

SECTION C

This document covers dehydrated cooked buffalo style macaroni and cheese with chicken breast meat packaged in a No. 10 metal can for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-B-063, BUFFALO STYLE MACARONI AND CHEESE WITH CHICKEN BREAST MEAT, DEHYDRATED, COOKED, PACKAGED IN A No. 10 METAL CAN, SHELF STABLE

C-2 PERFORMANCE 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 Performance-based 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 food shall meet the minimum shelf life requirement of 36 months at 80°F.

C. Dehydrated product.

(1) Appearance.

a. General. The finished product shall be a cooked, dehydrated mixture of enriched whole wheat elbow macaroni, chicken, carrots and celery covered in a buffalo style cheese sauce powder. The product shall be fully dehydrated. The finished product shall be free from foreign materials.

b. Macaroni. The whole wheat elbow macaroni shall be approximately 1/2 inch in length. The cooked, dehydrated whole wheat macaroni shall be an off-white to light tan color.

c. Chicken. The cooked, dehydrated, shredded chicken shall be produced from whole muscle chicken breast meat. The shredded chicken shall be an off-white to light tan color and shall be fibrous.

d. Vegetables. The cooked, dehydrated vegetables shall be orange carrot pieces and green celery pieces.

e. Sauce. The cooked, dehydrated buffalo style cheese sauce shall be an orange, free-flowing powder.

(2) Odor. The packaged food shall have a slight to moderate spicy and vinegar odor. The packaged food shall be free from foreign odors.

(3) Texture. The product shall not have wet or soft spots indicating incomplete dehydration.

(4) Net weight. The average net weight shall be not less than 18.6 ounces (527 grams). The net weight of an individual can shall be not less than 17.6 ounces (499 grams).

D. Rehydrated product.

(1) Appearance.

a. General. The finished product shall be a rehydrated mixture of elbow macaroni, chicken, carrots and celery in a buffalo style cheese sauce. The finished product shall be free from foreign materials.

b. Macaroni. The rehydrated whole wheat elbow macaroni shall be discernible and shall be an off-white to light tan color. The macaroni may have an orange color from the sauce.

c. Chicken. The rehydrated shredded chicken shall be an off-white to light tan color.

d. Vegetables. The rehydrated vegetables shall be orange carrot pieces and green celery pieces.

e. Sauce. The rehydrated sauce shall be slightly glossy, semi-translucent and moderately thick.

(2) Odor and flavor. The rehydrated packaged food shall have a moderate spicy, vinegar sour odor and may have a slight chicken and macaroni odor. The packaged food

shall have a cooked macaroni, cooked chicken, cooked carrot and celery in a seasoned buffalo cheese sauce flavor. The product shall elicit a sensation of mild to moderate heat. The rehydrated food shall be free from foreign odors and flavors.

(3) Texture.

a. General. The product shall fully rehydrate within ten minutes.

b. Macaroni. The rehydrated whole wheat elbow macaroni shall be slightly firm to firm.

c. Chicken. The rehydrated chicken meat shall be tender with a cooked whole muscle shredded chicken breast meat texture.

d. Vegetables. The rehydrated carrot and celery pieces shall be slightly soft to slightly firm.

e. Sauce. The rehydrated buffalo style cheese sauce shall be smooth and moderately thick.

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

F. Analytical requirements.

(1) Protein. The protein content shall be not less than 23.0 percent.

(2) Fat. The fat content shall be not less than 11.5 and not greater than 17.5 percent.

(3) Sodium. The sodium content shall be not less than 1050 and not greater than 1600 mg per 100 grams.

(4) Moisture. The moisture content of the dehydrated product shall not exceed 3.0 percent.

(5) Oxygen. The oxygen content of the headspace gas in the metal can shall not exceed 2.0 percent.

G. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall be not greater than 75,000 Colony Forming Units (CFU) per gram in four of five samples and not greater than 150,000 CFU per gram in any individual sample.

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

(3) Salmonella. The *Salmonella* test shall be negative for each of five cans tested per production lot.

SECTION D

D-1 PACKAGING

A. Packaging. The dehydrated product shall be packaged in a No. 10 metal can with an oxygen scavenger so that the oxygen content of the gases in the filled and sealed container shall not exceed 2.0 percent when tested after 96 hours of packing. The filled and sealed can shall conform to the United States Standards for Condition of Food Containers. The can shall not leak when tested in accordance with E-5, B(7).

B. Oxygen scavenger. The oxygen scavenger shall be constructed of materials that are safe for direct food contact. The oxygen scavenger shall be in compliance with all applicable Food and Drug Administration (FDA) regulations.

D-2 LABELING

A. Metal cans. The metal cans shall be labeled in accordance with DLA Troop Support Form 2997, Labeling of Metal Cans for Subsistence. The following information shall be included on a label or printed directly on one end of the can:

- (1) BUFFALO STYLE MACARONI AND CHEESE WITH CHICKEN BREAST MEAT, DEHYDRATED, COOKED
- (2) Net weight
- (3) Name and address of processor
- (4) Date of packaging (day-month-year)
- (5) Lot No. (concurrent with dehydration load)
- (6) Inspection legend

(7) Ingredients statement

(8) Directions for use:

Remove and discard oxygen scavenger packet(s). Bring 6 cups of water to a boil; Remove from heat source and immediately add contents of can; Stir thoroughly to distribute water. Cover and let stand for 10 minutes stirring occasionally or until completely rehydrated. Stir and serve.

Yield per No. 10 can: 7.5 portions of approximately 1 cup each.
For 50 portions use 7 cans and approximately 2.625 gallons (42 cups) of water.

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 of ASTM D5118/D5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The fiberboard shall conform to type CF, class D, variety SW, minimum burst grade 200 or ECT 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 and unit loads 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:

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

One lot shall be randomly selected during each calendar month of production or as otherwise specified in the contract. Two (2) sample units shall be randomly selected from that one production lot. The two (2) 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 Performance-based Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQ Z1.4. The lot size shall be expressed in cans. The sample unit shall be the contents of one can. 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 6.5 for minor defects. Defects and defect classifications are listed in table I.

TABLE I. Product defects 1/ 2/

Category		Defect
<u>Major</u>	<u>Minor</u>	
<u>Dehydrated product</u>		
<u>Appearance</u>		
101		Product not a cooked or not a dehydrated mixture of enriched whole wheat elbow macaroni or not chicken or not carrots or not celery or not covered in a buffalo style cheese sauce powder. <u>3/</u>
102		No. 10 metal can does not contain intact oxygen scavenger(s). <u>4/</u>
103		Tear or hole or open seal in oxygen scavenger.
104		Product not fully dehydrated. <u>5/</u>
	201	Whole wheat elbow macaroni not approximately 1/2 inch in length. <u>6/</u>
	202	Cooked, dehydrated whole wheat elbow macaroni not an off-white to light tan color.
105		Cooked, dehydrated chicken not shredded or not produced from whole muscle chicken breast meat. <u>7/</u>

TABLE I. Product defects 1/ 2/ - Continued

Category		Defect
<u>Major</u>	<u>Minor</u>	
	203	Cooked, dehydrated, shredded chicken not an off-white to light tan color or not fibrous.
	204	Cooked, dehydrated vegetables not orange carrot pieces or not green celery pieces.
	205	Cooked, dehydrated buffalo style cheese sauce not orange or not a free-flowing powder.
		<u>Odor</u>
106		Packaged food does not have a slight to moderate spicy or not a vinegar odor.
		<u>Texture</u>
107		Product has wet or soft spots indicating incomplete dehydration.
		<u>Net weight</u>
	206	Net weight of an individual can less than 17.6 ounces (499 grams). <u>8/</u>
		<u>Rehydrated product 9/</u>
108		Product not a rehydrated mixture of elbow macaroni or not chicken or not carrots or not celery or not in a buffalo style cheese sauce.
	207	Rehydrated elbow macaroni not discernible or not an off-white to light tan color.
	208	Rehydrated shredded chicken not an off-white to light tan color.
	209	Rehydrated vegetables not orange carrot pieces or not green celery pieces.

TABLE I. Product defects 1/ 2/ - Continued

Category		Defect
<u>Major</u>	<u>Minor</u>	
	210	Rehydrated sauce not slightly glossy or not semi-translucent or not moderately thick.
		<u>Odor and flavor</u>
109		Rehydrated packaged food does not have a moderate spicy or not a vinegar sour odor.
110		The packaged food does not have a cooked macaroni or not a cooked chicken or not a cooked carrot or not a cooked celery or not in a seasoned buffalo cheese sauce flavor.
111		The packaged food does not elicit a sensation of mild to moderate heat.
		<u>Texture</u>
	211	Rehydrated whole wheat elbow macaroni not slightly firm to firm.
	212	Rehydrated chicken not tender or not with a cooked whole muscle shredded chicken breast meat texture.
	213	Rehydrated carrot or celery pieces not slightly soft to slightly firm.
	214	Rehydrated buffalo style cheese sauce not smooth or not moderately thick.

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. Foreign flavor not applicable to dehydrated product.

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. Palatability not applicable to dehydrated product.

3/ Verification of the macaroni as enriched whole wheat macaroni product shall be with the statement of ingredients on the label or verified by the producer's Certificate of Conformance (CoC). Any nonconforming result shall be cause for rejection of the lot.

4/ Construction of the oxygen scavenger and compliance with FDA regulations will be verified by CoC.

5/ Presence of dark colored cores or a glazed surface area more than 0.25 inch in any dimension.

6/ Length of whole wheat elbow macaroni shall be verified by producer's CoC.

7/ Requirement for whole muscle chicken breast meat shall be verified by a CoC.

8/ Sample average net weight less than 18.6 ounces (527 grams) shall be cause for rejection of the lot.

9/ Prior to conducting the rehydrated product examination, the product shall be reconstituted per can instructions. Product that does not rehydrate within ten minutes 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 can shall be determined by weighing each sample unit on a suitable scale tared with a representative empty can, lid and appropriate number of oxygen scavengers. Results shall be reported to the nearest 0.1 ounce or to the nearest 1 gram.

(3) Analytical. The sample to be analyzed shall be a one-pound composite of three filled and sealed cans that have been selected at random from one production 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:

<u>Test</u>	<u>Method Number</u>
Protein	988.05 or 992.15
Fat	991.36, 2007.04, or 2008.06
Sodium	985.35, 984.27, 2011.14, or 2011.19

Test results for protein and fat shall be reported to the nearest 0.1 percent. Test results for sodium content shall be reported to the nearest 1.0 mg per 100 grams. Government verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the analytical requirement shall be cause for rejection of the lot.

(4) Moisture testing. The sample to be analyzed shall be a one-pound composite of three filled and sealed cans that have been selected at random from one production lot. The composite sample shall be tested for moisture content in accordance with the Official Methods of Analysis (OMA) of AOAC International method 950.46A (except that the temperature-time cycle for moisture analysis shall be modified by using a temperature of 70°C for 16 hours at a pressure of not more than 100 mm of mercury), method 2007.04 or 2008.06 are also acceptable indirect methods. Test results shall be reported to the nearest 0.1 percent. Government verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the requirements specified in Section C of this Performance-based Contract Requirements document shall be cause for rejection of the lot.

(5) Oxygen content in the headspace gas examination. The oxygen test shall be performed within 96 hours of packaging. The determination of the oxygen content in the headspace gas shall be by using an electronic oxygen analyzer which operates on the principle of the difference in partial pressure of oxygen between the oxygen reference and the oxygen content of the sample as detected by a porous zirconia sensor, such as the Illinois Instrument Analyzer or its equivalent, or on the principle of paramagnetic resonance such as the Servomex analyzer, or its equivalent. The oxygen analyzer shall be calibrated to a known standard prior to testing the headspace gas of the product. Any result not conforming to the oxygen in headspace requirement in C-2, F(5) shall be classified as a major defect. The lot size shall be expressed in units of cans. The sample unit shall be one filled and sealed can. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 1.5. Test results shall be reported to the nearest 0.1 percent.

(6) Microbiological testing. Five filled and sealed cans shall be selected at random from the lot regardless of lot size. The product shall be individually tested for microbiological levels in accordance with the Official Methods of Analysis (OMA) of AOAC International or the Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM). Government verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the requirements specified in Section

C of this Performance-based Contract Requirements document shall be cause for rejection of the lot.

<u>Test</u>	<u>Method Number</u>
Aerobic Plate Count	966.23, 990.12, or BAM, Ch. 3
<i>E. coli</i>	966.24, 991.14, 992.30, or BAM, Ch. 4
<i>Salmonella</i>	967.26, 967.28, 986.35, 991.13, 2003.09, 2004.03, 2013.09, or BAM Ch. 5

(7) Can leakage examination. Cans shall be inspected for leakage. The sample unit shall be one filled and sealed can. The lot size shall be expressed in cans. The sealed cans shall be examined for leakage by submerging the can in water contained in a vacuum desiccator, Mead Tester, or equivalent device, and drawing a vacuum of 10 inches of mercury (atmospheric pressure 29.9 inches of Hg) for at least 30 seconds. A leak is indicted by a steady progression of bubbles and is a major defect. Isolated bubbles caused by air entrapped in the double seam are not considered signs of leakage. The inspection level shall be S-2 and the AQL, expressed as defects per hundred units, shall be 1.5.

E-6 QUALITY ASSURANCE PROVISIONS (PACKAGING AND PACKING MATERIALS, No. 10 METAL CAN)

A. Packaging.

(1) Can condition examination. Examination of filled and sealed cans shall be in accordance with the United States Standards for Condition of Food Containers. In addition, scratches, scuffs or abrasions that occur on the outside coating as a result of the filling, sealing, and processing of the cans shall not be scored as a defect.

(2) Can closure examination. Can closures shall be examined visually and by teardowns in accordance with the can manufacturer's requirement and 21 CFR, Part 113, Subpart D, or 9 CFR, Part 318, Subpart G, as applicable. Any nonconformance based on observation of can seam teardowns or on record of can seam teardowns shall be classified as a major defect and shall be cause for rejection of any involved product.

B. Labeling.

(1) Can labeling examination. The can labeling shall be examined in accordance with the requirements of DLA Troop Support Form 2997, Labeling of Metal Cans for Subsistence. Any nonconformance shall be classified as a major defect.

C. Packing.

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Marking missing or incorrect or illegible.
102		Inadequate workmanship. <u>1/</u>
	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.

D. Unitization.

(1) Unit load examination. The unit load shall be examined in accordance with the requirements of DLA Troop Support Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Any nonconformance shall be classified as a major defect.

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 2997	Labeling of Metal Cans for Subsistence
Form 3507	Loads, Unit: Preparation of Semiperishable Subsistence Item
Form 3556	Marking Instructions for Boxes, Sacks and Unit Loads of Perishable and Semiperishable Subsistence

GOVERNMENT PUBLICATIONS

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder
(21 CFR Parts 1-199) and (9 CFR Parts 1-391)

U.S. Standards for Condition of Food Containers

FOOD AND DRUG ADMINISTRATION Bacteriological Analytical Manual (BAM)
[http://www.fda.gov/Food/ScienceResearch/
LaboratoryMethods/BacteriologicalAnalytic
alManualBAM/default.htm](http://www.fda.gov/Food/ScienceResearch/LaboratoryMethods/BacteriologicalAnalyticalManualBAM/default.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

ASTM INTERNATIONAL www.astm.org

D1974/D1974M Standard Practice for Methods of Closing, Sealing, and
Reinforcing Fiberboard Boxes

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