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SUPERSEDING
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MILITARY SPECIFICATION

CHILI CON CARNE, THERMOSTABILIZED, TRAY PACK

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers chili con carne thermostabilized in tray pack cans for use by the Department of Defense as a component of operation rations.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Documents. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

TT-C-495	- Coatings, Exterior, for Tinned Food Cans
PPP-B-636	- Boxes, Shipping, Fiberboard

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8940

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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- MIL-L-1497 - Labeling of Metal Cans for Subsistence Items
- MIL-L-35078 - Loads, Unit: Preparation of Semiperishable Subsistence Items; Clothing, Personal Equipment and Equipage; General Specification for

STANDARDS

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- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-900 - Bacterial Standards for Starches, Flours, Cereals, Alimentary Pastes, Dry Milks and Sugars Used in the Preparation of Thermostabilized Foods for the Armed Forces

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.1.2 Other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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

(Applications for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

U.S. DEPARTMENT OF AGRICULTURE (USDA)

U.S. Standards for Grades of Tomato Paste

(Applications for copies should be addressed to the Chief, Processed Products Branch, Fruit and Vegetable Division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington, DC 20250.)

United States Standards for Condition of Food Containers

(Application for copies should be addressed to the Director, Market Research and Development Division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington, DC 20250.)

Meat and Poultry Inspection Regulations

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(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Interim Primary Drinking Water Regulations

(Application for copies should be addressed to the Office of Drinking Water WH550, Environmental Protection Agency, Washington, DC 20460.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issues of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issues of the nongovernment documents which are current on the date of the solicitation.

ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS (AOAC)

Official Methods of Analysis of the Association of Official Analytical Chemists

(Application for copies should be addressed to the Association of Official Analytical Chemists, 1111 North 19th Street, Suite 210, Arlington, VA 22209.)

AMERICAN DEHYDRATED ONION AND GARLIC ASSOCIATION (ADOGA)

Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products

(Application for copies should be addressed to the American Dehydrated Onion and Garlic Association, P.O. Box 2109, Novato, CA 94947)

NATIONAL ACADEMY OF SCIENCES

Food Chemicals Codex

(Application for copies should be addressed to the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.4, 6.1, and 6.3).

3.2 Ingredients. All ingredients shall be clean, sound, wholesome, and free from foreign material, evidence of rodent and insect infestation, extraneous material, off-flavors, off-odors, and off-colors.

3.2.1 Beef. The beef shall be from steers, heifers, or cows and shall be derived from any combination of carcasses, quarters, and any of the following recognizable primal and subprimal cuts: square-cut chuck, shoulder clods, chuck rolls, ribs, ribeyes, trimmed full loins, trimmed short loins, strip loins, sirloins, top sirloin butts, rounds, top rounds, knuckles, and bottom rounds. Recognizable cuts are those which, when compared to Institutional Meat Purchase Specifications (IMPS) cuts, have no more than a minor amount of lean, fat, or bone removed or included from an adjacent cut. All suitable lean meat shall be used except tenderloins and any part of a rough cut may be excluded at the option of the contractor. The beef shall be in the fresh-chilled state and shall be in excellent condition; i.e., exposed lean and fat surfaces shall be of a color and bloom normally associated with the class, grade and cut of meat, and typical of meat which has been properly stored and handled. Cut surfaces and naturally exposed lean surfaces shall show no more than slight darkening or discoloration due to dehydration, aging, or microbial activity. The fat shall show no more than a very slight discoloration due to oxidation or microbial activity. No odors foreign to fresh meat shall be present. Changes in color and odor characteristically associated with vacuum-packaged meat in excellent condition shall be acceptable. Also, the meat shall show no evidence of freezing, defrosting, or mishandling.

3.2.1.1 Boning and trimming. The beef shall be boned and trimmed to remove objectionable material such as bone, cartilage, heavy connective tissue, etc. The boneless, trimmed meat shall meet the limitations specified in tables I and II.

3.2.1.2 Handling and storage. Handling and storage of the boned and trimmed beef prior to processing into the finished product shall be in accordance with the following requirements:

a. Beef processed on the day of initial certification shall be maintained in the temperature range of 28° to 50°F (inclusive).

b. Holding in the fresh-chilled state for not more than 4 days after certification is permitted provided the beef is maintained in the temperature range of 28° to 40°F (inclusive).

c. Holding in the frozen state for not more than 120 days after placement in the freezer is permitted provided that the beef is:

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- placed in the freezer within 4 hours after certification
- frozen to 0°F or lower within 72 hours after placement in the freezer
- stored at 0°F or lower
- protected from freezer deterioration and damage
- stored in containers that are adequate to maintain product excellence
- held after storage at an internal temperature not to exceed 40°F when further processing is resumed

3.2.2 Water. Water used for ice making, formulation, and washing shall conform to the National Interim Primary Drinking Water Regulations.

3.2.3 Tomatoes, canned, crushed. Canned tomatoes shall be peeled, cored, mature crushed tomatoes packed in puree. The use of safe and suitable firming and acidification ingredients and salt is permitted in accordance with Federal regulations. The canned tomatoes shall have not less than 8.0 percent tomato soluble solids and shall possess a red flesh color, normal character, and a good distinct acid sweet tomato flavor and odor. The crushed tomatoes shall be free of extraneous vegetable material and objectionable core material and skins (peel).

3.2.4 Tomato paste. The tomato paste shall be U.S. grade A in accordance with the U.S. Standards for Grades of Tomato Paste.

3.2.5 Chili powder. Chili powder shall be a blend of 77 to 82 percent chili pepper, not less than 8 percent cumin, not less than 4 percent oregano, not less than 1 percent garlic powder, and not more than 8 percent salt. Anticaking agents may be included at a level not to exceed 2 percent. Moisture content shall not exceed 13 percent. The Scoville Pungency Value shall be not less than 900. The chili powder shall be of such size that not less than 95 percent shall pass through a U.S. Standard No. 20 sieve.

3.2.6 Starch, waxy maize, modified. The starch shall be white, odorless, finely pulverized, modified waxy maize starch for use in thermostabilized foods and shall comply with MIL-STD-900. The modified starch shall demonstrate initial viscosity development in the temperature range of 140° to 170°F and a typical viscosity (be fully hydrated) at common retort temperatures. The starch shall resist breakdown at low pH, under shear stress and under conditions of cold storage. The cooked modified starch slurry shall be bland with essentially no cereal or starch taste.

3.2.7 Brown sugar. The brown sugar shall be partially refined cane or beet sugar, shall be light brown in color, and shall possess a sweet molasses-like flavor.

3.2.8 Onions, diced, dehydrated. Diced dehydrated onions shall be fancy grade of the Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products.

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3.2.9 Salt. The salt shall be noniodized, white, refined, sodium chloride, with or without anticaking agents and shall comply with the purity standards for sodium chloride of the Food Chemicals Codex.

3.2.10 Celery, sliced, dehydrated. The dehydrated sliced celery shall be derived from clean, sound, Pascal type celery. The slices shall be approximately 3/8 inch cross-cut stalk slices with no leaf cuts. The slices shall be free flowing with a uniform bright color. The dehydrated celery shall have a moisture content of not more than 4.5 percent.

3.2.11 Worcestershire sauce. The Worcestershire sauce shall be a brown to dark brown colored liquid, shall possess a pleasant, tart, peppery, fruit spice flavor, with a typical heavy viscosity. The Worcestershire sauce shall have a titratable acidity (as acetic acid) of not less than 2.8 percent nor greater than 3.8 percent.

3.2.12 Pepper, green, sweet, freeze-dried. The peppers shall be 1/4 inch dices of sweet bell peppers which have been dehydrated by freeze-drying or partially air dried followed by freeze-drying. The pepper dices shall be free of seeds, seed cells, and diseased or rotten areas. The pepper dices shall possess a fresh, clean, typical sweet green pepper flavor and odor and a green, with minimal brownish, color. The moisture content shall be not greater than 4 percent.

3.2.13 Lecithin. Lecithin shall comply with the be Food Chemicals Codex.

3.2.14 Cider vinegar. Cider vinegar shall be prepared from apple cider, shall be clear, light amber in color, free of haze, sediment, suspended matter and floating particles. The cider vinegar shall contain not less than 4.0 percent nor more than 5.0 percent acetic acid.

3.2.15 Cumin, ground. Ground cumin shall be the true aromatic substance derived from Cuminum cyminum L. from which no volatile or other flavoring constituents have been removed and shall be free from artificial coloring and impurities. Volatile oil content shall be not less than 2.2 mL/100g and the cumin shall be of such size that not less than 95 percent shall pass through a U.S. Standard No. 30 sieve.

3.2.16 Garlic powder. The garlic powder shall be fancy grade of the Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products.

3.2.17 Pepper, black, ground. Ground black pepper shall be derived from the deep brown to black, deep-set, wrinkled, immature berries of Piper nigrum L. The ground pepper shall have a characteristic penetrating odor, a hot, biting, pungent flavor and a light gray to speckled black-gray color. Volatile oil content shall be not less than 2.0 mL/100g and the black pepper shall be of such size that not less than 95 percent shall pass through a U.S. Standard No. 16 sieve.

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3.2.18 Hot sauce. Hot sauce shall be produced from ground fermented hot red peppers, distilled vinegar, and salt. The hot sauce shall be a smooth suspension with uniform particle size and may contain stabilizers. The hot sauce shall have a pungent, peppery odor and a reddish-orange color and shall have a heat value of not less than 500 Scoville Heat Units. Titratable acidity, as acetic acid, shall be not less than 8.2 nor more than 8.6 percent.

3.2.19 Preblended spice and seasoning mixture. Preblended spices and seasonings may be used. The spices and seasonings in the mixture shall comply with the requirements of this document. The containers used for the spice and seasoning blend shall be labeled with each ingredient and the percentage of each ingredient in the blend. The ingredients shall be in the same proportions as specified in the ingredient formula.

3.3 Preparation and processing. Processing shall be on a continuous basis.

3.3.1 Beef preparation. The boneless beef shall be ground once through a 5/8-inch plate, using a two-bladed knife. The ground beef shall be heated in a steam jacketed kettle with sufficient water to facilitate heat transfer to the beef (prevent scorching). The beef shall be cooked to approximately an 80 percent yield and broth and rendered fat reserved for inclusion in the chili con carne. If the ground beef, broth and rendered fat are not immediately incorporated into the chili con carne, they shall be cooled to a temperature of 28° to 40°F and held in this temperature range for not more than 24 hours prior to chili con carne preparation.

3.3.2 Chili con carne preparation. The chili con carne shall be formulated and prepared as follows:

<u>Ingredients</u>	<u>Percent by weight</u>
Beef, ground	52.50
Water, broth and rendered fat	24.22
Tomatoes, canned, crushed	8.25
Tomato paste (24 percent solids) <u>1/</u>	5.75
Chili powder	2.20
Starch, waxy maize, modified	2.00
Brown sugar	1.00
Onions, diced, dehydrated	1.00
Salt <u>2/</u>	0.75
Celery, sliced, dehydrated	0.75
Worcestershire sauce	0.50
Peppers, green, sweet, freeze-dried	0.30
Lecithin	0.25
Cider vinegar	0.25
Cumin, ground	0.10

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<u>Ingredients (cont'd)</u>	<u>Percent by weight (cont'd)</u>
Garlic powder	0.08
Pepper, black, ground	0.05
Hot sauce	0.05

- 1/ If the specified tomato solids are not available, the tomato solids that are used must be adjusted to bring the solid level to that specified.
2. The total amount of salt in the formula shall be adjusted as necessary to produce a product that complies with the finished product salt requirements (see 3.6).

a. Approximately 80 percent of the water-broth-rendered fat mixture shall be vigorously blended with the lecithin in a steam jacketed kettle.

b. The balance of the ingredients, except the remaining water-broth-fat mixture, starch, cider vinegar and beef shall be added to the lecithin mixture and heated to 190°F.

c. A thin slurry shall be prepared with the starch and remaining water-broth-fat mixture and added to the above mixture. The entire mixture shall be heated to 185° to 190°F and held in this temperature range for 5 minutes.

d. The beef and cider vinegar shall be added to the mixture and blended thoroughly.

e. The volume of the final mixture shall be adjusted with water prior to filling to compensate for evaporation loss during heating and holding.

f. The product shall be maintained in the temperature range of 150° to 180°F for not more than four hours prior to filling into tray pack cans.

3.4 Tray pack filling and sealing. Each tray pack can (see 5.1.1) shall be filled with product such as to conform to the finished product requirements and to the following requirements.

a. Immediately after filling, each can shall be hermetically sealed under a vacuum of 5 to 8 inches of mercury as determined by presence of visible concavity of the can lid.

b. The filled and sealed tray pack cans shall be in the retort process within 1 hour after sealing.

3.5 Tray pack thermoprocessing. The filled and sealed tray pack cans shall be thermostabilized by retorting until a sterilization value (F_0) of not less than 6.0 has been achieved.

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3.6 Finished product requirements. The finished product shall comply with the following requirements:

- a. There shall be no foreign material such as, but not limited to, dirt, insects, insect parts, hair, wood, paper, paint, glass, or metal.
- b. There shall be no foreign odors or flavors such as, but not limited to, burnt, scorched, stale, sour, rancid, musty, or moldy.
- c. There shall be no color foreign to the product.
- d. The total weight of cartilage, coarse connective tissues, section of tendons or ligaments, and glandular material, collectively, in a can shall be not more than 1 ounce.
- e. No individual can shall contain a bone piece measuring more than 0.3 inch in any dimension.
- f. The average drained weight of beef pieces shall be not less than 52.0 ounces.
- g. No individual can shall contain less than 50.0 ounces drained weight of of beef pieces.
- h. The average net weight shall be not less than 108 ounces.
- i. No individual can shall contain less than 106 ounces of product.
- j. The texture of the beef shall not be dry, rubbery, or mushy.
- k. The average fat content shall not be greater than 10.0 percent.
- l. No individual tray pack shall have a fat content greater than 12.0 percent.
- m. No individual tray pack shall have a salt content less than 0.5 percent or greater than 1.2 percent.
- n. The product shall show no evidence of excessive heating (materially darkened or scorched).

3.6.1 Palatability. The finished product shall be equal to or better than the preproduction sample (see 6.1) in palatability and overall appearance.

3.7 Plant qualification. The beef component and the finished product shall originate and be produced, processed, and stored in plants regularly operating under Meat and Poultry Inspection Regulations of the U.S. Department of Agriculture.

3.8 Federal Food, Drug, and Cosmetic Act. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder.

4. QUALITY ASSURANCE PROVISIONS

4.1 Contractor's responsibility. Inspection and acceptance by the USDA shall not relieve the contractor of obligation and responsibility to deliver a product complying with all requirements of this document. The contractor shall assure product compliance prior to submitting the product to the USDA for any inspection.

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4.2 Inspection and certification. Product acceptability shall be determined by the USDA. The USDA will determine the degree of supervision necessary to assure compliance with the requirements of this document.

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

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.4 First article inspection. When a first article is required (see 6.1), it shall be inspected in accordance with the quality assurance provisions of this document and evaluated for overall appearance and palatability. Any failure to conform to the quality assurance provisions of this document or any appearance or palatability failure shall be cause for rejection of the first article.

4.5 Quality conformance inspection.

4.5.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.5.1.1 Beef examination for condition and cut. All beef shall be examined in either the bone-in or boneless state for conformance to the condition and cut requirements in 3.2.1. Cuts initially examined in the boneless state shall be in the form of whole boneless recognizable cuts. Any nonconforming beef shall be rejected.

4.5.1.2 Boned and trimmed beef examination. After boning and trimming and prior to any further processing or to any freezing, the beef shall be examined for the defects listed in table II. The lot size expressed in terms of pounds shall be declared to the Agricultural Marketing Service (AMS) agent by the contractor. However, the AMS agent reserves the right to declare as a lot a portion of a declared lot, if, in his or her opinion, that portion may be out of compliance with any requirement. The sample unit shall be a minimum of 12 pounds of adjacent boneless beef. The sample size shall be as specified in Table I. If all or a portion of the sample unit falls within a larger cut, the entire cut shall be examined. Failure of the beef to meet the acceptance criteria as indicated in table I shall be cause for rejection of the lot. Except for beef rejected because of freezing, defrosting, or not being in excellent condition, the beef may be reworked by the contractor and reoffered for examination. For reexamination, the sampling plan used shall be the one in table I designed for the next larger lot size than the one under which the lot was initially rejected. Beef shall not be reexamined more than one time.

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TABLE I. Sampling plan for boned and trimmed beef

Lot size (pounds)	Sample size (No. of sample units)	Defect categories			
		<u>Major</u>		<u>Minor</u>	
		AC	RE	AC	RE
500 or less	13	1	2	3	4
501 to 1200	20	2	3	5	6
1201 to 3200	32	3	4	7	8
3201 to 10000	50	5	6	10	11
10001 to 35000	80	7	8	14	15
Reinspection lots of 10001 to 35000	125	10	11	21	22

TABLE II. Boned and trimmed beef defects 1/ 2/

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Presence of popliteal, prescapular, prefemoral, or any exposed lymph gland measuring 0.5 inch or more in any dimension.
102		Presence of blood clot measuring 1.0 inch or or more in any dimension.
	201	Presence of blood clot measuring 0.5 inch or more but less than 1.0 inch in any dimension.
103		Presence of bruise measuring 1.0 inch or more in any dimension.
	202	Presence of bruise measuring 0.5 inch or more but less than 1.0 inch in any dimension.

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TABLE II. Boned and trimmed beef defects 1/ 2/ (cont'd)

Category		Defect
<u>Major</u>	<u>Minor</u>	
104		Presence of bone measuring 0.3 inch or more in any dimension.
105		Presence of cartilage measuring 0.5 inch or more in any dimension.
106		Presence of backstrap measuring 1.0 inch or more in one dimension and 0.2 inch or more in a second dimension (when measured at right angles to each other).
	203	Presence of backstrap measuring 0.5 inch or more but less than 1.0 inch in one dimension and 0.2 inch or more in a second dimension (when measured at right angles to each other).
107		Presence of heavy connective tissue (for example, on the surface of the outside round adjacent to the knuckle, along the skin surface of the strip loin, or the gracilis membrane) measuring 2.0 square inches or more.
	204	Presence of heavy connective tissue (for example, on the surface of the outside round adjacent to the knuckle, along the skin surface of the strip loin, or the gracilis membrane) measuring 0.5 square inches or more but less than 2.0 square inches.
	205	Presence of heavy connective tissue on lower edge of short plate or flank.
	206	Presence of heavy connective (abdominal tunic) tissue on the flank measuring 1.0 inch or more in any dimension.

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TABLE II. Boned and trimmed beef defects 1/ 2/(cont'd)

Category		Defect
<u>Major</u>	<u>Minor</u>	
	207	Presence of membranous portion of diaphragm or membranous covering from skirt, flank or abdominal section of short plate measuring 3.0 square inches or more.
108		Presence of knuckle cover.
109		Presence of kidney, pizzle eye, prepubic tendon, thymus gland, or hanging tender measuring 1.0 inch or more in one dimension and 0.2 inch or more in a second dimension (when measured at right angles to each other).
	208	Presence of kidney, pizzle eye, prepubic tendon, thymus gland, or hanging tender measuring less than 1.0 inch in one dimension and 0.2 inch or more in a second dimension (when measured at right angles to each other).
	209	Presence of calcified (scratchy) periosteum measuring 2.0 square inches or more.
	210	Presence of shank, clod, knuckle, or bottom (outside) round with tendinous end showing less than 75 percent lean tissue on a cross-sectional cut surface.
	211	Presence of dehydrated surface measuring 1.0 square inch or more.
	212	Presence of discolored meat (including blood discolored neck meat) measuring 1.0 square inch or more.

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TABLE II. Boned and trimmed beef defects 1/ 2/(cont'd)

Category	Defect
213	Presence of exposed blood vessel measuring 1.0 inch or more in any dimension.
214	Presence of cod, udder, kidney, or pelvic fat.

1/ Determination of wholesomeness and acceptability of product with respect to the presence of foreign material (for example: glass, dirt, insect parts, hair, wood, metal) shall be made by a Meat and Poultry Inspection Operations employee.

2/ Evidence of freezing or defrosting, or product not in excellent condition shall cause rejection of the involved lot.

4.5.1.3 Ingredient and component examination. Conformance of ingredients and components to identity, condition, and other requirements specified in 3.2 shall be certified by the ingredient supplier or ingredient manufacturer, or compliance be verified by examination of pertinent labels, markings, U.S. Grade Certificates, certificates of analysis, or other such valid documents acceptable to the inspection agency. In addition, prior to use, each ingredient shall be examined organoleptically, as necessary, to determine conformance to the condition requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient or component lot or of any involved product.

4.5.2 In-process examination. In-process examination shall be performed to determine conformance to the preparation, processing, can interior coating, filling, sealing, and packing requirements. Any nonconformance revealed by actual examination or by review of records of time, temperature, and formulation or of other valid documents shall be cause for rejection of the involved product.

4.5.3 Tray pack inspection. The inspection lot shall include only tray packs produced in one workshift. The USDA reserves the right to separate the inspection lot into smaller inspection lots.

4.5.3.1 Net weight inspection. Randomly select 30 filled and sealed tray pack cans from the inspection lot and weigh separately. Subtract the average tare weight (determined by randomly selecting and weighing 30 of the empty tray pack cans and lids used in preparing the product and dividing the total weight by 30) from the weight of each tray pack in the sample. The results shall be reported to the nearest 1 ounce. If the average net weight is less than 108

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ounces or if the net weight of any individual can is less than 106 ounces, the lot shall be rejected.

4.5.3.2 Product inspection. The sample size shall be as indicated by the double sampling plan specified in table III. The tray pack cans shall be selected at random from the lot. The tray pack cans shall be heated for 35 minutes in boiling water, opened, and inspected for the defects listed in table IV.

TABLE III. Double sampling plan for product inspection. 1/

Lot size (cans)	Sample size (No. of cans)	Cumulative sample	Acceptance number	Rejection number
0 to 3200	8	-	0	2
	8	16	1	2
3201 to 35000	13	-	0	3
	13	26	3	4

- 1/ a. If no defects are found in the first sample, the lot shall be accepted.
- b. If the number of defects found in the first sample equals or exceeds the rejection number, the lot shall be rejected.
- c. If the number of defects found in the first sample exceeds the acceptance number but is less than the rejection number, the second sample shall be inspected. Defects found in the first and second samples shall be combined and if the number of defects in the cumulative sample equals or exceeds the rejection number, the lot shall be rejected.

TABLE IV. Product defects 1/ 2/

Category	Defect
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Major

- 101 Total weight of cartilage, coarse connective tissue, section of tendons or ligaments, and glandular material, collectively, in a can is more than 1 ounce.
- 102 Presence of bone greater than 0.3 inch in any dimension in an individual can.

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TABLE IV. Product defects 1/ 2/ (cont'd)

Category	Defect
<u>Major</u>	
103	Drained weight of beef pieces in a can is less than 50.0 ounces. <u>3/</u> <u>4/</u>
104	Texture of beef is dry, rubbery, or mushy.
105	Product shows evidence of excessive heating (materially darkened or scorched).

- 1/ The presence of foreign material (e.g. glass, dirt, insect parts, hair, wood, metal), foreign odor or flavor (e.g. burnt, scorched, moldy, rancid, sour, stale) or foreign color shall be cause for rejection of the lot.
- 2/ Product not equal to or better than the approved preproduction sample in palatability and overall appearance shall be cause for rejection of the lot. (This comparison shall be performed only when deemed necessary by an AMS agent.)
- 3/ To determine drained weight, the free liquid shall be poured off and the remaining contents shall be poured into a flat bottom container. A minimum of three times the tray pack can's volume of 190° to 212°F water shall be added to the container so as to cover the contents. The contents and water shall be agitated such as to liquify rendered fat without breaking the beef pieces. The contents shall then be poured into a U.S. Standard 1/4-inch sieve in a manner that will distribute the product over the sieve without breaking the beef pieces. Sieve area shall be such that the distributed product does not completely cover all the openings of the sieve. The sieve shall be tilted at approximately a 45 degree angle and allowed to drain for 2 minutes before determining the drained weight by subtracting the sieve tare weight from the gross weight. The drained weight shall be reported to the nearest 0.1 ounce.
- 4/ If the sample average drained weight of beef pieces is less than 52.0 ounces, the lot shall be rejected.

4.5.3.3 Fat and salt content testing. Nine tray packs shall be selected from the lot and distributed as follows:

- Three for laboratory analysis.
- Three for submission to the contractor.
- Three for retention by an AMS agent as a reserve sample.

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The three tray packs for laboratory analysis shall individually be tested for fat and salt content in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists, Chapter: Meat and Meat Products, except that preparation of the sample shall be as follows: The three unopened cans shall be gently warmed in a water bath to melt fat adhering to the inside of the cans. The cans shall be opened and the entire contents of each can shall be separately blended in a Waring blender or equivalent. Results shall be reported to the nearest 0.1 percent. The lot shall be rejected if:

- a. The average fat content of the three tray packs is greater than 10.0 percent.
- b. The fat content of any individual tray pack is greater than 12.0 percent.
- c. The salt content of any individual tray pack is less than 0.5 percent or greater than 1.2 percent.

Analysis of reserve samples at the request of the contractor shall not be permitted unless the original laboratory analysis indicated that the involved lot will be rejected because of noncompliance with the fat or salt content requirement. When the reserve samples are analyzed, the analyses for both fat and salt shall be made and will be considered final. Unused reserve samples shall be returned to the contractor for inclusion in subsequent lots.

4.5.4 Can condition examination. Examination of filled and sealed tray pack cans shall be in accordance with the United States Standards for Condition of Food Containers except that inspection for labeling shall be in accordance with MIL-L-1497 (see 5.4).

4.5.5 Can closure examination. Can closures shall be examined visually and by teardowns in accordance with 21 CFR, Part 113, Subpart D and the can manufacturer's requirement.

4.5.6 Vacuum examination. The sampling plan shall be as specified in table V. Cans shall be allowed to cool to $75^{\circ} \pm 5^{\circ}\text{F}$, held for at least 24 hours after sealing, and then examined for vacuum retention. To examine, lay a straight edge from bead to bead and verify that the distance from the straight edge to the lid is greater at the middle of the can than near the bead. The inspection lot shall include only tray packs produced in a single day on a single sealing machine.

TABLE V. Sampling plan for can vacuum examination

Lot size (cans)	Sample size (cans)	Acceptance number	Rejection number
0 to 1,200	32	0	1
1,201 to 3,200	50	0	1
3,201 to 10,000	80	1	2

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4.5.7 Shipping container examination. Shipping containers shall be examined for defects in assembly, closure, and reinforcement (when applicable), in accordance with PPP-B-636. In addition, the following defects shall be classified as follows:

Major: National stock number, item description, contract number, or date of pack markings missing, incorrect, or illegible.
Reinforced with other than nonmetallic strapping or tape.
Dimensions of pads not as specified.

Minor: Other required markings missing, incorrect, or illegible.
Interior packing with fiberboard liner or pads not as specified.
Arrangement or number of cans not as specified.

4.5.8 Unit load inspection. Inspection of unit loads shall be in accordance with the quality assurance provisions of MIL-L-35078.

5. PACKAGING

5.1 Preservation. The product shall be preserved in accordance with level A or C as specified (see 6.1).

5.1.1 Level A. A size 1001 by 1206 by 200 tray pack can shall be filled with 108 ounces of food product, sealed, and thermoprocessed as specified in 3.4 and 3.5. The base plate of the can shall be electrolytic chromium-coated steel and shall be of sufficient temper to protect the product during shipment and storage. The base plate weight of the body and end of each can shall be 90 pounds per base box. The entire inside area of the can shall be coated. Scratches or fractures shall not penetrate through the interior can coating. The interior can coating shall not peel or blister when in contact with the product. The interior can coating shall neither affect nor be affected by the packaged product. A certificate of conformance shall be furnished to certify compliance with the interior can coating requirements. The can shall be coated overall on the outside with a coating conforming to type I of TT-C-495.

5.1.1.1 When specified (see 6.1), the base plate of the can shall be electrolytic chromium-coated steel and shall be of sufficient temper to protect the product during shipment and storage. The base plate weight of the body and end of each can shall be 98 pounds per base box. The body design shall be reinforced on the bottom with six longitudinal beads or ribs 0.050 ± 0.010 inches deep. The beads shall be 9 inches by $3/4$ inch in length and width and shall be equidistant in the center panel of the bottom. The end design shall be reinforced with eight longitudinal beads 0.018 ± 0.004 inches deep. The beads shall be 11 inches by $3/4$ inch in length and width and shall be equidistant in the center panel of the end. The center four beads on the end design shall be interrupted to provide a 5-inch by 5-inch flat center panel for labeling. The apex of all beads shall be outward on the edge. The interior and exterior can coating requirements shall be as specified in 5.1.1.

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5.1.2 Level C. The product shall be preserved as specified in 5.1.1, except that cans with commercial exterior coating will be acceptable.

5.2 Packing. The product shall be packed in accordance with level A, B, or C as specified (see 6.1).

5.2.1 Level A packing. Four cans of product, preserved as specified in 5.1, shall be packed in a fiberboard box, constructed and closed in accordance with style HSC-L with a HSC full depth cover, grade V2s of PPP-B-636. The inside box dimensions shall be 12-3/4 inches in length by 10-1/2 inches in width by 8-1/2 inches in depth. The cans shall be packed flat, four in depth within the box with the first two cans placed with ends down and the next two cans with ends up. The inside of each box shall be provided with a box liner and five fiberboard pads fabricated of grade V3c fiberboard. The dimensions of the fiberboard pads shall be 11-1/4 by 9-1/4 inches ($\pm 1/8$ inch). The pads shall be placed between the cans and on the top and bottom of the stacked cans. Each box shall be reinforced with nonmetallic strapping or pressure-sensitive adhesive filament-reinforced tape in accordance with the appendix of PPP-B-636. Shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.1), except the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern so as to create columnar stacking. Strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Level B packing. Four cans of product, preserved as specified in 5.1, shall be packed as specified in 5.2.1 except the box shall be constructed of grade V3c, V3s, or V4s fiberboard.

5.2.3 Level C packing. Four cans of product, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L, class domestic, grade 275 of PPP-B-636. The inside box dimensions shall be 12-3/4 inches in length by 10-1/2 inches in width by 8-1/2 inches in depth. The cans shall be packed flat, four in depth within the box, with the first two cans placed with ends down and the next two cans with ends up. The inside of each box shall be provided with a box liner and five fiberboard pads fabricated of grade 275 fiberboard. The dimensions of the fiberboard pads shall be 11-1/4 inches by 9-1/4 inches ($\pm 1/8$ inch). The pads shall be placed between the cans and on the top and bottom of the stacked cans.

5.3 Unit loading. When specified (see 6.1), the product, packed as specified in 5.2.2 and 5.2.3, shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified except that the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern so as to create columnar stacking. When unit loads are strapped, the strapping shall be limited to nonmetallic strapping.

5.4 Labeling. Each tray pack can shall be labeled in accordance with MIL-L-1497. In addition, the name of product shall be marked, stamping is permitted, on one 1001 by 200 side of the can. The labeling shall be legible

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when examined in accordance with 4.5.4 after submerging the can in boiling water for 30 minutes. Paper labels are not permitted. Cans shall show the following statements:

TO HEAT

- a. To heat in water: Submerge sealed can in boiling water. Bring to a boil, continue boiling for 40-45 minutes. Avoid overheating to the point where internal pressure is evident (can shows evidence of bulging). Remove from water and open lid for serving.
CAUTION: Use care when opening as pressure may have been generated within the can.
- b. To heat in oven: Either punch several holes in lid of can or open can in usual manner leaving the loose lid in place to prevent moisture loss. Place in a 350°F oven for approximately 35 to 40 minutes until contents reach an internal temperature of 165°F.

WARNING: Do not place closed can in oven, as heating will increase internal pressure which may cause the can to burst.

YIELD

Approximately 12 servings of 1 cup each

5.5 Marking.

5.5.1 Shipping containers. In addition to any special marking required by the contract, shipping containers shall be marked in accordance with MIL-STD-129.

5.5.2 Unit loads. Unit loads shall be marked in accordance with MIL-L-35078. In addition, when tray pack cans are fabricated from 90 pounds per base box, the following precautionary markings in capital letters larger than other markings shall be included:

CAUTION: DO NOT STACK PALLETS IN TRANSIT OR MORE
THAN TWO HIGH IN STORAGE.

6. NOTES

6.1 Ordering data. Acquisition documents should specify the following:

- a. Title, number and date of this document.
- b. When a first article is required (see 3.1, 4.4, and 6.3).
- c. Provisions for approved preproduction samples (see 3.6.1 and 6.3).
- d. Level of preservation and packing required (see 5.1 and 5.2).

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- e. When tray pack cans are to be fabricated from 98 pounds per base box (see 5.1.1.1).
- f. Type and class of unit load when unit loading is required (see 5.2.1 and 5.3).

6.2 Appropriate level of pack. Based on the conditions known or expected to be encountered during shipment, handling, and storage of the specific item being procured, the procuring activity should select the appropriate level of pack in accordance with the criteria established in AR 700-15/NAVSUPINST 4030.28/AFR 71-6/MCO 4030.33A/DLAR 4145.7.

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should include specific instructions in all acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Subject term (key word) listing.

Beef
Canned foods
Chili
Rations
Tray pack

Custodians:

Army - GL
Navy - SA
Air Force - 50

Preparing activity:

Army - GL
Project No. 8940-A512

Review activities:

Army - MD, TS
Navy - MC, MS
DP - SS

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