

# Isolation/Quarantine Foods for Apollo 11 Astronauts

from *Stouffer's*



**Press  
Materials**





For: Stouffer Foods  
Division of Litton Industries  
1375 Euclid Avenue  
Cleveland, Ohio 44115  
Doris Davis - (216) 861-3450

From: Ketchum, MacLeod & Grove, Inc.  
Four Gateway Center - Pittsburgh, Pa. 15222  
Carol Moberg - (412) 261-5100  
7/15/69

Doris Davis, Stouffer's manager of research and development, tests heating instructions recommended to NASA. Frozen convenience foods will be heated in Atherton microwave and quartz ovens (shown above).

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A typical astronaut dinner will consist of short ribs of beef, potatoes au gratin and tossed green salad. Stouffer's has been selected to provide from its retail line a major portion of the entrees and side dishes for the astronauts' menu. Ease of preparation, purity, quality and variety as well as taste and appearance were main reasons for NASA's selection of Stouffer's foods.

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Stouffer's food included on the astronauts' menu for the three week isolation/quarantine period is from the regular production schedule. Production line (above) is at Stouffer's new \$8.5 million Solon processing plant near Cleveland.

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Purity and quality were important criteria in the selection of Stouffer's foods for the astronauts' menu. Quality Control Supervisor Mrs. Sara Thompson (above) checks bacteria count of raw materials in Stouffer's laboratory. Raw materials, both food ingredients and packaging, are checked visually, chemically and bacteriologically before every production run.

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Following extensive technical tests, officials of NASA's Manned Spacecraft Center and of Technology, Inc., subcontractor charged with developing the isolation/quarantine feeding program, chose 38 Stouffer Foods products along with selected products from other processors and suppliers as the bases for the menus.

Many of the food items the Apollo 11 astronauts will eat when they return from the moon will be popped into the oven, and served in the same way they are served to millions of American husbands every evening.

Ease of preparation, purity, quality and variety were the main reasons frozen convenience foods were selected for the astronauts' meals during the critical isolation/quarantine period after "splashdown," according to James M. Biggar, president of Stouffer Foods Division of Litton Industries.

After a nine-day diet of wet and dry "space" foods while going to and coming from the lunar landing, U. S. astronauts, and the scientists, medical personnel and technicians in confinement with them, will be served food products that are available in the neighborhood supermarket.

NASA dietitians will feed the 23 men in the Lunar Receiving Laboratory of the Manned Spacecraft Center in Houston, Texas, until August 14. The men will be quarantined to make certain no hostile organisms have been transported to the earth from the moon. During this period, the scientists looking for signs of alien organisms, have demanded assurance that diet will cause no illness that might mistakenly be attributed to hostile bacteria.

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The crew will have a wide selection of soups, entrees, side dishes, desserts and snacks on its menu. Many of the food items are the same products available in grocery freezers from Stouffer Foods, which has been selected by NASA to supply a major portion of this food.

Following extensive technical tests, officials of NASA's Manned Spacecraft Center and of Technology, Inc., subcontractor charged with developing the isolation/quarantine feeding program, chose 38 Stouffer Foods products along with selected products from other processors and suppliers as the bases for the menus.

Among the Stouffer's foods the astronauts will eat are lobster newburg, lasagna, and escalloped chicken and noodles. There also will be cream of mushroom and French onion soup, beef and chicken pies, escalloped apples, Williamsburg orange cake and pumpkin pie.

All Stouffer's products meet or exceed NASA specifications for purity based on bacteria plate count, staph tests, salmonella checks and coliform count.

The astronauts themselves also approved the selected foods. During simulated isolation/quarantine situations at NASA headquarters in Houston, the astronauts ate the products that will be served during the actual confinement period.

Foods will be prepared by three NASA stewards using Litton's Atherton microwave or quartz ovens in the kitchen of the Crew Reception Area. Meals will be served in the lounge and dining area adjacent to the kitchen.

Stouffer's foods for the three-week menu cycle have been shipped to Glazier Distributors, a food broker, in Houston, and will be stored in Glazier's freezers until quarantine begins.

(MORE)

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7/15/69

Glazier will supply Stouffer's foods to NASA once a week during quarantine. Each Stouffer's shipping case will be packed with dry ice, sealed and delivered to NASA's food receiving room. All food will be delivered at zero temperature.

Food will be received by NASA's head dietitian and will enter the LRL through a series of air locks to make sure that the quarantine is preserved. The food will arrive with specific directions from Stouffer's on the correct heating time and temperature needed for preparation of each item.

Stouffer's home economists have extensively tested the heating directions recommended to NASA. These instructions were developed for NASA, according to Mr. Biggar, because of the use of the microwave and quartz ovens which cut heating time to 10 minutes for most items. This compares with about one hour normally required to heat frozen foods in home, or conventional institutional ovens, Mr. Biggar said.

Mr. Biggar said that NASA's selection of Stouffer's food was based first on quality and then on the variety of food available. Taste and appearance of the food also were important considerations, he said. He said that NASA was chiefly concerned with serving its astronauts the best possible food when they returned from "man's greatest adventure."

All of the Stouffer's food involved in this program, Elder said, are from regular production. "The products the astronauts will eat are the same items that we offer the homemaker and our food service customers," he said.

Stouffer Foods participation in the Apollo 11 program began more than two years ago when Stouffer's executives and dietitians began working with NASA on the Manned Spacecraft Center's suggested menus. Final product tests began last January following the successful Christmas flight of Apollo 8 around the moon.

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July 11, 1969

#### Background Information About Stouffer Foods

Stouffer Foods Division of Litton Industries, founded by Vernon Stouffer, had its beginnings 45 years ago in an 18 by 40-foot restaurant in downtown Cleveland. Today, as the food industry's largest processor of frozen prepared entrees, Stouffer's is preparing food for the Apollo 11 astronauts in an \$8.5 million processing plant with a production capacity of 80 million pounds of convenience foods a year.

That little 1924 Cleveland lunchroom grew into the Stouffer Foods Corporation, comprising restaurants, inns, the frozen prepared foods division, and a management food service division, all of which were merged with Litton in 1967. In 1969 there are 50 Stouffer restaurants and nine motor inns; the familiar Stouffer packages are in grocery freezers nationwide; and Stouffer food systems service many of the country's largest universities, hospitals, and business institutions.

Today the frozen foods division manufactures and markets nearly 40 entrees and side dishes which are sold in grocery stores. With the increasing use of frozen convenience foods, Stouffer's has found a wide and growing market for its quality line of products such as meat pies, macaroni and cheese, escalloped chicken and noodles, spinach souffle and Alaska king crab newburg.

(MORE)

Stouffer Foods is also a leading supplier of frozen convenience foods to hospitals, hotels, airlines, colleges, restaurants and other food service operations. There are more than 125 soups, entrees, desserts and side dishes made for institutional use.

Consumer acceptance of Stouffer's frozen products has been enhanced by the reputation of the many Stouffer's restaurants. Stouffer's started marketing its frozen food products when customers began requesting the opportunity to buy at retail the same type of food they enjoyed in the restaurants.

One of the suburban Stouffer restaurants in Shaker Heights, Ohio, began to experiment with freezing of prepared foods. These were sold in a small pilot store attached to the restaurant and the enthusiastic acceptance of these products triggered the dramatic growth of the Frozen Foods Division, which was founded in 1954.

Macaroni and cheese, one of the "restaurant favorites," was among the first items to be packed and frozen. Even today, despite the introduction of such elaborate dishes as lobster newburg, Stouffer's macaroni and cheese is still one of the company's major items.

Recipe for the dish came from the mother of the firm's founder. Although she originally balked at the idea of frozen foods, she was converted when she couldn't tell the difference between two samples -- one fresh and one frozen four months earlier.

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FACT SHEET

STOUFFER'S FROZEN PREPARED FOODS

CONSUMER PRODUCTS

Product Name	Generic Name	Wt.
1. Stouffer's Escalloped Chicken and Noodles	A mixture of cooked egg noodles, cooked diced chicken, celery and mushrooms in chicken gravy topped with toasted bread crumbs.	11-1/2 oz.
2. Stouffer's Macaroni and Cheese	A cheese sauce with cooked macaroni, topped with grated Cheddar cheese.	12 oz.
3. Stouffer's Potatoes Au Gratin	Steamed diced potatoes and Cheddar cheese blended in a white sauce, topped with grated Cheddar cheese.	11-1/2 oz.
4. Stouffer's Cauliflower Au Gratin	Cooked fresh cauliflower in an aged Cheddar - pure cream sauce.	10 oz.
5. Stouffer's Club Style Potatoes	Steamed diced potatoes in cream, lightly seasoned and topped with toasted crumbs.	11-1/2 oz.
6. Stouffer's Escalloped Apples	Diced Jonathan apples blended with margarine, sugar, flour and cinnamon, cooked until "just" tender, topped with sugar-cinnamon mixture.	12 oz.
7. Stouffer's Lobster Newburg	Lobster pieces in a delicately sherried cream sauce.	11-1/2 oz.
8. Stouffer's Baked Breasts of Chicken with Gravy Southern Style	Whole baked chicken breasts in a cream chicken gravy.	1 lb.
9. Stouffer's Short Ribs of Beef, boneless with vegetable Gravy	Boneless short ribs of beef, frozen julienne carrots, celery and onion pieces in a beef gravy.	11-1/2 oz.
10. Stouffer's Chicken Pie	Freshly cooked, diced chicken with julienne carrots, and peas in a creamed chicken gravy topped with an unbaked pastry crust.	10 oz.

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11. Stouffer's Beef Pie	Oven browned beef cubes, julienne carrots, peas and onion pieces in a beef gravy topped with an unbaked pastry crust.	10 oz.
12. Stouffer's Sloppy Joe Sauce with Beef	Roasted ground beef, diced green pepper in a seasoned chili tomato sauce.	12 oz.
13. Stouffer's Lasagna with Meat	Seasoned tomato meat sauce containing cottage cheese which is layered between cooked lasagna noodles and a combination of Parmesan and Mozzarella cheese.	1# 14 oz. 11-1/2 oz.
14. Stouffer's Chicken & Dumplings	A product consisting of natural proportions of light and dark chicken pieces in a cream chicken gravy topped with tender, moist dumplings.	1# 12 oz.
Stouffer's Potatoes Au Gratin	Cooked potatoes and Cheddar cheese blended in a white sauce, topped with grated Cheddar cheese.	11-1/2 oz.
Stouffer's Cauliflower Au Gratin	##### Cooked fresh cauliflower in an aged Cheddar - pure cream sauce.	10 oz.
Stouffer's Club Style Potatoes	Steamed diced potatoes in cream, lightly seasoned and topped with toasted crumbs.	11-1/2 oz.
Stouffer's Escalloped Apples	Diced Jonathan apples blended with margarine, sugar, flour and cinnamon, cooked until "just" tender, topped with sugar-cinnamon mixture.	12 oz.
Stouffer's Lobster Newburg	Lobster pieces in a delicately sherried cream sauce.	11-1/2 oz.
Stouffer's Baked Breasts of Chicken with Gravy Southern Style	Whole baked chicken breasts in a cream chicken gravy.	1 lb.
Stouffer's Short Ribs of Beef, boneless with vegetable Gravy	Boneless short ribs of beef, frozen julienne carrots, celery and onion pieces in a beef gravy.	11-1/2 oz.
Stouffer's Chicken Pie	Freshly cooked, diced chicken with julienne carrots, and peas in a creamed chicken gravy topped with an unbaked pastry crust.	10 oz.

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9. Stouffer's Sliced  
Pot Roast of Beef

Selected choice beef round roasted  
to perfection in a rich beef-

FACT SHEET

Sliced and portioned,  
the beef is packed with a thickened  
sauce of mushrooms, celery  
and onions

72 oz.

STUFFER'S FROZEN PREPARED FOODS

INSTITUTIONAL FOOD SERVICE PRODUCTS

10. Stouffer's  
Seafood Cakes

A blend of shrimp, fish filets,  
Alaska king crabmeat combined  
with a delicately seasoned sauce,  
shaped and breaded

Weight

Product Name

Generic Name

Soups

Desserts

1. Stouffer's Split  
Pea Soup

Rich with ham stock, freshly  
ground ham and special seasonings

28 oz.

2. Stouffer's French  
Onion Soup

Grilled fresh onions in a rich,  
full-flavored beef broth

28 oz.

3. Stouffer's  
Mushroom Soup

Creamy soup abounding with tender  
slices of sauteed mushrooms  
flavored with mushroom broth

28 oz.

4. Stouffer's  
Mulligatawny Soup

Cubes of tender chicken, fresh  
apple pieces, carrots, celery,  
onions, green pepper and tomatoes  
simmered in a rich chicken broth  
with just a hint of curry

34 oz.

5. Stouffer's Clam  
Chowder

Tender sweet clams, simmered in a  
rich clam broth with colorful  
vegetables and just the right  
amount of selected spices

28 oz.

6. Stouffer's Cream  
of Chicken Soup

Tender pieces of chicken simmered  
in a delicately seasoned soup  
with a rich cherry sauce

28 oz.

7. Stouffer's Oyster  
Bisque

A rich blend of cream and tender  
sauteed oysters, served with  
selected seasonings

28 oz.

8. Stouffer's Corn Bread

Buttery blend of cornmeal, whole  
eggs, milk; baked until golden

38 oz.

Entrees

9. Stouffer's Chocolate  
Stroganoff

Rich chocolate brownie with  
Juicy slices of beef tenderloin  
are lightly grilled and packed  
with a rich sour cream flavored  
beef and mushroom gravy

24 oz.

70 oz.

9.	Stouffer's Sliced Pot Roast of Beef	Selected choice beef round roasted to perfection in a rich beef-tomato broth. Sliced and portioned, the beef is packed with a thickened au jus, julienne carrots, celery and onions	28 oz.
10.	Stouffer's Seafood Cakes	A blend of shrimp, fish filets, Alaska king crabmeat combined with a delicately seasoned sauce, shaped and lightly breaded	72 oz. 54 oz.
11.	Stouffer's Butter-scotch Brownies	Chewy brownies with chopped pecans	24 oz.
12.	Stouffer's Swiss Chocolate Cake	Coconut and pecan frosting compliments the chocolate flavor	24 oz.
13.	Stouffer's Covered Apple Pie	Freshly diced apples gently simmered in a seasoned mixture of cinnamon and sugar with a tender lightly browned crust	34 oz.
14.	Stouffer's Williamsburg Orange Wine Cake	Chopped walnuts, fresh oranges and white raisins, with a cream sherry wine-flavored icing	34 oz.
15.	Stouffer's Chocolate Lime Freeze	Creamy lime chiffon mixture with chocolate cookie crumb crust, lightly sprinkled with chocolate cookie crumbs	30 oz.
16.	Stouffer's Cherry Upside Down Cake	Yellow upside down cake with whole cherries in sweet-sour cherry sauce	38 oz.
17.	Stouffer's Pumpkin Pie	Pastry crust filled with rich, spicy pumpkin custard	34 oz.
18.	Stouffer's Corn Bread	Buttery blend of cornmeal, whole eggs, milk; baked until golden	38 oz.
19.	Stouffer's Chocolate Brownies	Rich chocolate brownie with chopped pecans; moist, slightly chewy, lightly crumbly	24 oz.

20.	Stouffer's Spice Cake	Light cake flavored with multiple spices; rich, smooth butterscotch cream icing	28 oz.
21.	Stouffer's Pecan Pie	Pastry crust; rich, sweet cooked custard filling topped with unbroken pecan halves	34 oz.
22.	Stouffer's Deep Dish Cherry Pie	Mixture of whole cherries in thickened sweet-sour cherry sauce; pastry top crust	57 oz.
23.	Stouffer's Oatmeal Nut Kuchen	Tender cake-like kuchen with brown sugar-pecan topping	27 oz.
24.	Stouffer's Chocolate Ice Cream Cake	Moist, light, tender cake of rich double chocolate flavor	19 oz.
2.	Stouffer's French Onion Soup	Grilled fresh onions in a rich, full-flavored beef broth	28 oz.
3.	Stouffer's Mushroom Soup	Creamy soup abounding with tender slices of sauteed mushrooms flavored with mushroom broth	28 oz.
4.	Stouffer's Mulligatawny Soup	Cubes of tender chicken, fresh apple pieces, carrots, celery, onions, green pepper and tomatoes simmered in a rich chicken broth with just a hint of curry	28 oz.
5.	Stouffer's Clam Chowder	Tender sweet clams, simmered in a rich clam broth with colorful vegetables and just the right amount of selected spices	28 oz.
6.	Stouffer's Cream of Chicken Soup	Tender pieces of chicken simmered in a delicately seasoned soup	28 oz.
7.	Stouffer's Oyster Bisque	A rich blend of cream and tender sauteed oysters, served with selected seasonings	28 oz.
Souffles			
Entrées			
8.	Stouffer's Beef Stroganoff	Juicy slices of beef tenderloin are lightly grilled and packed with a rich sour cream flavored beef and mushroom gravy	70 oz.

These are basics of the purity guarantee. Complete official specifications are attached. The convenience foods used in this program meet and exceed these specifications.

In addition to meeting the purity standards, food products had to pass taste tests.

#### COVERING INFORMATION FOR LUNAR RECEIVING LABORATORY FOOD REQUIREMENTS

The diet of the astronauts during the isolation/quarantine period following splashdown is vital. For accurate research into man's reaction to the moon's environment, there must be no problem with illness -- however minor -- caused by food.

"The best way NASA could be certain that no unwanted biological substances could enter the lunar receiving laboratory with food," said James M. Biggar, president of Stouffer Foods, "was to specify prepared convenience foods on the 21-day official menu cycle."

Stouffer foods and other suppliers to the isolation/quarantine program have certified food purity. On-premise preparation of food could not guarantee the same level of purity, according to Mr. Biggar.

Each package of food supplied for the program is certified that:

1. No salmonella is present.
2. No staph is present.
3. No E. Coli is present.
4. Bacteria and coliform count are less than NASA specifications.

These are basics of the purity guarantee. Complete official specifications are attached. The convenience foods used in this program meet and exceed these specifications.

In addition to meeting the purity standards, food products had to pass taste tests.

Mr. Biggar said, "We were delighted that the Apollo 11 astronauts approved of the menus prepared for them after eating this food in pre-launch simulations."

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Federal Food, Drug and Cosmetic Act and Regulations promulgated thereunder.

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Grade "A" Pasteurized Milk Ordinance-1965.  
Recommendations of the U.S. Public Health Service.

Bakery Products: Definitions and Standards of Identity.

U.S. DEPARTMENT OF AGRICULTURE

Regulations Governing the Meat Inspection of the U.S. Department of Agriculture.

Regulations Governing the Grading and Inspection of Poultry and Edible Products Thereof and the United States Specifications for Classes, Standards, and Grades with Respect Thereto.

Regulations Governing the Grading and Inspection of Egg Products.

U.S. Standards for Grades of Carcass Beef.

U.S. Standards or Grades for Fruits and Vegetables.

AMERICAN DRY MILK INSTITUTE, INC.

U.S. DEPARTMENT OF THE INTERIOR

Regulations Governing Processed Fishery Products.

Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, U.S. Department of the Interior.

3.0 REQUIREMENTS

STATEMENT OF WORK

3.1 Materials.

1.0 SCOPE

This document describes requirements for the production, packaging, testing and delivery of food for use in supporting simulations and missions in the Crew Reception Area (CRA) of the Lunar Receiving Laboratory (LRL) during quarantine periods.

2.0 APPLICABLE DOCUMENTS

3.1.1 The following documents form a part of this specification to the extent specified herein:

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Federal Food, Drug and Cosmetic Act and Regulations promulgated thereunder.

Grade "A" Pasteurized Milk Ordinance-1965.  
Recommendations of the U.S. Public Health Service.

3.1.3 Bakery Products: Definitions and Standards of Identity.

U.S. DEPARTMENT OF AGRICULTURE

Regulations Governing the Meat Inspection of the U.S. Department of Agriculture.

Regulations Governing the Grading and Inspection of Poultry and Edible Products Thereof and the United States Specifications for Classes, Standards, and Grades with Respect Thereto.

3.1.4

3.1.4.1

Regulations Governing the Grading and Inspection of Egg Products.

U.S. Standards for Grades of Carcass Beef.

U.S. Standards or Grades for Fruits and Vegetables.

3.1.4.1.1

Beef. AMERICAN DRY MILK INSTITUTE, INC.

U.S. DEPARTMENT OF THE INTERIOR

3.1.4.2

Poultry. Regulations Governing Processed Fishery Products.

Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, U.S. Department of the Interior.

3.0 1.4.3 REQUIREMENTS

3.1

Materials.

The products shall be manufactured from components which comply with the regulations of the Food and Drug Administration, U.S. Department of Health, Education and Welfare, or regulations of the Meat and Poultry Inspection, U.S. Department of Agriculture, or regulations of the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, U.S. Department of the Interior. All materials shall be of edible grade, clean, sound, wholesome, and shall be free from evidence of insect infestation or other objectionable foreign matter, odors and flavors. They shall be in excellent condition at the time of use.

3.1.1

Bread and Bakery Products.

Bread and Bakery Products shall be made in accordance with Definitions and Standards of Identity for Bakery Products as set forth under the Food, Drug and Cosmetic Act.

3.1.2

Eggs and Egg Products.

Eggs and egg products shall be procured from a source approved by the U.S. Department of Agriculture. Egg products shall be U.S. Grade A; fresh eggs shall be U.S. Grade AA.

3.1.3

Fruits and Vegetables.

Fruits and vegetables; fresh, frozen, dried and canned shall be U.S. Grade No. 1 or U.S. Grade A (or U.S. Fancy) as applicable. When fruits and vegetables are used which do not have applicable U.S. Standards for grades, they shall be of best commercial grade available and shall possess good characteristic flavor, odor and color. They shall be free from quality defects.

3.1.4

Meat, Poultry and Seafood.

3.1.4.1

Meat Products.

All Meat products shall be prepared and processed only in a plant which is operated under the inspection of the Processed Meat Inspection Division, Consumer and Marketing Service, USDA, and shall be inspected, passed and marked in accordance with regulations governing the Meat Inspection of the USDA.

3.1.4.1.1

Beef.

U.S. Grade Good or better beef shall be used.

3.1.4.2

Poultry.

Poultry shall be slaughtered and processed in a plant which is operated under the continuous inspection of the Poultry Inspection Division, Consumer and Marketing Service, U.S. Department of Agriculture. Poultry shall be U.S. Grade B or Better.

- 3.1.4.3 **Fish.** Fish and Seafood shall be prepared and processed in a plant which is operated under the continuous inspection of the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Department of the Interior.
- 3.1.5 **Milk and Dairy Products.** Milk and all dairy products shall be procured from a source approved by the U.S. Department of Agriculture and shall be U.S. Grade A. Nonfat dry milk shall be extra grade.
- 3.1.6 **Spices and Soluble Spice Flavors.**
- 3.2.2.2 Natural spices or soluble spice flavors shall be used. If soluble spice flavors are used, they shall be used in amounts necessary to produce the flavor equivalent of the ground natural spices. Spices and soluble spice flavors shall be clean, free-flowing, dry, good commercial grade.
- 3.2.2.2.1
- 3.2 **Preparation and Processing of Materials.**
- 3.2.1 **Vegetables.**
- 3.2.1.1 **Fresh.** Fresh vegetables shall be thoroughly cleaned, washed, peeled when necessary, and trimmed to remove all defective and undesirable material. Precautions shall be taken to prevent discoloration and other deterioration of the product during these operations.
- 3.2.1.2 **Frozen.** Frozen vegetables which have been sufficiently cooked prior to freezing shall meet product requirements specified in 3.2.1.3. Frozen vegetables requiring cooking shall not be defrosted before cooking. Surface thawing sufficient for easy removal from carton is permitted.
- 3.3.1
- 3.2.1.3 **Cooking and Filling.** Cooking of the fresh and frozen products shall be accomplished in the shortest time commensurate with the attainment of a firm but tender texture, good flavor, and natural color in the end product after freezing, thawing, and reheating to a serving temperature. The cooked product shall be filled into trays and shall enter the freezer within 2 hours after cooking.
- 3.4
- 3.2.2 **Meat, Fish and Poultry Products.**
- 3.2.2.1 **Meat Products.** All meat products shall be held under proper refrigeration

3.4.1 and shall show every evidence of freshness and quality at time of cooking. The temperature of the beef shall not be held longer than 1 hour in the warm state between cooking and entering the freezer. If further delay occurs, the product shall be properly protected from air exposure and shall be cooled promptly to a temperature of below 45°F; in no event shall the holding period exceed 6 hours. All bones, bone chips exceeding 1/4 inch in any dimension, cartilage, kidneys, blood clots, blood trimmings, bruised portions, thick tendons and ligaments, calcified periosteum, abdominal tunic, udders, prefemoral, prescapular and papliteal lymph glands, dehydrated trimmings and serous membranes shall be removed and excluded from all beef products prior to cooking.

3.2.2.2 Fish.

3.2.2.2.1 Frozen.

All fish products shall be held under proper refrigeration and shall show every evidence of freshness and quality at the time of cooking. The temperature of the fish shall not be held longer than 1 hour in the warm state between cooking and entering the freezer. If further delay occurs, the product shall be properly protected from air exposure and shall be cooled promptly to a temperature of below 45°F; in no event shall the holding period exceed 6 hours. Frozen fish shall be free of discoloration, foreign material and objectionable odors and flavors prior to cooking. Fish shall be free of scales, viscera, bruises, blemishes, blood spots, fins, pieces of fins and bones.

3.3 Filling.

Food shall be placed in trays and the trays shall enter a freezer, 0°F or below, within 30 minutes after filling.

3.3.1 Freezing and Refrigeration.

Food shall be frozen quickly at a temperature not higher than 0°F. The product temperature shall be reduced to 0°F or below within 12 hours after entering the freezer. The cased frozen product shall be held in forced air freezer storage for 12 hours (or longer) at 0°F or below, to insure equalization, of in-case temperature prior to shipment.

3.4 Finished Product.

After heating to a serving temperature of 160°F, food shall possess a typical color, flavor and texture with no evidence of over or under cooking. No foreign material, off-flavors, flavors foreign to the product, off odor, off color, or burned appearance shall be permitted. The finished product shall comply with 3.4.1 through 3.4.3, as applicable.

3.4.1 Meat.

The cooked meat and poultry products shall be free from ligaments and any tendon material which has not been tenderized during cooking. The cooked meat shall contain not more than 1/4 inch in thickness of seam fat or surface fat, perpendicular to the longest dimension of the fat. The cooked meat and poultry products shall possess a typical appearance, firm but tender texture, and characteristic flavor.

4.2.1

3.4.1.1 Fish.

The cooked fish shall contain no off-color, off-odor or flavors foreign to the product.

3.4.2 Gravies and Sauces.

Gravies and sauces shall be of a smooth thin sauce consistency, shall not be curdled or lumpy in appearance, and shall be of normal color for the type of gravy used.

3.4.3 Vegetables.

The vegetable products shall possess good, characteristic flavor, odor, and color, and a firm but tender texture.

3.4.4 Microbiological Requirements.

Microbiological examination shall be performed according to the procedure specified in 4.6. Total microbiological count on the contents of any one tray or bakery product shall not exceed 50,000 per gram. The total coliform count shall not be greater than 100 per gram and shall be negative for E. coli.

3.4.5 Deliveries.

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

3.5 The product shall be prepared only in an establishment which is regularly inspected by the U.S. Department of Agriculture. The product shall be handled and delivered under the same sanitary conditions that govern the handling and movements of similar products within and between establishments operated under USDA inspection.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection.

The Contractor shall be responsible for performing the examinations and tests specified in this document up to the point of delivery of the finished products at NASA. The records of all examinations and tests shall be delivered to: Chief, Food and Nutrition, DC-7, NASA-MSC, Houston, Texas 77058. For purposes of verification NASA reserves the right to monitor or perform any of the inspections, examinations and tests set forth in this document.

- 4.2 Examination of Ingredients.
- Examination of all ingredients for conformance with the requirements specified with respect to identity and grade shall be ascertained by examination of labels, invoices and grade certificates or other valid documents.
- 4.2.1 Foreign Material.
- Presence of foreign material, e.g., glass, wood, metal, dirt or foreign odor or flavor shall be cause for rejection of the entire lot.
- 4.3 Examination of Packaged Food.
- If the tray or covering material contains any objectionable color, flavor, or odor which is imparted to the food the food shall be rejected.
- 4.4 Examination of Finished Product.
- Presence of foreign material, e.g., metal, wood, glass, insect, dirt, or foreign odor or flavor shall be cause for the rejection of the lot.
- 4.5 Sampling Procedure and Acceptance Criteria for Testing of Finished Product.
- Procedures for microbiological examinations shall be in accordance with 4.6 or other procedures may be used by the supplier if they provide a quality assurance equivalent to that specified. A lot shall be rejected if one or more test results indicate nonconformance to test requirements.
- 4.6 Microbiological Examination.
- 4.6.1 Sample Preparation.
- Samples shall be kept completely frozen at all times prior to analysis. Holding time prior to analysis shall be kept to a minimum. Place frozen meal in a refrigerator at 35°F to 40°F for one to three hours to temper. Aseptically transfer about 100 grams into a sterile, tared blender jar with screw cap. Weigh. Calculate weight of sample. Measure sterile distilled water into a sterile graduated cylinder, enough to equal 4 times the weight of sample (1:5 dil). Aseptically add about half of this to the blender jar. Blend for 1 minute, add remainder of water and blend for two additional minutes. Prepare a 1:10 dilution

by pipetting 50 ml of the 1:5 suspension into a sterile, 50 ml buffered water blank (m/15 PO<sub>4</sub>, pH7 ± 0.2) contained in a regular 6-ounce dilution bottle. Shake the diluted suspension thoroughly to assure homogeneity.

4.6.2 Total Coliform Count.

From the 1:10 dilution transfer immediately 2 ml aliquots into 5 Petri-plates and add an appropriate quantity of Violet Red Bile (VRB) agar, freshly prepared and cooled to a constant temperature of about 45°C. Thoroughly mix the inoculum with medium and allow to solidify. Overlay with an additional 3-5 ml portion of the agar to minimize surface and spreader and incubate for 18-24 hours at 35°C. Count the typical (dark red) colonies at least 0.5 mm in diameter. A total count of all 5 plates greater than 100 constitutes rejection.

4.6.3 Total Microbial Count.

Proceed immediately after plating for total coliforms. Reshake thoroughly the 1:10 diluted suspension. Prepare consecutive decimal dilutions of 1:100 and 1:1000 by adding 11 ml to 99 ml buffered water blanks. Transfer 1 ml aliquots from each of the last two dilutions (1:100 and 1:1000) into duplicate Petri-plates and add an appropriate quantity of Plate Count Agar (tryptone glucose yeast extract agar), cooled to a constant temperature of about 45°C. Mix inoculum with medium thoroughly and allow to solidify. Invert and incubate for 72 hours at 32°C. Count plates and calculate total counts. A total count greater than 100,000 per gram constitutes rejection.

4.6.4 E. Coli Count.

According to the requirement specified in 4.6.2, a coliform plate count greater than 100 constitutes rejection and further testing for E. coli is not required. When the total coliform count is from 5 to 100 inclusive, further testing for E. coli shall be performed. The number of colonies picked for examination shall be determined by reference to Table I. From each of the selected colonies, subculture into 2 gas fermentation tubes of E. coli broth and incubate at 45.5°C for 24 hours. Any positive E. coli broth tube will constitute rejection of the product.

5.0 PREPARATION FOR DELIVERY

5.1 Packaging.

5.1.1 Container.

The contents shall be placed in a rigid aluminum tray or other suitable material of sufficient strength to withstand handling

6.0 and meal preparation without breakage or leakage. The filled containers shall be completely covered with a sheet of aluminum foil of 0.001 inch nominal thickness or other suitable material.

5.1.2 Packing.

The containers shall be packed in corrugated containers. Carton materials and construction shall comply with Mil-Spec. PP-B-636 as applicable.

5.1.3 Labeling.

Each shipping container shall contain the name of the consignee (i.e., NASA-MSC). Also a statement regarding storage conditions shall be included in the labeling. (Example: CAUTION: FROZEN FOODS, PERISHABLE). Lettering on the shipping container shall be a minimum of 1 inch in height.

5.1.4 The shipping containers shall be packed with enough dry ice to insure that the food shall remain frozen during shipment.

5.1.5 Shipping Instructions.

Finished product shall be shipped via commercial Air Freight or by refrigerated truck and addressed to:

Transportation Officer  
Building 420  
NASA-Manned Spacecraft Center  
Houston, Texas 77058

Mark For: Dr. M. C. Smith, Jr.  
Technical Monitor (DC-7)  
Telephone (713) 483-5056

The supplier shall notify the Technical Monitor by telephone or TWX of the expected time of arrival and the Air Bill number within 6 hours of the time of shipment if shipment is by Air Freight; or, by telephone, upon delivery if shipment is by truck from supplier.

5.1.6 Contractor Certification.

Each shipment shall be accompanied by the Contractor's certificate of compliance with the requirements of this document. This certification shall include the following:

- a. Product identification.
- b. Microbiological test results.
- c. Other data, as applicable.

6.0

DESTINATION INSPECTION

Each shipping container shall be inspected at destination by an authorized representative of the government. This inspection shall verify presence of products ordered and condition and shall include examination for the following:

- a. Presence of individual food items.
- b. Verify that food containers are free from puncture, breakage, and other defects.
- c. Verify delivery of foods in the frozen state.

Total Number of Coliform Organisms on Plates	for E.C.	of Coliform Organisms	Picked for E.C. Transfer
5-7	1	55-56	29
8	2	57-58	30
9	3	-----	--
10	4	59-60	31
11-12	5	61-62	32
13-14	6	63-64	33
15	7	65-66	34
16-17	8	67	35
18-19	9	68-69	36
20-21	10	70-71	37
22-23	11	72-73	38
24-25	12	74-75	39
26	13	76-77	40
27-28	14	78-79	41
29-30	15	80	42
31-32	16	81-82	43
33-34	17	83-84	44
35-36	18	85-86	45
37-38	19	87-88	46
39	20	89-90	47
40-41	21	91-92	48
42-43	22	93	49
44-45	23	94-95	50
46-47	24	96-97	51
48-49	25	98-99	52
50-51	26	100	53
52	27	-----	--
53-54	28	-----	--

<sup>1</sup>Derived from a hypergeometric distribution applied to sampling from a finite population without replacement.

NUMBER OF COLIFORM COLONIES TO BE  
TRANSFERRED FROM VRB AGAR PLATES INTO  
E.C. MEDIUM<sup>1</sup>

Total Number of Coliform Organisms on Plates	Total Colonies Picked for E.C. Transfer	Total Number of Coliform Organisms on Plates	Total Colonies Picked for E.C. Transfer
5-7	1	55-56	29
8	2	57-58	30
9	3	-----	--
10	4	59-60	31
11-12	5	61-62	32
13-14	6	63-64	33
15	7	65-66	34
16-17	8	67	35
18-19	9	68-69	36
20-21	10	70-71	37
22-23	11	72-73	38
24-25	12	74-75	39
26	13	76-77	40
27-28	14	78-79	41
29-30	15	80	42
31-32	16	81-82	43
33-34	17	83-84	44
35-36	18	85-86	45
37-38	19	87-88	46
39	20	89-90	47
40-41	21	91-92	48
42-43	22	93	49
44-45	23	94-95	50
46-47	24	96-97	51
48-49	25	98-99	52
50-51	26	100	53
52	27	-----	--
53-54	28	-----	--

<sup>1</sup>Derived from a hypergeometric distribution applied to sampling from a finite population without replacement.

- 2 -

For: Stouffer Foods  
Division of Litton Industries  
1375 Euclid Avenue  
Cleveland, Ohio 44115  
Doris Davis - (216) 861-3450

From: Ketchum, MacLeod & Grove, Inc.  
Four Gateway Center - Pittsburgh, Pa. 15222  
Carol Moberg - (412) 261-5100  
7/15/69

Supplier's Normal Production Line and Quality Control Standards  
Provide Foods for Apollo 11 Isolation/Quarantine Feeding Program

"We haven't done anything special to the food for the Apollo 11 astronauts that we don't do every day for the customers that buy our frozen prepared products in supermarkets or serve them in restaurants or institutions."

Alan MacDonald, vice president-manufacturing, for Stouffer Foods, Division of Litton Industries, responds with this statement to questions about any extraordinary provisions made by Stouffer's for foods consigned to the Lunar Receiving Laboratory of NASA's Manned Spacecraft Center in Houston, Texas.

The 38 Stouffer products on the isolation/quarantine menu for the Apollo 11 astronauts meet the specifications of the NASA Manned Spacecraft Center and it's subcontractor for confinement feeding, Technology, Inc., just as they come off the regular processing line.

He supports his statement that "this is a normal production run that happens to be consigned to some very special people" with confirmation from Stouffer's Quality Control Department, to which ten per cent of Stouffer Foods production employees are assigned.

"All of our quality control checks for this shipment are standard

(MORE)

checks for every production run," Mr. MacDonald said.

"All raw materials, both food ingredients and packaging, are checked visually, chemically and bacteriologically before they can be approved for product production.

Once ingredients are phased into production, roving quality control personnel check critical components, like sauces, right on the production line. When the product leaves the line it enters the plate freezer where the temperature is 40 degrees below zero (Fahrenheit).

Each batch of completed product is evaluated against control batches which have been stringently supervised by personnel from research and development, production, marketing and management to achieve the perfect batch that will serve as the Stouffer standard for future production.

Initial checks are made for taste, appearance, texture and consistency. Then the new batch is held for bacteriological measurement to make sure it meets Stouffer's rigorous standards for bacteria and coliform plate count, salmonella, staph and E. Coli tests. Stouffer's requirements, in fact, exceed the stringent specifications of NASA, said Mr. MacDonald.

"We're proud to provide food for the astronauts when purity is so critical to the process of the quarantine period. But I'm especially happy that every batch of product that goes out of here to a homemaker or a food service customer meets this same standard, which well may be the highest in the food industry in the United States," Mr. MacDonald observed.

#####

"All of our quality control checks for this shipment are standard

(MORE)

FOR ADDITIONAL INFORMATION

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