SECTION C

This document covers cooked dehydrated chili con carne with beans 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-C-059, CHILI CON CARNE WITH BEANS, COOKED, DEHYDRATED, 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 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. Ground beef. The ground beef shall be of a grind size typically produced by a 3/8 inch plate machine setting. The ground beef shall be practically free of bone or bone fragments, cartilage, coarse connective tissue, tendons or ligaments, and glandular material.

D. Kidney beans. The beans shall be light red kidney beans with cooked bean color. The beans shall be practically free of broken, mashed or loose skins.

E. Dehydrated product.

(1) General. The finished product shall be cooked dehydrated chili con carne with beans. The product shall show no evidence of incomplete dehydration such as wet or soft spots. There shall be no glazed surface areas or burned areas (as indicated by a black spot) measuring more than 0.5 inch in any dimension. There shall be no dark colored cores of any dimension. The dehydrated product shall have a reddish brown color with distinct kidney bean ingredient and distinct ground meat ingredient. The packaged food shall be free from foreign materials.

(2) Odor. The packaged food shall have a cooked bean, meat and tomato with chili spice odor. The packaged food shall be free from foreign odors.

(3) Particle size. Not less than 30 percent of the dehydrated product (by weight) shall be retained on a U.S. Standard No. 4 sieve.

(4) Net weight. The average net weight shall be not less than 40.0 ounces. No individual can shall have a net weight of less than 39.2 ounces.

(5) Microbiological. 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 sample. The E. coli count shall be less than 3 per gram (no positives in the standard 3 tube MPN technique) in four of five samples and not greater than 10 per gram in any sample.

F. Rehydrated product.

(1) General. The finished product shall be a mixture of coarsely ground beef, light red kidney beans in a tomato based sauce with onions, seasoned with spices. The rehydrated product shall show complete water penetration through all particles. The packaged food shall be free from foreign materials.

G. Odor and flavor. The rehydrated product shall have an odor and flavor of ground beef and kidney beans in a tomato based sauce with onions and shall elicit a sensation of medium to high heat. The packaged food shall be free from foreign odors and flavors.

H. Texture.

(1) Ground beef. The cooked ground beef shall be moist and tender.

(2) Kidney beans. The kidney beans shall be slightly soft to slightly firm.

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

J. Analytical requirements.

(1) Fat content. The fat content shall be not less than 15.0 percent and not greater than 30.0 percent.

(2) Sodium content per 100 grams. The sodium content shall be not less than 1330 mg and not greater than 2510 mg.

(3) Protein content. The protein content shall be not less than 25.0 percent.

K. Moisture content. The moisture content of the dehydrated product shall not exceed 2.0 percent.

L. Oxygen content. Oxygen content of the headspace gas shall not exceed 2.0 percent. Product shall be tested no more than 24 hours after packaging.

C-3 MISCELLANEOUS INFORMATION

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

A. Spice and seasoning mix preparation. The spice and seasoning mix may be a uniform blend of the following ingredients:

Ingredient	Percent by weight
Chili powder	39.20
Soup stock, dehydrated	20.00
Onions, chopped, dehydrated	16.70
Salt 1/	16.70
Garlic powder	3.30
Paprika, ground	2.80
Pepper, red, ground	1.30

B. Product preparation. The chili con carne with beans may be formulated as follows:

Ingredient	Percent by weight
Beef, ground (raw)	40.00
Beans, kidney, red (dry weight, 10 – 18 percent moisture)	24.00
Water	17.00
Tomatoes, crushed or pureed	10.00
Spice and seasoning mix	6.00
Tomato paste (24 – 28 percent solids)	3.00

1/ The total amount of salt in the formula may be adjusted as necessary to produce a product that complies with the finished product sodium requirement.

SECTION D

D-1 PACKAGING

A. Packaging. The dehydrated product shall be packaged in a No. 10 metal can under an atmosphere of nitrogen so that the oxygen content of the gases in the filled and sealed container shall not exceed 2.0 percent when tested within 24 hours of packing.

D-2 LABELING

A. Labeling of metal cans. Labeling of metal cans shall be as specified in DSCP FORM 2997, Labeling of Metal Cans for Subsistence. In addition, the following information, and directions for use, as applicable, shall appear on one end of the can:

CHLI CON CARNE WITH BEANS, COOKED, DEHYDRATED
DIRECTIONS FOR USE:
BRING 3 QUARTS OF WATER TO A BOIL; REMOVE FROM SOURCE OF HEAT. IMMEDIATELY ADD CONTENTS OF CAN; STIR THOROUGHLY TO DISTRIBUTE WATER. COVER; LET STAND 10 MINUTES OR UNTIL THOROUGHLY REHYDRATED.
STIR AND SERVE
YIELD: 15 PORTIONS (1 CUP)
FOR 100 PORTIONS: USE 6 1/2 CANS AND 4-7/8 GALLONS OF WATER
Ingredients
Date
Net weight
Official establishment number (for example, EST-38/USDA stamp)
Contractor's name and address

D-3 PACKING

A. Commercial packing. Six cans of product shall be packed in a shipping container complying with ASTM D3951-98 (2004), Standard Practice for Commercial Packaging.

B. Export packing. Six cans of product shall be packed in a fiberboard shipping container conforming to style RSC, grade W5c or W5s of ASTM D5118/D5118M-95 (2001), Standard Practice for Fabrication of Fiberboard Shipping Boxes. Each shipping container shall be closed and reinforced with nonmetallic strapping or pressure-sensitive adhesive filament-reinforced tape in accordance with ASTM D1974-98 (2003), Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

D-4 UNITIZATION

A. Unit loads. Unit loads shall be as specified in DSCP FORM 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items.

D-5 MARKING

A. Shipping containers and unit loads. Marking of shipping containers and unit loads shall be as specified in 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/ASQC Z1.4-1993, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, Single Sampling Plans indicated in ANSI/ASQC Z1.4-1993 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 performance 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. Two (2) sample units of each item produced shall be randomly selected from that one production lot. The two (2) 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 examinations 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 performance requirements specified in Section C of this Performance-based Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQC Z1.4 - 1993. 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 below.

TABLE I. Product defects 1/ 2/ 3/

Category		Defect
Major	Minor	
		Dehydrated product
101		Product not cooked dehydrated chili con carne with beans.
102		Evidence of incomplete dehydration such as wet or soft spots.
103		Presence of glazed surface areas measuring more than 0.5 inch in any dimension.

TABLE I. Product defects 1/ 2/ 3/ cont'd

Category		Defect
Major	Minor	
		Dehydrated product cont'd
104		Presence of burned areas as indicated by a black spot greater than 0.5 inch in any dimension.
105		Presence of dark colored cores in any dimension.
	201	Dehydrated product does not have a reddish brown color with distinct kidney bean ingredient and distinct ground meat ingredient.
106		The dehydrated product does not have cooked bean, meat and tomato with chili spice odor.
	202	Less than 30 percent (by weight) retained on a U.S. Standard No. 4 sieve. 4/
	203	Net weight of individual can less than 39.2 ounces. 5/
		Rehydrated product 6/
107		Not a mixture of coarsely ground beef, light red kidney beans in a tomato based sauce with onions, seasoned with spices.
108		Incomplete water penetration through all particles. 7/
	204	Total weight of cartilage, coarse connective tissue, section of tendons or ligaments, and glandular material, collectively, from a 120 gram aliquot of dehydrated product, is more than 9 grams after the product has been rehydrated.
109		Presence of a bone piece measuring 0.3 inch or more in any dimension per 120 gram aliquot of dehydrated product after rehydration.
	205	Beans not practically free of broken, mashed or loose skins.

TABLE I. Product defects 1/ 2/ 3/

Category		Defect
Major	Minor	
		Rehydrated product 6/ cont'd
		Odor and flavor
110		Odor or flavor not of ground beef and kidney beans in a tomato based sauce with onions.
	206	Rehydrated product does not elicit a sensation of medium to high heat.
		Texture
	207	Cooked ground beef not moist or not tender.
	208	Kidney beans not slightly soft to slightly firm.

1/ Presence of any foreign materials such as, but not limited to dirt, insect parts, hair, wood, glass, metal, or mold, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale 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/ Grinder plate size requirement for ground beef shall be verified by certificate of conformance.

4/ Four 10 ounce increments from one primary container shall be mechanically shaken for 2 minutes on an 8 inch sieve, or optionally, the entire contents of one whole can (40 ounces) shall be mechanically shaken for 2 minutes on a 12 inch diameter sieve.

5/ Sample average net weight less than 40.0 ounces shall be cause for rejection of the lot.

6/ Rehydrate product according to directions on can.

7/ Water penetration of the beans may be impeded by the skin. The beans shall be soft and easily crushed between the thumb and forefinger. Beans that are unrehydrated and hard

indicate improper processing and shall be cause for rejection. Dry areas attributable to gristle and similar material shall not be considered as defects.

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 80^0F. Government verification may include storage for 6 months at 100^0F or 36 months at 80^0F. 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 can shall be determined by weighing each sample unit on a suitable scale tared with a representative empty can and lid. Results shall be reported to the nearest 0.1 ounce.

(3) Microbiological testing. Five filled and sealed cans of finished product shall be selected at random from the lot regardless of lot size. The contents of each sample can shall be tested for aerobic plate count and for E. Coli in accordance with the Official Methods of Analysis of the AOAC, methods 966.23 and 966.24. The diluent shall be added to each sample of dry product and allowed to stand for 15 minutes before the blending of that sample. Continue as directed by the AOAC. Any result not conforming to the microbiological requirements in C-2, E, (5) shall be cause for rejection of the lot.

(4) Moisture content testing. Eight filled and sealed cans shall be selected at random from the lot regardless of lot size. The contents of each can shall be tested for moisture content in accordance with the Official Methods of Analysis of the AOAC method 925.45/A or 926.08 (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). Test results shall be reported to the nearest 0.1 percent. 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 24 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, L 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) 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 desicator, 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.

(7) 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 Official Methods of Analysis of AOAC International (OMA).

Test	Method Number
Protein	988.05 or 991.20 or 992.15
Fat	985.15
Sodium	985.35 or 984.27 or 969.23

Protein and fat test results shall be reported to the nearest 0.1 percent and sodium test results shall be reported to the nearest 10 mg/100g. Verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the analytical requirements shall be cause for rejection of the lot.

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 DSCP 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 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 II. Shipping container and marking defects

Category		Defect
Major	Minor	
101		Marking omitted, incorrect, illegible, or improper size, location sequence or method of application.
102		Inadequate workmanship. 1/
	201	Number of cans not as specified.

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 DSCP FORM 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Any nonconformance shall be classified as a major defect.

SECTION J REFERENCE DOCUMENTS

DSCP FORMS

DSCP FORM 2997	Labeling of Metal Cans for Subsistence
DSCP FORM 3507	Loads, Unit: Preparation of Semiperishable Subsistence Items
DSCP 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

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)

ANSI/ASQCZ1.4-1993	Sampling Procedures and Tables for Inspection by Attributes

ASTM INTERNATIONAL

D1974-98 (2003)	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D3951-98 (2004)	Standard Practice for Commercial Packaging
D5118/D5118M-95 (2001)	Standard Practice for Fabrication of Fiberboard Shipping Boxes

AOAC INTERNATIONAL	Official Methods of Analysis of the AOAC International (OMA)