PCR-P-049A
22 November 2021
SUPERSEEDING
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SECTION C

This document covers a shelf stable performance readiness bar fortified with calcium and vitamin D.

C-1 ITEM DESCRIPTION

PCR-P-049A, PERFORMANCE READINESS BAR, FORTIFIED WITH CALCIUM CARBONATE AND VITAMIN D3, SHELF STABLE

Flavors.

Flavor I –	Chocolate
Flavor II –	Tart cherry berry
Flavor III –	Salted caramel

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 12 months at 80ºF.

C. Appearance.

(1) General. The finished product shall be an intact bar with a smooth to slightly rough glossy exterior surface. The interior matrix shall have a dense and slightly porous structure. The finished product shall be free from foreign materials.

(2) Flavor I. The chocolate bar shall have a medium to dark brown exterior and interior color. The interior matrix shall have intact pieces of light and dark tan crisped cereal grains uniformly distributed throughout.

(3) Flavor II. The tart cherry berry bar shall have a medium reddish-pink exterior and interior color. The interior matrix shall have intact pieces of light tan crisped cereal grains and distinct small pieces of dried cranberries uniformly distributed throughout.

(4) Flavor III. The salted caramel bar shall have a light to medium tan exterior and interior color. The interior matrix shall have intact pieces of light and dark tan crisped cereal grains uniformly distributed throughout.

D. Odor and flavor. The bar may have a slight to moderate bicarbonate or leavening agent odor and flavor. The packaged food shall be free from foreign odors and flavors

(1) Flavor I. The chocolate bar shall have a moderately sweet baking chocolate, cocoa and toasted grains odor and flavor.

(2) Flavor II. The tart cherry berry bar shall have a moderate tart cherry, moderately sweet, slight cranberry and slight toasted grains odor and flavor.

(3) Flavor III. The salted caramel bar shall have a moderately sweet, moderate buttery caramel and slight toasted grains odor and flavor. The bar shall have a slightly salty flavor.

E. Texture. The bar shall be chewy and slightly soft with crispy pieces of cereal grains. The Flavor II, tart cherry berry bar shall have soft and chewy pieces of dried cranberries.

F. Dimensions. The bar shall be not less than 4-1/4 inches and not greater than 5-1/4 inches in length by not less than 1-1/2 inches and not greater than 2 inches in width.

G. Net weight. The net weight of an individual bar shall be not less than 2.3 ounces (65 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) Carbohydrate. The carbohydrate content shall be not less than 35 grams and not greater than 43 grams per bar.

(2) Protein. The protein content shall be not less than 8 grams and not greater than 12 grams per bar.

(3) Calories. The calorie content shall be not less than 200 calories and not greater than 250 calories per bar.

(4) Calcium. The calcium content shall be not less than 850 milligrams and not greater than 1100 milligrams per bar.

(5) Vitamin D. The vitamin D3 content shall be not less than 1400 International Units (IU) and not greater than 2000 IU per bar.

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

J. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall be not greater than 25,000 Colony Forming Units (CFU) per gram in eight of nine 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 nine pouches tested per production lot.

K. Product formulation and ingredients. The following formulas shall be used for Flavor I chocolate and Flavor II tart cherry berry. 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 (DEVCOM SC), Combat Feeding Division.

(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
Soy protein cereal crisps 80% protein 2/	12.300
Confectioners' sugar	10.000
Maltodextrin (DE 10)	8.220
Crisp rice cereal, tiny round 2/	8.000
High roast African liquor (chocolate wafers) 3/	7.250
Dextrose monohydrate powder	5.000
Palm oil shortening	4.300
Vitamin premix 4/	3.900
Cocoa powder, Red Dutch (10-12 percent fat)	3.000
Whey protein concentrate 80%	2.000
Glycerin USP or food grade	1.900
Lecithin	0.500
Vanilla powder	0.420
Ascorbyl palmitate	0.015
Mixed tocopherols	0.003

NOTE: The corn syrup and maltodextrin percentages may be adjusted to ease process 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 Ingredient Prod, 500 Crocker Rd., Vacaville, CA 95688.

2/ "Soy protein crisps 639" and "Crisp Rice Tiny Round 200" from Pacific Grain Products Inc., P.O. Box 2 Woodland, CA 95776.

3/ "H-365" from Wilbur Chocolate, Lititz, PA 17543.

4/ Vitamin premix shall include calcium carbonate and vitamin D3 and shall be made to ensure compliance with requirements as stated in C-2, I(4) and (5). Vendor shall use FT150302 from DSM Nutritional Products 2105 Technology Drive Schenectady, NY 12308 (or equivalent premix).

(2) Flavor II, Tart cherry berry.

Ingredients	Percent by weight
Corn syrup (DE 42)	20.000
Tart cherry fruit paste 1/	16.387
Maltodextrin (DE 10)	10.000
Milk protein cereal crisps 2/	9.000
Tart cherry powder 3/	9.000
Dried cranberries (Craisins)	8.430
Palm oil shortening	6.500
Milk protein isolate 90% 4/	5.000
Instant whole oats	5.000
Isomaltulose (Palatinose)	4.250
Vitamin premix 5/	3.910
Glycerin USP or food grade	2.000
Sunflower lecithin	0.400
Citric acid	0.100
Ascorbyl palmitate	0.020
Mixed tocopherols	0.003

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

1/ "Tart Cherry Filling Concentrate (052020-03-ST)" from Steward Ingredient Systems, Inc., 1843 W Fulton St., Chicago, IL 60612.

2/ "Crunchie milk protein crisps (74% protein)" from Glanbia Nutritionals, Inc, 227 W Monroe St. Suite 5100, Chicago, IL 60606.

3/ "Tart Cherry RapiDry Powder N298" from FutureCeuticals, Inc., 2692N. State Rt. 1-17, Momence, IL 60954.

4/ "Barpro 296 (milk protein isolate 90%)" from Glanbia Nutritionals, Inc, 227 W Monroe St. Suite 5100, Chicago, IL 60606.

5/ Vitamin premix shall include calcium carbonate and vitamin D3. The following premix has been show to meet end item analytical requirements: FT150302 from DSM Nutritional Products 2105 Technology Drive Schenectady, NY 12308 (or equivalent premix).

L. Preparation and processing. The following preparation and processes were used at the DEVCOM SC for processing the performance readiness bars fortified with calcium carbonate and vitamin D3. Industrial preparation and processing equipment may be used to produce product of the same quality as produced at DEVCOM 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 and heat to 180-200°F (82-93°C).

b. Add shortening, lecithin, mixed tocopherols and ascorbyl palmitate; mix until shortening is melted completely. Allow the product temperature to drop to 160°F (71°C).

c. Add fruit paste (as applicable) and mix thoroughly for 5 to 10 minutes or until uniformly mixed; maintain temperature at 150-160°F (66-71°C).

d. Add chocolate liquor (for Flavor I) and mix thoroughly for 5 minutes until uniform; maintain temperature at 140°F (60°C).

e. Maintain product under low agitation at 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.

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

(2) Matrix mix. The matrix 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. Add dry ingredients (dextrose, maltodextrin, cocoa, vanilla powder, as applicable) and mix 2 to 4 minutes on setting #1 (low speed 55 RPM) or until mix appears homogeneous.

c. Pre-blend isomaltulose (as applicable) and vitamin premix until uniform and then add to batch. Mix on setting #1 or #2 (low to medium speed 55-120 RPM) until uniformly distributed throughout the matrix.

d. Add dried cranberries and oats (for Flavor II) and mix for 2 to 4 minutes on setting #2 (medium speed 120 RPM) until uniformly dispersed throughout matrix.

e. Add cereal crisps and mix for 1 - 2 minutes on setting #1 (low speed 55 RPM) until crisps are uniformly dispersed throughout matrix.

NOTE: Caution needs to be taken throughout mixing process to minimize breaking 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. Any type of high shear bar forming shall be avoided to maintain rice crisp integrity.

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.

C-3 MISCELLANEOUS INFORMATION

THE FOLLOWING IS INFORMATION ONLY TO PROVIDE THE BENEFIT OF PAST EXPERIENCE. THIS IS NOT A MANDATORY CONTRACT REQUIREMENT.

A. Ingredients and formulation. The ingredients and a generic formulation may be as follows:

(3) Flavor III, Salted caramel.

Ingredients	Percent by weight
Flavored bar base	37.000
Maltodextrin (DE 10)	19.000
Isomaltulose (Palatinose)	11.000
Protein cereal crisps	10.000
Palm oil shortening	7.000
Milk protein isolate 90%	6.000
Vitamin premix 1/	4.000
Sunflower lecithin	Less than 2%
Ascorbyl palmitate	Less than 2%
Mixed tocopherols	Less than 2%

1/ Vitamin premix shall include calcium carbonate and vitamin D3. The following premix has been show to meet end item analytical requirements: FT150302 from DSM Nutritional Products 2105 Technology Drive Schenectady, NY 12308 (or equivalent premix).

SECTION D

D-1 PACKAGING

A. Packaging. 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. Packaged bar. Each packaged bar shall be labeled in accordance with all Food and Drug Administration (FDA) laws and regulations for commercially produced food products. In addition the commercially packaged product shall be labeled with the following:

(1) Name and flavor of product (letters not less than 1/8 inch high)
(2) Ingredients
(3) Date 1/
(4) Net weight
(5) Name and address of packer
(6) "Supplement Facts" label in accordance with the Dietary Supplement Health and Education Act (DSHEA) and all applicable FDA regulations
(7) DO NOT CONSUME MORE THAN 1 BAR WITHIN A 15 HOUR TIME PERIOD AND NO MORE THAN 2 BARS WITHIN A 24 HOUR TIME PERIOD

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 2050 would be coded as 0045. The Julian day code shall represent the day the product was packaged into the pouch.

D-3 PACKING

A. Packing. Not more than 40 pounds of product shall be packed in a snug-fitting shipping container and closed in accordance with good commercial practices.

D-5 MARKING

A. Shipping containers. 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.

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 consumption of the product.

(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 PDM shall be inspected in accordance with the provisions of this document and evaluated for overall appearance and palatability.

(2) Conformance inspection. Conformance inspection shall include the product examination and the methods of inspection cited in this section. The contractor shall submit (36) sample bars during the first large scale lot of production as first article samples to be evaluated for conformance and comparability to the initial PDM. The selected bars shall be submitted to the following address for evaluation:

COMBAT CAPABILITIES DEVELOPMENT COMMAND (DEVCOM) SOLDIER CENTER
FCDD-SCD-SCR
10 GENERAL GREENE AVENUE
NATICK, MA 01760-5000

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 sample unit shall be one bar. 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 performance readiness bar or not flavor specified.
	201	Bar not intact. 3/
	202	Bar does not have a smooth to slightly rough glossy exterior surface.
	203	Bar interior matrix not a dense or not a slightly porous structure.
		Appearance
	204	Flavor I chocolate bar not a medium to dark brown exterior or interior color.
	205	Flavor II tart cherry berry bar not a medium reddish-pink exterior or interior color.
	206	Flavor III salted caramel bar not a light to medium tan exterior or interior color.

TABLE I. Product defects 1/ 2/ - Continued

Category		Defect
Major	Minor	
	207	Flavor I chocolate or Flavor III salted caramel bar interior matrix do not have intact pieces of light or not dark tan crisped cereal grains or not uniformly distributed throughout. 4/
	208	Flavor II tart cherry berry bar interior matrix does not have intact pieces of light tan crisped cereal grains or not distinct small pieces of dried cranberries or not uniformly distributed throughout. 4/
		Odor and flavor
102		Flavor I chocolate bar not a moderately sweet baking chocolate or not cocoa or not toasted grains odor or flavor.
103		Flavor II tart cherry berry bar not a moderate tart cherry or not moderately sweet or not slight cranberry or not slight toasted grains odor or flavor.
104		Flavor III salted caramel bar not a moderately sweet or not a moderate buttery caramel or not slight toasted grains odor or flavor.
105		Flavor III salted caramel bar does not have a slightly salty flavor.
		Texture
	209	Bar not chewy or not slightly soft or not with crispy pieces of cereal grains.
	210	Flavor II tart cherry berry bar does not have soft or not chewy pieces of dried cranberries.
		Dimensions
	211	Bar is less than 4-1/4 inches or is greater than 5-1/4 inches in length by less than 1-1/2 inches or greater than 2 inches in width.
		Net weight
	212	Net weight of an individual bar less than 2.3 ounces (65 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/ The carbohydrate, protein and calories content shall be verified by the DSHEA "Supplement Facts" label. Product not conforming to the carbohydrate, protein or calories content requirements as specified in Section C-2, I of this document shall be cause for rejection of the lot.

3/ A bar that is broken into two or more pieces will be considered not intact.

4/ At least 50 percent of the crisped cereal grain pieces shall be intact upon visual examination of a cross section of the bar.

B. Methods of inspection.

(1) Shelf life. The contractor shall provide a Certificate of Conformance that the product has a 12 month shelf life when stored at 80°F.

(2) Net weight. The net weight of the packaged bars 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) Nutrient content. 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-2 of this Product Contract Requirements document shall be cause for rejection of the lot.

(4) 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 methods of the Official Methods of Analysis (OMA) of AOAC International.

Test	Method Number
Calcium	984.27, 985.01, or 2011.14 2/
Vitamin D3	2002.05, 2011.11, or 2016.05 2/

Verification will be conducted through actual testing by a third party certified analytical laboratory or DEVCOM SC. Test results shall be reported to the nearest milligram or IU, as

applicable. Any result not conforming to the vitamin and mineral requirement shall be cause for rejection of the lot.

2/ Tests will be conducted for calcium and vitamin D on the PDMs. If the formula is changed, then another set of tests shall be conducted by a third party certified analytical laboratory or DEVCOM SC, for calcium and vitamin D, and DEVCOM SC will be provided a copy of the formulation.

(5) 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 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. The sample unit shall be a specimen from the center of the product. Test results shall be reported to the nearest 0.01. Verification will be conducted through actual testing by a third party certified analytical laboratory or DEVCOM SC. Any nonconforming a_w result shall be cause for rejection of the lot.

(6) Microbiological testing. Nine filled and sealed bars shall be randomly selected from one lot regardless of lot size (recommend selecting three bars each from the beginning, middle and end of production). The pouched product shall be individually tested for microbiological levels in accordance with the latest edition of the OMA of AOAC International or the FDA Bacteriological Analytical Manual (BAM). For aerobic plate count the average result for all 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 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). Verification will be conducted through actual testing by a third party certified analytical laboratory or DEVCOM SC. 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 or 2005.03
Salmonella	994.04, 967.26, 2003.09, 2004.03, or 2013.09

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 Form

Form 3556	Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semiperishable Subsistence

GOVERNMENT PUBLICATION

FOOD AND DRUG ADMINISTRATION	Bacteriological Analytical Manual (BAM) http://www.fda.gov/food/foodscienceresearch/laboratorymethods/ucm2006949.htm

NON-GOVERNMENTAL STANDARDS

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

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

AOAC INTERNATIONAL www.aoac.org

Official Methods of Analysis (OMA) of AOAC International