

SECTION C

This document covers thermostabilized vegetable lasagna packaged in a polymeric tray for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-V-002, VEGETABLE LASAGNA, PACKAGED IN A POLYMERIC TRAY, SHELF STABLE

C-2 PERFORMANCE REQUIREMENTS

A. Product standard. A sample shall be subjected to first article or product demonstration model inspection as applicable, in accordance with the tests and inspections of Section E of this Performance-based Contract Requirements document.

B. Commercial sterility. The packaged food shall be processed until commercially sterile.

C. Shelf life. The packaged product shall meet the minimum shelf life requirement of 36 months at 80⁰F.

D. Appearance.

(1) General. The finished product shall be cooked vegetable lasagna. The packaged food shall be free from foreign materials. The product shall completely fill the polymeric tray, resembling a loaf. Portions cut 3 by 3 shall retain their shape when removed from the tray. The lasagna shall be layered in the tray as follows:

- a. Approximately 28 ounces of tomato sauce with vegetables.
- b. Pre-cooked frozen lasagna noodles (approximately 5 ounces).
- c. Approximately 11 ounces of cheese filling.
- d. Pre-cooked frozen lasagna noodles (approximately 5 ounces).
- e. Approximately 11 ounces of cheese filling.
- f. Pre-cooked frozen lasagna noodles (approximately 5 ounces).
- g. Approximately 27 ounces of tomato sauce with vegetables.

(2) Tomato sauce with vegetables. The tomato sauce shall be an opaque reddish color with pieces of vegetable (dices, slices or chopped) of carrots, spinach, red bell peppers, green bell peppers, and onions evenly distributed throughout the sauce.

(3) Noodles. The noodles shall be enriched, lasagna style, rippled sheets measuring 10.75 inches (+ 0.25 inch) by 8.75 inches (+ 0.25 inch) or enriched lasagna style noodles measuring 2 (+ 1/4 inch) inches wide by 9 (+ 1/2 inch) inches long with ridges running lengthwise and having fluted side edges.

(4) Sauce. The sauce shall be an opaque, reddish brown color.

E. Odor and flavor. The packaged food shall have an odor and flavor of cooked parmesan cheese and mildly spiced tomato sauce with vegetables. The packaged food shall be free from foreign odors and flavors.

F. Texture.

(1) Vegetables. The vegetables shall be slightly soft to slightly firm.

(2) Noodles. The noodles shall be slightly soft to slightly firm.

(3) Cheese filling. The cheese filling shall be smooth.

G. Net Weight. The average net weight shall be not less than 94 ounces. No individual polymeric tray shall have a net weight of less than 92 ounces.

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

I. Analytical requirements.

(1) Protein content. The protein content shall be not less than 5.0 percent.

(2) Fat content. The fat content shall be not greater than 8.0 percent.

(3) Salt content. The salt content shall be not less than 0.5 percent and not greater than 1.5 percent.

C-3 MISCELLANEOUS INFORMATION

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

A. Ingredients/formulation. Ingredients and formulation percentages for the tomato sauce with vegetables may be as follows:

<u>Ingredients</u>	<u>Percent by weight</u>
Crushed tomatoes (8.0 percent solids) <u>1/</u>	30.96
Water	26.13
Carrots, diced, frozen	10.00
Tomato paste (26 percent solids) <u>1/</u>	9.70
Spinach, chopped, frozen	6.00
Onion, diced, frozen	5.00
Green bell peppers, diced, frozen	4.00
Modified waxy maize starch	2.50
Parmesan and Romano cheese (50%/50% blend)	2.34
Granulated sugar	1.26
Salt <u>2/</u>	0.98
Red bell peppers, diced, dehydrated	0.60
Garlic powder	0.30
Ground or cracked oregano	0.06
Ground basil	0.04
Ground fennel	0.03
Ground cayenne pepper	0.03
Ground black pepper	0.03
Ground bay leaves	0.02
Ground thyme	0.02

1/ If the specified tomato solids are not available, the tomato solids that are used should be adjusted to bring the solid level to that specified.

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

B. Ingredients/formulation. Ingredients and formulation percentages for the cheese filling may be as follows:

<u>Ingredients</u>	<u>Percent by weight</u>
Ricotta cheese	49.00
Imitation mozzarella cheese	26.00
Parmesan and Romano cheese (50%/50% blend)	10.00
Water	14.00
Modified waxy maize starch	1.00

NOTES:

Frozen diced onions, frozen diced carrots and frozen diced green peppers used were supplied by SYSCO Food Services, Norton, MA.
Lasagna noodles used were precooked frozen rippled lasagna sheets manufactured by Reams Foods, Inc., Klive, Iowa 50325
Ricotta cheese used was part skim.
Crushed tomatoes used was Hunts canned chunky crushed tomatoes.

SECTION D

D-1 PACKAGING

A. Preservation. Product shall be filled into polymeric trays and the trays with protective sleeves, shall conform to the requirements of section 3 of MIL-PRF-32004A, Packaging of Food in Polymeric Trays. Verification testing and inspection of trays, lids and sleeves shall be in accordance with Section 4 of MIL-PRF-32004A and the Quality Assurance Provisions of Section E of this Performance-based Contract Requirements document.

B. Polymeric tray closure. The filled, sealed, and processed tray shall be securely closed.

D-2 LABELING

A. Polymeric tray body. The polymeric tray body shall be clearly printed or stamped, in a manner that does not damage the tray, with permanent ink of any contrasting color, which is free of carcinogenic elements. One end of the polymeric tray (see figure 1 of MIL-PRF-32004A) shall be marked with the product name and number of portions. If the tray body end markings are not readily legible in low light conditions, a small, easily legible label shall be applied, but not over any existing tray markings. All other markings may be applied along the tray body side. To avoid erroneous marking of trays, the product name, lot number and filling equipment number shall be applied prior to processing. Additional tray marking may be applied before or after processing. 1/

Tray body markings shall include:

- (1) Product name. Commonly used abbreviations may be used when authorized by the inspection agency.
- (2) Tray code includes: 2/
Lot Number
Filling equipment identification number
Retort identification number
Retort cook number

1/ As an alternate method, tray body markings may be clearly printed or stamped onto the polymeric tray lid prior to processing, in a manner that does not damage the lid, with permanent ink of any contrasting color, which is free of carcinogenic elements, provided that the required markings are applied onto the tray body after processing.

2/ 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 (Example, 14 February 2002 would be coded as 2045). The Julian code shall represent the day the product was packaged into the tray and processed. Sublotting (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.

B. Polymeric tray lid. The lid shall be clearly printed or stamped, in a manner that does not cause damage. Permanent ink of any contrasting color, which is free of carcinogenic elements, shall be used. As an alternate labeling method, a pre-printed self-adhering 0.002 inch thick clear polyester label printed with indelible contrasting color ink may be used.

- (1) Lid labeling shall include:

Product name
Ingredients
Net weight
Name and address of packer
Official establishment number (for example, EST 38) or a three letter code identifying the establishment

- (2) Lid labeling shall also show the following statements:

TO HEAT IN WATER: Submerge unopened tray in water. Bring water to a boil. Simmer gently 35-40 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 cut 3 x 3.

D-3 PACKING

A. Packing for shipment to ration assembler. Four filled, sealed, processed and sleeved polymeric trays shall be packed in a snug fitting fiberboard box conforming to style RSC-L, type CF, grade 275 of ASTM D 5118, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The sleeved trays shall be placed flat with the first two trays placed with the lids together and the next two trays with the lids together. The box shall be closed in accordance with ASTM D 1974, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Shipping Containers.

D-4 UNITIZATION

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

D-5 MARKING

A. Shipping containers and unit loads. Marking of shipping containers and unit loads shall be as specified in DPSC FORM 3556 Marking Instructions for Shipping Cases, Sacks and Palletized/Containerized Loads of Perishable and Semiperishable Subsistence.

SECTION E INSPECTION AND ACCEPTANCE

The following quality assurance criteria, utilizing ANSI/ASQC Z1.4-1993, Sampling Procedures and Tables for Inspection by Attributes, are required. When required, the manufacturer shall provide the certificate(s) of conformance to the appropriate inspection activity. Certificate(s) of conformance not provided shall be cause for rejection of the lot.

A. Definitions.

(1) Critical defect. A critical defect is a defect that judgment and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining, or depending on the item; or a defect that judgment and experience indicate is likely to prevent the performance of the major end item, i.e., the consumption of the ration.

(2) Major defect. A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.

(3) Minor defect. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

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

(1) Product standard inspection. The first article or product demonstration model shall be inspected in accordance with the provisions of this document and evaluated for overall appearance and palatability. Any failure to conform to the performance requirements or any appearance or palatability failure, shall be cause for rejection of the lot. The approved first article or product demonstration model shall be used as the product standard for periodic review evaluations. All food components that are inspected by the USDA shall be subject to periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

US Army Soldier & Biological Chemical Command
Soldiers System Ctr., Natick Soldier Center
Attn: AMSSB-RCF-F(N)
15 Kansas Street
Natick, MA 01760-5018

One lot shall be randomly selected during each calendar month of production. Two (2) sample units of each item produced shall be randomly selected from that one production lot. The two (2) sample units shall be shipped to Natick within five working days from the end of the production month and upon completion of all USDA inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

(2) Conformance inspection. Conformance inspection shall include the examinations and the methods of inspection cited in this section.

E-5 QUALITY ASSURANCE PROVISIONS (PRODUCT)

A. Product examination. The finished product shall be examined for compliance with the performance requirements specified in Section C of this Performance-based Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQC Z1.4 -

1993. The lot size shall be expressed in trays. The sample unit shall be the contents of one 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. Defects and defect classifications are listed in table I below. The trays shall be heated in accordance with the heating instructions from the tray label prior to conducting any portion of the product examination.

TABLE I. Product defects 1/ 2/ 3/ 4/

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Appearance</u>
101		Product not vegetable lasagna.
	201	The product does not completely fill the tray pack can, resembling a loaf.
	202	Portions cut 3 by 3 do not retain their shape when removed from the can.
	203	Product not layered in the can as follows: <u>5/</u> Approximately 28 ounces of tomato sauce with vegetables. Pre-cooked frozen lasagna noodles (approximately 5 ounces). Approximately 11 ounces of cheese filling. Pre-cooked frozen lasagna noodles (approximately 5 ounces). Approximately 11 ounces of cheese filling. Pre-cooked frozen lasagna noodles (approximately 5 ounces). Approximately 27 ounces of tomato sauce with vegetables.
	204	Vegetables not diced, sliced or chopped red bell pepper, green bell pepper, carrots, spinach, tomato, and onion evenly distributed throughout the tomato sauce.
	205	Sauce not an opaque, reddish brown color.
		<u>Odor and flavor</u>
102		The packaged food does not have an odor or flavor of cooked parmesan cheese and mildly spiced tomato sauce with vegetables.
		<u>Texture</u>
	206	Vegetables not slightly soft to slightly firm.
	207	Noodles not slightly soft to slightly firm.
	208	Cheese filling not smooth.
		<u>Net weight</u>
	209	Net weight of an individual polymeric tray less than 92 ounces. <u>6/</u>

1/ Presence of any foreign material such as, but not limited to dirt, insect parts, hair, wood, glass, metal, or mold, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale shall be cause for rejection of the lot.

2/ Finished product not equal to or better than the approved product standard in palatability and overall appearance shall be cause for rejection of the lot.

- 3/ Size requirement for the noodles shall be verified by certificate of conformance.
- 4/ Enriched lasagna style noodles shall be verified with the ingredient statement on the label.
- 5/ Shall be verified during product preparation.
- 6/ Sample average net weight less than 94 ounces shall be cause for rejection of the lot.

B. Methods of inspection.

(1) Commercial sterility. Commercial sterility shall be verified in accordance with USDA/FSIS regulations.

(2) Shelf life. The contractor shall provide a certificate of conformance that the product has a 3 year shelf life when stored at 80⁰F. Government verification may include storage for 6 months at 100⁰F or 36 months at 80⁰F. Upon completion of either storage period, the product will be subjected to a sensory evaluation panel for appearance and palatability and must receive an overall score of 5 or higher based on a 9 point hedonic scale to be considered acceptable.

(3) Net weight. The net weight of the filled and sealed polymeric tray shall be determined by weighing each sample unit on a suitable scale tared with a representative empty polymeric tray and lid. Results shall be reported to the nearest 1 ounce.

(4) Analytical. The sample to be analyzed shall be a one pound composite of three filled and sealed polymeric trays that have been selected at random from one production lot. The sample shall be prepared and analyzed in accordance with the latest edition of the Official Methods of Analysis of AOAC International (OMA). Test results shall be reported to the nearest 0.1 percent. Verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the analytical requirements shall be cause for rejection of the lot.

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

A. Packaging and labeling.

(1) Polymeric tray testing. For purposes of clarification, the polymeric tray without the lid will be referred to as the "tray" and the polymeric tray with the lid shall be referred to as the "container". The polymeric tray with protective sleeve and polymeric tray material shall be examined for the characteristics listed in table I of MIL-PRF-32004A, Packaging of Food in Polymeric Trays. Utilizing the single sampling plans indicated in ANSI/ASQC Z1.4 - 1993, the lot size, sample unit, and inspection level criteria are provided in table II below for each of the test characteristics. Any test failure shall be classified as a major defect and shall be cause for rejection of the lot. For rough handling survivability at frozen temperature, polymeric tray survival rate shall be at least 85 percent.

TABLE II. Polymeric tray quality assurance criteria

<u>Prior to processing</u>			
<u>Characteristic</u>	<u>Lot size expressed in</u>	<u>Sample unit</u>	<u>Inspection level</u>
Tray configurations and dimensions	Trays	1 tray	S-1
Oxygen gas transmission rate of tray	Trays	1 tray	S-1
Oxygen gas transmission rate of lid	Yards	1/2 yard	S-1
Water vapor transmission rate of tray	Trays	1 tray	S-1
Water vapor transmission rate of lid	Yards	1/2 yard	S-1
Camouflage	Containers	1 container	S-1

<u>After processing</u>			
<u>Characteristic</u>	<u>Lot size expressed in</u>	<u>Sample unit</u>	<u>Inspection level</u>
Processing	Trays	1 tray	S-2
Rough handling survivability	Test containers	1 container	S-2
Protective sleeve	Containers	1 container	S-1
Residual gas	Containers	1 container	S-1
Closure seal	Containers	1 container	S-1
Internal pressure	Containers	1 container	S-1
Lid opening	Containers	1 container	S-1

(2) Examination of container. The container with protective sleeve removed shall be examined for the defects listed in table II of MIL-PRF-32004A and the labeling defects listed in table III below. The lot size shall be expressed in containers. The sample unit shall be one processed and labeled container. Utilizing the single sampling plans indicated in ANSI/ASQC Z1.4 - 1993, the inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65 for major A defects, 2.5 for major B defects and 4.0 for minor defects. Two hundred sample units shall be examined for critical defects. The finding of any critical defect shall be cause for rejection of the lot.

TABLE III. Container labeling defects

<u>Category</u>		<u>Defect</u>
<u>Major A</u>	<u>Minor</u>	
101		Polymeric tray lid or body labeling missing, incorrect or illegible.
	201	When a pre-printed self adhering label is used, the label not adhering to tray lid (for example, label raised or peeled back from edge to corner) or presence of any areas of gaps along the perimeter of the label where the label is not properly adhered.

(3) Label adhesive examination. When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330. In lieu of testing, a certificate of conformance (COC) shall be provided.

B. Packing.

(1) Shipping container and marking examination. The filled and sealed shipping containers shall be examined for the defects listed in table IV below. The lot size shall be expressed in shipping containers. Utilizing the single sampling plans indicated in ANSI/ASQC Z1.4 - 1993, the sample unit shall be one shipping container fully packed. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total defects.

TABLE IV. Shipping container and marking defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Marking omitted, incorrect, illegible, or improper size, location sequence or method of application.
102		Inadequate workmanship. <u>1/</u>
	201	Arrangement or number of polymeric trays not as specified.

1/ Inadequate workmanship is defined as, but not limited to, incomplete closure of container flaps, loose strapping, inadequate stapling, improper taping, or bulged or distorted container.

C. Unitization.

(1) Unit load examination. The unit load shall be examined in accordance with the requirements of DSCP Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Any nonconformance shall be classified as a major defect and shall be cause for rejection of the lot.

SECTION J REFERENCE DOCUMENTS

DSCP FORMS

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

MILITARY SPECIFICATIONS

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

GOVERNMENT PUBLICATIONS

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

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 1974 Standard Practice for Methods of Closing, Sealing, and Reinforcing
Fiberboard Shipping Containers
- D 3330 Peel Adhesion of Pressure-Sensitive Tape
- D 5118 Standard Practice for Fabrication of Fiberboard Shipping Boxes

AOAC INTERNATIONAL

Official Methods of Analysis of the AOAC International (OMA)