SECTION C

This document covers shelf stable dessert bar packaged in a flexible pouch for use by the Department of Defense as a component of operational rations. The bar is designed to deliver high caloric content and low volume/weight.

C-1 ITEM DESCRIPTION

PCR-D-004, DESSERT BAR, PACKAGED IN A FLEXIBLE POUCH, SHELF STABLE

Flavors.

Flavor I -	Mocha
Flavor II -	Peanut butter
Flavor III -	Chocolate banana nut

Packages.

Package A -	Meal, Cold Weather (MCW)
Package B -	Food Packet, Long Range Patrol (LRP)
Package C -	Meal, Ready-to-Eat (MRE)
Package J -	First Strike Ration (FSR)

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 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.

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

C. Appearance. The product shall be free from foreign materials. The bar shall be intact and free of any cracks. The surface of the bar shall be smooth. The bar matrix shall have a dense structure.

(1) Flavor I. The mocha dessert bar shall have a medium brown color and may have visible dark chocolate chips throughout.

(2) Flavor II. The peanut butter dessert bar shall have a light tan color and shall have small pieces of peanuts visible on the surface and throughout.

(3) Flavor III. The chocolate banana nut dessert bar shall have a medium brown color and shall have small walnut pieces visible throughout. The bar may have visible dark chocolate chips throughout.

D. Odor and flavor. The bar shall be free from foreign odors and flavors. The bar shall be free from coconut odor and flavor.

(1) Flavor I. The mocha dessert bar shall have a semisweet chocolate, mild coffee, odor and flavor. The bar shall have a mild sweet cream flavor.

(2) Flavor II. The peanut butter dessert bar shall have a lightly roasted peanut odor and flavor. The bar shall have a mild sweet cream flavor.

(3) Flavor III. The chocolate banana nut dessert bar shall have a moderate banana and a mild cocoa odor and flavor. The bar shall have a mild sweet cream and a mild walnut flavor.

E. Texture. The bar shall have a dense matrix with a smooth, creamy mouthfeel. Flavors II and III shall have firm nut pieces.

F. Size. The rectangular bar dimensions shall be a maximum of 3.7 by 2.0 by 0.6 inches (9.4 by 5.0 by 1.5 cm).

G. Net weight. The net weight shall be not less than 1.4 ounces (40 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. For Flavors I and II, the water activity shall be not greater than 0.35. For Flavor III, the water activity shall be not greater than 0.48.

(2) Aflatoxin content. The aflatoxin content of Flavor II and Flavor III shall be negative.

J. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall be not greater than 25,000 per gram in 4 of 5 samples and not greater than 50,000 per gram in any individual sample.

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

(3) E. coli. *The Escherichia coli* count shall have no positive tubes in the standard 3 tube most probable number (MPN) technique.

(4) Salmonella. The dessert bar shall be *Salmonella* negative.

K. Nuts. All nuts and nut products shall be from the latest season's crop. The peanuts and walnuts should be protected by the types and amounts of antioxidants approved by the FDA for peanuts and walnuts.

L. Product formulation and ingredients. The following formulas have been successfully made at U.S. Army Natick Soldier Center and a large commercial manufacturer. Ingredient suppliers and available specific ingredients may change (companies bought out, part numbers change, ingredients no longer supplied, and etc.). Any changes in ingredients or formula will need to be approved by U.S. Army Natick Soldier Center.

(1) Flavor I, Mocha.

Ingredients	Percent by weight
Sugar, confectioners	32.00
Cream powder 1/	25.60
Chocolate chips, semisweet 2/	15.00
Shortening, vegetable 3/	12.00
Cocoa, Dutched 4/	6.50
Milk, nonfat, dry 5/	5.00
Lecithin, liquid	2.00
Flavoring, vanilla, artificial, powder 6/	1.00
Coffee, instant, spray dried, Brazilian 7/	0.50
Flavoring, vanilla, artificial, oil soluble 8/	0.20
Flavoring, coffee, artificial 9/	0.10
Ascorbyl palmitate	0.06
Mixed tocopherols	0.02
Butylated Hydroxyanisole (BHA) 10/	0.02

1/ “Quali-cream 7211 cream powder (76 percent fat)” from Quality Ingredients Corp., 14300 Rosemount Dr., Burnsville, MN 55306.

2/ “10,000 count/lb. semisweet chocolate chips” from Blommer Chocolate Co., 600 W. Kinzie St., Chicago, IL 60610

3/ “Primex vegetable shortening” from ACH Food Companies, Inc. 7171 Goodlett Farms Pkwy, Memphis, TN 38016.

4/ “Dutched Cocoa, (10 to 13 percent fat)” from The Hersheys Company, 100 Crystal A Drive, Hershey, PA 17033.

5/ “Nonfat Dry Milk NTH INST-I1532” from Kerry Inc., 100 East Grand Ave. Beloit, WI 53511.

6/ “IBS artificial vanilla flavor D980” from International Bakers Services Inc. South Bend, IN 46628.

7/ “0134BB230 Brazilian spray dried instant coffee” from Autocrat Inc., 10 Blackstone Valley Place, Lincoln, RI 02865.

8/ “Artificial vanilla flavor #16518 oil soluble” from David Michael & Co. Inc., 10801 Decatur Rd., Philadelphia, PA 19154.

9/ “Artificial coffee flavor #17772” from David Michael & Co. Inc., 10801 Decatur Rd., Philadelphia, PA 19154.

10/ “Tenox BHA” from Eastman Chemicals, Box 431, Kingsport, TN 37660.

(2) Flavor II, Peanut butter.

Ingredients	Percent by weight
Cream powder 1/	24.84
Sugar, confectioners	19.73
Shortening, vegetable 2/	13.11
Peanuts, dry roasted, unsalted (not greater than 3/8 inch)	13.10
Peanut flour 3/	11.40
Milk, nonfat, dry 4/	8.73
Peanut butter, smooth	5.83
Lecithin, liquid	1.58
Flavoring, vanilla, artificial, powder 5/	1.58
Ascorbyl palmitate	0.06
Mixed tocopherols	0.02
BHA 6/	0.02

Comment [RV1]: Natick ES07-101 – change 01 18 May 07-add size of peanut in order to not get cracks

1/ "Quali-cream 7211 cream powder (76 percent fat)" from Quality Ingredients Corp., 14300 Rosemount Dr., Burnsville, MN 55306.

2/ "Primex Vegetable Shortening" from ACH Food Companies, Inc. 7171 Goodlett Farms Pkwy, Memphis, TN 38016.

3/ "Lightly roasted peanut flour #522857, (28 percent fat)" from Golden Peanut Co., 100 North Point Center East, Suite 400, Alpharetta, GA 30022.

4/ "Nonfat Dry Milk NTH INST-I1532" from Kerry Inc., 100 East Grand Ave. Beloit, WI 53511.

5/ "IBS artificial vanilla flavor D980" from International Bakers Services Inc. South Bend, IN 46628.

6/ "Tenox BHA" from Eastman Chemicals, Box 431, Kingsport, TN 37660.

(3) Flavor III, Chocolate banana nut.

Ingredients	Percent by weight
Cream powder 1/	24.00
Sugar, confectioners	17.00
Chocolate chips, semisweet 2/	15.00
Walnuts, small (not greater than 3/8 inch)	12.00
Shortening, vegetable 3/	11.00
Milk, nonfat, dry 4/	8.00
Cream cheese powder 4/	5.00
Cocoa, Dutched 5/	4.00
Lecithin, liquid	1.60
Flavoring, vanilla, artificial, powder 6/	1.50
Banana extract, imitation 7/	0.80
Ascorbyl palmitate	0.06
Mixed tocopherols	0.02
BHA 8/	0.02

1/ "Quali-cream 7211 cream powder (76 percent fat)" from Quality Ingredients Corp., 14300 Rosemount Dr., Burnsville, MN 55306.

2/ "10,000 count/lb. semisweet chocolate chips" from Blommer Chocolate Co., 600 W. Kinzie St., Chicago, IL 60610

3/ "Primex vegetable shortening" from ACH Food Companies, Inc. 7171 Goodlett Farms Pkwy, Memphis, TN 38016.

4/ "Nonfat Dry Milk NTH INST-I1532 and Chees-treme 3919 (cream cheese powder)" from Kerry Inc., 100 East Grand Ave. Beloit, WI 53511.

5/ "Dutched Cocoa, (10 to13 percent fat)" from The Hersheys Company, 100 Crystal A Drive, Hershey, PA 17033.

6/ "IBS artificial vanilla flavor D980" from International Bakers Services Inc. South Bend, IN 46628.

7/ "Imitation banana extract F55922" from McCormick & Co. Inc., 226 Schilling Circle, Hunt Valley, MD 21031.

8/ "Tenox BHA" from Eastman Chemicals, Box 431, Kingsport, TN 37660.

M. Preparation and Processing (for all flavors). The following preparation and processes were used at U.S. Army Natick Soldier Center for processing the dessert bars. Industrial preparation, processing and equipment may be used to produce product of same quality as produced at U.S. Army Natick Soldier Center.

Liquid Mix:

Equipment: Steam-jacketed kettle equipped with or without swept surface agitator.

Add vegetable shortening; heat until melted, approximately 120°F. Add lecithin, mixed tocopherols (if liquid), liquid flavors, and where required peanut butter. Mix until well blended.

Paste Mixing:

Equipment: Hobart Mixer with standard paddle.

Add all dry ingredients to mixing bowl. Slowly add liquid mix to dry ingredients while mixer is on medium speed. Mix until paste forms (speed may be increased once dough is sticky enough to prevent product loss over the sides). Paste shall be mixed sufficiently to be warm enough to be extruded. Mixing the paste is important; if not mixed long enough the product will not extrude. After paste is formed, add nuts and/or cold chocolate chips. Mix only long enough to fully incorporate particulates into paste. Overmixing the paste may result in melting of chips and broken nuts. Chocolate chips are less likely to melt if chilled prior to preparation and processing.

Extrusion:

Equipment: Hosokawa BEPEX GmhH Model F 97 265 – 266 or Reiser Vmag, 72 Normal double screw extruder.

Product shall be extruded through the nozzle and cut to produce a bar with size and net weight in accordance with product requirements.

Cooling tunnel:

Finished product shall be cooled enough to maintain shape during handling and packaging.

SECTION D

D-1 PACKAGING

A. Packaging. One bar shall be packed in a preformed or form fill seal barrier pouch as described below.

(1) Preformed pouches.

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. For package A (MCW), the complete exterior surface of the pouch shall be colored white overall with a color in the range of 37778 through 37886 of FED-STD-595, Colors Used in Government Procurement. For package B (LRP), package C (MRE) and package J (FSR), the complete exterior surface of the pouch shall be uniformly colored in the range of 20219, 30219, 30227, 30279, 30313, 30324, or 30450 of FED-STD-595.

b. Pouch construction. The pouch shall be a flat style preformed pouch having maximum inside dimensions of 3-3/4 inches wide by 5-1/4 inches long. 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 when tested as specified in E-6,B(1)a. 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 as specified in E-6,B(1)c. A tear notch shall be made in one or both side seals 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 shall be inserted into the pouch. The pouch shall be hermetically sealed under a vacuum of not less than 28 inches of mercury. 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 when tested as specified in E-6,B(1)a. 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 as specified in E-6,B(1)c.

(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 D 1238, 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 D 1505, 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 unit of product shall be placed into the tray-shaped body of the pouch. The filled pouch body shall be hermetically sealed under a vacuum of not less than 28 inches of mercury. 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 when tested as specified in E-6,B(1)b. 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 as specified in E-6,B(1)c. The maximum outside dimensions of the sealed pouch shall be 4-1/2 inches wide by 5-3/4 inches long. A tear notch or serrations shall be provided on one or more edges of the 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.

D-2 LABELING

A. Pouches. Each pouch shall be correctly and legibly labeled. Printing ink shall be permanent black ink or other, dark, contrasting color which is free of carcinogenic elements. The label shall contain the following information:

(1) Name and flavor of product (letters not less than 1/8 inch high)
(2) Ingredients
(3) Date 1/
(4) Net Weight
(5) Contractor's name and address
(6) “Nutrition Facts” label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA/USDA regulations.

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, 13 October 06 would be coded as 6287. The Julian day code shall represent the day the product was packaged into the pouch.

D-3 PACKING

A. Packing for shipment to ration assembler. Not more than 40 pounds of pouched product shall be packed in a fiberboard shipping container constructed in accordance with style RSC-L, class domestic, variety SW, grade 200 of ASTM D 5118/D 5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. Each container shall be securely closed in accordance with ASTM D 1974, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

D-4 MARKING

A. Shipping containers. Shipping containers shall be marked in accordance with DSCP 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 overall appearance and palatability. Any failure to conform to the product requirements or any appearance or palatability failure shall be cause for rejection of the lot. 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:

US Army Research, Development, and Engineering Command
Natick Soldier Center
AMSRD-NSC-CF-F
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.

(2) Conformance inspection. Conformance inspection shall include the product examination and the 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 product 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/ 3/ 4/ 5/ ~~6~~/

Category		Defect
Major	Minor	
		General
101		Product not flavor as specified.
		Appearance
	202	Bar not intact.
	203	Bar has one or more cracks. 6/
	204	Surface of the bar not smooth.
	205	Bar matrix does not have a dense structure.

Comment [p2]: Natick ES07-101 change 01 18 May 07. delete footnote "6/" from header.

Comment [p3]: Natick ES07-101 change 01 18 May 07. defect 203, insert footnote "6/"

TABLE I. Product defects cont'd 1/ 2/ 3/ 4/ 5/ ~~6/~~ (cont'd)

Category		Defect
Major	Minor	
		Odor and flavor
	206	Bar has coconut odor or flavor.
		Texture
	207	Bar does not have a dense matrix with a smooth, creamy mouthfeel.
		Bar size
	208	Rectangular bar dimensions exceed 3.7 by 2.0 by 0.6 inches (9.4 by 5.0 by 1.5 cm).
		Net weight
	209	Net weight less than 1.4 ounces (40 grams).
		Flavor I, Mocha
		Appearance
	210	Bar not a medium brown color.
		Odor and flavor
102		Bar does not have a semisweet chocolate or mild coffee odor or flavor.
	211	Bar does not have a mild sweet cream flavor.
		Flavor II, Peanut butter
		Appearance
	212	Bar not a light tan color.
	213	Small pieces of peanuts not visible on the surface or throughout.

TABLE I. Product defects cont'd 1/ 2/ 3/ 4/ 5/ ~~6/~~ (cont'd)

Category		Defect
Major	Minor	
		Odor and flavor
103		Bar does not have a lightly roasted peanut odor or flavor.
	214	Bar does not have a mild sweet cream flavor.
		Texture
	215	Bar does not have firm nut pieces.
		Flavor III, Chocolate banana nut
		Appearance
	216	Bar not a medium brown color.
	217	Small walnut pieces not visible throughout.
		Odor and flavor
104		Bar does not have a moderate banana or a mild cocoa odor or flavor.
105		Bar does not have a mild sweet cream flavor or a mild walnut flavor.
		Texture
	218	Bar does not have firm nut pieces.

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.

3/ The producer shall provide a USDA Certificate that the peanuts are aflatoxin negative in accordance with the Farm Security and Rural Investment Act of 2002.

4/ Level of antioxidants in peanuts and walnuts shall be verified by producer's Certificate of Analysis.

5/ The producer shall provide a Certificate of Conformance (CoC) from the supplier for each incoming lot indicating that the nuts (walnuts and peanuts) supplied and used in the formulation meet all the requirements for the latest season's crop at the time of issue. The CoC shall be dated, state the harvest period for the lot(s) (for example – Harvested during October 2006 through January 2007 crop season), and identify the lot(s) covered by the CoC. Any nonconformance to this requirement shall be cause for rejection of any component lot(s) or any involved product.

6/ ~~The percentage of U.S. Extra Grade Instant Nonfat Dry Milk shall be verified by the producer's formulation. The producer shall provide a USDA Grading Certificate indicating that the instant nonfat dry milk used in the formulation met all the requirements for U.S. Extra Grade Instant Nonfat Dry Milk~~. Cracks due to matrix separation from nut pieces shall not be scored as a defect.

Comment [p4]: Natick ES07-101 change 01 18 May 07. delete "The percentage…Milk" and insert "Cracks due to matrix separation from nut pieces shall not be scored as a defect."

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 hedonic 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) Aflatoxin content. For the aflatoxin test, 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 Official Methods of Analysis (OMA) of AOAC International:

Test	Method number
Aflatoxin	998.03, 991.31(HPLC)

Verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the aflatoxin requirements shall be cause for rejection of the lot.

NOTE: The following conditions apply for aflatoxin testing on dessert bar:

a. For prepackaged dessert bar product received from a supplier and is not further processed, the contractor will furnish a Certificate of Analysis that the aflatoxin in the peanut butter or roasted peanuts or peanut flour or walnuts in the dessert bar represented is not greater than 15 parts per billion (ppb). No additional testing is required. Results shall be reported to the nearest whole number.

b. For peanut butter or roasted peanuts or peanut flour or walnuts received in bulk (to be used in dessert bar end item), the contractor shall have the bulk shipment sampled and tested by USDA. If (i) the bulk shipment is not more than 2 ppb for aflatoxin as evidenced by a USDA Certificate, (ii) the end item lots are manufactured using that bulk product, and (iii) both the bulk and end item lots' identities have been preserved, then no further aflatoxin testing is required. Results shall be reported to the nearest whole number.

c. For peanut butter, roasted peanuts, peanut flour, or walnuts received in bulk, if the conditions in (b) above are not met, each end-item lot of dessert bar must be sampled and tested by USDA. End item lots determined to have not greater than 15 ppb in aflatoxin as evidenced by a USDA Certificate will be considered acceptable. Bulk nuts or nut products with aflatoxin greater than 15 ppb shall not be used as ingredients.

NOTE: A USDA Certificate of Analysis on roasted peanuts from the most recent crop year which have been kept in cold storage (between approximately 40°F to 50°F at low humidity) is acceptable. Contractor must attest to these storage conditions. If storage conditions for roasted peanuts are not established, a USDA Certificate of Analysis for aflatoxin on roasted peanuts will be considered current if not more than 30 days have elapsed since the date of the analysis.

(4) Water activity (Aw) testing. Eight filled and sealed pouches shall be selected at random from the lot regardless of lot size. Water activity shall be determined not less than 48 hours after packaging to allow moisture equilibration in the product. The pouched product shall be individually tested for Aw in accordance with the OMA of the AOAC method 978.18, using an electric hygrometer system self temperature controlled at 77ºF (25ºC) or an equivalent instrument. The results of each Aw determination shall be reported to the nearest 0.01. Any result not conforming to the analytical requirements shall be cause for rejection of the lot.

(5) Microbiological testing. Five filled and sealed pouches shall be selected at random from the lot regardless of lot size. The pouched product shall be individually tested for microbiological levels in accordance with the OMA of the AOAC, for aerobic plate count

method 966.23 or 990.12 and for E. coli, method 966.24 or the methods on page 4.03 Section C and page 4.05, Section F, Chapter 4, 8th edition, FDA Bacteriological Analytical Manual (BAM). The diluent shall be added to each sample and allowed to stand for 15 minutes before blending the sample. Yeast and mold testing shall be in accordance with the OMA of the AOAC, method 997.02. *Salmonella* testing shall be in accordance with the OMA of the AOAC, methods 967.25, 967.28, 986.35, 991.13, 996.08, or 2003.09. Any result not conforming to the microbiological requirements shall be cause for rejection of the lot.

NOTE: The following conditions apply for *Salmonella* and microbiological testing:

(a) For prepackaged product received from a supplier and is not further processed, the contractor will furnish a Certificate of Analysis that the product represented is *Salmonella* negative and meets all microbiological requirements.

(b) For pre-made dessert bars received in bulk, the contractor is responsible for providing a Certificate of Analysis stating that the bulk product is *Salmonella* negative and meets all microbiological requirements. USDA *Salmonella* and additional microbiological testing is required for each end item lot and shall be the basis for lot acceptance with respect to *Salmonella* and other microbiological testing requirements.

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

A. Packaging.

(1) Pouch material certification. Material listed below may be accepted on the basis of a contractor's Certification of Conformance (CoC) to the indicated requirements. In addition, compliance to the requirements for inside pouch dimensions and dimensions of manufacturer's seals may be verified by CoC.

Requirement	Requirement paragraph	Test procedure
Thickness of films for laminated material	D-1,A(1)a and D-1,A(2)a	As specified in ASTM D 2103 1/
Aluminum foil thickness	D-1,A(1)a and D-1,A(2)a	As specified in ASTM B 479 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	Visual evaluation by FED-STD-595 3/

1/ ASTM D 2103 Standard Specification for Polyethylene Film and Sheeting

2/ ASTM B 479 Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil For Flexible Barrier, Food Contact, and Other Applications.

3/ FED-STD-595 Colors Used in Government Procurement.

(2) Unfilled preformed pouch certification. A certification of conformance 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 notch or serrations missing or does not facilitate opening.
	203	Seal width less than 1/8 inch but greater than 1/16 inch.
	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 (±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 less than 1/8 of the total surface area of one pouch face (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 F 88, Standard Test Method for Seal Strength of Flexible Barrier Materials. The lot size shall be expressed in pouches. 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 a major defect and shall be cause 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 F 88. The lot size shall be expressed in pouches. 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 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 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 bottom seals of the pouch. 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 approximate uniform rate of 1 pound 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 cause for rejection of the lot.

(2) Pouch vacuum examination. The filled and sealed pouches shall be visually examined for conformance to the vacuum requirement not less than 96 hours after filling and sealing. The sealed pouch shall continue to exhibit tight adherence to the surface contours of the contents when a pulling force is applied at the center of each side seal. This force shall be applied by holding each side seal between thumb and forefinger of each hand, while simultaneously exerting a slight pull with both hands. Any evidence of loss of vacuum shall be classified as a major defect. The lot size shall be expressed in pouches. The sample unit shall be one filled and sealed pouch. The inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65.

C. Packing.

(1) Shipping container and marking examination. The filled and sealed shipping containers shall be examined for the defects listed in table III below. 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

DSCP FORMS

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

FEDERAL STANDARD

FED-STD-595	Colors Used in Government Procurement

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)

ANSI/ASQ Z1.4 2003	Sampling Procedures and Tables for Inspection by Attributes

ASTM INTERNATIONAL

B 479-06	Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil For Flexible Barrier, Food Contact, and Other Applications
D 1238-04c	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
D 1505-03	Standard Test Method for Density of Plastics by the Density-Gradient Technique
D 1974-98 (2003)	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D 2103-05	Standard Specification for Polyethylene Film and Sheeting
D 5118/D 5118M-05a	Standard Practice for Fabrication of Fiberboard Shipping Boxes
F 88-06	Standard Test Method for Seal Strength of Flexible Barrier Materials

AOAC INTERNATIONAL

Official Methods of Analysis (OMA) of the AOAC International

GOVERNMENT PUBLICATIONS

FDA Bacteriological Analytical Manual (BAM), 8th Edition

TO DSCP WEB SITE

AMSRD-NSC-CF-F (Valvano/5907) 18 May 2007

TO: DSCP- FTRAC (Lecollier/3625)

Subject: ES07-101; Technical Inquiry; PCR-D-004 Dessert Bars, Packaged in a Flexible Pouch; Solicitation for FIRST STRIKE™ Ration (FSR), surface cracking and ingredient source issues

1. Vendors submitted questions on subject product with regard to product cracking (Table I defect 203) and clarification of requirement documentation for non fat dry milk (NFDM).

2. Photos were submitted to this Center for review on product bars manufactured with apparent cracking .The vendors were concerned that the peanut caused this condition. This Center reviewed the photos. The cracks appear to be caused by using whole and halved peanuts rather than quartered. Larger particulates and may be difficult to extrude. In addition, it was determined that the bar may be pulled away from the peanut surface during the extrusion since the matrix does not want to stick to the peanut. The cracks we want to avoid are those caused when moving the belt away from the extruder at a speed higher than the extruder speed.

3. The NFDM ingredient manufacturer informed this Center that the originally used ingredient from prototypes was not USDA Extra Grade Instant Nonfat Dry Milk as previously stated. The inspection requirement for a USDA certificate will be deleted. The subject document does allow for alternate ingredients as long as they are approved by this Center.

4. The following changes are highlighted in the attached file:

Sec C, C-2, L (2) Flavor II – For “Peanuts dry roasted” insert “(not greater than 3/8 inch)”.

Sec E, E-5, Table I, delete footnote “6/” from header.

Sec E, E-5 Table I, defect 203, insert footnote “6/”.

Sec E, E-5, Table I, footnote 6 – delete “The percentage…Milk” and insert “Cracks due to matrix separation from nut pieces shall not be scored as a defect.”