CONTRACT TECHNICAL REQUIREMENT
DATE: JANUARY 11, 2000

INCH-POUND

MIL-P-44465 *
31 December 1992

MILITARY SPECIFICATION

PORK RIBS, BONELESS, IMITATION, IN BARBECUE SAUCE, SMOKE FLAVORING ADDED, 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 specification covers imitation, boneless, pork ribs in barbecue sauce, smoke flavoring added, thermostabilized in tray pack cans or polymeric trays for use by the Department of Defense as a component of operational rations.

1.2 Classification. The packaging shall be of the following styles as specified (see 6.1):

Style A – Tray Pack Can
Style B – Polymeric Tray

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5018 by using the Standardization Document Improvement Proposal (DD Form 1426 appearing at the end of this document or by letter.

SPECIFICATIONS

FEDERAL

MILITARY

MIL-L-1497 - Labeling of Metal Cans for Subsistence Items

DSCP FORM 3507 - Loads, Unit: Preparation of Semiperishable Subsistence Items

MIL-C-44340 - Can, Tray Pack

MIL - PRF - 32004 - Packaging of Food in Polymeric Trays

STANDARDS

MILITARY

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

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094).

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

DRAWINGS

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

13-1-0182 Figure 1, Pork Rib Section

(Copies of drawings are available from the U.S. Army Natick Research, Development, and Engineering Center, ATTN: SATNC-EMSS, Natick, MA 01760-5014.)

ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Primary Drinking Water Regulations

(Copies are available from the Office of Drinking Water, Environmental Protection Agency, WH550D, 401 M Street, S.W., Washington, DC 20460).

U.S. DEPARTMENT OF AGRICULTURE (USDA)

Meat and Poultry Inspection Regulations (9 CFR Parts 301-399)

(Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001).

Institutional Meat Purchase Specifications for Fresh Pork, Series 400

(Copies are available from the Director, Livestock and Seed Division, Agricultural Marketing Service, U.S. Department of Agriculture, Room 2092, South Building, P.O. Box 96456, Washington, DC 20090-6456).

U.S. Standards for Grades of Canned Tomato Paste (7 CFR 52.5041

(Copies are available from the Director, Fruit and Vegetable Division, Agricultural Marketing Service, U.S. Department of Agriculture, Room 2077, South Building, P.O. Box 96456, Washington, DC 20090-6456).

U.S. Standards for Condition of Food Containers

(Copies are available from the Chairman, Condition of Food Container Committee, Agricultural Marketing Service, U.S. Department of Agriculture, Room 2506, South Building, P.O. Box 96456, Washington, DC 20090-6456).

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS)

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

(Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001).

DEFENSE SUPPLY CENTER PHILADELPHIA (DSCP)

DSCP Form 3556 Marking Instructions for Shipping Cases, Sacks and Palletized/Containerized Loads of Perishable and Semiperishable Subsistence
DSCP FORM 3507, Loads Unit: Preparation of Semiperishable Subsistence Items

(Copies are available from the Commander, Defense Supply Center Philadelphia, ATTN: DSCP-HSL, 700 Robbins Avenue, Bldg 6, Philadelphia, Pa 19111-5092)

2.2 Non-Government 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 are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.1).

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC)

Approved Methods of the American Association of Cereal Chemists

(Application for copies should be addressed to the American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121).

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, One Maritime Plaza, 23 Floor, San Francisco, CA 94111).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3330 - Peel Adhesion of Pressure-sensitive Tape

D 1974 – Methods of Closing, Sealing and Reinforcing Fiberboard Shipping Containers

D 5118 – Fabrication of Fiberboard Shipping Boxes

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor, West Conshohocken, Pa 19428-2959)

AOAC INTERNATIONAL

Official Methods of Analysis of the AOAC International

(Application for copies should be addressed to the AOAC International 2200, Wilson Boulevard, Suite 400-CD, Arlington, VA 22201-3301).

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).

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ANSI/ASQC Z1.4 – 1993 Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the ASCQ, 611 East Wisconsin Avenue, Milwaukee, WI 53201-3005)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services).

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

3. REQUIREMENTS

3.1 First Article. When specified (see 6.1), a sample shall be subjected to first article inspection (see 6.2) in accordance with 4.4.

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

3.2.1 Pork. Pork shall be derived from any one or any combination of the following USDA Certified Institutional Meat Purchase Specification (IMPS) Cuts: Item No. 402B (fresh ham, boneless), 402C (fresh ham, boneless, trimmed), 405A (shoulder, picnic, boneless), 405B (shoulder, picnic, cushion, boneless), 406A (shoulder, Boston butt, boneless), 407 (shoulder butt, cellar trimmed, boneless), 413 (loin, boneless). All pork shall be certified by a USDA, Agricultural Marketing Service (AMS) agent for Condition of the Product and Compliance with

the Institutional Meat Purchase Specifications Quality Assurance Provisions.

NOTE: Certified IMPS cuts may be further trimmed (see 3.3.1) and broken down into smaller cuts after certification as requested by the purchaser. Boxes used for shipment of the further trimmed and broken down cuts shall be labeled "Beef for further processing as specified in MIL-P-44465". The certificate shall be noted as such and shall accompany the shipment.

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

a. Pork processed on the day of initial certification shall be maintained in the temperature range of 28^0 to 50^0F, inclusive.

b. Holding in the fresh-chilled state for not more than 4 days after initial certification is permitted, provided that the pork is maintained in the temperature range of 28^0 to 40^0F, inclusive.

c. Holding in the frozen state for not more than 180 days after initial certification is permitted, provided that the pork is:
- frozen to 0^0F or lower within 72 hours after initial certification
- stored at 0^0F or lower
- protected from freezer deterioration and damage
- stored in containers that are adequate to maintain product excellence

d. Tempering/thawing of frozen pork shall comply with the following:
- microwave tempering/thawing of frozen pork is permitted provided excellent condition of the pork, as determined by USDA, is maintained
- the microwave tempering/thawing process shall not exceed 48 hours from time of removal of the pork from the freezer to further preparation
- regardless of the process used, frozen pork shall be tempered/thawed to a temperature not to exceed 40^0F
- when a tempering/thawing process other than microwave is used, the time from the start of the tempering/thawing process (removal from the freezer) to further preparation shall not exceed 96 hours
- pork which has been tempered/thawed shall not be refrozen

3.2.2 Pork ribs, raw, individually quick frozen (IQF). The pork ribs shall have been prepared from pork meeting the requirements of 3.2.1 and 3.2.1.1. The pork ribs shall have been processed in accordance with 3.3.1 and 3.3.2. Raw IQF pork ribs shall be packaged and sealed in USDA approved food packaging material. Raw packaged pork ribs shall have been held at an internal temperature of 0^0F or below for a period not to exceed 30 days prior to further processing. Raw IQF pork ribs shall be certified by a USDA AMS Agent to certify condition of

the product, the initial freezing (in-storage) date, and compliance with the above stated requirements.

3.2.2.1 Pork ribs, cooked, individually quick frozen (IQF). The pork ribs shall have been prepared from pork that complies with 3.2.1 and 3.2.1.1. The pork ribs shall have been processed in accordance with 3.3.1 and 3.3.2. Cooked IQF pork ribs shall be packaged and sealed in USDA approved food packaging material. Cooked pork ribs shall have been held at an internal temperature of 0^0F or below for not more than 60 days prior to tray pack filling. Cooked IQF pork ribs shall be certified by a USDA AMS Agent to certify condition of the product, the initial freezing (in-storage) date, and compliance with the above stated requirements.

3.2.3 Tomato paste. Tomato paste shall be U.S. Grade A of the U.S. Standards for Grades of Canned Tomato Paste.

3.2.4 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

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

3.2.6 Vinegar, cider. Cider vinegar shall be prepared from apple cider and be clear, light amber in color, free from haze, sediment, suspended matter, and floating particles. The cider vinegar shall contain not less than 5.0 grams of acetic acid per 100 ml at 20^oC.

3.2.7 Starch, food, modified, high opacity. The high opacity starch shall be white, odorless, finely pulverized, modified waxy maize food starch for use in thermostabilized foods. The modified starch shall demonstrate initial viscosity development in the temperature range 140^0 to 170^0F and a typical viscosity (be fully hydrated) at common retort temperatures. The starch shall resist breakdown at low pH and under shear stress, and under conditions of cold storage. The cooked slurry prepared from the starch shall be bland with essentially no cereal or starch taste. The starch shall comply with MIL-STD-900.

3.2.8 Salt. 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.

3.2.9 Sauce, Worcestershire. Worcestershire sauce shall be brown to dark brown liquid and shall possess a pleasant, tart, peppery, fruit-spice flavor with a typical heavy viscosity. Titratable acidity (as acetic acid) of the sauce shall be not less than 2.8 nor more than 3.3 percent.

3.2.10 Onions, dehydrated, chopped. Dehydrated chopped 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.

3.2.11 Flavoring, smoke. Smoke flavoring shall be an aqueous solution of natural maple and/or oak wood smoke and shall be dark brown-black in color with a clean smoke odor. It shall have a titratable acidity of 6.2 to 7.2 percent (expressed as acetic acid) a carbonyl level (butanone-2) of 7.0 to 8.0 grams per 100 ml and a phenolic level (dimethoxphenol) of 7.5 to 9.0 mg per ml.

3.2.12 Mustard flour. Mustard flour shall be a bright yellow powder prepared from a blend derived from the endosperm of the seed of Brassica hirta and Brassica juncea. Mustard flour shall contain not less than 0.5 ml volatile oil per 100 grams of mustard flour and be of such size that not less than 95 percent shall pass through a U.S. Standard No. 60 sieve.

3.2.13 Garlic powder. 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.

3.2.14 Lecithin. Lecithin shall comply with the Food Chemicals Codex.

3.2.15 Sodium tripolyphosphate. Sodium tripolyphosphate shall comply with the Food Chemicals Codex.

3.2.16 Pepper, red, ground. Ground red pepper shall be derived from dried, red, ripe fruit or genus Capsicum and shall possess the characteristic brownish-red to red color. The Scoville Pungency Value shall be not less than 25,000 units. The red pepper shall be uniformly ground to allow a minimum of 95 percent, by weight, to pass through a U.S. Standard No. 40 sieve and not less than 95 percent, by weight, to be retained on a U.S. Standard No. 60 sieve.

3.2.17 Pepper, white, ground. Ground white pepper shall be derived from the dried mature berries of Piper nigrum L. from which the outer covering or the outer and inner covering have been removed. The ground pepper shall have a characteristic, penetrating odor, a hot biting pungent flavor, and a light color. The ground white pepper shall contain not less than 1.0 ml of volatile oil per 100 grams of ground white pepper and be of such size that not less than 95 percent shall pass through a U.S. Standard No. 40 sieve.

3.2.18 Clove, ground. Ground cloves shall be prepared from the dried, unopened flower buds of Caryophyllus aromaticus L. The powder shall be dark reddish-brown in color and shall possess a strong aromatic odor with a hot pungent taste. The ground cloves shall contain not less than 15.0 ml of volatile oil per 100 grams of ground clove and be of such size that not less than 95 percent shall pass through a U.S. Standard No. 30 sieve.

3.2.19 Allspice, ground. Ground allspice shall be derived from dried, nearly ripe fruit of Pimenta officinalis Lindl and shall possess a fragrant, clove-like aroma, a strong aromatic, pungent, clove-like flavor, and a dark reddish-brown color. Allspice shall contain not less than 3.0 ml of volatile oil per 100 grams of ground allspice with 80.0 percent eugenol as a principle constituent. A minimum of 95 percent, by weight, shall pass through a U.S. Standard No. 30 sieve.

3.2.20 Cinnamon, ground. Ground cinnamon shall be prepared from dried bark of Cinnamomum burmannii Blume commonly known as "Korintiji Cinnamon." The cinnamon shall contain not less than 1.5 ml of volatile oil per 100 grams of ground cinnamon and be of such size that not less than 95 percent shall pass through a U.S Standard No. 30 sieve.

3.2.21 Preblended spice and seasoning mixture. Preblended spices and seasoning 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 formulation.

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

3.3.1 Preparation of pork. Boned and trimmed pork which meets the requirements of 3.2.1 shall be further trimmed, if necessary, to ensure compliance with finished product requirements (see 3.6). Boned and trimmed pork cuts shall be prepared for mechanical flaking in accordance with good commercial practice. The pork shall be mechanically flaked through a comitrol flaking machine (or its equivalent) equipped with a 1600-14 flaking head. The flaked pork shall be held for not more than 24 hours at an internal temperature of 28^0 to 40^0F from time of flaking to pork rib preparation. Alternatively the boned and trimmed pork may be ground once through a mechanical grinder equipped with a 2-bladed knife and a grinder plate having holes measuring 3/4 inch in diameter. The ground pork shall be thoroughly combined with the ingredients in paragraph 3.3.2 and re-ground through a mechanical grinder equipped with a 4-bladed knife and a grinder plate with holes measuring 1/4 inch in diameter. The ground pork shall be held for not more than 24 hours at an internal temperature of 24^0 to 40^0F prior to pork rib preparation.

3.3.2 Pork rib preparation. The pork ribs shall be formulated and prepared as follows:

Ingredient	Percent by weight
Pork, flaked or ground	98.10
Salt	1.50
Sodium tripolyphosphate	0.30
Pepper, white, ground	0.10

a. The ingredients shall be combined and thoroughly mixed.

b. The pork mixture shall be cooled sufficiently to facilitate forming of the pork ribs.

c. The pork mixture shall be formed into rib sections approximately the size and shape of figure 1.

d. For Style a, each pork rib section shall weigh not less than 3.4 ounces. For style b, each pork rib section shall weigh not less than 2.7 ounces.

e. The pork ribs shall be maintained at an internal temperature of 24^0 to 40^0F for not more than 12 hours from time of forming to beginning of the IQF process (see 3.2.2.) or to the browning (cooking) process.

f. Pork ribs shall be cooked (browned) (see 6.7) as necessary to provide a uniform medium brown color and to comply with the finished product requirement 3.6 g, i, and j.

g. Cooked pork rib sections shall be maintained at an internal temperature of 24^0 to 40^0F for not more than 48 hours from time of cooking to beginning of the IQF process (see 3.2.2.1) or to tray pack can or polymeric tray filling. Pork rib sections previously frozen in the raw state shall not be refrozen. Cooling of the pork ribs is not necessary if can or polymeric tray filling occurs immediately after cooking.

3.3.3 Preparation of barbecue sauce. The barbecue sauce shall be formulated and prepared as follows:

3.3.4

Ingredient	Percent by weight
Tomato paste (24% natural tomato soluble solids) 1/	36.00
Water	35.80
Sugar, brown, light	11.00
Vinegar, cider	8.30
Starch, modified, high opacity 2/	3.50
Salt 3/	0.90
Sauce, Worcestershire	1.50
Onions, dehydrated, chopped	0.95
Flavoring, smoke	0.50
Mustard flour	0.50
Garlic powder	0.50
Lecithin	0.30

Pepper, red, ground	0.10
Clove, ground	0.10
Allspice, ground	0.03
Cinnamon, ground	0.02

1/ If the specified tomato solids are not available, the tomato solids which are used must be calculated to bring the solids level to that specified and the water shall be adjusted accordingly.

2/ The total amount of starch in the sauce formula shall be adjusted, as necessary, to produce a product that complies with the finished product viscosity requirements (see 3.6).

3/ The total amount of salt in the sauce formula shall be adjusted, as necessary, to produce a product that complies with the finished product salt requirements (see 3.6).

NOTE: The following sauce preparation procedures were used in the development of this product. Alternate procedures in accordance with good commercial practices may be used provided finished product requirements are met.

a. A thin slurry shall be made with the starch and part of the water.

b. The balance of the water and the remaining ingredients shall be mixed together and heated to 180^0 to 190^0F to form an emulsion.

c. The starch slurry shall be added to the emulsion to form the sauce.

d. The sauce shall be heated to 180^0 to 190^0F and held for approximately five minutes in this temperature range.

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

f. The sauce shall be maintained in the temperature range of 150^0 to 180^0F and filled into tray pack cans or polymeric trays within four hours after preparation.

3.4 Tray pack or polymeric tray filling and sealing. Each tray pack can (see 5.1.1) or polymeric tray (see 5.1.2) shall be filled with product to conform to the finished product requirements and to the following requirements.

a. Not less than 18 intact pork rib sections shall be shingled in two rows, lengthwise, in the tray pack can or polymeric tray, and then the barbecue sauce shall be added.

b. For Style a, immediately after filling, each can shall be sealed in accordance with the can manufactures guidelines/requirements and 21 CFR, Part 113, Subpart D, or CFR 9, Part 318, Subpart G, as applicable (see 4.5.5), and under a vacuum established by a processing authority and specified in the scheduled process so as to ensure compliance with finished product requirement (see 3.6). For Style b, immediately after filling, each polymeric tray shall be hermetically sealed so as to ensure compliance with the requirements specified in MIL-PRF-32004 (see 4.5.5.1).

c. Each filled and sealed tray pack can or polymeric tray shall be in the retort process within 2 hours after sealing.

3.5 Tray pack thermoprocessing (Style a only). The filled and sealed tray pack cans shall be thermostabilized by retorting until a sterilization value (F_o) of not less than 6 has been achieved.

3.5.1 Polymeric tray processing (Style b only). The filled and sealed polymeric trays shall be processed until commercially sterile (see 4.5.3.5).

3.6 Finished product requirements. Unless otherwise specified finished product for Style a and Style b shall comply with the following requirements:

a. There shall be no foreign material such as, but not limited to, dirt, insect parts, hair, wood, glass, or metal.

b. There shall be no foreign odor or flavor such as, but not limited to, stale, sour, rancid, or moldy.

c. There shall be no color foreign to the product.

d. Total weight of cartilage, coarse connective tissue, section of tendons or ligaments, and granular material collectively, in any individual can or polymeric tray shall be not more than 2.0 ounces.

e. No individual can or polymeric tray shall contain a bone piece measuring 0.3 inch or more in any dimension.

f. No individual can or polymeric tray shall contain not less than 18 intact pork rib sections.

g. Pork rib section texture shall not be dry, rubbery, tough, or mushy.

h. Pork ribs sections shall approximate the size and shape shown in figure 1.

i. For Style a, drained weight of 18 intact pork rib sections, in any individual tray pack can, shall be not less than 44.0 ounces. For Style b, drained weight of 18 intact pork rib sections, in any polymeric tray, shall be not less than 36.0 ounces.

j. For Style a, the average drained weight of the pork rib sections shall be not less than 46.0 ounces. For Style b, the average drained weight of the pork rib sections shall be not less than 38.0 ounces.

k. For Style a, the average net weight shall be not less than 106 ounces. For Style b, the average net weight shall be not less than 88 ounces.

l. For Style a, no individual can shall contain less than 104 ounces. For Style b, no individual polymeric tray shall contain less than 86 ounces.

m. The average fat content of the finished product shall be not greater than 9.0 percent and no individual tray pack or polymeric tray shall have a fat content greater than 11.0 percent.

n. The salt content of any individual tray pack or polymeric tray shall be not less than 0.70 percent nor greater than 1.60 percent.

o. The viscosity of the sauce shall be not less than 4.0 cm per 10 seconds nor greater than 12.0 cm per 10 seconds when determined by a Bostwick Consistometer(see 4.5.3.4).

p. The sauce shall not be lumpy.

q. The product shall show no evidence of excessive heating (materially darkened or scorched).

r. For Style a only, filled, sealed, and retorted cans shall show evidence of proper vacuum as determined by concavity of the can lid (see 4.5.6).

s. For Style b only, the packaged food shall meet the minimum shelf life requirement of 18 months at 80^{o}F or 36 months at 80^{o}F (see 4.5.3.6).

t. For Style b only, the filled, sealed, and processed polymeric tray shall show evidence of proper residual gas volume and internal pressure (see 4.5.6.1.).

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

3.7 Plant qualification. The meat component and the finished product shall originate and be

produced, processed, and stored in plants regularly operating under the Meat and Poultry Products 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 specification. The contractor shall ensure product compliance prior to submitting the product to the USDA for any inspection.

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

4.3 Classification of inspections. 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 specification and evaluated for overall appearance and palatability. Any failure to conform to the quality assurance provisions of this specification or any appearance or palatability failure shall be cause for rejection of the first article.

4.5 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASCQ Z1.4-1993.

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 specification or applicable purchase document.

4.5.1.1 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, and compliance shall be verified by examination of pertinent labels, markings, US Grade Certificates, certificates of analyses, or other such valid documents acceptable to the inspection agency. If necessary, each ingredient shall be examined

organoleptically or inspected according to generally recognized test methods, such as the standard methods described in the Official Methods of Analysis of the AOAC International and in the Approved Methods of the American Association of Cereal Chemists, to determine conformance to the 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 or polymeric tray 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 or Polymeric tray inspection. 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 or 30 filled and sealed polymeric trays 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 or 30 polymeric trays and lids used in preparing the product and dividing the total weight by 30) from the weight of each tray pack or polymeric tray in the sample. The results shall be reported to the nearest one ounce. For Style a, if the average net weight is less than 106 ounces, or if the net weight of any individual can is less than 104 ounces, the lot shall be rejected. For Style b, if the average net weight is less than 88 ounces, or if the net weight of any individual polymeric tray is less than 86 ounces, the lot shall be rejected.

4.5.3.2 Double sampling plan for product inspection. The finished product shall be examined for the defects listed in table I utilizing the double sampling plans indicated in ANSI/ASCQ Z1.4-1993. The lot size shall be expressed in tray pack cans or polymeric trays. The sample unit shall be one filled and sealed tray pack can or polymeric tray. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 6.5 for minor defects. The sample cans or polymeric trays shall be heated in accordance with heating instructions on the label.

TABLE I Product defects 1/ 2/

Category		Defect
Major	Minor	
101		Total weight of cartilage, coarse connective tissue, section of tendons or ligaments, and glandular material, collectively, in a can or polymeric tray is more than 2.0 ounces
102		Presence of a bone piece measuring 0.3 inch or more in any dimension
103		Less than 18 intact pork rib sections in any individual can or polymeric tray
104		For Style a, drained weight of 18intact pork rib sections in a can is less than 44.0 ounces. For Style b, drained weight of 18 intact pork rib sections in a polymeric tray is less than 36.0 ounces.3/ 4/
105		Texture of pork rib section is dry, rubbery, tough, or mushy.
106		Sauce is lumpy.
107		Product shows evidence of excessive heating (materially darkened or scorched).
	201	Slices not arranged in a shingled manner
	202	More than one pork rib section not approximating the size and shape shown in figure 1 5/

1/ The presence of any foreign material (for example, dirt, insect parts, hair, wood, glass, metal), foreign odor or flavor (for example, 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.

3/ To determine drained weight, the sauce in the can or polymeric tray shall be poured off, strained through a U.S. Standard No. 8 sieve, and reserved for viscosity determinations. The remaining contents shall be poured into a flat-bottom container. A minimum of three times the

tray pack can's or polymeric tray's volume of 180^0 to 190^0F water shall be added to the container so as to cover the contents. The contents and water shall be agitated so as to liquefy rendered fat and remove the sauce without breaking the pork rib sections. The contents shall then be poured into the U.S. Standard 1/4 inch sieve in a manner that will distribute the product over the sieve without breaking the pork rib sections. 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 45^0 angle and allowed to drain for two minutes before determining the drained weight. Determine 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/ For Style a, the lot shall be rejected if the sample average drained weight is less than 46.0 ounces. For Style b, the lot shall be rejected if the sample average drained weight is less than 38.0 ounces.

5/ Rib sections approximating the shape of figure 1 which have broken corners shall not be considered as intact sections.

4.5.3.3 Fat and salt content testing. Three filled and sealed tray pack cans or three filled and sealed polymeric trays. shall be selected at random from the lot. The tray pack cans or polymeric trays shall be individually tested for fat content in accordance with the Official Methods of Analysis of AOAC, method 976.21, 985.15, or 960.39, and for salt content in accordance with the Official Methods of Analysis of AOAC, method 935.47, except that preparation of the samples shall be as follows: The unopened tray pack cans or polymeric trays shall be warmed in a water bath to melt fat adhering to the inside of the cans or polymeric trays. The cans or polymeric trays shall be opened and the entire contents of each can or polymeric tray shall be separately blended in a Waring blender or equivalent. The test results for fat content shall be reported to the nearest 0.1 percent. The test results for salt content shall be reported to the nearest 0.1 percent. Any result failing to conform to the fat and salt requirements in 3.6 shall be classified as a major defect and shall be cause for rejection of the lot.

4.5.3.4 Viscosity testing. The strained sauce collected from each of the cans in the first sample of cans or polymeric trays selected for drained weight inspection (see 4.5.3.2 and 3/ of table I) shall be individually tested for viscosity as specified below (see 6.5):

Instrument: Bostwick Consistometer
Catalog Number: 23270-004
VWR Scientific Company
P.O. Box 7900
San Francisco, CA 94120

or Catalog Number: 15-347-50
Fisher Scientific
585 Alpha Drive
Pittsburgh, PA 15238

Method:

a. Level the instrument.
b. Bring sauce to $100^{o} \pm 1^{0}F$ in a water bath in a covered container.
c. Stir sauce thoroughly before filling the Bostwick cavity.
d. Scrape sauce evenly across upper edge of cavity.
e. Release sauce and time sauce flow with a stop watch to the nearest one second and measure distance traveled to the nearest 0.1 cm.

If the Bostwick viscosity value of the sauce from any can or polymeric tray in the sample fails to conform to the requirement specified in 3.6, it shall be classified as a major defect and the lot shall be rejected.

4.5.3.5 Commercial sterility. The sample size shall be one filled, sealed, and thermoprocessed tray pack can or polymeric tray selected from each process batch in the lot. Incubate the sample cans or trays at $95^{o}F$ +/- $5^{o}F$ for 10 days, unless otherwise specified by the inspection agency. Any evidence of swelling or microbial activity following incubation shall be cause for rejection of the lot.

4.5.3.6 Shelf life (Style b only).

4.5.3.6.1 Shelf life (18 months). Compliance with requirement shall be determined by incubation for 18 months at $80^{o}F$. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.3.6.2 Shelf life (36 months). Compliance with requirement shall be determined by incubation for 1 month at 120 or 6 months at $100^{o}F$ or 36 months at $80^{o}F$. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.4 Can condition examination (Style a only). 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 4.5.4.1. In addition, scratches, scuffs, or abrasions that occur on the outside coating as a result of the filling, sealing, and thermoprocessing of the tray cans shall not be scored as a defect.

4.5.4.1 Can label examination (Style a only). Labels shall be examined for defects in accordance with MIL-L-1497 (see 5.4) except, for self-adhering labels, the following additional defects shall apply:

Major: Label torn or scratched so as to obliterate any of the markings.

Minor: Air bubbles under label.
Label not properly adhered to can or polymeric tray, (for example, label raised or peeled back from edges or corners).

4.5.4.2 Label adhesive examination (Style a only). When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330.

4.5.4.3 Polymeric tray condition examination (Style b only). Examination of filled and sealed polymeric trays shall be in accordance with Table II or MIL-PRF-32004.

4.5.4.3.1 Polymeric tray label examination (Style b only). Labels shall be examined in accordance with the Quality Assurance Provisions and Packaging Requirements of MIL-PRF-32004.

4.5.5 Can closure examination (Style a only). Can closure shall be examined visually and by teardowns in accordance with the can manufacturer's requirements 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 of record of can seam teardowns shall be classified as a major defect and shall be cause for rejection of any involved product.

4.5.5.1 Polymeric tray closure examination (Style b only). Polymeric tray closure shall be examined in accordance with Table II of MIL-PRF-32004.

4.5.6 Vacuum examination (Style a only). Cans shall be allowed to cool to $75^0 \pm 5^0$F, held for at least 24 hours after sealing, and then examined for vacuum retention. To examine, lay a straight edge in the center of the lid along the length of the tray pack. Both ends of the straight edge shall touch the lid at the inside edge of the double seam. There shall be a visible gap between the straight edge and the lid for the entire distance of the label panel. Using a shorter edge, the same procedure shall be used across the width, in the center of the tray pack can. One measurement shall be made when examining a ribbed lid; lay the straight edge between the two center ribs along the length of the can. The inspection lot shall include only tray packs produced in a single shift on a single sealing machine. The sample size shall be 50 cans. Any nonconformance shall be classified as a major defect and shall be for rejection of the lot.

4.5.6.1 Polymeric tray testing(Style b only). Polymeric trays shall be tested for conformance to residual gas volume and internal pressure requirements in accordance with MIL-PRF-32004.

4.5.7 Shipping container examination (Style a and Style b). The filled and sealed shipping containers shall be examined for the defects listed 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.

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.
For Style a only, dimensions of pads not as specified.
For Style b only, interior packing with fiberboard liner or pads not as specified.
For Style b only, protective sleeve missing.

Minor: Other required markings missing, incorrect, or illegible.
Arrangement or number of cans or polymeric trays not as specified.

4.5.8 Unit load inspection (Style a only). Inspection of unit loads shall be in accordance with the quality assurance provisions of DSCP FORM 3507.

4.5.8.1 Unit load inspection (Stle b only). The unit loads shall be examined in accordance with the Quality Assurance Provisions and Packaging Requirements of MIL-PRF-32004.

5. PACKAGING

5.1 Preservation. The product shall be preserved in accordance with Level A

5.1.1 Level A (Style a only). One hundred and six ounces of food product shall be filled into a tray pack can conforming to MIL-C-44340 and sealed and thermoprocessed as specified in 3.4 and 3.5.

5.1.2 Level A (Style b only). Eighty-eight ounces of food product shall be filled into a polymeric tray conforming to MIL-PRF-32004 and sealed and processed as specified in 3.4 and 3.5.1.

5.2 Packing (Style a only). 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 snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L or HSC-L with an HSC full depth cover, grade V2s of ASTM D 5118. The cans shall be packed flat, four in depth within the box, with the first two cans placed with the lids together and the next two

cans with the lids together. The inside of each box shall be provided with a box liner and five fiber-board pads fabricated of grade V3c fiberboard. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box. Each box shall be reinforced with nonmetallic strapping or pressure-sensitive adhesive filament-reinforced tape in accordance with ASTM D 1974. Shipping containers shall be arranged in unit loads in accordance with DSCP FORM 3507 for the type and class of load specified (see 6.1), 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. Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, 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 ASTM D 5118. The cans shall be packed flat, four in depth within the box with the first two cans placed with the lids together and the next two cans with the lids together. The inside of each box shall be provided with a box liner and five fiberboard pads. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box and shall be fabricated of class domestic, grade 175 fiberboard.

5.2.4 Polymeric tray packing for shipment to ration assembler (Style b only). Packing for shipment to ration assembler shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

5.3 Unit loading (Style a only). When specified (see 6.1), the product, packed as specified in 5.2.2 or 5.2.3, shall be arranged in unit loads in accordance with DSCP FORM 3507 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. Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.3.1 Unit loading (Style b only). Unit loads shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

5.4 Labeling (Style a only). Each tray pack can shall be labeled in accordance with MIL-L-1497 and with the following:

- Official establishment number (for example, EST 38) or a three digit letter code identifying the establishment.
- Lot number 1/
- Production shift number 1/
- Retort identification number 1/
- Retort cook number 1/

1/ The lot number shall be expressed as a four digit Julian code. The first digit shall indicate the year of production and the next three digits shall indicate the day of the year (for example, 9 November, 1993, would be coded as 3313). The Julian code shall represent the day the product was packaged and processed. Sub-lotting (when used) shall be represented by an alpha character immediately following the four digit Julian code. Following the four digit Julian code and the alpha character (when used), the other required code information shall be printed in the sequence as listed above.

In addition, the name of the product shall be made, stamping is permitted, on one 1001 by 200 side of the can. The labeling shall be legible when examined as specified in 4.5.4.1 after preparation of product in accordance with heating instructions. Paper labels are not permitted. In addition, cans shall show the following statements:

TO HEAT IN WATER: Submerge unopened can in boiling water. Simmer gently 40-45 minutes. Avoid overheating (can shows evidence of bulging).

CAUTION: Use care when opening as pressure may have been generated within the can.

TO HEAT IN OVEN: Either punch several holes in lid of can or open can in usual manner leaving the loose lid in place. Place in a 350^0F oven 35 - 40 minutes.

WARNING: Do not place unopened can in oven. This may cause the can to burst.

YIELD: Serves 9 portions of 2 rib sections each.

As an alternate labeling method, a preprinted, self-adhering, 0.002 inch thick, clear polyester label printed with indelible black ink may be used. Self-adhering labels shall be applied after retorting. Pressure-sensitive adhesive shall require no preparation prior to application. Labels

shall tack quickly and adhere without curling or breaking. The adhesive shall have a minimum adhesion of 60 ounces per inch width when examined as specified in 4.5.4.2. When self-adhering labels are used, the tray pack cans shall be labeled with the Julian code and a product code prior to retorting

5.4.1. Labeling (Style b only).

5.4.1.1. Tray. Each polymeric tray shall be labeled in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

The tray lid shall show the following statements:

TO HEAT IN WATER: Submerge unopened tray in boiling water. Simmer gently 40-45 minutes. Avoid overheating (tray shows evidence of bulging).

WARNING: Do not heat tray in oven.

TO TRANSPORT AFTER HEATING: Insert tray back into protective sleeve to protect during transport. If sleeve is unavailable, stack trays lid-to-lid with fiberboard pads in between.

CAUTION: Use care when opening as pressure may have been generated within the tray.

TO OPEN: Using a clean knife, cut the lidding around the inside perimeter of the tray seals.

SUGGESTION: Cut lid along 3 sides and fold over uncut portion. Fold back to keep unused portions protected.

YIELD: Serves 9 portions of 2 rib sections each.

5.5 Marking (Style a only).

5.5.1 Shipping containers. In addition to any special marking required by the contract or purchase order, shipping containers shall be marked in accordance with DSCP Form 3556.

5.5.2 Unit loads. Unit loads shall be marked in accordance with DSCP Form 3556. In addition, the following precautionary marking in capital letters larger than other markings shall be included:

5.6 Marking (Style b only). Marking of shipping containers and unit loads shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

CAUTION: DO NOT STACK PALLETS IN TRANSIT OR MORE THAN TWO HIGH IN STORAGE, UNLESS PALLET RACKS ARE USED.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory).

6.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. When a first article is required (see 3.1, 4.4, and 6.2).
d. Provisions for approved preproduction samples (see 3.6.1 and 6.2).
e. Level of packing required (see 5.2).
f. Type and class of unit load when unit loading is required (see 5.2.1 and 5.3).
g. Style required (see 1.2).

6.2 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209-4. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.3 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.

6.4 Ingredient information.

6.4.2 Flavoring, smoke. It has been found that CHARSOL C-6 manufactured by Red Arrow Products Company, Inc., Post Office Box 1537, Manitowoc, WI 54221-1537, meets the requirements of 3.2.12 and performs satisfactorily in this product. The 0.50 percent by weight smoke flavoring in the sauce formula is based on the titratable acidity and phenol levels specified in 3.2.12. The tray pack or polymeric tray pork ribs in barbecue sauce producer is cautioned to verify these requirements prior to sauce formulation.

6.5 Alternate viscosity testing method. The contracting officer may authorize an alternate contractor recommended method of viscosity testing if the alternate method is approved by the U.S. Army Natick Research, Development, and Engineering Center.

6.6 Subject term (key word) listing.

Canned food
Combat field feeding
Food processing
Operational rations
Shelf stable

6.7 Rib cooking process. Cooking of the pork ribs to an approximate yield of 80 to 85 percent of the raw rib weight during development and production testing of this product has been found adequate in complying with the finished product requirements.

Custodians:

Army - GL
Navy - SA
Air Force - 50

Preparing activity:

Army - GL

(Project 8940-A697)

Review activities:

Army - MD, QM
Navy - MC
DP – SS

Notes:

1. 5-18-99 Changes made to addresses and DSCP FORM 3507.