged in a foil or metalized laminate pouch that will provide an effective light, moisture and oxygen barrier.

D-2 LABELING

A. Pouches (Style A and Style B, Type I). For style A, each pouch shall be clearly printed or stamped on one side, in a manner that does not damage the pouch, in accordance with the colors and design of the FIRST STRIKE bar label shown in Figure 1 (A-1 through A-4). All figures are located in Appendix A to the document and show required graphics for all types. Details for "Nutrition Facts" label and ingredients used shall be labeled in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations. (NOTE: The label design of the CCDC-SC is available upon request.) Alternatively, each pouch shall be labeled as shown in Figure 2 (A-5 through A-8) and the commercially packaged bar is overwrapped in the barrier pouch. For style B, when specified as a component of the First Strike ration, each pouch shall be labeled as specified in D-2,A and in accordance with colors and design of the FIRST STRIKE bar label shown in Figure 3 (A-9 through A-12). All figures are located in Appendix A to the document and show required graphics for all types. Details for “Nutrition Facts” label and ingredients used shall be labeled in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable

FDA regulations. (NOTE: The label design of the CCDC-SC is available upon request.) Alternatively, each pouch shall be labeled as shown in Figure 4 (A-13 through A-16) and the commercially packaged bar is overwrapped in the barrier pouch. The barrier pouch shall be labeled with the following information:

(1) Name and flavor of product (letters not less than 1/8 inch high)
(2) Ingredients 2/
(3) Date 1/
(4) Net weight 2/
(5) Name and address of packer
(6) "Nutrition Facts" label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations 2/

1/ Each pouch shall have the date of pack noted by using a four digit code beginning with the final digit of the current year followed by the three digit Julian day code. For example, 14 February 2018 would be coded as 8045. The Julian day code shall represent the day the product was packaged into the pouch.

2/ Shall appear on the commercial package or the barrier pouch, as applicable.

B. Pouches (Style A, Type II). For Paratrooper Bar, each pouch shall be labeled as shown in Figure 5 (A-17). All figures are located in Appendix A to the document and show required graphics for all types. Details for "Nutrition Facts" label and ingredients used shall be labeled in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations. (NOTE: The label design of the CCDC-SC is available upon request.)

D-3 PACKING

A. Packing. Not more than 40 pounds of product shall be packed in a fiberboard shipping box constructed in accordance with style RSC-L of ASTM D5118/D5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The fiberboard shall conform to type CF, class D, variety SW, burst grade 200 or ECT grade 32 of ASTM D4727/D4727M, Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes. Each box shall be closed in accordance with ASTM D1974/D1974M, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

D-4 UNITIZATION

A. Unit loads. Unit loads shall be as specified in accordance with DLA Troop Support Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items.

D-5 MARKING

A. Shipping containers and unit loads. Shipping containers shall be marked in accordance with DLA Troop Support Form 3556, Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semiperishable Subsistence.

SECTION E INSPECTION AND ACCEPTANCE

The following quality assurance criteria, utilizing ANSI/ASQ Z1.4, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, single sampling plans indicated in ANSI/ASQ Z1.4 will be utilized. When required, the manufacturer shall provide the Certificate(s) of Conformance to the appropriate inspection activity. Certificate(s) of Conformance not provided shall be cause for rejection of the lot.

A. Definitions.

(1) Critical defect. A critical defect is a defect that judgment and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining, or depending on the item; or a defect that judgment and experience indicate is likely to prevent the performance of the major end item, i.e., the consumption of the ration.

(2) Major defect. A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.

(3) Minor defect. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

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

(1) Product standard inspection. The first article or product demonstration model shall be inspected in accordance with the provisions of this document and evaluated for appearance, odor, flavor, and texture. Any failure to conform to the performance requirements or any appearance or palatability failure shall be cause for rejection of the lot.

(2) Periodic review evaluation. The approved first article or product demonstration model shall be used as the product standard 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:

DEPARTMENT OF THE ARMY
FCDD-SCC-EMR
COMBAT CAPABILITIES DEVELOMENT COMMAND-SOLDIER CENTER
10 GENERAL GREENE AVENUE
NATICK, MA 01760-5056

One lot shall be randomly selected during each calendar month of production or as otherwise specified in the contract. Three (3) sample units shall be randomly selected from that one production lot. The three (3) sample units shall be shipped to Natick within five (5) working days from the end of the production month from which they are randomly selected and upon completion of all USDA inspection requirements. The sample units will be evaluated for overall quality against the current first article or product demonstration model.

(3) Conformance inspection. Conformance inspection shall include the examinations/tests and methods of inspection cited in this section.

E-5 QUALITY ASSURANCE PROVISIONS (PRODUCT)

A. Product examination. The finished product shall be examined for compliance with the performance requirements specified in Section C of this Product Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQ Z1.4. The lot size shall be expressed in pouches. The sample unit shall be the contents of one pouch. 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. Defects and defect classifications are listed in table I.

TABLE I. Product defects 1/ 2/

Category		Defect
Major	Minor	
		General
101		Product not flavor or not style specified.
	201	The finished product does not have a smooth to slightly rough glossy exterior.
	202	The finished product does not have a dense or slightly porous interior structure.
		Appearance
	203	Flavor I Chocolate bar not a dark brown color.
	204	Flavor I Chocolate, Flavor II Apple-Cinnamon and Flavor V Mocha, bar does not contain small intact pieces of light or dark tan colored crisped cereal grains distributed throughout.
	205	Flavor II Apple-Cinnamon bar not a golden tan color.
	206	Flavor III Cran-Raspberry bar not a medium pink to red color.
	207	Flavor III Cran-Raspberry bar does not contain small intact pieces of light tan colored crisped cereal grains or distinct pieces of dried cranberries distributed throughout.
	208	Flavor V Mocha bar not a medium brown color.
		Odor and flavor
	209	The packaged food does not exhibit a mild grain aftertaste.
102		Flavor I Chocolate bar not sweet or not a baking chocolate odor or flavor.

TABLE I. Product defects 1/ 2/ - Continued

Category		Defect
Major	Minor	
103		Flavor II Apple-Cinnamon bar not sweet or not apple or not cinnamon or not a nutmeg odor or flavor.
104		Flavor III Cran-Raspberry bar not sweet or not cranberry or not a raspberry odor or flavor.
105		Flavor V Mocha bar not sweet or not chocolate or not a coffee odor or flavor.
	210	Flavor V Mocha bar does not exhibit a slightly bitter aftertaste.
		Texture
	211	Bar not chewy or not slightly soft or not with crispy pieces of cereal grain.
		Dimensions
	212	Dimensions not as specified.
		Net weight
	213	Style A net weight of an individual bar less than 2.3 ounces (65 grams).
	214	Style B net weight of an individual bar less than 1.2 ounces (35 grams).

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

2/ Finished product not equal to or better than the approved product standard in palatability and overall appearance shall be cause for rejection of the lot.

B. Methods of inspection.

(1) Shelf life. The contractor shall provide a Certificate of Conformance that the product has a 36 month shelf life when stored at 80°F. Government verification may include storage for 6 months at 100°F or 36 months at 80°F. Upon completion of either storage period, the product will be subjected to a sensory evaluation panel for appearance and palatability and must receive an overall score of 5 or higher based on a 9 point quality scale to be considered acceptable.

(2) Net weight. The net weight of the filled and sealed pouches shall be determined by weighing each sample unit on a suitable scale tared with a representative empty pouch. Results shall be reported to the nearest 0.1 ounce or to the nearest 1 gram.

(3) Vitamins and minerals. The contractor shall provide a Certificate of Conformance (CoC) for the lot including the production formula and premix source formula. Product not conforming to the ingredients, including vitamin premix and percentages as specified in Section C of this Product Contract Requirements document shall be cause for rejection of the lot.

(4) Water activity (a_w) testing. Eight filled and sealed pouches shall be randomly selected from one production lot and tested for a_w in accordance with the latest edition of the Official Methods of Analysis (OMA) of AOAC International, method 978.18, using an electric hygrometer system self-temperature controlled (at 25°C) or an equivalent instrument. Water activity shall be determined not less than 48 hours after packaging to allow moisture equilibration in the product. Test results shall be reported to the nearest 0.01. Verification will be conducted through actual testing by a government laboratory. Any nonconforming a_w result shall be cause for rejection of the lot.

(5) Microbiological testing. The finished product shall be tested for microbiological activity. Five filled and sealed pouches shall be randomly selected from the lot regardless of lot size. The pouched product shall be individually tested for microbiological levels in accordance with the latest edition of the Official Methods of Analysis (OMA) of AOAC International or the FDA Bacteriological Analytical Manual (BAM). For aerobic plate count the results for each pouched product tested must comply as provided in C-2, J(1). For yeast and mold, results for each pouched product must comply as provided respectively in C-2, J(2). For *E. coli* and *Salmonella*, results for each pouch must comply as provided respectively in C-2, J(3) and (4). Any result not conforming to the microbiological requirements shall be cause for rejection of the lot.

Test	Method Number
Aerobic plate count	966.23, 990.12, or BAM, Ch. 3
Yeast and mold	997.02 or BAM, Ch. 18
E.coli	991.14, 2005.03
Salmonella	994.04, 967.26, ~~996.08,~~ 2003.09, 2004.03, 2013.09

E-6 QUALITY ASSURANCE PROVISIONS (PACKAGING AND PACKING MATERIALS)

A. Packaging.

(1) Pouch material certification. The pouch material shall be tested for these characteristics. A CoC may be accepted as evidence that the characteristics conform to the specified requirements.

Characteristic	Requirement paragraph	Test procedure
Thickness of films for laminated material	D-1,A(1)a and D-1,A(2)a	ASTM D2103 1/
Aluminum foil thickness	D-1,A(1)a and D-1,A(2)a	ASTM B479 2/
Laminated material identification and construction	D-1,A(1)a and D-1,A(2)a	Laboratory evaluation
Color of laminated material	D-1,A(1)a and D-1,A(2)a	SAE AMS-STD-595 3/

1/ Standard Specification for Polyethylene Film and Sheeting

2/ Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

3/ Colors Used in Government Procurement

(2) Unfilled preformed pouch certification. A CoC may be accepted as evidence that unfilled pouches conform to the requirements specified in D-1,A(1)a and b. When deemed necessary by the USDA, testing of the unfilled preformed pouches for seal strength shall be as specified in E-6, B(1)a.

(3) Filled and sealed pouch examination. The filled and sealed pouches shall be examined for the defects listed in table II. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The inspection level shall be I and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 0.65 for major defects and 2.5 for minor defects.

TABLE II. Filled and sealed pouch defects 1/

Category		Defect
Major	Minor	
101		Tear or hole or open seal.
102		Seal width less than 1/16 inch. 2/
103		Presence of delamination. 3/
104		Unclean pouch. 4/
105		Pouch has foreign odor.
106		Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. 5/
107		Not packaged as specified.
108		Presence of stress cracks in the aluminum foil. 6/ 7/
	201	Label missing or incorrect or illegible.
	202	Tear nick or notch or serrations missing or does not facilitate opening.
	203	Seal width less than 1/8 inch but greater than or equal to 1/16 inch. 2/
	204	Presence of delamination. 3/

1/ Any evidence of rodent or insect infestation shall be cause for rejection of the lot.

2/ The effective closure seal is defined as any uncontaminated, fusion bonded, continuous path, minimum 1/16 inch wide, from side seal to side seal that produces a hermetically sealed pouch.

3/ Delamination defect classification:

Major - Delamination of the outer ply in the pouch seal area that can be propagated to expose aluminum foil at the food product edge of the pouch after manual flexing of the delaminated area. To flex, the delaminated area shall be held between the thumb and forefinger of each hand with both thumbs and forefingers touching each other. The delaminated area shall then be rapidly flexed 10 times by rotating both hands in alternating clockwise- counterclockwise directions. Care shall be exercised when flexing delaminated areas near the tear notches to avoid tearing the pouch material. After flexing, the separated outer ply shall be grasped between thumb and forefinger and gently lifted toward the food product edge of the seal or if the separated area is too small to be held between thumb and forefinger, a number two stylus shall be inserted into the delaminated area and a gentle lifting force applied against the outer ply. If separation of the outer ply can be made to extend to the product edge of the seal with no discernible resistance to the gentle lifting, the delamination shall be classified as a major defect. Additionally, spot delamination of the outer ply in the body of the pouch that is able to be propagated beyond its initial borders is also a major defect. To determine if the laminated area is a defect, use the following procedure: Mark the outside edges of the delaminated area using a bold permanent marking pen. Open the pouch and remove the contents. Cut the pouch transversely not closer than 1/4 inch ($\pm$1/16 inch) from the delaminated area. The pouch shall be flexed in the area in question using the procedure described above. Any propagation of the delaminated area, as evidenced by the delaminated area exceeding the limits of the outlined borders, shall be classified as a major defect.

Minor - Minor delamination of the outer ply in the pouch seal area is acceptable and shall not be classified as a minor defect unless it extends to within 1/16 inch of the food product edge of the seal. All other minor outer ply delamination in the pouch seal area or isolated spots of delamination in the body of the pouch that do not propagate when flexed as described above shall be classified as minor defects.

4/ Outer packaging shall be free from foreign matter which is unwholesome, has the potential to cause pouch damage (for example, glass, metal filings) or generally detracts from the clean appearance of the pouch. The following examples shall not be classified as defects for unclean:

a. Foreign matter which presents no health hazard or potential pouch damage and which can be readily removed by gently shaking the package or by gently brushing the pouch with a clean dry cloth.

b. Dried product which affects 1/8 inch by 1/8 inch or equivalent area or less (localized and aggregate).

5/ If doubt exists as to whether or not the sealing equipment leaves an impression or design on the closure seal surface that could conceal or impair visual detection of seal defects, samples shall be furnished to the contracting officer for a determination as to acceptability.

6/ Applicable to form-fill-seal pouches only.

7/ The initial examination shall be a visual examination of the closed package. Any suspected visual evidence of stress cracks in the aluminum foil (streaks, breaks, or other disruptions in the laminated film) shall be verified by the following physical examination. To examine for stress cracks, the inside surface of both tray-shaped bodies shall be placed over a light source and the outside surface observed for the passage of light. Observation of light through the pouch material in the form of a curved or straight line greater than 2 mm in length shall be evidence of the presence of stress cracks. Observation of light through the pouch material in the form of a curved or straight line 2 mm in length or smaller or of a single pinpoint shall be considered a pinhole. Observation of ten or more pinholes per pouch shall be evidence of material degradation.

B. Methods of inspection.

(1) Seal testing. The pouch seals shall be tested for seal strength as required in a, b, or c, as applicable.

a. Unfilled preformed pouch seal testing. The seals of the unfilled preformed pouch shall be tested for seal strength in accordance with ASTM F88/F88M, Standard Test Method for Seal Strength of Flexible Barrier Materials. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The sample size shall be the number of pouches indicated by inspection level S-1. Three adjacent specimens shall be cut from each of the three sealed sides of each pouch in the sample. The average seal strength of any side shall be calculated by averaging the three specimens cut from that side. Any average seal strength of less than 6 pounds per inch of width or any test specimen with a seal strength of less than 5 pounds per inch of width shall be classified as a major defect and shall be cause for rejection of the lot.

b. Pouch closure seal testing. The closure seals of the pouches shall be tested for seal strength in accordance with ASTM F88/F88M. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The sample size shall be the number of pouches indicated by inspection level S-1. For the closure seal on preformed pouches, three adjacent specimens shall be cut from the closure seal of each pouch in the sample. For form-fill-seal pouches, three adjacent specimens shall be cut from each side and each end of each pouch in the sample. The average seal strength of any side, end or closure shall be calculated by averaging the three specimens cut from that side, end or closure. Any average seal strength of less than 6 pounds per inch of width or any test specimen with a seal strength of less than 5 pounds per inch of width shall be classified as a major defect and shall be cause for rejection of the lot.

c. Internal pressure test. The internal pressure resistance shall be determined by pressurizing the pouches while they are restrained between two rigid plates. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The sample size shall be the number of pouches indicated by inspection level S-1. If a three-seal tester (one that pressurizes the pouch through an open end) is used, the closure seal shall be cut off for testing the side and end of the pouch and the distance between restraining plates shall be 1/2 inch. For testing the closure seal, the bottom seal shall be cut off. The pouches shall be emptied prior to testing. If a four-seal tester (designed to pressurize filled pouches by use of a hypodermic needle through the pouch wall) is used, all four seals can be tested simultaneously. The distance between rigid restraining plates on the four-seal tester shall be equal to the thickness of the product +1/16 inch. Pressure shall be applied at the rate of 1- 2 pounds per square inch gage (psig) per second until 14 psig pressure is reached. The 14 psig pressure shall be held constant for 30 seconds and then released. The pouches shall then be examined for separation or yield of the heat seals. Any rupture of the pouch or evidence of seal separation greater than 1/16 inch in the pouch manufacturer's seal shall be considered a test failure. Any seal separation that reduces the effective closure seal width to less than 1/16 inch (see table II, footnote 2/) shall be considered a test failure and shall be classified as a major defect and shall because for rejection of the lot.

C. Packing.

(1) Shipping container and marking examination. The filled and sealed shipping containers shall be examined for the defects listed in table III. The lot size shall be expressed in shipping containers. The sample unit shall be one shipping container fully packed. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total defects.

TABLE III. Shipping container and marking defects

Category		Defect
Major	Minor	
101		Marking missing or incorrect or illegible.
102		Inadequate workmanship. 1/
	201	More than 40 pounds of product.

1/ Inadequate workmanship is defined as, but not limited to, incomplete closure of container flaps, loose strapping, inadequate stapling, improper taping, or bulged or distorted container.

SECTION J REFERENCE DOCUMENTS

Unless otherwise specified, the applicable version of these documents is that which is active on the date of the solicitation or contract.

DLA Troop Support Forms

Form 3507	Loads, Unit: Preparation of Semiperishable Subsistence Items
Form 3556	Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semiperishable Subsistence

GOVERNMENT PUBLICATIONS

FOOD AND DRUG ADMINISTRATION	Bacteriological Analytical Manual (BAM) http://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006949.htm

NON-GOVERNMENTAL STANDARDS

SAE INTERNATIONAL www.sae.org

SAE-AMS-STD-595	Colors Used in Government Procurement

AMERICAN SOCIETY FOR QUALITY (ASQ) www.asq.org

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

ASTM INTERNATIONAL www.astm.org

B479	Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications
D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
D1974/D1974M	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D2103	Standard Specification for Polyethylene Film and Sheeting
D4727/D4727M	Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes
D5118/D5118M	Standard Practice for Fabrication of Fiberboard Shipping Boxes
F88/F88M	Standard Test Method for Seal Strength of Flexible Barrier Materials

AOAC INTERNATIONAL www.aoac.org

Official Methods of Analysis (OMA) of AOAC International