

## SECTION C

This document covers thermostabilized glazed sweet potatoes in syrup packaged in a tray pack can for use by the Department of Defense as a component of operational rations.

### C-1 ITEM DESCRIPTION

**PCR-P-024, POTATOES, SWEET, GLAZED, PACKAGED IN A TRAY PACK CAN, SHELF STABLE**

### C-2 PERFORMANCE REQUIREMENTS

A. Product standard. A sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with the tests and inspections of Section E of this Performance-based Contract Requirements (PCR) document. The approved sample shall serve as the product standard. Should the contractor at any time plan to, or actually produce the product using different raw material or process methodologies from the approved Product Standard, which result in a product non-comparable to the Product Standard, the contractor shall arrange for a new or alternate FA or PDM approval. In any event, all product produced must meet all requirements of this document including Product Standard comparability.

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

C. Shelf life. The packaged product shall meet the minimum shelf life requirement of 36 months at 80°F.

D. Appearance.

(1) General. The finished product shall be cooked glazed diced sweet potatoes in syrup. The packaged product shall meet the requirements of U.S. Grade A, golden, pieces, cuts, or cut canned sweet potatoes of the U.S. Standards for Grades of Canned Sweet Potatoes. The packaged food shall be free from foreign materials.

(2) Sweet potato dices. The sweet potatoes shall be dice sizes typically produced by a 1-1/4 by 3/4 by 1/2 inch dicer setting.

(3) Syrup. The syrup shall be translucent and tan-yellow in color.

E. Odor and flavor. The packaged food shall have an odor and flavor of glazed sweet potatoes in syrup. The packaged food shall be free from foreign odors and flavors.

F. Texture.

(1) Sweet potatoes. The sweet potato dices shall be slightly soft to slightly firm.

(2) Syrup. The syrup shall be smooth.

G. Net Weight. The average net weight shall be not less than 106 ounces. No individual tray pack can shall have a net weight of less than 104 ounces.

H. Drained weight. The average drained weight shall be not less than 58.0 ounces. The drained weight in an individual tray pack can shall be not less than 56.0 ounces.

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

J. Analytical requirements. The salt content shall be not less than 0.5 percent and not greater than 1.2 percent.

K. Viscosity. The viscosity of the syrup shall be not less than 7.5 cm per ten seconds and not greater than 18.5 cm per ten seconds.

**C-3 MISCELLANEOUS INFORMATION**

THE FOLLOWING IS FOR 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 syrup may be as follows:

<u>Ingredients</u>	<u>Percent by weight</u>
Water	47.4
Light brown sugar	37.0
Margarine	7.0
Modified waxy maize starch <u>1/</u>	4.4
Orange juice concentrate	3.0
Salt <u>2/</u>	1.2

1/ The total amount of starch in the syrup formula may be adjusted, if necessary, to ensure compliance with the finished product viscosity requirements.

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

## **SECTION D**

### **D-1 PACKAGING**

A. Preservation. Product shall be filled into a tray pack can conforming to MIL-C-44340, Can, Tray Pack. The practice of reconditioning tray pack cans by buffing with an abrasive substance shall not be permitted. Verification testing and inspection of tray pack can conformance to the requirements shall be by the testing and inspections of Section 4 of MIL-C-44340 and the Quality Assurance Provisions of Section E of this Performance-based Contract Requirements document.

B. Can condition. The filled, sealed, and processed tray pack can shall conform to the United States Standards for Condition of Food Containers.

C. Can closure. The filled, sealed, and processed tray pack can shall be securely closed.

D. Can vacuum. The filled, sealed, and processed tray pack can shall show evidence of vacuum.

### **D-2 LABELING**

A. Tray pack can body. One side of each tray pack can body shall be clearly printed or stamped, in a manner that does not damage the tray pack can, with permanent black ink or any other contrasting color, which is free of carcinogenic elements. Paper labels are not permitted. Each tray pack can shall be labeled with the following:

(1) Product name. Commonly used abbreviations may be used when authorized by the inspection agency.

(2) Tray pack can code includes: 1/  
Lot Number  
Filling equipment identification number  
Retort identification number  
Retort cook number

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 (Example, 28 March 2003 would be coded as 3087). The Julian code shall represent the day the product was packaged into the tray pack can 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.

B. Tray pack can lid. The tray pack can lid shall be clearly printed or stamped, in a manner that does not damage the lid, with permanent black ink or any other contrasting color, which is free of carcinogenic elements. As an alternate lid labeling method, a preprinted self-adhering 0.002 inch thick clear polyester label printed with indelible black or other contrasting color ink may be used. Tray pack can labels shall show the following statements:

(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 can in water. Bring water to a boil. 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.

YIELD: Serves 18 portions of approximately 2/3 cup each.

### **D-3 PACKING**

A. Packing for shipment to ration assembler. Four filled, sealed, and processed cans of product, shall be packed in a snug fitting fiberboard box conforming to style RSC-L, type CF, grade 275 of ASTM D5118/D5118M-95 (2001), Standard Practice for Fabrication of Fiberboard Shipping Boxes. The cans shall be packed flat, with the first two cans placed with the lids together and the next two cans with the lids together. Fiberboard 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 inside dimensions of the box and shall be fabricated of class domestic, grade 175 fiberboard. The box shall be closed in accordance with ASTM D1974-98, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

#### **D-4 UNITIZATION**

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

#### **D-5 MARKING**

A. Shipping containers and unit loads. Marking of shipping containers and unit loads shall be as specified in DSCP FORM 3556 Marking Instructions for 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. Unless otherwise specified, Single Sampling Plans indicated in ANSI/ASQC Z1.4-1993 will be utilized. When required, the manufacturer shall provide the certificate(s) of conformance to the appropriate inspection activity. Certificate(s) of conformance not provided shall be cause for rejection of the lot.

#### A. Definitions.

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

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

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

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

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

periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

US Army 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 tray pack cans. The sample unit shall be the contents of one tray pack can. 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 tray pack cans shall be heated in accordance with the heating instructions from the tray pack can label prior to conducting any portion of the product examination. The samples for drained weight inspection shall be selected using the same sampling criteria as above.

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Appearance</u>
101		Product not cooked glazed sweet potatoes in syrup.
	201	Syrup not translucent or not tan-yellow in color.
		<u>Odor and flavor</u>
102		Packaged food does not have an odor or flavor of glazed sweet potatoes in syrup.
		<u>Texture</u>
	202	Sweet potato dices not slightly soft to slightly firm.
	203	Syrup not smooth.
		<u>Net weight</u>
	204	Net weight of an individual tray pack can less than 104 ounces. <u>5/</u>
	205	Drained weight of sweet potato dices in an individual tray pack can is less than 56.0 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 sweet potato dices shall be verified by certificate of conformance.

4/ Packaged product not meeting the requirements of U.S. Grade A, golden, pieces, cuts, or cut canned sweet potatoes of the U.S. Standards for Grades of Canned Sweet Potatoes shall be cause for rejection of the lot.

5/ Sample average net weight less than 106 ounces shall be cause for rejection of the lot.

6/ Sample average drained weight less than 58.0 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 80°F. Government verification may include storage for 6 months at 100°F or 36 months at 80°F. Upon completion of either storage period, the product will be subjected to a sensory evaluation panel for appearance and palatability and must receive an overall score of 5 or higher based on a 9 point hedonic scale to be considered acceptable.

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

(4) Drained weight. The free liquid in the tray pack can shall be poured off, strained through a U.S. Standard No. 8 sieve, and reserved for viscosity determinations. The remaining contents of the can shall be poured into a flat bottom container. A minimum of three times the can's volume of 180°F to 190°F water shall be added to the container so as to cover the contents. The contents and water shall be agitated so as to fully dissolve the syrup without undue breakup of the sweet potato dices. The contents shall then be poured into a U.S. Standard No. 1/4 sieve in a manner that will distribute the product evenly over the sieve. 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 such an angle to assure complete drainage of liquid from the product. Drain product 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 0.5 ounce.

(5) Syrup viscosity. Viscosity testing shall be performed by collecting the free liquid from each of the samples used to determine the drained weight. The syrup temperature at time of testing shall be 100°F ± 1°F (37.8°C ± 0.5°C). Any result not conforming to the requirements specified in Section C of this Performance-based Contract Requirements shall be cause for rejection of the lot.

(6) Analytical. The sample to be analyzed shall be a one-pound composite of three filled and sealed tray pack cans that have been selected at random from one production lot. The composite sample shall be prepared and analyzed in accordance with the following Official Methods of Analysis of AOAC International (OMA).

<u>Test</u>	<u>Method Number</u>
Salt	971.27

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, TRAY PACK CAN)**

A. Packaging.

(1) 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. In addition, scratches, scuffs or abrasions that occur on the outside coating as a result of the filling, sealing, and processing of the tray pack cans shall not be scored as a defect.

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

(3) Vacuum examination. 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 in the center of the lid along the length of the tray pack can. 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 straight 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 pack cans 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 cause for rejection of the lot.

B. Labeling.

(1) Can body labeling examination. The tray pack can body shall be examined for the labeling defects listed in table II below. The lot size shall be expressed in tray pack cans. The sample unit shall be one tray pack can. The inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65 for major defects and 4.0 for minor defects.

TABLE II. Can body labeling defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Tray pack can code or product name missing, incorrect, or illegible.
102		Not printed or stamped as specified.
103		Printing or stamping causes can body damage.
	201	Labeling ink not a contrasting color.

(2) Can lid labeling examination. The tray pack can shall be examined for the defects listed in table III below. The lot size shall be expressed in tray pack cans. The sample unit shall be one tray pack can. The inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65 for major defects and 4.0 for minor defects.

TABLE III. Can lid labeling defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Label torn or scratched so as to obliterate any of the markings.
102		Labeling missing, incorrect or illegible.
	201	Air bubbles under label.
	202	Label not properly adhered to can (label raised or peeled back from edges or corners).

(3) Label adhesive examination. When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D3330/D3330M-00. In lieu of testing, a certificate of conformance (COC) shall be provided.

C. 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. 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 tray pack cans not as specified.

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

D. Unitization.

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

**SECTION J REFERENCE DOCUMENTS**

DSCP FORMS

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

MILITARY SPECIFICATIONS

MIL-C-44340	Can, Tray Pack
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GOVERNMENT PUBLICATIONS

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder (21 CFR Parts 1-199) and (9 CFR Parts 1-391)  
U.S. Standards for Condition of Food Containers

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)

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

ASTM INTERNATIONAL

D1974-98 Standard Practice for Methods of Closing, Sealing,  
and Reinforcing Fiberboard Boxes  
D3330/D3330M-00 Standard Test Method for Peel Adhesion of  
Pressure-Sensitive Tape  
D5118/D5118M-95 (2001) Standard Practice for Fabrication of Fiberboard  
Shipping Boxes

AOAC INTERNATIONAL Official Methods of Analysis of the AOAC International