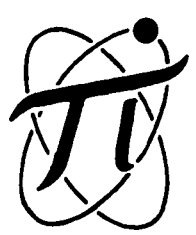


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DEVELOPMENT

FINAL REPORT

Period 1 May 1971 to 31 January 1973

Contract NAS9-11843

Skylab Food Test and Integration

National Aeronautics and Space Administration
Manned Spacecraft Center
Houston, Texas 77058

TECHNOLOGY INCORPORATED

LIFE SCIENCES DIVISION

HOUSTON, TEXAS

FINAL REPORT

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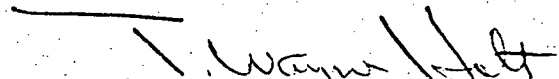
Skylab Food Test and Integration

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Deputy Manager, Food Sciences



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General Manager

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Table 4. Cmdr. Paul J. Weitz, PLT

Skylab 3

Table 5. Captain Alan L. Bean, CDR

Table 6. Owen K. Garriott, Ph.D., SPT

Table 7. Major Jack Lousma, PLT

Table 8. Col. Gerald P. Carr, CDR

Table 9. Edward G. Gibson, Ph.D., SPT

Table 10. Col. William R. Pogue, PLT

Back-up Crew

Skylab 2

Table 11. Mr. Russell L. Schweickart, Back-up, CDR

Table 12. Story Musgrave, M.D., Back-up SPT

Table 13. Lt. CDR. Bruce McCandless, II, Back-up PLT

Skylab 3

Table 14. Mr. Vance Brand, Back-up CDR

Table 15. William B. Lenoir, Ph.D., SPT

Table 16. Don L. Lind, Ph.D., Back-up PLT

Skylab 4

Table 17. Mr. Vance Brand, Back-up CDR

Table 18. William B. Lenoir, Ph.D., Back-up SPT

Table 19. Don L. Lind, Ph.D., Backup PLT

ORBITAL WORKSHOP MENUS

Prime Crew

Skylab 2

Table 20. Captain Charles Conrad, CDR

Table 21. Cmdr. Joseph P. Kerwin, M.D., SPT

Table 22. Cmdr. Paul J. Weitz, PLT

Skylab 3

Table 23. Captain Alan L. Bean, CDR

Table 24. Owen K. Garriott, Ph.D., SPT

Table 25. Major Jack Lousma, PLT

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Table 26. Col. Gerald P. Carr, CDR

Table 27. Edward G. Gibson, Ph.D., SPT

Table 28. Col. William R. Pogue, PLT

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Table 30. Cmdr. Joseph P. Kerwin, M.D., SPT

Table 31. Cmdr. Paul J. Weitz, PLT

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Table 32. Captain Alan L. Bean, CDR

Table 33. Owen K. Garriott, Ph.D., SPT

Table 34. Major Jack Lousma, PLT

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Table 35. Col. Gerald P. Carr, CDR

Table 36. Edward G. Gibson, Ph.D., SPT

Table 37. Col. William R. Pogue, PLT

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Table 40. Cmdr. Paul J. Weitz, PLT

Skylab 3

Table 41. Captain Alan L. Bean, CDR

Table 42. Owen K. Garriott, Ph.D., SPT

Table 43. Major Jack Lousma, PLT

Skylab 4

Table 44. Col. Gerald P. Carr, CDR

Table 45. Edward G. Gibson, Ph.D., SPT

Table 46. Col. William R. Pogue, PLT

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Prime Crew

Skylab 2

Table 47. Captain Charles Conrad, CDR

Table 48. Cmdr. Joseph P. Kerwin, M.D., SPT

Table 49. Cmdr. Paul J. Weitz, PLT

Skylab 3

Table 50. Captain Alan L. Bean, CDR

Table 51. Owen K. Garriott, Ph.D., SPT

Table 52. Major Jack Lousma, PLT

Skylab 4

Table 53. Col. Gerald P. Carr, CDR

Table 54. Edward G. Gibson, Ph.D., SPT

Table 55. Col. William R. Pogue, PLT

PRE-POSTFLIGHT MENUS

Prime Crew

Skylab 2

Table 56. Captain Charles Conrad, CDR

Table 57. Cmdr. Joseph P. Kerwin, M.D., SPT

Table 58. Cmdr. Paul J. Weitz, PLT

Skylab 3

Table 59. Captain Alan L. Bean, CDR

Table 60. Owen K. Garriott, Ph.D., SPT

Table 61. Major Jack Lousma, PLT

Skylab 4

Table 62. Col. Gerald P. Carr, CDR

Table 63. Edward G. Gibson, Ph.D., SPT

Table 64. Col. William R. Pogue, PLT

Back-up Crew

Skylab 2

Table 65. Mr. Russell L. Schweickart, Back-up
CDR

Table 66. Story Musgrave, M.D., Back-up SPT

Table 67. Lt. Cdr. Bruce McCandless, II,
Back-up PLT

Skylab 3

Table 68. Mr. Vance Brand, Back-up CDR

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Table 70. Don L. Lind, Ph.D., Back-up PLT

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1.0 INTRODUCTION

This Final Report is submitted in compliance with Contractual Agreement NAS 9-11843 "Skylab Food Test and Integration", and covers the period 1 May 1971 through 31 January 1973. Quarterly and Annual Progress Reports have been submitted during this period. This final report includes a summary of the support activities performed and reported in Quarterly Progress Reports from 1 May 1971 through 31 January 1973. Many of the support activities for the Skylab Food System have not been completed and will be continued under contract NAS 9-13291. However, the current status of each of these activities is reported in this final report.

2.0 WORK ACCOMPLISHED

2.1 MENU DEVELOPMENT

2.1.1 SMEAT (Skylab Medical Experiment Altitude Test Menus)

Menus were designed for the three SMEAT crewmen utilizing the results of a five day food compatibility test, and basal energy requirements calculated at NIH by determining surface area and computing calories/square meter/24 hours, and the method recommended by the Food and Nutrition Board of the National Research

Council in Recommended Dietary Allowances 1968. The menus were presented to the SMEAT crewmen, modified as necessary for both crew and M070 compatibility and transmitted to Whirlpool Corporation for production. Nutritional levels of the SMEAT menus were estimated from analytical values for Lot A foods and handbook values. The nutrient tolerance levels used in planning the menu cycle for each SMEAT crewmen were as follows:

	<u>M070</u>	<u>Bobko</u>	<u>Crippen</u>	<u>Thornton</u>
Calories	2000 - 2800	3100 + 22	2895 + 20	3276 + 15
Protein	90-125 + 10	123 + 10	115 + 10	110 + 10
Calcium	750-850 + 16	850 + 16	850 + 16	850 + 16
Phosphorus	1500-1700 + 120	1700 + 120	1700 + 120	1700 + 120
Sodium	3000-4000 + 500	4000 + 500	3990 + 500	4000 + 500
Magnesium	300-400 + 25	320 + 25	325 + 25	350 + 25
Potassium	3000-4000 + 200	3915 + 200	3921 + 200	4000 + 200

Pre- and post-chamber menus designed for SMEAT incorporated the following supplemental foods: lettuce, tomatoes,

Roquefort cheese dressing, French dressing, baked potatoes, sugar cookies, carbonated beverage, chocolate ice cream, whole milk, salt-free butter, and eggs. SMEAT menus were reported in the Annual Progress Report for 1 May 1971 to 30 April 1972.

2.1.2 COMPUTERIZATION OF MENUS

Computer programs were developed for analytical data reduction and menu planning. These programs were designed to convert raw analytical data to nutritional intake values. The computer programs convert all analytical values from units per 100 g to units per 100 g dry weight basis, units per 100 g wet weight, units per serving size on wet weight basis, total units per meal and per day per crewman. The final computer printout displays the total nutrient intake including water per meal and per day for each crewman. Daily totals are displayed with any overages or shortages. Number of supplements required to compensate for shortages is also displayed. These programs were developed and used during SMEAT and are being refined for use on Skylab. Use of these programs provide a reliable and accurate real-time status of all nutrient intake.

2.1.3 SKYLAB MENUS

Four menu sets were designed for each crewman to support all phases of the Mineral Balance Study (M-071). Included in each menu set were: Orbital Workshop menus, Command Module menus, pre-postflight menus and Skylab Mobile Laboratory menus.

2.1.4 ORBITAL WORKSHOP MENUS (OWS Menus)

Menus for use in the Orbital Workshop (OWS) were designed on a six-day cycle utilizing food items on the Skylab Food List (Table 1). All menus were designed to provide three meals per day plus snacks. The following nutrient tolerance levels were imposed on menu design.

Protein (g)	90	-	125	±	10
Calcium (mg)	750	-	850	±	16
Phosphorus (mg)	1500	-	1700	±	120
Sodium (mg)	3000	-	6000	±	500
Magnesium (mg)	300	-	400	±	100
Potassium (mg)	2740 minimum, no maximum no tolerance range.				

Basal energy requirements were calculated on an individual basis by determining surface area and computing calories/square meter/twenty-four hours. Caloric levels planned for each crewman along with individual nutrient tolerance levels are presented in Tables 2 - 11 for the prime crew and Tables 12 - 19 for back-up crewmembers.

OWS Menus and the controlled nutrient content of each are presented for the Skylab 2 prime crew in Tables 20 - 22, Skylab 3 prime crew in Tables 23 - 25, and Skylab 4 prime crew in Tables 26 - 28. In the event that a back-up crewmember would fly a Skylab mission, the menu for the prime crewman he replaces will be adjusted to the caloric level required for the back-up crewmember, but the tolerance levels of protein and the critical minerals and electrolytes will remain the same as that planned for the original crewmember (see Tables 12 - 19).

Frozen food was limited to nine items per six-day menu cycle. All flight food items were rated by each of the Skylab astronauts on a hedonic rating scale from 1 to 9. On this scale "5" was a neutral rating; "9", like extremely; and "1" extreme dislike. Items rated "5" or below by any given astronaut were not used in the design of that individual's menus.

2.1.5 MINERAL SUPPLEMENTS

Mineral supplements were available for precise adjustment of Skylab menus to each individual's specified tolerance levels. The supplements available and the amount of each nutrient supplied are listed in Table 2, (identical information is also contained in Tables 3 - 19 since these tables are pages from the crew log books and the information was made available to each individual astronaut). The

number of supplements required for each menu is indicated on the menus (Tables 2 - 64).

In the event that all items on a menu are not completely consumed and actual nutrient intake falls below planned levels the mineral supplements will be used to replace up to 15% of the total level of each nutrient for that day.

2.1.6 COMMAND MODULE MENUS

During the transition period between launch and full activation of the Orbital Workshop (OWS) and during the return flight from the OWS unique menu requirements exist, necessitating the design of a special set of menus for that period. Some of the circumstances affecting menu design include the unavailability of an "Automatic Meal Reconstitution Module" (AMRM) and frozen food lockers, and the energy requirement transition between a 1 g or ground-based environment and a null gravity or flight environment. Items which required heating for palatability could not be used, but rehydratable items which require hot water were included during the first four days of the mission because hot water will be available on the Command Module. Hot water will not be available during the return trip to earth, however.

CSM menus for use during the flight to the Orbital Workshop and during the first three days in the workshop while it is being activated are presented in Tables 29 - 37 for prime crewmembers. CSM menus for the return flight or last mission day are presented in Tables 38 - 45 for

prime crewmen. In the event that a back-up crewmember would fly a Skylab mission, he would use the meals planned for the prime crewman he replaces. Specific modification of CSM menus from OWS menus are as follows:

Mission Day 1

Fresh food used for Meal A
Contains 300 calories more than OWS menus
No frozen food after Meal A
No heated food after Meal A

Mission Days 2 and 3

No frozen food
No heated food

Mission Day 4

No frozen item for Skylab 3 and 4
No frozen food for Skylab 2
No heated food

Last Mission Day

No frozen food
No heated food
No hot rehydratable items
300 calories more than OWS menus

2.1.7 MOBILE LABORATORY MENUS

Orbital Workshop menus were modified for use postflight on the recovery ship by the addition of 300 calories and utilizing salt-free butter and carbonated beverage. These menus are designated Mobile Laboratory Menus and are presented in Tables 47 - 55 for prime crewmembers. If a back-up crewmember flies a Skylab Mission, he will use the menus prepared for the prime crewman he replaces.

PRE-POSTFLIGHT MENUS

Orbital Workshop menus were modified for use pre- and postflight at MSC and KSC by the addition of 300 calories and utilizing the following ten supplemental food items:

1. Butter, salt-free
2. Chocolate Ice Cream
3. Carbonated Cola Beverage
4. Eggs
5. Lettuce
6. Milk
7. Potatoes, baked
8. Salad Dressing, French
9. Salad Dressing, Roquefort
10. Tomatoes

Pre- and postflight menus are presented in Tables 56 - 64 for prime crewmembers and Tables 65 - 73 for back-up crewmen.

Both prime and back-up crewmembers will consume the metabolic diets preflight. Postflight, only the astronauts who flew on the Skylab mission will follow the metabolic diet.

Since the first three days of the preflight feeding period are considered a dietary stabilization period, crewmen will begin the twenty-one day preflight feeding period with the fourth day of the preflight menu cycle and end the twenty-one day period with the sixth day of the menu cycle.

2.1.9

FECAL DYE MARKERS

Two fecal dye markers will be used during the study, carmine red and FD & C blue. A carmine red dye marker will be consumed by each crewmember at the beginning of the first cycle of menus which will be the fourth day of the pre-flight period, or eighteen days before launch. An alternate color will be used thereafter at the beginning of each six-day menu cycle. In addition, a dye marker will be consumed on recovery day whether it occurs at the beginning of a menu cycle or not, since that will mark a change in the experimental conditions.

2.2 FOOD DEVELOPMENT

2.2.1 Lot A

Technology Incorporated was directed by the National Aeronautics and Space Administration to develop seventeen foods for the Skylab Food System. These foods were:

- * 45 Potato Soup
- * 49 German Potato Salad
- * 51 Shrimp Cocktail
- * 53 Turkey Rice Soup
- * 55 Chicken and Rice
- * 56 Creamed Peas
- * 57 Chicken and Gravy
- * 59 Pork and Scalloped Potatoes
- * 61 Mashed Sweet Potatoes
- 70 Fruit Beverage
- * 71 Veal and Barbecue Sauce
- * 72 Spaghetti and Meat Sauce
- * 73 Green Beans
- * 74 Macaroni and Cheese
- 76 Butter Cookies
- 77 Apple Drink
- 78 Cherry Drink

Thirteen (*) of these foods were considered to be technically very difficult to formulate in order to conform with the Skylab MO70 experiment requirements. These rehydratable items are normally prepared by blending all ingredients, heat processing and then freeze-

dried. Optimal flavor retention is obtained by this method. However, this method would not provide the nutrient control per serving required by the M070 experiments.

A system of freeze drying individual homogenous ingredients and dry blending the final product on a serving size basis was established for these rehydratable foods. This resulted in a highly acceptable product which met all of the stringent nutrient control parameters imposed by the MO-70 experiments.

Formulations and specifications were written for each of the foods and submitted through NASA to the prime food contractor where they were documented into the Skylab Food System.

2.2.2 #70 Fruit Beverage

Product selection for Skylab Lot A food item #70, Fruit Beverage was accomplished during the reporting period. A very stable product was required, since the beverage would be transferred from the primary container to the Skylab fruit beverage package and then undergo the storage period imposed by the Skylab mission profile.

Fruit Beverage was limited to sherry due to the stability requirements. A series of commercially available beverages were organoleptically evaluated by a technical taste panel and Skylab/SMEAT crewmembers. Analytical analyses were performed on fresh samples and stored samples.

Based upon these studies, a California cream sherry was selected for Skylab fruit beverage. A specification for Skylab fruit beverage was written and reported in the Quarterly Progress report for 1 November 1971 to 31 January 1972. Fruit beverage was later deleted from the Skylab food list.

2.2.3 Butter Cookies

Menus designed to comply with MO70 experiments required food items high in energy and nearly void of the critical nutrients. These "pure energy" foods were required for energy adjustment without affecting the mineral balance. A cookie (#76 Butter Cookies) was developed for use as an energy adjustment item. This item was labelled sugar cookie in some of the early quarterly progress reports, but was later changed to Butter Cookie to avoid confusion with Skylab food #9 Sugar Cookie. A production guide was written for #76 Butter Cookie and reported in the Annual Progress Report for 1 May 1971 to 30 April 1972. The Butter Cookie was well accepted by the astronauts. This product received a very high mean acceptance rating of 8.1 with a standard deviation of 0.7 when subjected to a panel of eleven (11) astronauts and rated on a nine point hedonic scale. This was one of the highest acceptance rating received from the astronauts for any Skylab food item.

2.2.4 Freeze Dried Prime Rib of Beef

The feasibility of substituting a freeze-dried prime rib of beef for Skylab food item #68 Prime Rib of Beef, which is frozen,

was investigated. Presence of excessive free liquid in the Lot A Prime Rib of Beef prompted this study. Freeze-dried Prime Rib of Beef was not recommended for Skylab since storage studies indicated that a considerable amount of oxidation occurred during storage, resulting in a product with questionable organoleptic qualities.

2.2.5 Lot B (Flight Food)

Two additional energy adjustment foods were developed and incorporated into the Lot B system. These beverages, Apple Drink and Cherry Drink were well accepted and possess very small amounts of the M070 critical nutrients. Production guides for these beverages were reported in the Quarterly Progress Report for 1 May 1972 to 31 July 1972.

2.3 FOOD PRODUCTION

Several foods were produced as GFE food items for use in Skylab and SMEAT. Many foods were produced in the laboratory for crew evaluation in the early part of the program when the actual foods were not available. These foods were produced in accordance with the appropriate Skylab food specification

2.3.1 SMEAT

Apple Drink, Cherry Drink, Butter Cookies and Fruit Beverage were produced for use in SMEAT. Apple Drink and Cherry Drink was produced at MSC and shipped to Whirlpool Corporation for final packaging. Butter Cookies were produced, canned, and

cleaned under Quality Assurance surveillance for use in SMEAT. Fruit Beverage was procured, transferred from the primary container to the Skylab fruit beverage container, sealed, canned, and cleaned under surveillance of Quality Assurance personnel.

2.3.2 Skylab

Butter Cookies, Apple Drink, and Cherry Drink were produced by Technology Incorporated personnel during the reporting period as GFE items for Lot B. The cookies were produced in accordance with Skylab food specification "Butter Cookies". MSC Cafeteria facilities were utilized for the production. Over 3,000 cookies were individually weighed, baked and packaged in number 10 cans and shipped to Whirlpool Corporation, St. Joseph, Michigan. Apple Drink and Cherry Drink were dry blended, packaged in number 10 cans and shipped to Whirlpool Corporation.

2.4 FOOD SPECIFICATIONS

Three staff members were assigned to the Skylab Food Evaluation Team. The team was assigned the task of evaluating all Skylab food items, and associated analytical and organoleptical results and food specifications.

Data packages containing analytical results, crewmember comments, Zero-g evaluations, specification review comments by the U.S. Army Natick Laboratories, and NASA technical panel

evaluations for each food item under consideration were mailed to each Skylab Food Evaluation Team member prior to each meeting. A list of the team members and their organizational affiliation follows:

DB3/Food and Nutrition Branch

N. D. Heidelbaugh, V.M.D., Ph.D.
P.C. Rambaut, Sc.D.
Miss R.M. Rapp
M. C. Smith, Jr., D.V.M.

DE5/Operational Systems and Planning Branch

Mr. Thomas R. Turner

EW7/Spacecraft Engineering Branch

Mr. David S. Grissom

ND6/Procurement Support Branch

Mr. D. Netzband

National Institutes of Health, Bethesda, Md.

Miss Jeanne M. Reid
G. Donald Whedon, M.D.

Technology Incorporated, Houston, Texas

C. T. Bourland, Ph.D.
C. S. Huber, Ph.D.
D. J. Rhodes

U. S. Army Natick Laboratories, Natick, Massachusetts

Herbert Hollender, Ph.D.

Whirlpool Corporation, St. Joseph, Michigan

R. Larson, Ph.D.

All of the Skylab foods were evaluated by the team.

Changes in formulation, serving size, deletions and additions to the Skylab food list were initiated by this team.

In addition to writing the specifications for the 17 foods which were developed, Technology Incorporated reviewed and corrected each of the Lot A food specifications. These corrections were submitted to NASA for documentation into the Skylab Food System.

2.5 SKYLAB FOOD MICROBIOLOGICAL SPECIFICATIONS

Food microbiological testing procedures and requirements were prepared for the Skylab Food System. Each method and technique outlined in the specifications was researched, tested, and verified in the laboratory using Skylab or prototype Skylab foods.

Skylab food item #61 Mashed Sweet Potatoes was originally a thermostabilized product. However, microbiological testing of commercially available thermostabilized mashed sweet potatoes revealed that this product would not meet the rigid microbiological specifications for thermostabilized Skylab foods. A dried mashed sweet potato product was developed to replace the thermostabilized mashed sweet potatoes. This item was accepted and is on the Skylab food list.

Results of the microbiological analysis performed on Skylab Lot A foods, were evaluated and summarized. These results along with methods and requirements were published in the January issue of Applied Microbiology in an article entitled: "Microbiological Testing of Skylab Foods".

Potential public health applications of space food processing procedures and safety standards were summarized in an article in the Journal of the American Veterinary Medical Association. This article is included in Appendix A.

2.5.1 SKYLAB FOOD HEATING STUDY

The Skylab food heating study described in the Quarterly Progress Report for 1 August 1972 to 31 October 1972 which was designed to determine the effects of the AMRM heating parameters on the growth rate of Clostridium perfringens and Bacillus cereus will continue under contract NAS 9-13291. Growth rates at the various temperatures for both organisms have been determined in sterile cooked meat and mashed potatoes. Growth rate determinations in turkey rice soup are near completion.

2.6 ZERO G EVALUATIONS

All of the Skylab food items from Lot A which were susceptible to handling difficulties in weightlessness were systematically evaluated in a null-gravity environment created by parabolic flight in an Air Force C-135 aircraft. These evaluations were

documented and presented to the Skylab Food Evaluation Team. Other ancillary food hardware was also evaluated in null-gravity. These items included wet wipes, beverage packages, Automatic Meal Reconstitution Module (AMRM) and eating utensils.

Support was also rendered in the evaluation of a device which would standardize acceptance criteria for foods proposed for use in weightlessness. This device, referred to as the Food Adhesion Test Unit, was designed by NASA/Food and Nutrition personnel and was manufactured by Whirlpool Corporation under NASA contract NAS 9-9032, Task 27. A summary of the null gravity observations was reported in the Journal of Food Technology. A reprint of this article entitled "Some Flow Properties of Foods in Null Gravity" is included in Appendix B.

2.7 PACKAGING DEVELOPMENT AND EVALUATION

Basic concepts for the Skylab food packaging system were studied and evaluated in the early part of Skylab. These studies were coordinated with major packaging concerns and involved matters such as cans vs flexible packaging, round vs square or rectangular cans, steel vs aluminum cans and spacecraft stowage concepts. These studies were conducted under contract NAS 9-8927 and reported in the Quarterly Progress Reports.

FRUIT BEVERAGE PACKAGE DEVELOPMENT

Design studies for a fruit beverage package were completed during the reporting period. Flight packages constructed with flexible materials for the consumption of liquid in weightlessness were not compatible with sherry. Beverage packages in present flight food systems are designed for filling and consumption aboard the spacecraft, therefore, these packages are not subject to vibrations and other physical stresses associated with launch while containing the liquid. Flexible materials used in the construction of these containers were found to be permeable to the alcohol in the sherry. The alcohol also solubilized plasticizing agents in the flexible materials, resulting in a highly unacceptable product. Storage studies were conducted with various thicknesses of Aclar, Mylar, Nylon, modified polyethylene, and laminated foil in an attempt to find a compatible material. Nylon and mylar appeared to be the most suitable packaging material.

Initial studies were oriented toward a tetrahedron shaped flexible package that would fit into an aluminum Skylab can with a full-panel pull-out lid. However, the aluminum can restricted the size, surface, and the selection of materials and valve assemblies. It was decided that development efforts be devoted toward a flexible tetrahedron package which would fit into the Skylab canister. Several prototype models of tetrahedron shaped packages were evaluated in simulated Zero-g.

The shape of this container permitted complete removal of the liquid by collapsing uniformly as the liquid was withdrawn. These evaluations pointed out the need for a valve assembly which would permit removal of liquid and prevent leakage of liquid out of the package and air into the package while the package was not in direct contact with the mouth.

The final package for the fruit beverage consisted of a tetrahedron shaped flexible package inserted in an aluminum can.

Four ounces of Cream Sherry was packaged in a tetrahedron flex-pack constructed of 3 Mil polyaminocaproyl (Nylon 6). The NASA part number for the flex-pack assembly is SDC 39108282-001. The flex-pack assembly was placed in a 208 x 203 drawn aluminum can with a full panel pull-out lid. The part number for the total assembly is SDC 39108293. This assembly was utilized for packaging fruit beverage for SMEAT. Fruit Beverage was deleted from the Skylab food list, therefore this package will not be used for flight. A new technology report was submitted on this packaging innovation.

2.8 AMINO ACID ANALYSIS OF SKYLAB FOOD

A program was initiated to determine the amino acid content of Skylab foods. Foods from Skylab Lot A are currently undergoing analysis. All amino acids including tryptophan and cystine are being quantitated in each Skylab food. Total amino acid nitrogen will be calculated for each food. A conversion factor for converting total nitrogen to protein will be computed for each food. This will provide a more accurate estimate of the protein intake. A total of twenty-six food items have been analyzed for all amino acids except cystine. This program will continue under contract NAS 9-13291.

2.9 FATTY ACID ANALYSIS OF SKYLAB FOODS

Fatty acid analysis of Skylab foods was initiated during the reporting period. The fatty acid composition of the lipid fraction of each food will be quantitated for each food. Approximately twenty-five lot B food items have been analyzed. Analyses were performed on each third Lot portion of the food. This program will continue under contract NAS 9-13291.

2.10 FECAL ANALYSIS

A fecal material analysis program was initiated during Apollo in order to establish sampling techniques, sample processing procedures, analytical techniques and baseline values for the MO70 experiments aboard Skylab. Metabolic studies required that fecal material be subjected to analyses

similar to those performed on food prior to ingestion. The fecal material analysis program was designed to test samples for moisture, crude fiber, caloric value, nitrogen, lipid, ash, chloride, phosphorus, calcium, magnesium, sodium, potassium, fatty acids and nickel. During the contract period all of the available fecal samples from the Apollo missions were analyzed utilizing the techniques established for this program. Additional fecal analytical data generated from previous contracts was assimilated and reported in the January 1972 Monthly Progress Report.

2.10.1 FECAL SAMPLE PROCESSING

A unique sample processing technique was developed for the analysis of fecal samples. A 0.5 g sample was removed for a wet moisture analysis. The samples were pressed into a 1/2 to 1 inch wafer while in the flexible container and frozen. Flexible packaging material was removed from the topside and the frozen material placed in a freeze-drier. The maximum pressure and temperature during freeze-drying was 2.0MM of Hg and 23.9°C, respectively. Feces were not removed from the dryer until product temperature was above 21.1°C. After freeze-drying the samples were ground in a Wiley mill and sealed in a glass jar.

The freeze drying process provided several advantages over other routine methods. The dried sample is easily handled and does not require refrigeration for storage. The dried sample

does not create odor problems associated with moist samples. Grinding of the dried sample provides a more homogenous sample. All of the nutrients of interest are preserved by the freeze-drying process with the exception of water which is accounted for by sampling prior to freeze-drying.

.10.2 POLYETHYLENE GLYCOL

A requirement in SMEAT called for the analysis of polyethylene glycol in fecal samples. Polyethylene glycol was originally scheduled for use in the SMEAT and Skylab programs as a fecal marker. An analytical method was developed to meet the requirements. This method was tested and verified in the laboratory. The polyethylene glycol requirement was deleted from the experiment and will not be used on the Skylab samples. All of the SMEAT samples were analyzed for polyethylene glycol utilizing this method.

A literature survey was conducted on fecal material analyses. This survey reviewed sample handling techniques and analytical procedures for the nutrients in question. This survey was reported in the Monthly Progress Report for February 1972.

.10.3 SMEAT

A total of 288 fecal samples were collected, processed and analyzed during SMEAT. Results of these analyses were reported in the Quarterly Progress Report for Fecal Material Analysis for the period 1 September through 30 November 1972.

APOLLO 17

Sixteen fecal samples collected during the Apollo 17 menu compatibility test were received and analyzed. Part of these results were reported in the Quarterly Progress Report for 1 September through 30 November 1972. The fecal fatty acid content of the lipid portion of these samples is included in Table 74.

Thirty fecal samples were received and analyzed from the Apollo 17 mission. This included nine samples preflight, sixteen samples in-flight, and five samples postflight. Results of these analyses are presented in Tables 75 - 82.

TABLE 1. SKYLAB FOOD LIST

NASA Food Number	Food Item	WPC ^a Manufacturing Specification Number
2	Butterscotch Pudding (T)	24-00401
3	Tuna Sandwich Spread (T)	24-00402
4A	Lemon Pudding (T)	24-00414
5	Dry Roasted Peanuts (M)	24-00406
6	Ice Cream, Vanilla (F)	24-00407
7	Dried Apricots (M)	24-00408
11	Cheddar Cheese Crackers (M)	24-00412
12A	Mints	24-00426
13	Sausage Patties (R)	24-00419
15	Sugar Coated Cornflakes (R)	24-00415
16	Scrambled Eggs (R)	24-00422
17	Bacon Wafers (M)	24-00420
20	Catsup (T)	24-00429
21	Filet Mignon (F)	24-00421
22	Asparagus (R)	24-00416
23	Lemonade (B)	24-00423
24	Pre-Buttered Roll (F)	24-00430
25	Salmon Salad (R)	24-00424
26	Pork Loin with Dressing and Gravy (F)	24-00431
27	Strawberries (R)	24-00418
28	Vanilla Wafers (M)	24-00432
31	Coffee Cake (F)	24-00434

^aWhirlpool Corporation, Benton Harbor, Michigan

TABLE 1. SKYLAB FOOD LIST (Con't)

NASA Food Number	Food Item	WPC Manufacturing Specification Number
32	Mashed Potatoes (R)	24-00435
33	Peanut Butter (T)	24-00436
34	Chili with Meat (T)	24-00437
36	Fruit Jam (T)	24-00439
37	Pea Soup (R)	24-00440
38	Pineapple (T)	24-00441
39	Lobster Newburg (F)	24-00442
40	Turkey and Gravy (T)	24-00443
41	Hard Candy (M)	24-00444
42	Grape Drink	24-00445
43	Applesauce (T)	24-00446
44	Hot Dogs (T)	24-00447
45	Potato Soup (R)	24-00448
46	Peaches (T)	24-00449
47	Pears (T)	24-00450
48	Biscuits (M)	24-00451
49	German Potato Salad (R)	24-00452
50	Chocolate Instant Breakfast (R)	24-00453
51	Shrimp Cocktail (R)	24-00454
53	Turkey Rice Soup (R)	24-00456
54	Rice Krispies (R)	24-00457
55	Chicken and Rice (R)	24-00458

TABLE 1. SKYLAB FOOD LIST (Con't)

NASA Food Number	Food Item	WPC Manufacturing Specification Number
56	Creamed Peas (R)	24-00459
57	Chicken and Gravy (R)	24-00460
58	Cocoa (B)	24-00461
59	Pork and Scalloped Potatoes (R)	24-00462
60	Orange Drink (B)	24-00463
61	Mashed Sweet Potatoes (R)	24-00464
62	Black Coffee (B)	24-00465
63	Beef Hash (R)	24-00466
64	Stewed Tomatoes (T)	24-00467
65	Cream Style Corn (R)	24-00404
66	Tea with Lemon and Sugar (B)	24-00468
67	Sliced Dried Beef (M)	24-00469
68	Prime Rib of Beef (F)	24-00470
69	Peach Ambrosia (R)	24-00471
71	Veal and Barbeque Sauce (R)	24-00472
72	Spaghetti and Meat Sauce (R)	24-00473
73	Green Beans (R)	24-00475
74	Macaroni and Cheese (R)	24-00474
75	White Bread (M)	TED
76	Butter Cookies (M)	TI022 ^b
77	Apple Drink (B)	TI023
78	Cherry Drink (B)	TI024

b

Technology Incorporated Manufacturing Specification Number,
Houston, Texas

TABLE 1. SKYLAB FOOD LIST (Con't)

NASA Food Number	Food Item	WPC Manufacturing Specification Number
------------------------	--------------	---

79	Grapefruit Drink (B)	TBD
----	----------------------	-----

80	Strawberry Drink (B)	TBD
----	----------------------	-----

(B) Beverage

(F) Frozen

(M) Miscellaneous

(R) Rehydratable

(T) Thermostabilized

TABLE 2. CAPTAIN CHARLES CONRAD, CDR, SKYLAB 2, NUTRIENT TOLERANCE

LEVELS

CONRAD

NUTRIENT TOLERANCES

Calories	2250 + 300 free calories	
Protein (g)	100 <u>+ 10</u>	(90-110)
Ca (mg)	839 <u>+ 16</u>	(823-855)
P (mg)	1662 <u>+ 120</u>	(1542-1782)
Na (mg)	5000 <u>+ 500</u>	(4500-5500)
Mg (mg)	300 <u>+ 100</u>	(200-400)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT

98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 3. CMDR. JOSEPH P. KERWIN, M.D., SPT
SKYLAB 2, NUTRIENT TOLERANCE LEVELS

KERWIN

NUTRIENT TOLERANCES

Calories	2600 + 300 free calories	
Protein (g)	108 ± 10	(98-118)
Ca (mg)	847 ± 16	(831-863)
P (mg)	1700 ± 120	(1580-1820)
Na (mg)	5100 ± 500	(4600-5600)
Mg (mg)	308 ± 100	(208-408)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
 SUPPLEMENT SCHEDULES

TABLE 4. CMDR PAUL J. WEITZ, PLT, SKYLAB 2

NUTRIENT TOLERANCE LEVELS

WEITZ

NUTRIENT TOLERANCES

Calories	2650 + 300 free calories	
Protein (g)	100 ± 10	(90-110)
Ca (mg)	825 ± 16	(809-841)
P (mg)	1700 ± 120	(1580-1820)
Na (mg)	4837 ± 500	(4337-5337)
Mg (mg)	300 ± 100	(200-400)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 5. CAPTAIN ALAN L. BEAN, CDR SKYLAB 3, NUTRIENT TOLERANCE LEVELS

BEAN

NUTRIENT TOLERANCES

Calories		2450 + 300 free calories
Protein (g)	93 + 10	(83-103)
Ca (mg)	775 + 16	(759-791)
P (mg)	1500 + 120	(1380-1620)
Na (mg)	5300 + 500	(4800-5800)
Mg (mg)	361 + 100	(261-461)
K (mg)	2740	minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
 SUPPLEMENT SCHEDULES

TABLE 6. OWEN K. GARRIOTT, Ph.D., SPT, SKYLAB 3,

NUTRIENT TOLERANCE LEVELS

GARRIOTT

NUTRIENT TOLERANCES

Calories	2250 + 300 free calories	
Protein (g)	104 \pm 10	(94-114)
Ca (mg)	818 \pm 16	(802-834)
P (mg)	1700 \pm 120	(1580-1820)
Na (mg)	5505 \pm 500	(5005-6005)
Mg (mg)	290 \pm 100	(190-390)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 7. MAJOR JACK LOUSMA, PLT
SKYLAB 3, NUTRIENT TOLERANCE LEVELS

LOUSMA

NUTRIENT TOLERANCES

Calories	3300 + 300 free calories
Protein (g)	160 ± 10 (150-170)
Ca (mg)	1370 ± 16 (1354-1386)
P (mg)	2493 ± 120 (2373-2613)
Na (mg)	6936 ± 500 (6436-7436)
Mg (mg)	450 ± 100 (350-550)
K (mg)	2740 minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
 SUPPLEMENT SCHEDULES

TABLE 8. COL. GERALD P. CARR, CDR. SKYLAB 4

NUTRIENT TOLERANCE LEVELS

CARR

NUTRIENT TOLERANCES

Calories	2450 + 300 free calories	
Protein (g)	105 ± 10	(95-115)
Ca (mg)	792 ± 16	(776-808)
P (mg)	1629 ± 120	(1509-1749)
Na (mg)	4681 ± 500	(4181-5181)
Mg (mg)	300 ± 100	(200-400)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 9. EDWARD G. GIBSON, Ph.D., SPT, SKYLAB 4

NUTRIENT TOLERANCE LEVELS

GIBSON

NUTRIENT TOLERANCES

Calories	2250 + 300 free calories	
Protein (g)	105 ± 10	(95-115)
Ca (mg)	809 ± 16	(793-825)
P (mg)	1557 ± 120	(1437-1677)
Na (mg)	5790 ± 500	(5290-6290)
Mg (mg)	294 ± 100	(194-394)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 93 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 10. COL. WILLIAM R. POGUE, PLT, SKYLAB 4

NUTRIENT TOLERANCE LEVELS

POGUE

NUTRIENT TOLERANCES

Calories	2500 + 300 free calories
Protein (g)	115 \pm 10 (105-125)
Ca (mg)	846 \pm 16 (830-862)
P (mg)	1700 \pm 120 (1580-1820)
Na (mg)	5618 \pm 500 (5118-6118)
Mg (mg)	300 \pm 100 (200-400)
K (mg)	2740 minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195
SALT	98 Na each pack. Two equal 49 mg. parts in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 11. MR. RUSSELL L. SCHWEICKART, BACKUP CDR SKYLAB 2,

NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2550 + 300 free calories	
Protein (g)	100 ± 10	(90-110)
Ca (mg)	839 ± 16	(823-855)
P (mg)	1662 ± 120	(1542-1782)
Na (mg)	5000 ± 500	(4500-5500)
Mg (mg)	300 ± 100	(200-400)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 12. STORY MUSGRAVE, M.D., BACKUP SPT
SKYLAB 2, NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2800 + 300 free calories	
Protein (g)	108 ± 10	(98-118)
Ca (mg)	847 ± 16	(831-863)
P (mg)	1700 ± 120	(1580-1820)
Na (mg)	5100 ± 500	(4600-5600)
Mg (mg)	308 ± 100	(208-408)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
 Two equal 49 mg. parts
 in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
 SUPPLEMENT SCHEDULES

TABLE 13. LT. CDR. BRUCE McCANDLESS, II, BACKUP PLT

SKYLAB 2, NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2500	+ 300	free calories
Protein (g)	100	+ 10	(90-110)
Ca (mg)	825	+ 16	(809-841)
P (mg)	1700	+ 120	(1580-1820)
Na (mg)	4837	+ 500	(4337-5337)
Mg (mg)	300	+ 100	(200-400)
K (mg)	2740		minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT

98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 12/6/72

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 14. MR. VANCE BRAND, BACKUP CDR

Skylab 3, NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2550 + 300 free calories	
Protein (g)	93 ± 10	(83-103)
Ca (mg)	775 ± 16	(759-791)
P (mg)	1500 ± 120	(1380-1620)
Na (mg)	5300 ± 500	(4800-5800)
Hg (mg)	361 ± 100	(261-461)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Hg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 15. WILLIAM B. LENOIR, Ph.D., BACKUP SPT

SKYLAB 3, NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2450 + 300 free calories
Protein (g)	104 \pm 10 (94-114)
Ca (mg)	818 \pm 16 (802-834)
P (mg)	1700 \pm 120 (1580-1820)
Na (mg)	5505 \pm 500 (5005-6005)
Mg (mg)	290 \pm 100 (190-390)
K (mg)	2740 minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 16. DON L. LIND, Ph.D., BACKUP PLT SKYLAB 3

NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2650 + 300 free calories
Protein (g)	115 ± 10 (105-125)
Ca (mg)	846 ± 16 (830-862)
P (mg)	1700 ± 120 (1580-1820)
Na (mg)	5618 ± 500 (5118-6118)
Mg (mg)	300 ± 100 (200-400)
K (mg)	2740 minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 17. MR. VANCE BRAND, BACKUP CDR SKYLAB 4,

NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2550	+ 300	free calories
Protein (g)	105	\pm 10	(95-115)
Ca (mg)	792	\pm 16	(776-808)
P (mg)	1629	\pm 120	(1509-1749)
Na (mg)	4681	\pm 500	(4181-5181)
Mg (mg)	300	\pm 100	(200-400)
K (mg)	2740		minimum

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

Table 18. WILLIAM B. LENOIR, Ph.D., BACKUP PLT SKYLAB 4

NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2450 + 300 free calories	
Protein (g)	105 + 10	(95-115)
Ca (mg)	809 + 16	(793-825)
P (mg)	1557 + 120	(1437-1677)
Na (mg)	5790 + 500	(5290-6290)
Mg (mg)	294 + 100	(194-394)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT

98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 19. DON L. LIND, Ph.D., BACKUP PLT SKYLAB 4,

NUTRIENT TOLERANCE LEVELS

NUTRIENT TOLERANCES

Calories	2500 + 300 free calories	
Protein (g)	115 ± 10	(105-125)
Ca (mg)	846 ± 16	(830-862)
P (mg)	1700 ± 120	(1580-1820)
Na (mg)	5618 ± 500	(5118-6118)
Mg (mg)	300 ± 100	(200-400)
K (mg)	2740 minimum	

MINERAL SUPPLEMENT TABLET SIZES

Ca (mg)	32
P (mg)	110 P + 131 Na + 28 K
Na (mg)	197
Mg (mg)	25
K (mg)	195

SALT 98 Na each pack.
Two equal 49 mg. parts
in each pack.

DATE 1/29/73

NUTRIENT TOLERANCES
SUPPLEMENT SCHEDULES

TABLE 20. CAPTAIN CHARLES CONRAD, CDR SKYLAB 2,
ORBITAL WORKSHOP MENUS.

Food Item No.	CONRAD STANDARD MENU 1 of 6							STANDARD MENU NUTRIENTS
	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16 EGGS	199	13.0	147	217	519	17	239	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
48 BISCUIT	49	1.0	2	11	103	3	16	
36 JAM	99	0	6	5	13	4	32	
62 COFFEE - W/S	51	0	5	11	1	11	109	
<u>MEAL B</u>								
37 PEA SOUP	217	6.8	22	169	857	28	416	
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207	
47 PEARS	178	0	12	12	25	8	122	
48 BISCUIT	49	1.0	2	11	103	3	16	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL C</u>								
71 VEAL	188	32.7	23	274	733	35	574	
32 M. POTATOES	174	3.4	59	79	426	19	297	
73 GREEN BEANS	68	2.8	70	77	389	20	232	
06 ICE CREAM	257	4.7	152	128	94	15	227	
79 G.F. DRINK	122	0	86	124	76	0	395	
<u>SNACK</u>								
05 PEANUTS	263	11.5	25	185	336	83	403	
79 G.F. DRINK	122	0	86	124	76	0	395	
62 COFFEE - W/S	51	0	5	11	1	11	109	
TOTALS **	2432	93.4	823	1752	5044	289	4024	
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0	

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OPTIONAL SALT - 4.5 PACKS. OPTIONAL CALORIES - 118.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 20. Continued

STANDARD MENU
NUTRIENTS

CONRAD
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
31 COFFEE CAKE	210	4.1	39	60	210	12	94
50 INSTANT B.F.	204	15.1	503	400	269	145	771
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
44 HOT DOGS	643	25.5	24	224	1881	37	646
65 CORN	127	3.6	5	85	435	26	318
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
53 TURKEY R. SOUP	94	11.9	18	128	974	12	125
68 PRIME RIB	313	33.8	20	354	102	39	629
22 ASPARAGUS	25	3.1	18	67	179	11	154
38 PINEAPPLE	168	0	21	8	26	28	152
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2285	99.4	844	1593	4220	362	4336
NOMINAL MINERAL TABLETS REQ'D			0	0	2	0	0

OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - 265.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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Table 20. Continued.

CONRAD
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
59 PORK & POTATO	158	12.9	57	153	270	24	345
56 PEAS	115	5.3	60	118	932	21	187
69 AMBROSIA	173	2.0	27	65	15	32	196
48 BISCUIT	49	1.0	2	11	103	3	16
58 COCOA	204	4.0	74	169	196	36	460
<u>MEAL C</u>							
72 SPAGHETTI	213	20.3	26	30	588	34	320
32 M. POTATO	174	3.4	59	79	426	19	297
73 GREEN BEANS	68	2.8	70	77	389	20	232
06 ICE CREAM	257	4.7	152	128	94	15	227
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2350	91.4	840	1418	4271	301	4200
NOMINAL MINERAL TABLETS REQ'D			0	2	0	0	0

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OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 200.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 20. Continued.

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CONRAD
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
50 INSTANT B.F.	204	15.1	503	400	269	145	771
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
37 PEA SOUP	217	6.8	22	169	857	28	416
34 CHILI	331	19.4	48	198	2042	43	633
48 BISCUIT	49	1.0	2	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
49 POTATO SALAD	150	5.8	20	65	603	16	190
27 STRAWBERRIES	89	0.6	22	26	6	13	144
24 ROLL	202	4.4	39	59	358	10	58
42 G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2362	104.9	855	1554	4732	380	4592
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

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OPTIONAL SALT - 7.5 PACKS. OPTIONAL CALORIES - 188.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 20. Continued.

CONRAD
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
17 BACON	127	15.0	8	117	743	13	212
47 PEARS	178	0	12	12	25	8	122
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
25 SALMON	254	25.1	70	341	939	29	329
75 BREAD	99	2.5	31	48	207	8	44
02 B.S. PUDDING	179	3.2	126	96	248	11	166
79 G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
26 PORK LOIN	369	30.0	54	211	895	31	380
64 TOMATOES	82	1.4	66	41	520	22	357
22 ASPARAGUS	25	3.1	18	67	179	11	154
38 PINEAPPLE	168	0	21	8	26	28	152
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2306	95.6	848	1581	4536	229	4301
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

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OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 244.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 20. Continued.

CONRAD
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
46 PEACHES	184	0	7	27	33	11	206
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
55 CHICK & RICE	208	17.8	27	245	834	24	267
74 MACARONI	184	7.9	104	153	373	28	98
02 B.S. PUDDING	179	3.2	126	96	248	11	166
79 G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
68 PRIME RIB	313	33.8	20	354	102	39	629
49 POTATO SALAD	150	5.8	20	65	603	16	190
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
23 LEMONADE	82	0.1	11	6	28	0	3
20 CATSUP	21	0.6	3	15	237	4	104
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2324	102.4	836	1645	3352	256	4109
NOMINAL MINERAL TABLETS REQ'D			0	0	6	0	0

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OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 226.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. CMDR. JOSEPH P. KERWIN, M.D., SPT SKYLAB 2

ORBITAL WORKSHOP MENUS

DATE	Food Item No.	KERWIN STANDARD MENU 1 of 6							STANDARD MENU NUTRIMENTS
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
	<u>MEAL A</u>								
	16	EGGS	199	13.0	147	217	519	17	239
	13	SAUSAGE	160	17.2	6	143	436	17	249
	47	PEARS	178	0	12	12	25	8	122
	79	G.F. DRINK	122	0	86	124	76	0	395
	62	COFFEE - W/S	51	0	5	11	1	11	109
	<u>MEAL B</u>								
	25	SALMON	254	25.1	70	341	939	29	329
	75	BREAD	99	2.5	31	48	207	8	44
	22	ASPARAGUS	25	3.1	18	67	179	11	154
	04	LEMON PUDDING	186	0	10	0	126	7	97
	42	G. DRINK	122	0	4	1	15	1	1
	<u>MEAL C</u>								
	71	VEAL	188	32.7	23	274	733	35	574
	74	MACARONI	184	7.9	104	153	373	28	98
	56	PEAS	115	5.3	60	118	932	21	187
	27	STRAWBERRIES	89	0.6	22	26	6	13	144
	06	ICE CREAM	257	4.7	152	128	94	15	227
	66	TEA	80	0.1	1	3	10	2	33
	20	CATSUP	21	0.6	3	15	237	4	104
	<u>SNACK</u>								
	76	BUTTER COOKIES	142	1.4	4	14	9	3	17
	07	APRICOTS	161	2.3	40	61	20	28	1047
	42	G. DRINK	122	0	4	1	15	1	1
	<u>TOTALS **</u>		2755	116.5	802	1757	4952	259	4171
	<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	0	0	0

OPTIONAL SALT - 6.5 PACKS. OPTIONAL CALORIES - 145.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D", OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. Continued.

STANDARD MENU
NUTRIMENTS

KERWIN
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13	147	217	519	17	239
17 BACON	127	15.0	8	117	743	13	212
46 PEACHES	184	0	7	27	33	11	206
58 COCOA	204	4.0	74	169	196	36	460
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
03 TUNA	108	8.2	17	65	432	12	149
73 GREEN BEANS	68	2.8	70	77	389	20	232
75 BREAD	99	2.5	31	48	207	8	44
27 STRAWBERRIES	89	0.6	22	26	6	13	144
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
68 PRIME RIB	313	33.8	20	354	102	39	629
64 TOMATOES	82	1.4	66	41	520	22	357
32 M. POTATOES	174	3.4	59	79	426	19	297
48 BISCUIT	49	1.0	2	11	103	3	16
02 B.S. PUDDING	179	3.2	126	96	248	11	166
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2596	103.1	816	1600	4223	282	4024
NOMINAL MINERAL TABLETS REQ'D			1	0	2	0	0

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OPTIONAL SALT - 10 PACKS. OPTIONAL CALORIES - 304.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. Continued.

KERWIN
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
72 SPAGHETTI	213	20.3	26	30	588	34	320
20 CATSUP	21	0.6	3	15	237	4	104
75 BREAD	99	2.5	31	48	207	8	44
22 ASPARAGUS	25	3.1	18	67	179	11	154
46 PEACHES	184	0	7	27	33	11	206
79 G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
39 LOBSTER	231	23.7	142	437	1168	51	412
56 PEAS	115	5.3	60	118	932	21	187
32 M. POTATOES	174	3.4	59	79	426	19	297
02 B.S. PUDDING	179	3.2	126	96	248	11	166
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
TOTALS **	2618	98.5	861	1626	5294	268	4214
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

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OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - 282.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. Continued.

KERWIN
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
50 INSTANT B.F.	204	15.1	503	400	269	145	771
17 BACON	127	15.0	8	117	743	13	212
46 PEACHES	184	0	7	27	33	11	206
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
34 CHILI	331	19.4	48	198	2042	43	643
48 BISCUIT	49	1.0	2	11	103	3	16
27 STRAWBERRIES	89	0.6	22	26	6	13	144
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
65 CORN	127	3.6	5	85	435	26	318
22 ASPARAGUS	25	3.1	18	67	179	11	154
24 ROLL	202	4.4	39	59	358	10	58
06 ICE CREAM	257	4.7	152	128	94	15	227
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
62 COFFEE - W/S	51	0	5	11	1	11	109
23 LEMONADE	82	0.1	11	6	28	0	3
TOTALS **	2580	115.9	863	1734	4999	379	4083
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

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OPTIONAL SALT - 6 PACKS. OPTIONAL CALORIES - 320.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. Continued.

KERWIN
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
46 PEACHES	184	0	7	27	33	11	206
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
37 PEA SOUP	217	6.8	22	169	857	28	416
74 MACARONI	184	7.9	104	153	373	28	98
75 BREAD	99	2.5	31	48	207	8	44
20 CATSUP	21	0.6	3	15	237	4	104
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
26 PORK LOIN	369	30	54	211	895	31	380
56 PEAS	115	5.3	60	118	932	21	187
61 S. POTATOES	196	2.2	45	94	575	27	557
06 ICE CREAM	257	4.7	152	128	94	15	227
79 G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
62 COFFEE - W/S	51	0	5	11	1	11	109
66 TEA	80	0.1	1	3	10	2	33
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
07 APRICOTS	161	2.3	40	61	20	28	1047
TOTALS **	2763	106.7	844	1659	5480	290	4596
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

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OPTIONAL SALT - 1 PACK. OPTIONAL CALORIES - 137.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 21. Continued.

		KERWIN STANDARD MENU 6 of 6						
Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16 EGGS	199	13	147	217	519	17	239	
63 BEEF HASH	207	26.1	18	259	2025	35	545	
20 CATSUP	21	0.6	3	15	237	4	104	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE - W/S	51	0	5	11	1	11	109	
<u>MEAL B</u>								
33 PEANUT BUTTER	240	9.9	18	145	255	67	273	
75 BREAD	99	2.5	31	48	207	8	44	
36 JAM	99	0	6	5	13	4	32	
02 B.S. PUDDING	179	3.2	126	96	248	11	166	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL C</u>								
21 FILET	312	44.6	8	396	135	47	681	
73 GREEN BEANS	68	2.8	70	77	389	20	232	
32 M. POTATOES	174	3.4	59	79	426	19	297	
47 PEARS	178	0	12	12	25	8	122	
60 O. DRINK	119	0	73	92	61	1	91	
<u>SNACK</u>								
07 APRICOTS	161	2.3	40	61	20	28	1047	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE - W/S	51	0	5	11	1	11	109	
76 BUTTER COOKIES	142	1.4	4	14	9	3	17	
TOTALS **		2657	109.8	844	1814	4754	297	4381
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0	0

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OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 243.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. CMDR. PAUL J. WEITZ, PLT SKYLAB 2

ORBITAL WORKSHOP MENUS

Food Item No.	WEITZ STANDARD MENU 1 of 6							STANDARD MENU NUTRIMENTS
	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
15 CORN FLAKES	157	4.8	119	113	261	13	198	
63 BEEF HASH	207	26.1	18	259	2025	35	545	
79 G.F. DRINK	122	0	86	124	76	0	395	
58 COCOA	204	4	74	169	196	36	460	
<u>MEAL B</u>								
72 SPAGHETTI	213	20.3	26	30	588	34	320	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
75 BREAD	99	2.5	31	48	207	8	44	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL C</u>								
45 POTATO SOUP	185	2.7	14	169	525	15	379	
68 PRIME RIB	313	33.8	20	354	102	39	629	
22 ASPARAGUS	25	3.1	18	67	179	11	154	
75 BREAD	99	2.5	31	48	207	8	44	
06 ICE CREAM	257	4.7	152	128	94	15	227	
60 O. DRINK	119	0	73	92	61	1	91	
<u>SNACK</u>								
23 LEMONADE	82	0.1	11	6	28	0	3	
23 LEMONADE	82	0.1	11	6	28	0	3	
07 APRICOTS	161	2.3	40	61	20	28	1047	
62 COFFEE - W/S	51	0	5	11	1	11	109	
76 BUTTER COOKIES	142	1.4	4	14	9	3	17	
TOTALS **	2726	109.0	828	1817	4674	271	4900	
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0	

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OPTIONAL SALT - 6.5 PACKS. OPTIONAL CALORIES - 225.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. Continued.

STANDARD MENU NUTRIMENTS	WEITZ STANDARD MENU 2 of 6							
	Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
	16 EGGS	199	13.0	147	217	519	17	239
	17 BACON	127	15.0	8	117	743	13	212
	60 O. DRINK	119	0	73	92	61	1	91
	62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
	33 PEANUT BUTTER	240	9.9	18	145	255	67	273
	36 JAM	99	0	6	5	13	4	32
	48 BISCUIT	49	1.0	2	11	103	3	16
	69 AMBROSIA	173	2.0	27	65	15	32	196
	80 S.B. DRINK	122	0	88	110	63	0	95
<u>MEAL C</u>								
	21 FILET	312	44.6	8	396	135	47	681
	74 MACARONI	184	7.9	104	153	373	28	98
	64 TOMATOES	82	1.4	66	41	520	22	357
	75 BREAD	99	2.5	31	48	207	8	44
	43 APPLESAUCE	160	0	6	12	24	5	110
	60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
	02 B.S. PUDDING	179	3.2	126	96	248	11	166
	07 APRICOTS	161	2.3	40	61	20	28	1047
	62 COFFEE - W/S	51	0	5	11	1	11	109
	42 G. DRINK	122	0	4	1	15	1	1
<u>TOTALS **</u>		2648	102.8	837	1684	3377	310	3967
<u>NOMINAL MINERAL TABLETS REQ'D</u>				0	0	5	0	0

DATE 12/6/72

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 302.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. Continued.

WEITZ
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
13 SAUSAGE	160	17.2	6	143	436	17	249
16 EGGS	199	13.0	147	217	519	17	239
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
55 CHICK & RICE	208	17.8	27	245	834	24	267
65 CORN	127	3.6	5	85	435	26	318
02 B.S. PUDDING	179	3.2	126	96	248	11	166
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
39 LOBSTER	231	23.7	142	437	1168	51	412
22 ASPARAGUS	25	3.1	18	67	179	11	154
32 M. POTATOES	174	3.4	59	79	426	19	297
46 PEACHES	184	0	7	27	33	11	206
79 G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
62 COFFEE - W/S	51	0	5	11	1	11	109
07 APRICOTS	161	2.3	40	61	20	28	1047
42 G. DRINK	122	0	4	1	15	1	1
42 G. DRINK	122	0	4	1	15	1	1
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
TOTALS **	2650	91.3	819	1802	4739	254	4461
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

DATE 12/6/72

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OPTIONAL SALT - 6 PACKS. OPTIONAL CALORIES - 290.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. Continued.

WEITZ
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16 EGGS	199	13.0	147	217	519	17	239	
17 BACON	127	15.0	8	117	743	13	212	
62 COFFEE - W/S	51	0	5	11	1	11	109	
79 G.F. DRINK	122	0	86	124	76	0	395	
<u>MEAL B</u>								
34 CHILI	331	19.4	48	198	2042	43	643	
43 APPLESAUCE	160	0	6	12	24	5	110	
48 BISCUIT	49	1.0	2	11	103	3	16	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL C</u>								
21 FILET	312	44.6	8	396	135	47	681	
32 M. POTATOES	174	3.4	59	79	426	19	297	
65 CORN	127	3.6	5	85	435	26	318	
75 BREAD	99	2.5	31	48	207	8	44	
06 ICE CREAM	257	4.7	152	128	94	15	227	
60 O. DRINK	119	0	73	92	61	1	91	
<u>SNACK</u>								
62 COFFEE - W/S	51	0	5	11	1	11	109	
79 G.F. DRINK	122	0	86	124	76	0	395	
04 LEMON PUDDING	186	0	10	0	126	7	97	
28 VANILLA WAFERS	108	1.5	4	27	123	4	20	
<u>TOTALS **</u>		2713	108.7	808	1772	5253	231	4094
<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	0	0	0

DATE _____

DATE 12/6/72

OPTIONAL SALT - 0.5 PACKS. OPTIONAL CALORIES - 237.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. Continued.

WEITZ
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
50 INSTANT B.F.	204	15.1	503	400	269	145	771
13 SAUSAGE	160	17.2	6	143	436	17	249
46 PEACHES	184	0	7	27	33	11	206
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
56 PEAS	115	5.3	60	118	932	21	187
48 BISCUIT	49	1.0	2	11	103	3	16
47 PEARS	178	0	12	12	25	8	122
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
26 PORK LOIN	369	30	54	211	895	31	380
64 TOMATOES	82	1.4	66	41	520	22	357
04 LEMON PUDDING	186	0	10	0	126	7	97
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
62 COFFEE - W/S	51	0	5	11	1	11	109
23 LEMONADE	82	0.1	11	6	28	0	3
07 APRICOTS	161	2.3	40	61	20	28	1047
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
12 MINTS	141	0	1	0	0	0	0
TOTALS **	2725	109.5	824	1518	4804	363	4584
NOMINAL MINERAL TABLETS REQ'D			0	1	0	0	0

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OPTIONAL SALT - 4 PACKS. OPTIONAL CALORIES - 225.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 22. Continued.

WEITZ
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
54 R. KRISPIES	132	5.2	134	133	292	23	214
16 EGGS	199	13.0	147	217	519	17	239
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
44 HOT DOGS	643	25.5	24	224	1881	37	646
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
38 PINEAPPLE	168	0	21	8	26	28	152
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
49 POTATO SALAD	150	5.8	20	65	603	16	190
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
79 G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
62 COFFEE - W/S	51	0	5	11	1	11	10
07 APRICOTS	161	2.3	40	61	20	28	1047
23 LEMONADE	82	0.1	11	6	28	0	3
TOTALS **	2753	103.8	825	1616	4010	254	4370
NOMINAL MINERAL TABLETS REQ'D			0	0	2	0	0

DATE

DATE 12/6/72

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 197.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 23. CAPTAIN ALAN L. BEAN. CDR, SKYLAB 3

ORBITAL WORKSHOP MENUS

Food Item No.	BEAN STANDARD MENU 1 of 6							STANDARD MENU NUTRIENTS
	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
54 R. KRISPIES	132	5.2	134	133	292	23	214	
07 APRICOTS	161	2.3	40	61	20	28	1047	
75 BREAD	99	2.5	31	48	207	8	44	
35 JAM	99	0	6	5	13	4	32	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL B</u>								
72 SPAGHETTI	213	20.3	26	30	588	34	320	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
06 ICE CREAM	257	4.7	152	128	94	15	227	
48 BISCUIT	49	1.0	2	11	103	3	16	
48 BISCUIT	49	1.0	2	11	103	3	16	
23 LEMONADE	82	0.1	11	6	28	0	3	
<u>MEAL C</u>								
21 FILET	312	44.6	8	396	135	47	681	
65 CORN	127	3.6	5	85	435	26	318	
74 MACARONI	184	7.9	104	153	373	28	98	
02 B.S. PUDDING	179	3.2	126	96	248	11	166	
20 CATSUP	21	0.6	3	15	237	4	104	
20 CATSUP	21	0.6	3	15	237	4	104	
20 CATSUP	21	0.6	3	15	237	4	104	
23 LEMONADE	82	0.1	11	6	28	0	3	
<u>SNACK</u>								
28 VANILLA WAFERS	108	1.5	4	27	123	4	20	
28 VANILLA WAFERS	108	1.5	4	27	123	4	20	
<u>TOTALS **</u>								
	2512	101.9	770	1386	3691	264	3772	
<u>NOMINAL MINERAL TABLETS REQ'D</u>								
			0	0	6	0	0	

OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - 238.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D", "OPTIONAL SALT" or "OPTIONAL CALORIES."

DATE

TABLE 23. Continued.

STANDARD MENU
NUTRIENTS

BEAN
STANDARD MENU 2 of 6

Food Item No.	cal.	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
47 PEARS	178	0	12	12	25	8	122
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>							
34 CHILI	331	19.4	48	198	2042	43	643
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
02 B.S. PUDDING	179	3.2	126	96	248	11	166
80 S.B. DRINK	122	0	88	110	63	0	95
<u>MEAL C</u>							
69 PRIME RIB	313	33.8	20	354	102	39	629
56 PEAS	115	5.3	60	118	932	21	187
74 MACARONI	184	7.9	104	153	373	28	98
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>							
33 PEANUT BUTTER	240	9.9	18	145	255	67	273
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
23 LEMONADE	82	0.1	11	6	28	0	3
07 APRICOTS	161	2.3	40	61	20	28	1047
TOTALS **	2630	94.1	751	1580	5684	287	3951
NOMINAL MINERAL TABLETS REQ'D			1	0	0	0	0

DATE

OPTIONAL SALT - 1 PACKS. OPTIONAL CALORIES - 120.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 23. Continued.

BEAN
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
54 R. KRISPIES	132	5.2	134	133	292	23	214
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
46 PEACHES	184	0	7	27	33	11	206
79 G. F. DRINK	122	0	86	124	76	0	395
<u>MEAL B</u>							
72 SPAGHETTI	213	20.3	26	30	588	34	320
47 PEARS	178	0	12	12	25	8	122
48 BISCUIT	49	1.0	2	11	103	3	16
43 BISCUIT	49	1.0	2	11	103	3	16
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
22 ASPARAGUS	25	3.1	18	67	179	11	154
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>							
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
07 APRICOTS	161	2.3	40	61	20	28	1047
80 S. B. DRINK	122	0	88	110	63	0	95
TOTALS **	2571	90.2	735	1386	2983	229	4159
NOMINAL MINERAL TABLETS REQ'D			1	0	10	2	0

DATE

DATE

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 179.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D".
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 23. Continued.

		BEAN STANDARD MENU 4 of 6							
Food Item No.		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>									
16	EGGS	199	13	147	127	519	17	239	
27	STRAWBERRIES	89	0.6	22	26	6	13	144	
48	BISCUIT	49	1.0	2	11	103	3	16	
58	COCOA	204	4.0	74	169	196	36	460	
<u>MEAL B</u>									
55	CHICK & RICE	208	17.8	27	245	834	24	267	
46	PEACHES	184	0	7	27	33	11	206	
06	ICE CREAM	257	4.7	152	128	94	15	227	
23	LEMONADE	82	0.1	11	6	28	0	3	
<u>MEAL C</u>									
34	CHILI	331	19.4	48	198	2042	43	643	
74	MACARONI	184	7.9	104	153	373	28	98	
48	BISCUIT	49	1.0	2	11	103	3	16	
48	BISCUIT	49	1.0	2	11	103	3	16	
02	B.S. PUDDING	179	3.2	126	96	248	11	166	
23	LEMONADE	82	0.1	11	6	28	0	3	
<u>SNACK</u>									
33	PEANUT BUTTER	240	9.9	18	145	255	67	273	
48	BISCUIT	49	1.0	2	11	103	3	16	
48	BISCUIT	49	1.0	2	11	103	3	16	
<u>TOTALS **</u>		2484	85.7	757	1471	5171	280	2809	
<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	0	0	0	

OPTIONAL SALT - 6 PACKS. OPTIONAL CALORIES - 266.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

DATE

DATE

TABLE 23. Continued.

BEAN
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
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MEAL A

15 CORN FLAKES	157	4.8	119	113	261	13	198
47 PEARS	178	0	12	12	25	8	122
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
79 G.F. DRINK	122	0	86	124	76	0	395

MEAL B

34 CHILI	331	19.4	48	198	2042	43	643
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
23 LEMONADE	82	0.1	11	6	28	0	3

MEAL C

21 FILET	312	44.6	8	396	135	47	681
56 PEAS	115	5.3	60	118	932	21	187
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
02 B.S. PUDDING	179	3.2	126	96	248	11	166
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
23 LEMONADE	82	0.1	11	6	28	0	3

SNACK

07 APRICOTS	161	2.3	40	61	20	28	1047
12 MINTS	141	0	1	0	0	0	0

TOTALS **	2623	91.4	721	1394	5051	228	4228
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NOMINAL MINERAL TABLETS REQ'D			2	0	0	2	0
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OPTIONAL SALT - 7.5 PACKS. OPTIONAL CALORIES - 127.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

DATE

DATE

TABLE 23. Continued.

BEAN
STANDARD MENU 6 of 6

Food Item No.	cal	Prot. gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
50 INSTANT B.F.	204	15.1	503	400	269	145	771
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
07 APRICOTS	161	2.3	40	61	20	28	1047
<u>MEAL B</u>							
55 CHICK & RICE	208	17.8	27	245	834	24	267
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
04 LEMON PUDDING	186	0	10	0	126	7	97
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
66 PRIME RIB	313	33.8	20	354	102	39	629
65 CORN	127	3.6	5	85	435	26	318
46 PEACHES	184	0	7	27	33	11	206
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
20 CATSUP	21	0.6	3	15	237	4	104
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SHACK</u>							
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
41 LEMON DROPS	234	0	1	0	13	0	3
60 O. DRINK	119	0	73	92	61	1	91
TOTALS **	2691	85.1	774	1504	3578	327	3935
NOMINAL MINERAL TABLETS REQ'D			0	0	7	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 59.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 24. OWEN K. GARRIOTT, Ph.D., SPT SKYLAB 3,
ORBITAL WORKSHOP MENUS.

DATE	Food Item No.	GARRIOTT STANDARD MENU 1 of 6						STANDARD MENU NUTRIENTS
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	
	<u>MEAL A</u>							
	16 EGGS	199	13.0	147	217	519	17	239
	48 BISCUIT	49	1.0	2	11	103	3	16
	17 BACON	127	15.0	8	117	743	13	212
	60 O. DRINK	119	0	73	92	61	1	91
	<u>MEAL B</u>							
	03 TUNA	108	8.2	17	65	432	12	149
	22 ASPARAGUS	25	3.1	18	67	179	11	154
	75 BREAD	99	2.5	31	48	207	8	44
	02 B.S. PUDDING	179	3.2	126	96	248	11	166
	23 LEMONADE	82	0.1	11	6	28	0	3
	<u>MEAL C</u>							
	37 PEA SOUP	217	6.8	22	169	857	28	416
	21 FILET	312	44.6	8	396	135	47	681
	48 BISCUIT	49	1.0	2	11	103	3	16
	73 GREEN BEANS	68	2.8	70	77	389	20	232
	06 ICE CREAM	257	4.7	152	128	94	15	227
	23 LEMONADE	82	0.1	11	6	28	0	3
	<u>SNACK</u>							
	07 APRICOTS	161	2.3	40	61	20	28	1047
	60 O. DRINK	119	0	73	92	61	1	91
	TOTALS **	2252	108.4	811	1659	4207	218	3787
	NOMINAL MINERAL TABLETS REQ'D			0	0	5	0	0

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 298.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 24. Continued.

STANDARD MENU
NUTRIENTS

GARRIOTT
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
50 INSTANT B.F.	204	15.1	503	400	269	145	771
13 SAUSAGE	160	17.2	6	143	436	17	249
43 APPLESAUCE	160	0	6	12	24	5	110
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
49 POTATO SALAD	150	5.8	20	65	603	16	190
48 BISCUIT	49	1.0	2	11	103	3	16
04 LEMON PUDDING	186	0	10	0	126	7	97
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
39 LOBSTER	231	23.7	142	437	1168	51	412
56 PEAS	115	5.3	60	118	932	21	187
48 BISCUIT	49	1.0	2	11	103	3	16
69 AMBROSIA	173	2.0	27	65	15	32	196
42 G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>							
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
TOTALS **	2247	106.4	832	1537	4809	348	2897
NOMINAL MINERAL TABLETS REQ'D			0	0	1	0	0

DATE _____

OPTIONAL SALT - 10 PACKS. OPTIONAL CALORIES - 303

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 24. Continued.

GARRIOTT
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
17 BACON	127	15.0	8	117	743	13	212
15 CORN FLAKES	157	4.8	119	113	261	13	198
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
75 BREAD	99	2.5	31	48	207	8	44
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
49 POTATO SALAD	150	5.8	20	65	603	16	190
65 CORN	127	3.6	5	85	435	26	318
75 BREAD	99	2.5	31	48	207	8	44
02 B.S. PUDDING	179	3.2	126	96	248	11	166
42 G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>							
42 G. DRINK	122	0	4	1	15	1	1
TOTALS **	2253	113.6	689	1736	5260	196	2862
NOMINAL MINERAL TABLETS REQ'D			4	0	0	0	0

OPTIONAL SALT - 7.5 PACKS. OPTIONAL CALORIES - 297.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

DATE

DATE

TABLE 24. Continued.

GARRIOTT
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
17 BACON	127	15.0	8	117	743	13	212
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>							
59 PORK & POTATO	158	12.9	57	153	270	24	345
48 BISCUIT	49	1.0	2	11	103	3	16
74 MACARONI	184	7.9	104	153	373	28	98
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539
56 PEAS	115	5.3	60	118	932	21	187
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
04 LEMON PUDDING	186	0	10	0	126	7	97
TOTALS **	2320	105.5	803	1631	4639	232	3404
NOMINAL MINERAL TABLETS REQ'D			0	0	2	0	0

DATE

DATE

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 230.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 24. Continued.

GARRIOTT
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
31 COFFEE CAKE	210	4.1	39	60	210	12	94
63 BEEF HASH	207	26.1	18	259	2025	35	545
79 G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL B</u>							
33 PEANUT BUTTER	240	9.9	18	145	255	67	273
36 JAM	99	0	6	5	13	4	32
75 BREAD	99	2.5	31	48	207	8	44
02 B.S. PUDDING	179	3.2	126	96	248	11	166
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
68 PRIME RIB	313	33.8	20	354	102	39	629
32 M. POTATOES	174	3.4	59	79	426	19	297
73 GREEN BEANS	68	2.8	70	77	389	20	232
06 ICE CREAM	257	4.7	152	128	94	15	227
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>							
05 PEANUTS	263	11.5	25	185	336	83	403
<hr/>							
TOTALS **	2432	102.1	734	1658	4470	314	3431
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			3	0	3	0	0
<hr/>							

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 118.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

DATE

DATE

TABLE 24. Continued.

5-6

GARRIOTT
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
54 R. KRISPIES	132	5.2	134	133	292	23	214
13 SAUSAGE	160	17.2	6	143	436	17	249
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>							
55 CHICK & RICE	208	17.8	27	245	834	24	267
47 PEARS	178	0	12	12	25	8	122
75 BREAD	99	2.5	31	48	207	8	44
80 S.B. DRINK	122	0	88	110	63	0	95
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
26 PORK LOIN	369	30.0	54	211	895	31	380
73 GREEN BEANS	68	2.8	70	77	389	20	232
69 AMBROSIA	173	2.0	27	65	15	32	196
48 BISCUIT	49	1.0	2	11	103	3	16
79 G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
67 DRIED BEEF	48	9.9	3	92	1352	11	200
60 O. DRINK	119	0	73	92	61	1	91
TOTALS **	2237	103.5	784	1614	5206	219	2844
NOMINAL MINERAL TABLETS REQ'D			1	0	0	0	0

DATE

DATE

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 313.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 25. MAJOR JACK LOUSMA, PLT SKYLAB 3

ORBITAL WORKSHOP MENUS

		LOUSMA STANDARD MENU 1 of 6							STANDARD MENU NUTRIMENTS
Food Item No.		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>									
16	EGGS	199	13.0	147	217	519	17	239	
17	BACON	127	15.0	8	117	743	13	212	
60	O. DRINK	119	0	73	92	61	1	91	
58	COCOA	204	4.0	74	169	196	36	460	
<u>MEAL B</u>									
03	TUNA	108	8.2	17	65	432	12	149	
75	BREAD	99	2.5	31	48	207	8	44	
53	TURKEY R. SOUP	94	11.9	18	128	974	12	125	
59	PORK & POTATO	158	12.9	57	153	270	24	345	
65	CORN	127	3.6	5	85	435	26	318	
43	APPLESAUCE	160	0	6	12	24	5	110	
66	TEA	80	0.1	1	3	10	2	33	
<u>MEAL C</u>									
25	SALMON	254	25.1	70	341	939	29	329	
21	FILET	312	44.6	8	396	135	47	681	
32	M. POTATOES	174	3.4	59	79	426	19	297	
73	GREEN BEANS	68	2.8	70	77	389	20	232	
27	STRAWBERRIES	89	0.6	22	26	6	13	144	
06	ICE CREAM	257	4.7	152	128	94	15	227	
42	G. DRINK	122	0	4	1	15	1	1	
50	INSTANT B.F.	204	15.1	503	400	269	145	771	
<u>SNACK</u>									
07	APRICOTS	161	2.3	40	61	20	28	1047	
04	LEMON PUDDING	186	0	10	0	126	7	97	
<u>TOTALS **</u>		3302	169.8	1375	2598	6290	480	5952	
<u>NOMINAL MINERAL TABLETS REQ'D</u>				0	0	1	0	0	

DATE

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 298

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 25. Continued.

STANDARD MENU
NUTRIENTS

LOUSMA
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
43 APPLESAUCE	160	0	6	12	24	5	110
58 COCOA	204	4.0	74	169	196	36	460
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
72 SPAGHETTI	213	20.3	26	30	588	34	320
49 POTATO SALAD	150	5.8	20	65	603	16	190
46 PEACHES	184	0	7	27	33	11	206
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
26 PORK LOIN	369	30.0	54	211	895	31	380
74 MACARONI	184	7.9	104	153	373	28	98
56 PEAS	115	5.3	60	118	932	21	187
56 PEAS	115	5.3	60	118	932	21	187
47 PEARS	178	0	12	12	25	8	122
69 AMBROSIA	173	2.0	27	65	15	32	196
23 LEMONADE	82	0.1	11	6	28	0	3
50 INSTANT B. F.	204	15.1	503	400	269	145	771
<u>SNACK</u>							
02 B. S. PUDDING	179	3.2	126	96	248	11	166
<hr/>							
TOTALS **	3328	151.7	1335	2032	6577	490	4454
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			1	4	0	0	0
<hr/>							

DATE

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - 272

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 25. Continued.

LOUSMA
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
58 COCOA	204	4.0	74	169	196	36	460
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>							
03 TUNA	108	8.2	17	65	432	12	149
75 BREAD	99	2.5	31	48	207	8	44
45 POTATO SOUP	185	2.7	14	169	525	15	379
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
43 APPLESAUCE	160	0	6	12	24	5	110
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
21 FILET	312	44.6	8	396	135	47	681
32 M. POTATOES	174	3.4	59	79	426	19	297
65 CORN	127	3.6	5	85	435	26	318
65 CORN	127	3.6	5	85	435	26	318
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
50 INSTANT B.F.	204	15.1	503	400	269	145	771
42 G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>							
04 LEMON PUDDING	186	0	10	0	126	7	97
07 APRICOTS	161	2.3	40	61	20	28	1047
<u>TOTALS **</u>							
	3322	154.0	1336	2570	5924	485	6096
<u>NOMINAL MINERAL TABLETS REQ'D</u>							
			1	0	4	0	0

DATE

DATE

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 278

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 25. Continued.

LOUSMA
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
15 CORN FLAKES	157	4.8	119	113	261	13	198	
13 SAUSAGE	160	17.2	6	143	436	17	249	
75 BREAD	99	2.5	31	48	207	8	44	
36 JAM	99	0	6	5	13	4	32	
79 G.F. DRINK	122	0	86	124	76	0	395	
58 COCOA	204	4.0	74	169	196	36	460	
<u>MEAL B</u>								
37 PEA SOUP	217	6.8	22	169	857	28	416	
71 VEAL	188	32.7	23	274	733	35	574	
22 ASPARAGUS	25	3.1	18	67	179	11	154	
49 POTATO SALAD	150	5.8	20	65	603	16	190	
02 B.S. PUDDING	179	3.2	126	96	248	11	166	
66 TEA	80	0.1	1	3	10	2	33	
<u>MEAL C</u>								
51 SHRIMP	73	12.6	61	106	177	28	176	
51 SHRIMP	73	12.6	61	106	177	28	176	
26 PORK LOIN	369	30.0	54	211	895	31	380	
32 M. POTATOES	174	3.4	59	79	426	19	297	
56 PEAS	115	5.3	60	118	932	21	187	
43 APPLESAUCE	160	0	6	12	24	5	110	
23 LEMONADE	82	0.1	11	6	28	0	3	
50 INSTANT B.F.	204	15.1	503	400	269	145	771	
69 AMBROSIA	173	2.0	27	65	15	32	196	
<u>SNACK</u>								
04 LEMON PUDDING	186	0	10	0	126	7	97	
<u>TOTALS **</u>		3289	161.3	1384	2379	6838	497	5304
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	

OPTIONAL SALT - 5.5 PACKS. OPTIONAL CALORIES - 311

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 25. Continued.

LOUSMA
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16 EGGS	199	13.0	147	217	519	17	239	
67 DRIED BEEF	48	9.9	3	92	1352	11	200	
60 O. DRINK	119	0	73	92	61	1	91	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL B</u>								
03 TUNA	108	8.2	17	65	432	12	149	
75 BREAD	99	2.5	31	48	207	8	44	
53 TURKEY R. SOUP	94	11.9	18	128	974	12	125	
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539	
73 GREEN BEANS	68	2.8	70	77	389	20	232	
38 PINEAPPLE	168	0	21	8	26	28	152	
42 G. DRINK	122	0	4	1	15	1	1	
<u>MEAL C</u>								
21 FILET	312	44.6	8	396	135	47	681	
65 CORN	127	3.6	5	85	435	26	318	
65 CORN	127	3.6	5	85	435	26	318	
32 M. POTATOES	174	3.4	59	79	426	19	297	
46 PEACHES	184	0	7	27	33	11	206	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
06 ICE CREAM	257	4.7	152	128	94	15	227	
60 O. DRINK	119	0	73	92	61	1	91	
50 INSTANT B.F.	204	15.1	503	400	269	145	771	
<u>SNACK</u>								
04 LEMON PUDDING	186	0	10	0	126	7	97	
07 APRICOTS	161	2.3	40	61	20	28	1047	
<u>TOTALS **</u>		3303	166.5	1373	2613	7140	499	6060
<u>NOMINAL MINERAL TABLETS REQ'D</u>		0	0	0	0	0	0	

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - 297.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

TABLE 25. Continued.

LOUSMA
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
63 BEEF HASH	207	26.1	18	259	2025	35	545
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
27 STRAWBERRIES	89	0.6	22	26	6	13	144
79 G.F. DRINK	122	0	86	124	76	0	395
60 O. DRINK	119	0	73	92	61	1	91

MEAL B

53 TURKEY R. SOUP	94	11.9	18	128	974	12	125
71 VEAL	188	32.7	23	274	733	35	574
49 POTATO SALAD	150	5.8	20	65	603	16	190
43 APPLESAUCE	160	0	6	12	24	5	110
42 G. DRINK	122	0	4	1	15	1	1

MEAL C

25 SALMON	254	25.1	70	341	939	29	329
68 PRIME RIB	313	33.8	20	354	102	39	629
73 GREEN BEANS	68	2.8	70	77	389	20	232
46 PEACHES	184	0	7	27	33	11	206
69 AMBROSIA	173	2.0	27	65	15	32	196
32 M. POTATOES	174	3.4	59	79	426	19	297
42 G. DRINK	122	0	4	1	15	1	1
50 INSTANT B.F.	204	15.1	503	400	269	145	771

SNACK

02 B.S. PUDDING	179	3.2	126	96	248	11	166
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TOTALS **	3277	169.8	1312	2587	7434	450	5276
NOMINAL MINERAL TABLETS REQ'D			2	0	0	0	0

OPTIONAL SALT 0 PACKS. OPTIONAL CALORIES - 323

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT", or OPTIONAL CALORIES.

DATE

DATE

TABLE 26. COL. GERALD P. CARR, CDR SKYLAB 4

ORBITAL WORKSHOP MENUS

DATE	Food Item No.	CARR STANDARD MENU 1 of 6						STANDARD MENU NUTRIENTS
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	
	<u>MEAL A</u>							
	17 BACON	127	15.0	8	117	743	13	212
	16 EGGS	199	13.0	147	217	519	17	239
	75 BREAD	99	2.5	31	48	207	8	44
	36 JAM	99	0	6	5	13	4	32
	80 S.B. DRINK	122	0	88	110	63	0	95
	62 COFFEE - W/S	51	0	5	11	1	11	109
	<u>MEAL B</u>							
	53 TURKEY R. SOUP	94	11.9	18	128	974	12	125
	03 TUNA	108	8.2	17	65	432	12	149
	75 BREAD	99	2.5	31	48	207	8	44
	06 ICE CREAM	257	4.7	152	128	94	15	227
	60 O. DRINK	119	0	73	92	61	1	91
	<u>MEAL C</u>							
	68 PRIME RIB	313	33.8	20	354	102	39	629
	64 TOMATOES	82	1.4	66	41	520	22	357
	48 BISCUIT	49	1.0	2	11	103	3	16
	69 AMOROSIA	173	2.0	27	65	15	32	196
	62 COFFEE - W/S	51	0	5	11	1	11	109
	<u>SNACK</u>							
	23 LEMONADE	82	0.1	11	6	28	0	3
	23 LEMONADE	82	0.1	11	6	28	0	3
	62 COFFEE - W/S	51	0	5	11	1	11	109
	62 COFFEE - W/S	51	0	5	11	1	11	109
	07 APRICOTS	161	2.3	40	61	20	28	1047
	TOTALS **	2469	98.5	768	1546	4133	258	3945
	NONIHAL MINERAL TABLETS REQ'D			1	0	1	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 281

**TOTALS do not include "NONIHAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 26. Continued.

STANDARD MENU
NUTRIENTS

CARR
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
13 SAUSAGE	160	17.2	6	143	436	17	249
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
34 CHILI	331	19.4	48	198	2042	43	643
48 BISCUIT	49	1.0	2	11	103	3	16
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
21 FILET	312	44.6	8	396	135	47	681
22 ASPARAGUS	25	3.1	18	67	179	11	154
38 PINEAPPLE	168	0	21	8	26	28	152
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>SNACK</u>							
69 AMBROSIA	173	2.0	27	65	15	32	196
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
80 S.B. DRINK	122	0	88	110	63	0	95
60 O. DRINK	119	0	73	92	61	1	91
TOTALS **	2680	97.5	644	1681	4250	257	3822
NOMINAL MINERAL TABLETS REQ'D			5	0	0	0	0

DATE

OPTIONAL SALT 9.5 PACKS. OPTIONAL CALORIES - 70

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 26. Continued.

CARR
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
48 BISCUIT	49	1.0	2	11	103	3	16
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
33 PEANUT BUTTER	240	9.9	18	145	255	67	273
36 JAM	99	0	6	5	13	4	32
75 BREAD	99	2.5	31	48	207	8	44
04 LEMON PUDDING	186	0	10	0	126	7	97
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
26 PORK LOIN	369	30.0	54	211	895	31	380
64 TOMATOES	82	1.4	66	41	520	22	357
27 STRAWBERRIES	89	0.6	22	26	6	13	144
06 ICE CREAM	257	4.7	152	128	94	15	227
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>SNACK</u>							
23 LEMONADE	82	0.1	11	6	28	0	3
62 COFFEE - W/S	51	0	5	11	1	11	109
62 COFFEE - W/S	51	0	5	11	1	11	109
05 PEANUTS	263	11.5	25	185	336	83	403
TOTALS **	2653	104.6	718	1443	3805	361	3504
NOMINAL MINERAL TABLETS REQ'D			2	1	2	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 97.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 26. Continued.

CARR
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
54 R. KRISPIES	132	5.2	134	133	292	23	214
31 COFFEE CAKE	210	4.1	39	60	210	12	94
27 STRAWBERRIES	89	0.6	22	26	6	13	144
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
48 BISCUIT	49	1.0	2	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
80 S.B. DRINK	122	0	88	110	63	0	95
<u>MEAL C</u>							
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539
32 M. POTATOES	174	3.4	59	79	426	19	297
73 GREEN BEANS	68	2.8	70	77	389	20	232
48 BISCUIT	49	1.0	2	11	103	3	16
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
79 G.F. DRINK	122	0	86	124	76	0	395
62 COFFEE - W/S	51	0	5	11	1	11	109
62 COFFEE - W/S	51	0	5	11	1	11	109
04 LEMON PUDDING	186	0	10	0	126	7	97
05 PEANUTS	263	11.5	25	185	336	83	403
TOTALS **	2505	102.8	699	1668	4049	321	3862
NOMINAL MINERAL TABLETS REQ'D			3	0	1	0	0

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 245.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 26. Continued.

CARR
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
63 BEEF HASH	207	26.1	18	259	2025	35	545
16 EGGS	199	13.0	147	217	519	17	239
20 CATSUP	21	0.6	3	15	237	4	104
62 COFFEE - W/S	51	0	5	11	1	11	109
60 O. DRINK	119	0	73	92	61	1	91
75 BREAD	99	2.5	31	48	207	8	44
<u>MEAL B</u>							
72 SPAGHETTI	213	20.3	26	30	588	34	320
02 B.S. PUDDING	179	3.2	126	96	248	11	166
48 BISCUIT	49	1.0	2	11	103	3	16
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
68 PRIME RIB	313	33.8	20	354	102	39	629
49 POTATO SALAD	150	5.8	20	65	603	16	190
22 ASPARAGUS	25	3.1	18	67	179	11	154
07 APRICOTS	161	2.3	40	61	20	28	1047
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
04 LEMON PUDDING	186	0	10	0	126	7	97
62 COFFEE - W/S	51	0	5	11	1	11	109
62 COFFEE - W/S	51	0	5	11	1	11	109
TOTALS **	2474	111.9	707	1541	5181	251	4187
NOMINAL MINERAL TABLETS REQ'D			3	0	0	0	0

OPTIONAL SALT - 0 PACKS. OPTIONAL CALORIES - 276.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 26. Continued.

CARR
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
15 CORN FLAKES	157	4.8	119	113	261	13	198
43 APPLESAUCE	160	0	6	12	24	5	110
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
25 SALMON	254	25.1	70	341	939	29	329
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
39 LOBSTER	231	23.7	142	437	1168	51	412
65 CORN	127	3.6	5	85	435	26	318
06 ICE CREAM	257	4.7	152	128	94	15	227
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>SNACK</u>							
62 COFFEE - W/S	51	0	5	11	1	11	109
62 COFFEE - W/S	51	0	5	11	1	11	109
23 LEMONADE	82	0.1	11	6	28	0	3
07 APRICOTS	161	2.3	40	61	20	28	1047
42 G. DRINK	122	0	4	1	15	1	1
TOTALS **	2551	109.2	805	1749	4387	291	3986
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 199

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 27. EDWARD G. GIBSON, Ph.D., SPT SKYLAB 4

ORBITAL WORKSHOP MENUS

DATE	GIBSON STANDARD MENU 1 of 6							STANDARD MENU NUTRIENTS	
	Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg		K mg
	<u>MEAL A</u>								
	50	INSTANT B.F.	204	15.1	503	400	269	145	771
	75	BREAD	99	2.5	31	48	207	8	44
	36	JAM	99	0	6	5	13	4	32
	79	G.F. DRINK	122	0	86	124	76	0	395
	66	TEA	80	0.1	1	3	10	2	33
	<u>MEAL B</u>								
	53	TURKEY R. SOUP	94	11.9	18	128	974	12	125
	72	SPAGHETTI	213	20.3	26	30	588	34	320
	48	BISCUIT	49	1.0	2	11	103	3	16
	46	PEACHES	184	0	7	27	33	11	206
	42	G. DRINK	122	0	4	1	15	1	1
	<u>MEAL C</u>								
	21	FILET	312	44.6	8	396	135	47	681
	56	PEAS	115	5.3	60	118	932	21	187
	28	VANILLA WAFERS	108	1.5	4	27	123	4	20
	23	LEMONADE	82	0.1	11	6	28	0	3
	<u>SNACK</u>								
	33	PEANUT BUTTER	240	9.9	18	145	255	67	273
	48	BISCUITS	49	1.0	2	11	103	3	16
	48	BISCUITS	49	1.0	2	11	103	3	16
	23	LEMONADE	82	0.1	11	6	28	0	3
	TOTALS **		2303	114.4	800	1497	3995	365	3142
	NOMINAL MINERAL TABLETS REQ'D				0	0	7	0	0

OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - 247.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 27. Continued.

STANDARD MENU
NUTRIENTS

GIBSON
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
17 BACON	127	15.0	8	117	743	13	212
54 R. KRISPIES	132	5.2	134	133	292	23	214
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
48 BISCUIT	49	1.0	2	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
79 G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
26 PORK LOIN	369	30.0	54	211	895	31	380
49 POTATO SALAD	150	5.8	20	65	603	16	190
73 GREEN BEANS	68	2.8	70	77	389	20	232
06 ICE CREAM	257	4.7	152	128	94	15	227
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
27 STRAWBERRIES	89	0.6	22	26	6	13	144
60 O. DRINK	119	0	73	92	61	1	91
TOTALS **	2251	100.4	762	1433	4319	196	3081
NOMINAL MINERAL TABLETS REQ'D			1	1	5	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 299.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

TABLE 27. Continued.

GIBSON
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
13 SAUSAGE	160	17.2	6	143	436	17	249
15 CORN FLAKES	157	4.8	119	113	261	13	198
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
60 O. DRINK	119	0	73	92	61	1	91
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
74 MACARONI	184	7.9	104	153	373	28	98
64 TOMATOES	82	1.4	66	41	520	22	357
02 B.S. PUDDING	179	3.2	126	96	248	11	166
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
68 PRIME RIB	313	33.8	20	354	102	39	629
73 GREEN BEANS	68	2.8	70	77	389	20	232
24 ROLL	202	4.4	39	59	358	10	58
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
67 DRIED BEEF	48	9.9	3	92	1352	11	200
42 G. DRINK	122	0	4	1	15	1	1
TOTALS **	2364	100.7	825	1493	4636	224	2780
NOMINAL MINERAL TABLETS REQ'D			0	0	4	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 186.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 27. Continued.

GIBSON
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16 EGGS	199	13.0	147	217	519	17	239	
13 SAUSAGE	160	17.2	6	143	436	17	249	
66 TEA	80	0.1	1	3	10	2	33	
79 G.F. DRINK	122	0	86	124	76	0	395	
<u>MEAL B</u>								
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207	
64 TOMATOES	82	1.4	66	41	520	22	357	
43 APPLESAUCE	160	0	6	12	24	5	110	
42 G. DRINK	122	0	4	1	15	1	1	
<u>MEAL C</u>								
21 FILET	312	44.6	8	396	135	47	681	
65 CORN	127	3.6	5	85	435	26	318	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
06 ICE CREAM	257	4.7	152	128	94	15	227	
80 S.B. DRINK	122	0	88	110	63	0	95	
<u>SNACK</u>								
02 B.S. PUDDING	179	3.2	126	96	248	11	166	
23 LEMONADE	82	0.1	11	6	28	0	3	
<u>TOTALS **</u>		2230	104.5	754	1584	3834	194	3225
<u>NOMINAL MINERAL TABLETS REQ'D</u>			2	0	8	0	0	

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 320

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 27. Continued.

GIBSON
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
17 BACON	127	15.0	8	117	743	13	212
50 INSTANT B.F.	204	15.1	503	400	269	145	771
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>							
59 PORK & POTATO	158	12.9	57	153	270	24	345
48 BISCUIT	49	1.0	2	11	103	3	16
47 PEARS	178	0	12	12	25	8	122
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
40 TURKEY & GRAVY	219	40.3	32	414	1054	50	539
22 ASPARAGUS	25	3.1	18	67	179	11	154
38 PINEAPPLE	168	0	21	8	26	28	152
79 G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
33 PEANUT BUTTER	240	9.9	18	145	255	67	273
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
42 G. DRINK	122	0	4	1	15	1	1
<u>TOTALS **</u>							
	2245	103.1	792	1663	3397	381	3473
<u>NOMINAL MINERAL TABLETS REQ'D</u>							
			1	0	8	0	0

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 305.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 27. Continued.

GIBSON
STANDARD MENU 6 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>							
34 CHILI	331	19.4	48	198	2042	43	643
49 POTATO SALAD	150	5.8	20	65	603	16	190
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
37 PEA SOUP	217	6.8	22	169	857	28	416
39 LOBSTER	231	23.7	142	437	1168	51	412
22 ASPARAGUS	25	3.1	18	67	179	11	154
75 BREAD	99	2.5	31	48	207	8	44
06 ICE CREAM	257	4.7	152	128	94	15	227
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
23 LEMONADE	82	0.1	11	6	28	0	3
<u>TOTALS **</u>	<u>2247</u>	<u>96.4</u>	<u>756</u>	<u>1677</u>	<u>6290</u>	<u>218</u>	<u>2914</u>
<u>NOMINAL MINERAL TABLETS REQ'D</u>			<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

OPTIONAL SALT - 0 PACKS. OPTIONAL CALORIES - 303.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 28. COL. WILLIAM R. POGUE, PLT SKYLAB 4,

ORBITAL WORKSHOP MENUS

DATE	POGUE STANDARD MENU 1 of 6								STANDARD MENU NUTRIENTS
	Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
	<u>MEAL A</u>								
	31	COFFEE CAKE	210	4.1	39	60	210	12	94
	13	SAUSAGE	160	17.2	6	143	436	17	249
	54	R. KRISPIES	132	5.2	134	133	292	23	214
	60	O. DRINK	119	0	73	92	61	1	91
	62	COFFEE	7	0	5	11	1	11	109
	<u>MEAL B</u>								
	34	CHILI	331	19.4	48	198	2042	43	643
	48	BISCUIT	49	1.0	2	11	103	3	16
	27	STRAWBERRIES	89	0.6	22	26	6	13	144
	60	O. DRINK	119	0	73	92	61	1	91
	<u>MEAL C</u>								
	51	SHRIMP	73	12.6	61	106	177	28	176
	68	PRIME RIB	313	33.8	20	354	102	39	629
	74	MACARONI	184	7.9	104	153	373	28	98
	06	ICE CREAM	257	4.7	152	128	94	15	227
	66	TEA	80	0.1	1	3	10	2	33
	<u>SNACK</u>								
	05	PEANUTS	263	11.5	25	185	336	83	403
	60	O. DRINK	119	0	73	92	61	1	91
	62	COFFEE	7	0	5	11	1	11	109
	62	COFFEE	7	0	5	11	1	11	109
	62	COFFEE	7	0	5	11	1	11	109
<u>TOTALS **</u>			2526	118.1	853	1820	4368	353	3635
<u>NOMINAL MINERAL TABLETS REQ'D</u>					0	0	4	0	0

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 274.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 28. Continued.

STANDARD MENU
NUTRIENTS

POGUE
STANDARD MENU 2 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
25 SALMON	254	25.1	70	341	939	29	329
64 TOMATOES	82	1.4	66	41	520	22	357
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
02 B.S. PUDDING	179	3.2	126	96	248	11	166
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
26 PORK LOIN	369	30.0	54	211	895	31	380
22 ASPARAGUS	25	3.1	18	67	179	11	154
56 PEAS	115	5.3	60	118	932	21	187
75 BREAD	99	2.5	31	48	207	8	44
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
66 TEA	80	0.1	1	3	10	2	33
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
<u>TOTALS **</u>							
	2533	117.9	862	1707	5463	277	4058
<u>NOMINAL MINERAL TABLETS REQ'D</u>							
			0	0	0	0	0

DATE

OPTIONAL SALT - 6.5 PACKS. OPTIONAL CALORIES - 267.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 28. Continued.

POGUE
STANDARD MENU 3 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
63 BEEF HASH	207	26.1	18	259	2025	35	545
47 PEARS	178	0	12	12	25	8	122
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
73 GREEN BEANS	68	2.8	70	77	389	20	232
46 PEACHES	184	0	7	27	33	11	206
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
32 M. POTATOES	174	3.4	59	79	426	19	297
22 ASPARAGUS	25	3.1	18	67	179	11	154
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
66 TEA	80	0.1	1	3	10	2	33
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
04 LEMON PUDDING	186	0	10	0	126	7	97
TOTALS **	2553	113.0	724	1814	5682	248	3600
NOMINAL MINERAL TABLETS REQ'D			4	0	0	0	0

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OPTIONAL SALT - 4 PACKS. OPTIONAL CALORIES - 247.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 28. Continued.

POGUE
STANDARD MENU 4 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
54 R. KRISPIES	132	5.2	134	133	292	23	214	
13 SAUSAGE	160	17.2	6	143	436	17	249	
47 PEARS	178	0	12	12	25	8	122	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE	7	0	5	11	1	11	109	
<u>MEAL B</u>								
25 SALMON	254	25.1	70	341	939	29	329	
48 BISCUIT	49	1.0	2	11	103	3	16	
48 BISCUIT	49	1.0	2	11	103	3	16	
02 B.S. PUDDING	179	3.2	126	96	248	11	166	
66 TEA	80	0.1	1	3	10	2	33	
<u>MEAL C</u>								
51 SHRIMP	73	12.6	61	106	177	28	176	
68 PRIME RIB	313	33.8	20	354	102	39	629	
49 POTATO SALAD	150	5.8	20	65	603	16	190	
06 ICE CREAM	257	4.7	152	128	94	15	227	
75 BREAD	99	2.5	31	48	207	8	44	
23 LEMONADE	82	0.1	11	6	28	0	3	
20 CATSUP	21	0.6	3	15	237	4	104	
<u>SNACK</u>								
05 PEANUTS	263	11.5	25	185	336	83	403	
62 COFFEE	7	0	5	11	1	11	109	
62 COFFEE	7	0	5	11	1	11	109	
62 COFFEE	7	0	5	11	1	11	109	
<u>TOTALS **</u>		2486	124.4	769	1793	4005	334	3443
<u>NOMINAL MINERAL TABLETS REQ'D</u>			2	0	6	0	0	

OPTIONAL SALT - 9.5 PACKS. OPTIONAL CALORIES - 314.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 28. Continued.

POGUE
STANDARD MENU 5 of 6

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
17 BACON	127	15.0	8	117	743	13	212
64 TOMATOES	82	1.4	66	41	520	22	357
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
71 VEAL	188	32.7	23	274	733	35	574
65 CORN	127	3.6	5	85	435	26	318
69 AMBROSIA	173	2.0	27	65	15	32	196
20 CATSUP	21	0.6	3	15	237	4	104
42 G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>							
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
74 MACARONI	184	7.9	104	153	373	28	98
73 GREEN BEANS	68	2.8	70	77	389	20	232
22 ASPARAGUS	25	3.1	18	67	179	11	154
06 ICE CREAM	257	4.7	152	128	94	15	227
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
05 PEANUTS	263	11.5	25	185	336	83	403
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
TOTALS **	2478	116.9	810	1816	6118	386	3991
NOMINAL MINERAL TABLETS REQ'D			1	0	0	0	0

OPTIONAL SALT - 0 PACKS. OPTIONAL CALORIES - 322.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 28. Continued.

POGUE
STANDARD MENU 6 of 6.

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
15 CORN FLAKES	157	4.8	119	113	261	13	198
38 PINEAPPLE	168	0	21	8	26	28	152
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539
48 BISCUIT	49	1.0	2	11	103	3	16
02 B.S. PUDDING	179	3.2	126	96	248	11	166
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
73 GREEN BEANS	68	2.8	70	77	389	20	232
46 PEACHES	184	0	7	27	33	11	206
75 BREAD	99	2.5	31	48	207	8	44
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
67 DRIED BEEF	48	9.9	3	92	1352	11	200
42 G. DRINK	122	0	4	1	15	1	1
04 LEMON PUDDING	186	0	10	0	126	7	97
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
TOTALS **	2528	122.3	816	1815	4684	267	3437
NOMINAL MINERAL TABLETS REQ'D			1	0	3	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 272.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

**TABLE 29. CAPTAIN CHARLES CONRAD, CDR SKYLAB 2,
COMMAND MODULE MENUS FOR INITIAL FOUR MISSION DAYS**

**CONRAD
CSM MENU A MD-1 ONLY**

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
MEAL A							
* EGGS (80 GMS)	132	9.9	48	166	119	18	107
21 FILET	312	44.6	8	396	135	47	681
24 ROLL	202	4.4	39	59	358	10	58
36 JAM	99	0	6	5	13	4	32
* BUTTER(15 GMS)	108	0	3	5	1	0	3
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE - W/S	51	0	5	11	1	11	109
MEAL B							
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
64 TOMATOES	82	1.4	66	41	520	22	357
48 BISCUIT	49	1.0	2	11	103	3	16
02 B. S. PUDDING	179	3.2	126	96	248	11	166
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
MEAL C							
72 SPAGHETTI	213	20.3	26	30	588	34	320
75 BREAD	99	2.5	31	48	207	8	44
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
69 AMBROSIA	173	2.0	27	65	15	32	196
79 G. F. DRINK	122	0	86	124	76	0	395
79 G. F. DRINK	122	0	86	124	76	0	395
TOTALS **	2545	106.7	808	1680	3991	225	3379
NOMINAL MINERAL TABLETS REQ'D			1	0	3	0	0

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OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - N/A.

* Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 29. Continued.

CONRAD
CSM MENU B MD-2 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
17 BACON	127	15.0	8	117	743	13	212
50 INSTANT B. F.	204	15.1	503	400	269	145	771
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
44 HOT DOGS	643	25.5	24	224	1881	37	646
48 BISCUIT	49	1.0	2	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
55 CHICK & RICE	208	17.8	27	245	834	24	267
22 ASPARAGUS	25	3.1	18	67	179	11	154
27 STRAWBERRIES	89	0.6	22	26	6	13	144
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
05 PEANUTS	263	11.5	25	185	336	83	403

TOTALS **	2266	92.3	801	1666	5032	368	3489
NOMINAL MINERAL TABLETS REQ'D			1	0	0	0	0

OPTIONAL SALT - 4.5 PACKS. OPTIONAL CALORIES - 284.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 29. Continued.

CONRAD
CSM MENU C MD-3 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
59 PORK & POTATO	158	12.9	57	153	270	24	345
65 CORN	127	3.6	5	85	435	26	318
69 AMBROSIA	173	2.0	27	65	15	32	196
48 BISCUIT	49	1.0	2	11	103	3	16
58 COCOA	204	4.0	74	169	196	36	460
<u>MEAL C</u>							
71 VEAL	188	32.7	23	274	733	35	574
32 M. POTATOES	174	3.4	59	79	426	19	297
22 ASPARAGUS	25	3.1	18	67	179	11	154
75 BREAD	99	2.5	31	48	207	8	44
02 B. S. PUDDING	179	3.2	126	96	248	11	166
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
<hr/>							
TOTALS **	2264	103.4	730	1624	4069	291	4381
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			3	0	3	0	0
<hr/>							

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 286.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 29. Continued.

CONRAD
CSM MENU D MD-4 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
15 CORN FLAKES	157	4.8	119	113	261	13	198
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
50 INSTANT B. F.	204	15.1	503	400	269	145	771
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
45 POTATO SOUP	185	2.7	14	169	525	15	379
34 CHILI	331	19.4	48	198	2042	43	643
48 BISCUIT	49	1.0	0	11	103	3	16
46 PEACHES	184	0	7	27	33	11	206
23 LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>							
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539
49 POTATO SALAD	150	5.8	20	65	603	16	190
47 PEARS	178	0	12	12	25	8	122
48 BISCUIT	49	1.0	2	11	103	3	16
66 TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
<hr/>							
TOTALS **	2278	95.1	853	1554	5307	360	4348
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0
<hr/>							

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OPTIONAL SALT - 1.5 PACKS. OPTIONAL CALORIES - 272.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 30. CMDR. JOSEPH P. KERWIN, M.D., SPT SKYLAB 2, COMMAND MODULE

MENUS FOR INITIAL FOUR MISSION DAYS.

		KERWIN CSM MENU A MD-1 ONLY						
Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
* EGGS (80 GMS)	132	9.9	48	166	119	18	107	
21 FILET	312	44.6	8	396	135	47	681	
24 ROLL	202	4.4	39	59	358	10	58	
36 JAM	99	0	6	5	13	4	32	
* BUTTER(15 GMS)	108	0	3	4	1	0	3	
46 PEACHES	184	0	7	27	33	11	206	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE - W/S	51	0	5	11	1	11	109	
<u>MEAL B</u>								
03 TUNA	108	8.2	17	65	432	12	149	
75 BREAD	99	2.5	31	48	207	8	44	
76 BUTTER COOKIES	142	1.4	4	14	9	3	17	
02 B. S. PUDDING	179	3.2	126	96	248	11	166	
07 APRICOTS	161	2.3	40	61	20	28	1047	
60 O. DRINK	119	0	73	92	61	1	91	
60 O. DRINK	119	0	73	92	61	1	91	
<u>MEAL C</u>								
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207	
74 MACARONI	184	7.9	104	153	373	28	98	
56 PEAS	115	5.3	60	118	932	21	187	
47 PEARS	178	0	12	12	25	8	122	
60 O. DRINK	119	0	73	92	61	1	91	
20 CATSUP	21	0.6	3	15	237	4	104	
<u>TOTALS **</u>		2888	106.2	831	1814	4612	246	3701
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

OPTIONAL SALT - 10 PACKS. OPTIONAL CALORIES - N/A.

* Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 30. Continued.

KERWIN
CSM MENU B MD-2 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
17 BACON	127	15.0	8	117	743	13	212
38 PINEAPPLE	168	0	21	8	26	28	152
58 COCOA	204	4.0	74	169	196	36	460
62 COFFEE - W/S	51	0	5	11	1	11	109
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
25 SALMON	254	25.1	70	341	939	29	329
75 BREAD	99	2.5	31	48	207	8	44
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
46 PEACHES	184	0	7	27	33	11	206
79 G. F. DRINK	122	0	86	124	76	0	395
79 G. F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
71 VEAL	188	32.7	23	274	733	35	574
32 M. POTATOES	174	3.4	59	79	426	19	297
64 TOMATOES	82	1.4	66	41	520	22	357
48 BISCUIT	49	1.0	2	11	103	3	16
04 LEMON PUDDING	186	0	10	0	126	7	97
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<hr/>							
TOTALS **	2635	112.3	767	1728	4931	285	4250
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			2	0	0	0	0
<hr/>							

OPTIONAL SALT - 6.5 PACKS. OPTIONAL CALORIES - 265.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 30. Continued.

KERWIN
CSM MENU C MD-3 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
48 BISCUIT	49	1.0	2	11	103	3	16
36 JAM	99	0	6	5	13	4	32
58 COCOA	204	4.0	74	169	196	36	460
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
72 SPAGHETTI	213	20.3	26	30	588	34	320
20 CATSUP	21	0.6	3	15	237	4	104
75 BREAD	99	2.5	31	48	207	8	44
22 ASPARAGUS	25	3.1	18	67	179	11	154
46 PEACHES	184	0	7	27	33	11	206
79 G. F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>							
51 SHRIMP	73	12.6	61	106	177	28	176
55 CHICK & RICE	208	17.8	27	245	834	24	267
56 PEAS	115	5.3	60	118	932	21	187
32 M. POTATOES	174	3.4	59	79	426	19	297
02 B. S. PUDDING	179	3.2	126	96	248	11	166
23 LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>							
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109
76 BUTTER COOKIES	142	1.4	4	14	9	3	17

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TOTALS **	2611	107.8	804	1603	5262	301	4597
NOMINAL MINERAL TABLETS REQ'D			1	0	0	0	0

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - 289.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 30. Continued.

		KERWIN CSM MENU D MD-4 ONLY						
Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
50	INSTANT B. F.	204	15.1	503	400	269	145	771
13	SAUSAGE	160	17.2	6	143	436	17	249
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
46	PEACHES	184	0	7	27	33	11	206
62	COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
45	POTATO SOUP	185	2.7	14	169	525	15	379
34	CHILI	331	19.4	48	198	2042	43	643
48	BISCUIT	49	1.0	2	11	103	3	16
27	STRAWBERRIES	89	0.6	22	26	6	13	144
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
71	VEAL	188	32.7	23	274	733	35	574
65	CORN	127	3.6	5	85	435	26	318
73	GREEN BEANS	68	2.8	70	77	389	20	232
75	BREAD	99	2.5	31	48	207	8	44
69	AMBROSIA	173	2.0	27	65	15	32	196
66	TEA	80	0.1	1	3	10	2	33
<u>SNACK</u>								
62	COFFEE - W/S	51	0	5	11	1	11	109
23	LEMONADE	82	0.1	11	6	28	0	3
76	BUTTER COOKIES	142	1.4	4	14	9	3	17
76	BUTTER COOKIES	142	1.4	4	14	9	3	17
TOTALS **		2685	105.2	836	1641	5499	410	4139
NOMINAL MINERAL TABLETS REQ'D				0	0	0	0	0

OPTIONAL SALT - 1 PACKS. OPTIONAL CALORIES - 215.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 31. CMDR. PAUL J. WEITZ, PLT SKYLAB 2, COMMAND MODULE MENUS

FOR INITIAL FOUR MISSION DAYS.

WEITZ
CSM MENU A MD-1 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
* EGGS (80 GMS)	132	9.9	48	166	119	18	107
21 FILET	312	44.6	8	396	135	47	681
24 ROLL	202	4.4	39	59	358	10	58
* BUTTER(20 GMS)	144	0	4	6	2	0	4
46 PEACHES	184	0	7	27	33	11	206
60 O. DRINK	119	0	73	92	61	1	91
36 JAM	99	0	6	5	13	4	32
<u>MEAL B</u>							
03 TUNA	108	8.2	17	65	432	12	149
75 BREAD	99	2.5	31	48	207	8	44
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
07 APRICOTS	161	2.3	40	61	20	28	1047
02 B. S. PUDDING	179	3.2	126	96	248	11	166
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
32 M. POTATOES	174	3.4	59	79	426	19	297
22 ASPARAGUS	25	3.1	18	67	179	11	154
75 BREAD	99	2.5	31	48	207	8	44
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>TOTALS **</u>							
	2936	101.5	841	1818	4057	222	3793
<u>NOMINAL MINERAL TABLETS REQ'D</u>							
			0	0	2	0	0

OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - N/A.

* Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE 12/6/72

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TABLE 31. Continued.

WEITZ
CSM MENU B MD-2 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
43 APPLESAUCE	160	0	6	12	24	5	110
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>							
33 PEANUT BUTTER	240	9.9	18	145	255	67	273
36 JAM	99	0	6	5	13	4	32
48 BISCUIT	49	1.0	2	11	103	3	16
69 AMBROSIA	173	2.0	27	65	15	32	196
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
71 VEAL	188	32.7	23	274	733	35	574
74 MACARONI	184	7.9	104	153	373	28	98
56 PEAS	115	5.3	60	118	932	21	187
75 BREAD	99	2.5	31	48	207	8	44
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
02 B. S. PUDDING	179	3.2	126	96	248	11	166
07 APRICOTS	161	2.3	40	61	20	28	1047
62 COFFEE - W/S	51	0	5	11	1	11	109

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TOTALS **	2643	97.0	837	1658	4088	309	3844
NOMINAL MINERAL TABLETS REQ'D			0	0	2	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 307.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 31. Continued.

		WEITZ CSM MENU C MD-3 ONLY						
Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
17 BACON	127	15.0	8	117	743	13	212	
16 EGGS	199	13.0	147	217	519	17	239	
75 BREAD	99	2.5	31	48	207	8	44	
36 JAM	99	0	6	5	13	4	32	
79 G. F. DRINK	122	0	86	124	76	0	395	
62 COFFEE - W/S	51	0	5	11	1	11	109	
<u>MEAL B</u>								
55 CHICK & RICE	208	17.8	27	245	834	24	267	
64 TOMATOES	82	1.4	66	41	520	22	357	
28 VANILLA WAFERS	108	1.5	4	27	123	4	20	
04 LEMON PUDDING	186	0	10	0	126	7	97	
23 LEMONADE	82	0.1	11	6	28	0	3	
<u>MEAL C</u>								
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539	
22 ASPARAGUS	25	3.1	18	67	179	11	154	
32 M. POTATOES	174	3.4	59	79	426	19	297	
75 BREAD	99	2.5	31	48	207	8	44	
46 PEACHES	184	0	7	27	33	11	206	
79 G. F. DRINK	122	0	86	124	76	0	395	
<u>SNACK</u>								
76 BUTTER COOKIES	142	1.4	4	14	9	3	17	
62 COFFEE - W/S	51	0	5	11	1	11	109	
07 APRICOTS	161	2.3	40	61	20	28	152	
60 O. DRINK	119	0	73	92	61	1	91	
<u>TOTALS **</u>		2659	104.3	756	1778	5266	252	4674
<u>NOMINAL MINERAL TABLETS REQ'D</u>			2	0	0	0	0	

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OPTIONAL SALT - 0.5 PACKS. OPTIONAL CALORIES - 291.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 31. Continued.

WEITZ
CSM MENU D MD-4 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
13 SAUSAGE	160	17.2	6	143	436	17	249
16 EGGS	199	13.0	147	217	519	17	239
15 CORN FLAKES	157	4.8	119	113	261	13	198
62 COFFEE - W/S	51	0	5	11	1	11	109
58 COCOA	204	4.0	74	169	196	36	460
<u>MEAL B</u>							
34 CHILI	331	19.4	48	198	2042	43	643
69 AMBROSIA	173	2.0	27	65	15	32	196
48 BISCUIT	49	1.0	2	11	103	3	16
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
59 PORK & POTATO	158	12.9	57	153	270	24	345
65 CORN	127	3.6	5	85	435	26	318
75 BREAD	99	2.5	31	48	207	8	44
04 LEMON PUDDING	186	0	10	0	126	7	97
79 G. F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>							
23 LEMONADE	82	0.1	11	6	28	0	3
05 PEANUTS	263	11.5	25	185	336	83	403
62 COFFEE - W/S	51	0	5	11	1	11	109
79 G. F. DRINK	122	0	86	124	76	0	395
<hr/>							
TOTALS **	2653	92.0	817	1755	5189	332	4310
<hr/>							
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0
<hr/>							

OPTIONAL SALT - 1.5 PACKS. OPTIONAL CALORIES - 297.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 32. CAPTAIN ALAN L. BEAN, CDR SKYLAB 3, COMMAND MODULE MENUS

FOR INITIAL FOUR MISSION DAYS.

		BEAN CSM MENU A MD-1 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
21	FILET	312	44.6	8	396	135	47	681
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
*	BUTTER(25 GMS)	180	0	5	8	2	0	5
20	CATSUP	21	0.6	3	15	237	4	104
20	CATSUP	21	0.6	3	15	237	4	104
20	CATSUP	21	0.6	3	15	237	4	104
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
46	PEACHES	184	0	7	27	33	11	206
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
55	CHICK & RICE	208	17.8	27	245	834	24	267
73	GREEN BEANS	68	2.8	70	77	389	20	232
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
02	B.S. PUDDING	179	3.2	126	96	248	11	166
23	LEMONADE	82	0.1	11	6	28	0	3
<u>TOTALS**</u>		2758	95.5	676	1617	3997	242	2804
<u>NOMINAL MINERAL TABLETS REQ'D</u>				3	0	5	1	0

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OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - N/A.

*Fresh items for Meal A only eaten on ground.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 32. Continued.

		BEAN CSM MENU B MD-2 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
07	APRICOTS	161	2.3	40	61	20	28	1047
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
55	CHICK & RICE	208	17.8	27	245	834	24	267
48	BISCUIT	49	1.0	2	11	103	3	16
02	B.S. PUDDING	179	3.2	126	96	248	11	166
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
34	CHILI	331	19.4	48	198	2042	43	643
22	ASPARAGUS	25	3.1	18	67	179	11	154
74	MACARONI	194	7.9	104	153	373	28	98
46	PEACHES	184	0	7	27	33	11	206
48	BISCUIT	49	1.0	2	11	103	3	16
23	LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
60	O. DRINK	119	0	73	92	61	1	91
<u>TOTALS**</u>		2615	84.6	705	1517	5213	321	3597
<u>NOMINAL MINERAL TABLETS REQ'D</u>			2	0	0	0	0	0

OPTIONAL SALT - 5.5 PACKS. OPTIONAL CALORIES - 135.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

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TABLE 32. Continued.

Food No.	ITEM	BEAN CSM MENU C MD-3 ONLY						
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
79	G.F. DRINK	122	0	86	124	0	0	395
<u>MEAL B</u>								
55	CHICK & RICE	208	17.8	27	245	834	24	267
46	PEACHES	184	0	7	27	33	11	206
48	BISCUIT	49	1.0	2	11	103	3	16
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
34	CHILI	331	19.4	48	198	2042	43	643
22	ASPARAGUS	25	3.1	18	67	179	11	154
27	STRAWBERRIES	69	0.6	22	26	6	13	144
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
23	LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
80	S.B. DRINK	122	0	88	110	63	0	95
02	B.S. PUDDING	179	3.2	126	96	243	11	166
<u>TOTALS**</u>		2583	85.0	736	1606	5334	292	3105
<u>NOMINAL MINERAL TABLETS REQ'D</u>			1	0	0	0	0	0

OPTIONAL SALT - 4.5 PACKS. OPTIONAL CALORIES - 167.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 32. Continued.

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BEAN
CSM MENU D MD-4 ONLY

Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
47	PEARS	178	0	12	12	25	8	122
48	BISCUIT	49	1.0	2	11	103	3	16
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
34	CHILI	331	19.4	48	198	2042	43	643
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
73	GREEN BEANS	68	2.8	70	77	389	20	232
46	PEACHES	184	0	7	27	33	11	206
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
21	FILET	312	44.6	8	396	135	47	681
74	MACARONI	184	7.9	104	153	373	28	98
20	CATSUP	21	0.6	3	15	237	4	104
20	CATSUP	21	0.6	3	15	237	4	104
20	CATSUP	21	0.6	3	15	237	4	104
02	B.S. PUDDING	179	3.2	126	96	248	11	166
23	LEMONADE	82	0.1	11	6	28	0	3
<u>SNACK</u>								
07	APRICOTS	161	2.3	40	61	20	28	1047
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
<u>TOTALS**</u>		2505	101.9	680	1473	5167	243	3931
<u>NOMINAL MINERAL TABLETS REQ'D</u>			3	0	0	0	0	0

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OPTIONAL SALT - 6 PACKS. OPTIONAL CALORIES - 245.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 33. OWEN K. GARRIOTT, Ph.D., SPT SKYLAB 3, COMMAND MODULE

MENUS FOR INITIAL FOUR MISSION DAYS.

		GARRIOTT						
		CSM MENU A MD-1 ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
* EGGS (80 GMS)	132	9.9	48	166	119	18	107	
21 FILET	312	44.6	8	396	135	47	681	
75 BREAD	99	2.5	31	48	207	8	44	
36 JAM	99	0	6	5	13	4	32	
* BUTTER(30 GMS)	216	0	6	9	3	0	6	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE	7	0	5	11	1	11	109	
<u>MEAL B</u>								
03 TUNA	108	8.2	17	65	432	12	149	
75 BREAD	99	2.5	31	48	207	8	44	
02 B. S. PUDDING	179	3.2	126	96	248	11	166	
07 APRICOTS	161	2.3	40	61	20	28	1047	
67 DRIED BEEF	48	9.9	3	92	1352	11	200	
58 COCOA	204	4.0	74	169	196	36	460	
<u>MEAL C</u>								
57 CHICK & GRAVY	137	5.9	26	196	1225	18	207	
32 M. POTATOES	174	3.4	59	79	426	19	297	
73 GREEN BEANS	68	2.8	70	77	389	20	232	
75 BREAD	99	2.5	31	48	207	8	44	
46 PEACHES	184	0	7	27	33	11	206	
60 O. DRINK	119	0	73	92	61	1	91	
<u>TOTALS**</u>		2564	111.7	734	1777	5335	272	4213
<u>NOMINAL MINERAL TABLETS REQ'D</u>			3	0	0	0	0	

OPTIONAL SALT - 6.5 PACKS. OPTIONAL CALORIES - N/A.

* Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D", OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 33. Continued.

		GARRIOTT CSM MENU B MD-2 ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
50	INSTANT B. F.	204	15.1	503	400	269	145	771
13	SAUSAGE	160	17.2	6	143	436	17	249
27	STRAWBERRIES	89	0.6	22	26	6	13	144
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
71	VEAL	188	32.7	23	274	733	35	574
49	POTATO SALAD	150	5.8	20	65	603	16	190
04	LEMON PUDDING	186	0	10	0	126	7	97
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
55	CHICK & RICE	208	17.8	27	245	834	24	345
65	CORN	127	3.6	5	85	435	26	318
56	PEAS	115	5.3	60	118	932	21	187
48	BISCUIT	49	1.0	2	11	103	3	16
69	AMBROSIA	173	2.0	27	65	15	32	196
42	G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>								
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
<u>TOTALS**</u>		2278	105.5	834	1611	4939	357	3200
<u>NOMINAL MINERAL TABLETS REQ'D</u>				0	0	1	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 272.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

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TABLE 33. Continued.

		GARRIOTT CSM MENU C MD-3 ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17 239	
13	SAUSAGE	160	17.2	6	143	436	17 249	
15	CORN FLAKES	157	4.8	119	113	261	13 198	
60	O. DRINK	119	0	73	92	61	1 91	
<u>MEAL B</u>								
45	POTATO SOUP	185	2.7	14	169	525	15 379	
57	CHICK & GRAVY	137	15.9	26	196	1225	18 207	
48	BISCUIT	49	1.0	2	11	103	3 16	
60	O. DRINK	119	0	73	92	61	1 91	
<u>MEAL C</u>								
40	TURKEY & GRAVY	219	40.3	32	414	1054	50 539	
49	POTATO SALAD	150	5.8	20	65	603	16 190	
73	GREEN BEANS	68	2.8	70	77	389	20 232	
75	BREAD	99	2.5	31	48	207	8 44	
02	B. S. PUDDING	179	3.2	126	96	248	11 166	
42	G. DRINK	122	0	4	1	15	1 1	
<u>SNACK</u>								
42	G. DRINK	122	0	4	1	15	1 1	
07	APRICOTS	161	2.3	40	61	20	28 1047	
<u>TOTALS**</u>		2245	111.6	787	1796	5752	220 3690	
<u>NOMINAL MINERAL TABLETS REQ'D</u>			1	0	0	0	0	

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OPTIONAL SALT - 2.5 PACKS. OPTIONAL CALORIES - 305.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 33. Continued.

		GARRIOTT CSM MENU D MD-4 ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
17	BACON	127	15.0	8	117	743	13	212
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
57	CHICK & GRAVY	137	15.9	26	196	1225	18	207
74	MACARONI	184	7.9	104	153	373	28	98
04	LEMON PUDDING	186	0	10	0	126	7	97
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
21	FILET	312	44.6	8	396	135	47	681
22	ASPARAGUS	25	3.1	18	67	179	11	154
56	PEAS	115	5.3	60	118	932	21	187
02	B. S. PUDDING	179	3.2	126	95	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
07	APRICOTS	161	2.3	40	61	20	28	1047
80	S. B. DRINK	122	0	88	110	63	0	95
<u>TOTALS**</u>		2265	112.9	829	1774	4933	215	3444
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	1	0	0	

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 285.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

**TABLE 34. MAJOR JACK LOUSMA, PLT SKYJAR 3, COMMAND MODULE MENUS
FOR INITIAL FOUR MISSION DAYS.**

		LOUSMA CSM MENU A MD-1 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
*	EGG (80 GMS)	132	9.9	48	166	119	18	107
21	FILET	312	44.6	8	396	135	47	681
75	BREAD	99	2.5	31	48	207	8	44
35	JAM	99	0	6	5	13	4	32
*	BUTTER(65 GMS)	468	0	13	19	6	0	13
60	O. DRINK	119	0	73	92	61	1	91
58	COCOA	204	4	74	169	196	36	460
<u>MEAL B</u>								
03	TUNA	108	8.2	17	65	432	12	149
75	BREAD	99	2.5	31	48	207	8	44
53	TURKEY R. SOUP	94	11.9	18	128	974	12	125
59	PORK & POTATO	158	12.9	57	153	270	24	345
43	APPLESAUCE	160	0	6	12	24	5	110
07	APRICOTS	161	2.3	40	61	20	28	1047
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>								
25	SALMON	254	25.1	70	341	939	29	329
72	SPAGHETTI	213	20.3	26	30	588	34	320
32	M. POTATOES	174	3.4	59	79	426	19	297
73	GREEN BEANS	68	2.8	70	77	389	20	232
27	STRAWBERRIES	89	0.6	22	26	6	13	144
02	B.S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
50	INSTANT B.F.	204	15.1	503	400	269	145	771
TOTALS **		3593	169.4	1372	2505	5600	477	5631
NOMINAL MINERAL TABLETS REQ'D			0	0	5	0	0	0

OPTIONAL SALT - 3.5 PACKS. OPTIONAL CALORIES - N/A.

*Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 34. Continued.

		LOUSMA CSM MENU B MD-2 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
43	APPLESAUCE	160	0	6	12	24	5	110
58	COCOA	204	4.0	74	169	196	36	460
42	G. DRINK	122	0	4	1	15	1	1
<u>MEAL B</u>								
71	VEAL	188	32.7	23	274	733	35	574
72	SPAGHETTI	213	20.3	26	30	588	34	320
49	POTATO SALAD	150	5.8	20	65	603	16	190
46	PEACHES	184	0	2	27	33	11	206
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
74	MACARONI	184	7.9	104	153	373	28	98
56	PEAS	115	5.3	60	118	932	21	187
56	PEAS	115	5.3	60	118	932	21	187
47	PEARS	178	0	12	12	25	8	122
69	AMBROSIA	173	2.0	27	65	15	32	196
60	O. DRINK	119	0	73	92	61	1	91
50	INSTANT B.F.	204	15.1	503	400	269	145	771
<u>SNACK</u>								
02	B.S. PUDDING	179	3.2	126	96	248	11	166
23	LEMONADE	82	0.1	11	6	28	0	3
<u>TOTALS**</u>		3597	162.0	1381	2327	6807	510	4704
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	1	0	0	0	0

OPTIONAL SALT - 5 PACKS. OPTIONAL CALORIES - 303.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 34. Continued.

5-9

		LOUSMA CSM MENU C MD-3 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
13	SAUSAGE	160	17.2	6	143	436	17	249
58	COCOA	204	4.0	74	169	196	36	460
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
03	TUNA	108	8.2	17	65	432	12	149
75	BREAD	99	2.5	31	48	207	8	44
45	POTATO SOUP	185	2.7	14	169	525	15	379
57	CHICK & GRAVY	137	15.9	26	196	1225	18	207
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
38	PINEAPPLE	168	0	21	8	26	28	152
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
32	M. POTATOES	174	3.4	59	79	426	19	297
65	CORN	127	3.6	5	85	435	26	318
65	CORN	127	3.6	5	85	435	26	318
48	BISCUIT	49	1.0	2	11	103	3	16
27	STRAWBERRIES	89	0.6	22	26	6	13	144
02	B.S. PUDDING	179	3.2	126	96	248	11	166
50	INSTANT B.F.	204	15.1	503	400	269	145	771
42	G. DRINK	122	0	4	1	15	1	1
<u>SNACK</u>								
07	APRICOTS	161	2.3	40	61	20	28	1047
04	LEMON PUDDING	186	0	10	0	126	7	97
<u>TOTALS**</u>		3316	150.7	1355	2590	7135	514	5971
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - 284.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 34. Continued.

		LOUSMA CSM MENU D MD-4 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
13	SAUSAGE	160	17.2	6	143	436	17	249
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
79	G.F. DRINK	122	0	86	124	76	0	395
58	COCOA	204	4.0	74	169	196	36	460
<u>MEAL B</u>								
37	PEA SOUP	217	6.8	22	169	857	28	416
71	VEAL	188	32.7	23	274	733	35	574
22	ASPARAGUS	25	3.1	18	67	179	11	154
49	POTATO SALAD	150	5.8	20	65	603	16	190
02	B.S. PUDDING	179	3.2	126	96	248	11	166
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
51	SHRIMP	73	12.6	61	106	177	28	176
26	PORK LOIN	369	30.0	54	211	895	31	380
32	M. POTATOES	174	3.4	59	79	426	19	297
56	PEAS	115	5.3	60	118	932	21	187
43	APPLESAUCE	160	0	6	12	24	5	110
23	LEMONADE	82	0.1	11	6	28	0	3
50	INSTANT B.F.	204	15.1	503	400	269	145	771
69	AMBROSIA	173	2.0	27	65	15	32	196
<u>SNACK</u>								
04	LEMON PUDDING	186	0	10	0	126	7	97
<u>TOTALS**</u>		3289	161.3	1384	2379	6838	497	5304
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

OPTIONAL SALT - 5.5 PACKS. OPTIONAL CALORIES - 311.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 35. COL. GERALD P. CARR, CDR SKYLAP 2, COMMAND MODULE MENUS

FOR INITIAL FOUR MISSION DAYS.

		CARR						
		CSM MENU A MD-1 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	.K mg
<u>MEAL A</u>								
*	EGGS (80 GMS)	132	9.9	48	166	119	18	107
21	FILET	312	44.6	8	396	135	47	681
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
*	BUTTER(40 GMS)	288	0	8	12	4	0	8
80	S.B. DRINK	122	0	88	110	63	0	95
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
53	TURKEY R. SOUP	94	11.9	18	128	974	12	125
03	TUNA	108	8.2	17	65	432	12	149
75	BREAD	99	2.5	31	48	207	8	44
02	B.S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
07	APRICOTS	161	2.3	40	61	20	28	1047
<u>MEAL C</u>								
59	PORK & POTATO	158	12.9	57	153	270	24	345
64	TOMATOES	82	1.4	66	41	520	22	357
48	BISCUIT	49	1.0	2	11	103	3	16
69	AMBROSIA	173	2.0	27	65	15	32	196
62	COFFEE-W/S	51	0	5	11	1	11	109
62	COFFEE-W/S	51	0	5	11	1	11	109
60	O. DRINK	119	0	73	92	61	1	91
66	TEA	80	0.1	1	3	10	2	33
TOTALS***		2745	102.5	808	1717	3526	267	4045
NOMINAL MINERAL TABLETS REQ'D				0	0	4	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - N/A.

*Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 35. Continued.

Food No.	ITEM	CARR CSM MENU B MD-2 ONLY						
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
13	SAUSAGE	160	17.2	6	143	436	17	249
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
79	G.F. DRINK	122	0	86	124	76	0	395
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
71	VEAL	188	32.7	23	274	733	35	574
48	BISCUIT	49	1.0	2	11	103	3	16
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
69	AMBROSIA	173	2.0	27	65	15	32	196
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
32	M. POTATOES	174	3.4	59	79	426	19	297
22	ASAPRAGUS	25	3.1	18	67	179	11	154
38	PINEAPPLE	168	0	21	8	26	28	152
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>SNACK</u>								
04	LEMON PUDDING	186	0	10	0	126	7	97
60	O. DRINK	119	0	73	92	61	1	91
80	S.B. DRINK	122	0	88	110	63	0	95
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>TOTALS**</u>		2440	108.5	693	1705	3976	266	3567
<u>NOMINAL MINERAL TABLETS REQ'D</u>				3	0	2	0	0

OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 310.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 35. Continued.

		CARR CSM MENU C MD-3 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
13	SAUSAGE	160	17.2	6	143	436	17	249
48	BISCUIT	49	1.0	2	11	103	3	16
79	G.F. DRINK	122	0	86	124	76	0	395
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
36	JAM	99	0	6	5	13	4	32
75	BREAD	99	2.5	31	48	207	8	44
04	LEMON PUDDING	186	0	10	0	126	7	97
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
63	BEEF HASH	207	26.1	18	259	2025	35	545
48	BISCUIT	49	1.0	2	11	103	3	16
64	TOMATOES	82	1.4	66	41	520	22	357
27	STRAWBERRIES	89	0.6	22	26	6	13	144
62	COFFEE-W/S	51	0	5	11	1	11	109
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
62	COFFEE-W/S	51	0	5	11	1	11	109
62	COFFEE-W/S	51	0	5	11	1	11	109
05	PEANUTS	263	11.5	25	185	336	83	403
80	S.B. DRINK	122	0	88	110	63	0	95
<u>TOTALS**</u>		2481	96.8	754	1659	5091	353	3699
<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	0	0	0

OPTIONAL SALT - 0.5 PACKS. OPTIONAL CALORIES - 269.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 35. Continued.

Food No.	ITEM	CARR CSM MENU D MD-4 ONLY						
		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
54	R. KRISPIES	132	5.2	134	133	292	23	214
31	COFFEE CAKE	210	4.1	39	60	210	12	94
27	STRAWBERRIES	89	0.6	22	26	6	13	144
62	COFFEE-W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
71	VEAL	188	32.7	23	274	733	35	574
48	BISCUIT	49	1	2	11	103	3	16
46	PEACHES	184	0	7	27	33	11	206
80	S.B. DRINK	122	0	88	110	63	0	95
<u>MEAL C</u>								
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
32	M. POTATOES	174	3.4	59	79	426	19	297
72	GREEN BEANS	68	2.8	70	77	389	20	232
47	PEARS	178	0	12	12	25	8	122
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
79	G.F. DRINK	122	0	86	124	76	0	395
62	COFFEE-W/S	51	0	5	11	1	11	109
62	COFFEE-W/S	51	0	5	11	1	11	109
04	LEMON PUDDING	186	0	10	0	126	7	97
05	PEANUTS	263	11.5	25	185	336	83	403
<u>TOTALS**</u>		2456	101.6	697	1657	3946	318	3846
<u>NOMINAL MINERAL TABLETS REQ'D</u>				3	0	2	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 294.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 36. EDWARD G. GIBSON, Ph.D., SPT SKYLAB 4, COMMAND MODULE

MENUS FOR INITIAL FOUR MISSION DAYS.

		GIBSON CSM MENU A MD-1 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
*	EGGS (80 GMS)	132	9.9	48	166	119	18	107
21	FILET	312	44.6	8	396	135	47	681
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
*	BUTTER(15 GMS)	108	0	3	5	1	0	3
79	G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL B</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
46	PEACHES	184	0	7	27	33	11	206
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
<u>MEAL C</u>								
53	TURKEY R. SOUP	94	11.9	18	128	974	12	125
72	SPAGHETTI	213	20.3	26	30	588	34	320
56	PEAS	115	5.3	60	118	932	21	187
75	TOMATOES	82	1.4	66	41	520	22	357
02	B.S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
<u>TOTALS**</u>		2542	112.4	730	1653	4613	268	3221
<u>NOMINAL MINERAL TABLETS REQ'D</u>				2	0	4	0	0

DATE

DATE

OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - N/A.

*Fresh items for Meal A only eaten on ground.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 36. Continued.

		GIBSON CSM MENU B MD-2 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
13	SAUSAGE	160	17.2	6	143	436	17	249
15	CORN FLAKES	157	4.8	119	113	261	13	198
60	O. DRINK	119	0	73	92	61	1	91
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>								
57	CHICK & GRAVY	137	15.9	26	196	1225	18	207
64	TOMATOES	82	1.4	66	41	520	22	357
48	BISCUIT	49	1.0	2	11	103	3	16
02	B.S. PUDDING	179	3.2	126	96	248	11	166
79	G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
71	VEAL	188	32.7	23	274	733	35	574
75	BREAD	99	2.5	31	48	207	8	44
47	PEARS	178	0	12	12	25	8	122
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
23	LEMONADE	82	0.1	11	6	28	0	3
<u>TOTALS**</u>		2262	103.9	771	1555	4646	237	3071
<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	4	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 288.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 36. Continued.

		GIBSON CSM MENU C MD-3 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
17	BACON	127	15.0	8	117	743	13	212
50	INSTANT B.F.	204	15.1	503	400	269	145	771
48	BISCUIT	49	1.0	2	11	103	3	16
36	JAM	99	0	6	5	13	4	32
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>								
59	PORK & POTATO	158	12.9	57	153	270	24	345
48	BISCUIT	49	1.0	2	11	103	3	16
47	PEARS	178	0	12	12	25	8	122
42	G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>								
45	POTATO SOUP	185	2.7	14	169	525	15	379
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
22	ASPARAGUS	25	3.1	18	67	179	11	154
38	PINEAPPLE	168	0	21	8	26	28	152
79	G.F. DRINK	122	0	86	124	76	0	395
<u>SNACK</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
42	G. DRINK	122	0	4	1	15	1	1
<u>TOTALS**</u>		2245	103.5	792	1663	3997	381	3473
<u>NOMINAL MINERAL TABLETS REQ'D</u>				1	0	8	0	0

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OPTIONAL SALT - 8 PACKS. OPTIONAL CALORIES - 305.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 36. Continued.

		GIBSON CSM MENU D MD-4 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
17	BACON	127	15.0	8	117	743	13	212
54	R. KRISPIES	132	5.2	134	133	292	23	214
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>								
34	CHILI	331	19.4	48	198	2042	43	643
48	BISCUIT	49	1.0	2	11	103	3	16
46	PEACHES	184	0	7	27	33	11	206
79	G.F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>								
21	FILET	312	44.6	8	396	135	47	681
49	POTATO SALAD	150	5.8	20	55	603	16	190
73	GREEN BEANS	68	2.8	70	77	389	20	232
02	B.S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
27	STRAWBERRIES	89	0.6	22	26	6	13	144
60	O. DRINK	119	0	73	92	61	1	91
<u>TOTALS**</u>		2259	100.3	715	1510	5022	216	3390
<u>NOMINAL MINERAL TABLETS REQ'D</u>				3	0	2	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 291.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 37. COL. WILLIAM R. POGUE, PLT SKYLAB 4, COMMAND MODULE

MENUS FOR INITIAL FOUR MISSION DAYS.

		POGUE						
		CSM MENU A MD-1 ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
* EGGS (80 GMS)	132	9.9	48	166	119	18	107	
31 COFFEE CAKE	210	4.1	39	60	210	12	94	
21 FILET	312	44.6	8	396	135	47	681	
* BUTTER(5 GMS)	36	0	1	1	0	0	1	
60 O. DRINK	119	0	73	92	61	1	91	
62 COFFEE	7	0	5	11	1	11	109	
<u>MEAL B</u>								
03 TUNA	108	8.2	17	65	432	12	149	
48 BISCUIT	49	1.0	2	11	103	3	16	
48 BISCUIT	49	1.0	2	11	103	3	16	
02 B. S. PUDDING	179	3.2	126	96	248	11	166	
07 APRICOTS	161	2.3	40	61	20	28	1047	
27 STRAWBERRIES	89	0.6	22	26	6	13	144	
42 G. DRINK	122	0	4	1	15	1	1	
42 G. DRINK	122	0	4	1	15	1	1	
<u>MEAL C</u>								
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539	
64 TOMATOES	82	1.4	66	41	520	22	357	
74 MACARONI	184	7.9	104	153	373	28	98	
46 PEACHES	184	0	7	27	33	11	206	
04 LEMON PUDDING	186	0	10	0	126	7	97	
60 O. DRINK	119	0	73	92	61	1	91	
60 O. DRINK	119	0	73	92	61	1	91	
<u>TOTALS**</u>		2788	124.5	756	1817	3706	281	4102
<u>NOMINAL MINERAL TABLETS REQ'D</u>			3	0	8	0	0	

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OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - N/A.
 * Fresh items for Meal A only eaten on ground.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 37. Continued.

Food ITEM No.	POGUE CSM MENU B MD-2 ONLY						
	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
07 APRICOTS	161	2.3	40	61	20	28	1047
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
57 CHICK & GRAVY	137	15.9	26	196	1225	18	207
73 GREEN BEANS	68	2.8	70	77	389	20	232
47 PEARS	178	0	12	12	25	8	122
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
71 VEAL	188	32.7	23	274	733	35	574
32 M. POTATOES	174	3.4	59	79	426	19	297
48 BISCUIT	49	1.0	2	11	103	3	16
48 BISCUIT	49	1.0	2	11	103	3	16
27 STRAWBERRIES	89	0.6	22	26	6	13	144
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
05 PEANUTS	263	11.5	25	185	336	83	403
67 DRIED BEEF	48	9.9	3	92	1352	11	200
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
42 G. DRINK	122	0	4	1	15	1	1
42 G. DRINK	122	0	4	1	15	1	1
TOTALS**	2504	111.3	752	1787	5950	314	4439
NOMINAL MINERAL TABLETS REQ'D			3	0	0	0	0

OPTIONAL SALT - 1.5 PACKS. OPTIONAL CALORIES - 296.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 37. Continued.

		POGUE CSM MENU C MD-3 ONLY						
Food ITEM No.		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
63	BEEF HASH	207	26.1	18	259	2025	35	545
47	PEARS	178	0	12	12	25	8	122
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
60	O. DRINK	119	0	73	92	61	1	91
62	COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>								
25	SALMON	254	25.1	70	341	939	29	329
73	GREEN BEANS	68	2.8	70	77	389	20	232
38	PINEAPPLE	168	0	21	8	26	28	152
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>								
72	SPAGHETTI	213	20.3	26	30	588	34	320
22	ASPARAGUS	25	3.1	18	67	179	11	154
65	CORN	127	3.6	5	85	435	26	318
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>								
05	PEANUTS	263	11.5	25	185	336	83	403
62	COFFEE	7	0	5	11	1	11	109
62	COFFEE	7	0	5	11	1	11	109
<u>TOTALS**</u>		2505	109.7	760	1762	6051	344	3601
<u>NOMINAL MINERAL TABLETS REQ'D</u>				3	0	0	0	0

OPTIONAL SALT - 0.5 PACKS. OPTIONAL CALORIES - 295.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 37. Continued.

Food ITEM No.	POGUE CSM MENU D MD-4 ONLY						
	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
15 CORN FLAKES	157	4.8	119	113	261	13	198
38 PINEAPPLE	168	0	21	8	26	28	152
60 O. DRINK	119	0	73	92	61	1	91
62 COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>							
40 TURKEY & GRAVY	219	40.3	32	414	1064	50	539
48 BISCUIT	49	1.0	2	11	103	3	16
02 B. S. PUDDING	179	3.2	126	96	248	11	166
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>							
21 FILET	312	44.6	8	396	135	47	681
73 GREEN BEANS	68	2.8	70	77	389	20	232
46 PEACHES	184	0	7	27	33	11	206
75 BREAD	99	2.5	31	48	207	8	44
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91
<u>SNACK</u>							
67 DRIED BEEF	48	9.9	3	92	1352	11	200
42 G. DRINK	122	0	4	1	15	1	1
04 LEMON PUDDING	186	0	10	0	126	7	97
62 COFFEE	7	0	5	11	1	11	109
62 COFFEE	7	0	5	11	1	11	109
TOTALS**	2528	122.4	816	1815	4684	267	3437
NOMINAL MINERAL TABLETS REQ'D			1	0	3	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - 272.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

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TABLE 38. CAPTAIN CHARLES CONRAD, CDR SKYLAB 2, COMMAND MODULE

MENUS FOR LAST MISSION DAY.

		CONRAD CSM MENU E MD-29 ONLY						
Food Item No.		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
17	BACON	127	15.0	8	117	743	13	212
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
47	PEARS	178	0	12	12	25	8	122
79	G. F. DRINK	122	0	86	124	76	0	395
62	COFFEE - W/S	51	0	5	11	1	11	109
<u>MEAL B</u>								
25	SALMON	254	25.1	70	341	939	29	329
75	BREAD	99	2.5	31	48	207	8	44
02	B. S. PUDDING	179	3.2	126	96	248	11	166
79	G. F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>								
71	VEAL	188	32.7	23	274	733	35	574
64	TOMATOES	82	1.4	66	41	520	22	357
65	CORN	127	3.6	5	85	435	26	318
75	BREAD	99	2.5	31	48	207	8	44
38	PINEAPPLE	168	0	21	8	26	28	152
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
60	O. DRINK	119	0	73	92	61	1	91
42	G. DRINK	122	0	4	1	15	1	1
<u>TOTALS **</u>		2542	103.0	835	1719	5174	234	3644
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

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OPTIONAL SALT - 3.0 PACKS. OPTIONAL CALORIES - N/A.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 39. CMDR. JOSEPH P. KERWIN, M.D., SPT SKYLAB 2, COMMAND MODULE

MENUS FOR LAST MISSION DAY.

KERWIN
CSM MENU E MD-29 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>							
16 EGGS	199	13.0	147	217	519	17	239
13 SAUSAGE	160	17.2	6	143	436	17	249
46 PEACHES	184	0	7	27	33	11	206
75 BREAD	99	2.5	31	48	207	8	44
36 JAM	99	0	6	5	13	4	32
79 G. F. DRINK	122	0	86	124	76	0	395
66 TEA	80	0.1	1	3	10	2	33
66 TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>							
03 TUNA	108	8.2	17	65	432	12	149
75 BREAD	99	2.5	31	48	207	8	44
02 B. S. PUDDING	179	3.2	126	96	248	11	166
76 BUTTER COOKIES	142	1.4	4	14	9	3	17
05 PEANUTS	263	11.5	25	185	336	83	403
60 O. DRINK	119	0	73	92	61	1	91
<u>MEAL C</u>							
71 VEAL	188	32.7	23	274	733	35	574
65 CORN	127	3.6	5	85	435	26	318
64 TOMATOES	82	1.4	66	41	520	22	357
75 BREAD	99	2.5	31	48	207	8	44
38 PINEAPPLE	168	0	21	8	26	28	152
28 VANILLA WAFERS	108	1.5	4	27	123	4	20
60 O. DRINK	119	0	73	92	61	1	91
60 O. DRINK	119	0	73	92	61	1	91

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TOTALS **	2943	101.4	857	1737	4763	304	3748
NOMINAL MINERAL TABLETS REQ'D			0	0	0	0	0

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - N/A.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 40. CMDR. PAUL J. WEITZ, PLT SKYLAB 2, COMMAND MODULE MENUS FOR

LAST MISSION DAY

WEITZ
CSM MENU E MD-29 ONLY

Food Item No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
07 APRICOTS	161	2.3	40	61	20	28	1047	
50 INSTANT B. F.	204	15.1	503	400	269	145	771	
13 SAUSAGE	160	17.2	6	143	436	17	249	
46 PEACHES	184	0	7	27	33	11	206	
42 G. DRINK	122	0	4	1	15	1	1	
62 COFFEE - W/S	51	0	5	11	1	11	109	
<u>MEAL B</u>								
71 VEAL	188	32.7	23	274	733	35	574	
65 CORN	127	3.6	5	85	435	26	318	
28 VANILLA WAFERS	108	1.5	4	27	123	4	20	
47 PEARS	178	0	12	12	25	8	122	
66 TEA	80	0.1	1	3	10	2	33	
42 G. DRINK	122	0	4	1	15	1	1	
<u>MEAL C</u>								
45 POTATO SOUP	185	2.7	14	169	525	15	379	
55 CHICK & RICE	208	17.8	27	245	834	24	267	
64 TOMATOES	82	1.4	66	41	520	22	357	
56 PEAS	115	5.3	60	118	932	21	187	
04 LEMON PUDDING	186	0	10	0	126	7	97	
75 BREAD	99	2.5	31	48	207	8	44	
76 BUTTER COOKIES	142	1.4	4	14	9	3	17	
42 G. DRINK	122	0	4	1	15	1	1	
42 G. DRINK	122	0	4	1	15	1	1	
<u>TOTALS **</u>		2946	103.6	834	1682	5298	391	4801
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

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OPTIONAL SALT - 0 PACKS. OPTIONAL CALORIES - N/A.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

**TABLE 41. CAPTAIN ALAN L. BEAN, CDR SKYLAB 3, COMMAND MODULE MENUS
FOR LAST MISSION DAY.**

		BEAN CSM MENU E MD-57 ONLY						
Food No.	ITEM	cal	Prot. gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
50	INSTANT B.F.	204	15.1	503	400	269	145	771
47	PEARS	178	0	12	12	25	8	122
48	BISCUIT	49	1.0	2	11	103	3	16
36	JAM	99	0	6	5	13	4	32
07	APRICOTS	161	2.3	40	61	20	28	1047
<u>MEAL B</u>								
55	CHICK & RICE	208	17.8	27	245	834	24	267
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
04	LEMON PUDDING	186	0	10	0	126	7	97
23	LEMONADE	82	0.1	11	6	28	0	3
23	LEMONADE	82	0.1	11	6	28	0	3
<u>MEAL C</u>								
72	SPAGHETTI	213	20.3	26	30	588	34	320
73	GREEN BEANS	68	2.8	70	77	389	20	232
65	CORN	127	3.6	5	85	435	26	318
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
46	PEACHES	184	0	7	27	33	11	206
23	LEMONADE	82	0.1	11	6	28	0	3
TOTALS**		2766	89.8	791	1348	3984	461	4071
NOMINAL MINERAL TABLETS REQ'D			0	1	4	0	0	0

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OPTIONAL SALT - 9 PACKS. OPTIONAL CALORIES - N/A.
**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 42. OWEN K. GARRIOTT, Ph.D., SPT SKYLAB 3, COMMAND MODULE MENUS
FOR LAST MISSION DAY.

		GARRIOTT CSM MENU E MD-57-ONLY						
Food ITEM No.	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg	
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
67	DRIED BEEF	48	9.9	3	92	1352	11	200
47	PEARS	178	0	12	12	25	8	122
48	BISCUIT	49	1.0	2	11	103	3	16
58	COCOA	204	4.0	74	169	196	36	460
05	PEANUTS	263	11.5	25	185	336	83	403
<u>MEAL B</u>								
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
36	JAM	99	0	6	5	13	4	32
75	BREAD	99	2.5	31	48	207	8	44
02	B. S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
79	G. F. DRINK	122	0	86	124	76	0	395
<u>MEAL C</u>								
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
65	CORN	127	3.6	5	85	435	26	318
73	GREEN BEANS	68	2.8	70	77	389	20	232
75	BREAD	99	2.5	31	48	207	8	44
38	PINEAPPLE	168	0	21	8	26	28	152
60	O. DRINK	119	0	73	92	61	1	91
<u>TOTALS**</u>		2557	96.0	807	1816	5315	378	3776
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

OPTIONAL SALT - 7 PACKS. OPTIONAL CALORIES - N/A.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

DATE

DATE

TABLE 43. MAJOR JACK LOUSMA, PLT SKYLAB 4, COMMAND MODULE MENUS
FOR LAST MISSION DAY.

		LOUSMA CSM MENU E MD-57 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
16	EGGS	199	13.0	147	217	519	17	239
13	SAUSAGE	160	17.2	6	143	436	17	249
07	APRICOTS	161	2.3	40	61	20	28	1047
47	PEARS	178	0	12	12	25	8	122
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
<u>MEAL B</u>								
03	TUNA	108	8.2	17	65	432	12	149
75	BREAD	99	2.5	31	48	207	8	44
53	TURKEY R. SOUP	94	11.9	18	128	974	12	125
71	VEAL	188	32.7	23	274	733	35	574
73	GREEN BEANS	68	2.8	70	77	389	20	232
04	LEMON PUDDING	186	0	10	0	126	7	97
28	VANILLA WAFERS	108	1.5	4	27	123	4	20
38	PINEAPPLE	168	0	21	8	26	28	152
42	G. DRINK	122	0	4	1	15	1	1
42	G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>								
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
65	CORN	127	3.6	5	85	435	26	318
65	CORN	127	3.6	5	85	435	26	318
32	M. POTATOES	174	3.4	59	79	426	19	297
46	PEACHES	184	0	7	27	33	11	206
27	STRAWBERRIES	89	0.6	22	26	6	13	144
02	B.S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
50	INSTANT B.F.	204	15.1	503	400	269	145	771
<u>TOTALS**</u>		3621	161.9	1385	2550	7139	502	6084
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - N/A.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 44. COL. GERALD P. CARR, CDR SKYLAB 4, COMMAND MODULE

MENUS FOR LAST MISSION DAY.

		CARR CSM MENU E MD-57 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
17	BACON	127	15.0	8	117	743	13	212
62	COFFEE-W/S	51	0	5	11	1	11	109
62	COFFEE-W/S	51	0	5	11	1	11	109
60	O. DRINK	119	0	73	92	61	1	91
60	O. DRINK	119	0	73	92	61	1	91
41	LEMON DROPS	234	0	1	0	13	0	3
<u>MEAL B</u>								
03	TUNA	108	8.2	17	65	432	12	149
75	BREAD	99	2.5	31	48	207	8	44
02	B.S. PUDDING	179	3.2	126	96	248	11	166
25	LEMONADE	82	0.1	11	6	28	0	3
60	O. DRINK	119	0	73	92	61	1	91
07	APRICOTS	161	2.3	40	61	20	28	1047
<u>MEAL C</u>								
51	SHRIMP	73	12.6	61	106	177	28	176
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
56	PEAS	115	5.3	60	118	932	21	187
22	ASPARAGUS	25	3.1	18	67	179	11	154
48	BISCUIT	49	1.0	2	11	103	3	16
46	PEACHES	184	0	7	27	33	11	206
66	TEA	80	0.1	1	3	10	2	33
66	TEA	80	0.1	1	3	10	2	33
42	G. DRINK	122	0	4	1	15	1	1
<u>TOTALS**</u>		2751	101.1	805	1607	4880	251	3734
<u>NOMINAL MINERAL TABLETS REQ'D</u>				0	0	0	0	0

OPTIONAL SALT - 3 PACKS. OPTIONAL CALORIES - N/A.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 45. EDWARD G. GIBSON, PH.D., SPT SKYLAB 4, COMMAND MODULE

MENUS FOR LAST MISSION DAY.

		GIBSON CSM MENU E MD-57 ONLY						
Food No.	ITEM	cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
50	INSTANT B.F.	204	15.1	503	400	269	145	771
47	PEARS	178	0	12	12	25	8	122
33	PEANUT BUTTER	240	9.9	18	145	255	67	273
48	BISCUIT	49	1.0	2	11	103	3	16
48	BISCUIT	49	1.0	2	11	103	3	16
36	JAM	99	0	6	5	13	4	32
60	O. DRINK	119	0	73	92	61	1	91
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL B</u>								
72	SPAGHETTI	213	20.3	26	30	588	34	320
64	TOMATOES	82	1.4	66	41	520	22	357
43	APPLESAUCE	160	0	6	12	24	5	110
04	LEMON PUDDING	186	0	10	0	126	7	97
42	G. DRINK	122	0	4	1	15	1	1
<u>MEAL C</u>								
45	POTATO SOUP	185	2.7	14	169	525	15	379
40	TURKEY & GRAVY	219	40.3	32	414	1064	50	539
22	ASAPARGUS	25	3.1	18	67	179	11	154
46	PEACHES	184	0	7	27	33	11	206
48	BISCUIT	49	1.0	2	11	103	3	16
23	LEMONADE	82	0.1	11	6	28	0	3
<u>TOTALS**</u>		2525	96.3	813	1457	4044	392	3536
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	7	0	0	

DATE

DATE

OPTIONAL SALT - 8.5 PACKS. OPTIONAL CALORIES - N/A.
 **TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D",
 OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 46. COL. WILLIAM R. POGUE, PLT SKYLAB 4, COMMAND MODULE

MENUS FOR LAST MISSION DAY.

		POGUE						
		CSM MENU E 11D-57 ONLY						
Food ITEM No.		cal	Prot gm	Ca mg	P mg	Na mg	Mg mg	K mg
<u>MEAL A</u>								
15	CORN FLAKES	157	4.8	119	113	261	13	198
17	BACON	127	15.0	8	117	743	13	212
75	BREAD	99	2.5	31	48	207	8	44
36	JAM	99	0	6	5	13	4	32
60	O. DRINK	119	0	73	92	61	1	91
62	COFFEE	7	0	5	11	1	11	109
62	COFFEE	7	0	5	11	1	11	109
<u>MEAL B</u>								
71	VEAL	188	32.7	23	274	733	35	574
65	CORN	127	3.6	5	85	435	26	318
69	AMBROSIA	173	2.0	27	65	15	32	196
48	BISCUIT	49	1.0	2	11	103	3	16
42	G. DRINK	122	0	4	1	15	1	1
42	G. DRINK	122	0	4	1	15	1	1
62	COFFEE	7	0	5	11	1	11	109
05	PEANUTS	263	11.5	25	185	336	83	403
66	TEA	80	0.1	1	3	10	2	33
66	TEA	80	0.1	1	3	10	2	33
<u>MEAL C</u>								
57	CHICK & GRAVY	137	15.9	26	196	1225	18	207
74	MACARONI	184	7.9	104	153	373	23	98
64	TOMATOES	82	1.4	66	41	520	22	357
73	GREEN BEANS	68	2.8	70	77	389	20	232
75	BREAD	99	2.5	31	48	207	8	44
02	B. S. PUDDING	179	3.2	126	96	248	11	166
60	O. DRINK	119	0	73	92	61	1	91
42	G. DRINK	122	0	4	1	15	1	1
<u>TOTALS**</u>		2216	107.0	844	1740	5998	366	3675
<u>NOMINAL MINERAL TABLETS REQ'D</u>			0	0	0	0	0	0

DATE

DATE

OPTIONAL SALT - 1 PACKS. OPTIONAL CALORIES - N/A.

**TOTALS do not include "NOMINAL MINERAL TABLETS REQ'D", OPTIONAL SALT, or OPTIONAL CALORIES.

TABLE 47. CAPTAIN CHARLES CONRAD, CDR SKYLAB 2, MOBILE

LABORATORY MENUS

TO BE DETERMINED

TABLE 48. CMDR. JOSEPH P. KERWIN, M.D., SPT SKYLAB 2 MOBILE

LABORATORY MENUS

TO BE DETERMINED

TABLE 49. CMDR. PAUL J. WEITZ, PLT SKYLAB 2, MOBILE

LABORATORY MENUS

TO BE DETERMINED

TABLE 50. CAPTAIN ALAN L. BEAN, CDR SKYLAB 3,
MOBILE LABORATORY MENUS

TO BE DETERMINED




TABLE 51. OWEN K. GARRIOTT, Ph.D., SPT SKYLAB 3, MOBILE LABORATORY

MENUS

TO BE DETERMINED.

TABLE 52. MAJOR JACK LOUSMA, PLT SKYLAB 3, MOBILE

LABORATORY MENUS

TO BE DETERMINED

TABLE 53. COL. GERALD P. CARR, CDR SKYLAB 4, MOBILE

LABORATORY MENUS

TO BE DETERMINED

TABLE 54. EDWARD G. GIBSON, Ph.D., SPT SKYLAB 4,
MOBILE LABORATORY MENUS

TO BE DETERMINED

TABLE 55. COL. WILLIAM R. POGUE, PLT SKYLAB 4

MOBILE LABORATORY MENUS

TO BE DETERMINED

TABLE 56. PRE - POSTFLIGHT MENUS, CAPTAIN CHARLES CONRAD, CDR, Skylab 2

Day 1
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Strawberries
Coffee with Sugar
Milk (240 ml)

MEAL B

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
French Dressing (40 gms)
Chicken and Gravy
Pineapple
Biscuit
Coke (300 ml)

MEAL C

Veal and BBQ Sauce
Baked Potato (200 gms)
SF Butter (20 gms)
Green Beans
Chocolate Ice Cream (130 gms)
Strawberry Drink
SNACKS: peanuts
Coffee with Sugar

SUPPLEMENTS NECESSARY:

Sodium: 2 or 4 salt Packets
MAY USE 9 1/2 EXTRA SALT PACKETS

Day 2
MEAL A

Coffee Cake
SF Butter (10 gms)
Milk (240 ml)
Coffee with Sugar

MEAL B

Hot Dogs
Stewed Tomatoes
Strawberries
Orange Drink

MEAL C

Lettuce Wedge Salad (150 gms)
French Dressing (20 gms)
Filet Mignon
Asparagus
Baked Potato (200 gms)
SF Butter (20 gms)
Vanilla Ice Cream
Orange Drink
SNACKS: Vanilla Wafers
Coffee with Sugar

SUPPLEMENTS NECESSARY:

CALCIUM: 1
SODIUM: 4 or 6 1/2 SALT PACKETS.
MAY USE 8 EXTRA SALT PACKETS.

Day 3
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Sausage Patties
Bread Jam
SF Butter (10 gms)
Coffee with Sugar

MEAL B

Pork and Scalloped Potatoes
Creamed Peas
Strawberries
Biscuit
Coke (300 ml)

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
French Dressing (40 gms)
Veal and BBQ Sauce
Green Beans
Chocolate Ice Cream (130 gms)
Orange Drink
SNACKS: Peanuts
Coffee with Sugar
Orange Drink

SUPPLEMENTS NECESSARY:

CALCIUM: 4
MAY USE 9 EXTRA SALT PACKETS.

TABLE 56. PRE - POSTFLIGHT MENUS, CAPTAIN CHARLES CONRAD, CDR, Skylab 2 (Continued).

Day 4
MEAL A

Rice Krispies
Peaches
Milk (240 ml)
Coffee with Sugar

MEAL B

Sliced Tomato Salad
(Lettuce 10 gms)
(Tomato 150 gms)
French Dressing (40 gms)
Spaghetti with Meat
Butterscotch Pudding
Biscuit
Lemonade

MEAL C

Lettuce Wedge Salad (150 gms)
French Dressing (40 gms)
Filet Mignon
Baked Potato (200 gms)
SF Butter (20 gms)
Vanilla Ice Cream
Tea with Lemon and Sugar

SNACKS: Dried Beef
Coffee with Sugar

SUPPLEMENTS NECESSARY:
Phosphorus: 2
MAY USE 6 EXTRA SALT PACKETS.

Day 5
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bacon Wafers
Pears
Coffee with Sugar

MEAL B

Salmon Salad
Bread
Chocolate Ice Cream (130 gms)
Strawberry Drink

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
French Dressing (40 gms)
Pork Loin with Dressing
Asparagus
Pineapple
Grapefruit Drink

SNACKS: Dried Apricots
Grapefruit Drink
Coffee with Sugar

SUPPLEMENTS NECESSARY:
Calcium: 3
Sodium: 2 or 2 1/2 salt packets.
MAY USE 8 EXTRA SALT PACKETS.

Day 6
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Peaches
Coffee with Sugar

MEAL B

Lettuce Wedge Salad (150 gms)
French Dressing (40 gms)
Chili with Meat
Macaroni and Cheese
Butterscotch Pudding
Orange Drink

MEAL C

Shrimp Cocktail
Catsup
Prime Rib of Beef
Green Beans
Baked Potato (200 gms)
SF Butter (15 gms)
Vanilla Ice Cream
Lemonade

SNACKS: Coffee with Sugar
SUPPLEMENTS NECESSARY:
Calcium: 1

MAY USE 7 1/2 EXTRA SALT PACKETS

TABLE 57. PRE - POSTFLIGHT MENUS, DR. JOSEPH P. KERWIN, SPT, Skylab 2

Day 1	Day 2	Day 3
MEAL A	MEAL A	MEAL A
Scrambled Eggs (80 gms) SF Butter (5 gms) Sausage Pears Milk (240 ml) Coffee with Sugar	Scrambled Eggs (80 gms) SF Butter (5 gms) Bacon Wafers Peaches Grapefruit Drink Coffee with Sugar	Scrambled Eggs (80 gms) SF Butter (5 gms) Sausage Patties Bread Jam SF Butter (10 gms) Milk (240 ml) Coffee with Sugar
MEAL B	MEAL B	MEAL B
Salmon Salad Bread Creamed Corn Lemon Pudding Coke (300 ml)	Lettuce (10 gms) Tomato Slices (25 gms) Tuna Salad Spread Bread SF Butter (10 gms) Green Beans Strawberries Coke (300 ml)	Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gms) Spaghetti and Meat Sauce Catsup Asparagus Biscuit X 2 Vanilla Wafers Coke (300 ml)
MEAL C	MEAL C	MEAL C
Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Veal and BBQ Sauce Macaroni and Cheese Peaches Vanilla Ice Cream Tea with Lemon and Sugar X 2 Catsup	Shrimp Cocktail Prime Rib of Beef Stewed Tomatoes Baked Potato (200 gms) SF Butter (20 gms) Biscuit Chocolate Ice Cream (130 gms) Tea with Lemon and Sugar X 2	Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Lobster Newburg Baked Potato (200 gms) SF Butter (20 gms) Lemon Pudding Bread Lemonade
SNACKS: Coke (300 ml) Coffee with Sugar	SNACKS: Coffee with Sugar Dried Beef Orange Drink X 2	SNACKS: Dried Apricots Coffee with Sugar
SUPPLEMENTS NECESSARY: Sodium: 2; or 2 1/2 salt packets. MAY USE 8 1/2 EXTRA SALT PACKETS.	SUPPLEMENTS NECESSARY: Calcium: 2 MAY USE 9 1/2 EXTRA SALT PACKETS.	NO SUPPLEMENTS NECESSARY. MAY USE 9 EXTRA SALT PACKETS.

TABLE 57. PRE - POSTFLIGHT MENUS, DR. JOSEPH P. KERWIN, SPT, Skylab 2 (Continued)

Day 4 MEAL A	Day 5 MEAL A	Day 6 MEAL A
Sugar Coated Cornflakes	Scrambled Eggs (80 gms)	Scrambled Eggs (80 gms)
Bacon Wafers	SF Butter (5 gms)	SF Butter (5 gms)
Peaches	Sausage Patties	Bacon Wafers
Coffee with Sugar	Pears	Milk (240 mls)
Cocoa	Coffee with Sugar	Coffee with Sugar
MEAL B	MEAL B	MEAL B
Sliced Tomato Salad (Lettuce 10 gms) (Tomato 150 gms)	Pea Soup	Peanut Butter
Roka Blue Cheese Dressing (30 gms)	Macaroni and Cheese	Bread
Chili with Meat	Bread	Jam
Biscuit	Catsup	Strawberries
Strawberries	Coke (300 ml)	Vanilla Ice Cream
Coke (240 ml)		Coke (300 ml)
MEAL C	MEAL C	MEAL C
Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms)	Shrimp Cocktail	Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms)
Roka Blue Cheese Dressing (30 gms)	Pork Loin with Dressing	Blue Cheese Dressing (30 gms)
Filet Mignon	Creamed Peas	Filet Mignon
Creamed Style Corn	Baked Potato (200 gms)	Baked Potato (200 gms)
Pre-Buttered Roll	SF Butter (20 gms)	SF Butter (20 gms)
SF Butter (10 gms)	Strawberries	Biscuit
Chocolate Ice Cream (130 gms)	Vanilla Ice Cream	Pears
Tea with Lemon and Sugar	Grapefruit Drink	Orange Drink
SNACKS: Coffee with Sugar	SNACKS: Coffee with Sugar	Catsup
Orange Drink	Dried Apricots	SNACKS: Apricots
	Orange Drink	Coffee with Sugar
SUPPLEMENTS NECESSARY:	SUPPLEMENTS NECESSARY:	Dried Beef
Calcium: 4	Calcium: 1	
MAY USE 1 EXTRA SALT PACKET.	MAY USE 10 EXTRA SALT PACKETS.	SUPPLEMENTS NECESSARY:
		Calcium: 1
		Sodium: 3; or 6 1/2 Salt Packets.
		MAY USE 10 EXTRA SALT PACKETS.

TABLE 58. PRE - POSTFLIGHT MENUS, CMDR. P. J. WEITZ, PLT, Skylab 2

Day 1
MEAL A

Sugar Coated Cornflakes
Beef Hash
Milk (240 ml)
Grape Drink

MEAL B

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
Roka Blue Cheese Dressing (30 gms)
Spaghetti and Meat Sauce
Strawberries
Biscuit X 2
Coke (300 ml)

MEAL C

Lettuce Wedge Salad (150 gms)
French Dressing (30 gms)
Prime Rib of Beef
Baked Potato (250 gms)
SF Butter (20 gms)
Chocolate Ice Cream (130 gms)
Bread
Coke (240 ml)

SNACKS: Coffee with Sugar X 2
Tea with Lemon & Sugar

NO SUPPLEMENTS NECESSARY.
MAY USE 5 EXTRA SALT PACKETS.

Day 2
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bacon Wafers
Orange Drink
Coffee with Sugar

MEAL B

Peanut Butter
Jam
Biscuit
Peach Ambrosia
Coke (300 ml)

MEAL C

Lettuce Wedge Salad (150 gms)
French Dressing (40 gms)
Filet Mignon
Macaroni and Cheese
Stewed Tomatoes
Bread
Butterscotch Pudding
Tea with Lemon and Sugar

SNACKS: Chocolate Ice Cream (130 gms)
Dried Apricots
Coffee with Sugar
Orange Drink

SUPPLEMENTS NECESSARY:
Sodium: 3; or 5 1/2 salt packets
MAY USE 9 EXTRA SALT PACKETS.

Day 3
MEAL A

Sausage Patties
Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bread Jam
SF Butter (15 gms)
Milk (240 ml)
Coffee with Sugar

MEAL B

Chicken and Rice
Creamed Corn
Lemon Pudding
Coke (300 ml)

MEAL C

Sliced Tomato Salad
(Tomato 150 gms)
(Lettuce 10 gms)
Roka Blue Cheese Dressing (30g)
Lobster Newburg
Asparagus
Baked Potato (200 gms)
SF Butter (30 gms)
Peaches

Orange Drink

SNACKS: Coffee with Sugar
Butter Cookies
Grape Drink

SUPPLEMENTS NECESSARY:
Calcium: 2
Sodium: 1; or 1 salt packet
MAY USE 9 EXTRA SALT PACKETS

TABLE 58. PRE - POSTFLIGHT MENUS, CMDR. P. J. WEITZ, PLT, Skylab 2 (Continued).

Day 4
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bacon Wafers
Coffee with Sugar
Milk (240 ml)

MEAL B

Chili with Meat
Applesauce
Biscuit
Coke (300 ml)

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
French Dressing (40 gms)
Filet Mignon
Baked Potato (200 gms)
SF Butter (30 gms)
Stewed Tomatoes
Bread
Vanilla Ice Cream
Orange Drink

SNACKS: Coffee with Sugar
Lemon Pudding

NO SUPPLEMENTS NECESSARY.
MAY USE 1 EXTRA SALT PACKET.

Day 5
MEAL A

Sausage Patties
Bread Jam
SF Butter (15 gms)
Peaches
Coffee with Sugar
Milk (240 ml)

MEAL B

Veal and BBQ Sauce
Creamed Peas
Biscuit
Pears
Coke (300 ml)

MEAL C

Lettuce Wedge Salad (150 gms)
Roka Blue Cheese Dressing (30 gms)
Pork Loin with Dressing
Creamed Corn
Lemon Pudding
Tea with Lemon and Sugar

SNACKS: Coffee with Sugar
Apricots
Grapefruit Drink X 2

SUPPLEMENTS NECESSARY:

Calcium: 1
MAY USE 6 1/2 EXTRA SALT PACKETS.

Day 6
MEAL A

Rice Krispies
Scrambled Eggs (80 gms)
SF Butter (5 gms)
Milk (240 ml)
Coffee with Sugar

MEAL B

Hot Dogs
Biscuit X 2
Pears
Grape Drink

MEAL C

Sliced Tomato Salad
(Tomatoes 100 gms)
(Lettuce 10 gms)
Roka Blue Cheese Dressing (30 gm)
Filet Mignon
German Potato Salad
Chocolate Ice Cream (130 gms)
Tea with Lemon and Sugar

SNACKS: Coffee with Sugar
Vanilla Wafers
Lemonade
Grapefruit Drink

SUPPLEMENTS NECESSARY:

Sodium: 1; or 2 salt packets
MAY USE 10 EXTRA SALT PACKETS.

TABLE 59. PRE and POSTFLIGHT MENUS, CAPT. A. L. BEAN, C.D.R., Skylab 3

Day 1	Day 2	Day 3
MEAL A	MEAL A	MEAL A
Rice Krispies Bread Jam SF Butter (10 gms) Orange Drink	Scrambled Eggs (80 gms) SF Butter (5 gms) Pears Bread Jam SF Butter (10 gms) Orange Drink	Rice Krispies Bread Jam SF Butter (10 gms) Grapefruit Drink
MEAL B	MEAL B	MEAL B
Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 50 gms) Roka Blue Cheese Dressing (30 gms) Spaghettini and Meat Sauce Chocolate Ice Cream (130 gms) Biscuit X 2 Coca Cola (300 cc)	Sliced Tomato Salad (Tomatoes 150 gms) (Lettuce 10 gms) Roka Blue Cheese Dressing (30 gms) Chili with Meat Biscuit X 2 Butterscotch Pudding Lemonade	Spaghettini and Meat Sauce Lettuce and Tomato Salad (Lettuce 150 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gms) Strawberries Biscuit X 2 Coca Cola (300 ml)
MEAL C	MEAL C	MEAL C
Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Filet Mignon Baked Potato (200 gms) SF Butter (20 gms) Creamed Corn Strawberries Catsup X 3 Lemonade SNACKS: Butterscotch Pudding SUPPLEMENTS NECESSARY: Sodium: 5; or 9 salt packets MAY USE 8 1/2 EXTRA SALT PACKETS	Lettuce and Tomato Salad (Lettuce 100 gms) (Tomatoes 50 gms) Roka Blue Cheese Dressing (30 gms) Prime Rib of Beef Asparagus Macaroni and Cheese Catsup X 3 Dried Apricots Coca Cola (300 cc) SNACKS: Vanilla Wafers SUPPLEMENTS NECESSARY: Calcium: 2	Filet Mignon Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Baked Potato (200 gms) SF Butter (20 gms) Chocolate Ice Cream (130 gms) Catsup X 3 Strawberry Drink Snack: Vanilla Wafers X 2 SUPPLEMENTS NECESSARY: Sodium 7; or 12 1/2 salt packets. MAY USE 8 EXTRA SALT PACKETS.

TABLE 59. PRE-POSTFLIGHT MENUS, CAPT. A. L. BEAN, C.D.R., Skylab 3 (Continued)

Day 4
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Pears
Biscuit
Cocoa

Sugar Coated Cornflakes
Biscuit Jam
SF Butter (5 gms)
Grapefruit Drink

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bread Jam
SF Butter (15 gms)
Orange Drink

Day 5
MEAL A

MEAL B

Sliced Tomato Salad
(Sliced Tomato 100 gms)
(Lettuce 10 gms)
Roka Blue Cheese Dressing (30 gms)
Chicken and Rice
Butterscotch Pudding
Coke (240 ml)

Lettuce Wedge Salad (150 gms)
Roka Blue Cheese Dressing (30 gms)
Chili with Meat
Biscuit X 2
Strawberries
Vanilla Ice Cream
Coke (300 ml)

MEAL B

Sliced Tomato Salad
(Lettuce 10 gms)
(Tomato 150 gms)
Roka Blue Cheese Dressing (30 gms)
Chicken and Rice
Biscuit X 2
Lemon Pudding
Coke (300 ml)

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 50 gms)
Roka Blue Cheese Dressing (30 gms)
Chili with Meat
Macaroni and Cheese
Biscuit X 2
Chocolate Ice Cream (130 gms)
Lemonade

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 50 gms)
Roka Blue Cheese Dressing (30 gms)
Filet Mignon
Baked Potato (200 gms)
SF Butter (20 gms)
Vanilla Wafers
Catsup X 3
Orange Drink

MEAL C

Lettuce Wedge Salad (150 gms)
Roka Blue Cheese Dressing (30 gms)
Prime Rib of Beef
Creamed Peas
Chocolate Ice Cream (130 gms)
Catsup X 3
Lemonade

SNACK: Peanut Butter
Biscuit X 2

SNACKS: Vanilla Wafers X 2
Orange Drink

SUPPLEMENTS NECESSARY:
Calcium: 3

NO SUPPLEMENTS NECESSARY.

SUPPLEMENTS NECESSARY:

Sodium: 1; or 1 salt Packet

Sodium: 2; or 2 1/2 salt packets
MAY USE 8 EXTRA SALT PACKETS.

MAY USE 2 1/2 EXTRA SALT PACKETS

MAY USE 8 1/2 EXTRA SALT PACKET

TABLE 60. PRE - POSTFLIGHT MENUS, DR. OWEN K. GARRIOTT, SPT, Skylab 3

<p>Day 1 MEAL A</p> <p>Scrambled Eggs (80 gms) SF Butter (5 gms) Biscuit Jam SF Butter (15 gms) Sausage Patties Milk (240 ml) Coffee</p> <p>MEAL B</p> <p>Tuna Salad Spread Asparagus Bread Lemon Pudding Coke (300 ml)</p> <p>MEAL C</p> <p>Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gms) Filet Mignon Bread SF Butter (10 gms) Green Beans Chocolate Ice Cream (130 gms) Lemonade</p> <p>SNACKS: Dried Apricots Coffee</p> <p>SUPPLEMENTS NECESSARY: Sodium: 10; or 20 salt packets. MAY USE 9 1/2 EXTRA SALT PACKETS.</p>	<p>Day 2 MEAL A</p> <p>Sugar Coated Cornflakes Bacon Wafers Biscuit Jam SF Butter (10 gms) Orange Drink Coffee</p> <p>MEAL B</p> <p>Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 100 gms) Roka Blue Cheese Dressing (30 gms) Veal and BBQ Sauce German Potato Salad Biscuit Butterscotch Pudding Coke (240 ml)</p> <p>MEAL C</p> <p>Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Lobster Newburg Baked Potato (200 gms) SF Butter (25 gms) Biscuit Strawberries Orange Drink</p> <p>SNACKS: Vanilla Wafers Coffee</p> <p>NO SUPPLEMENTS NECESSARY. MAY USE 8 EXTRA SALT PACKETS.</p>	<p>Day 3 MEAL A</p> <p>Scrambled Eggs (80 gms) SF Butter (5 gms) Bacon Wafers Bread Jam SF Butter (15 gms) Orange Drink Coffee</p> <p>MEAL B</p> <p>Chicken and Gravy Green Beans Bread Coke (300 ml)</p> <p>MEAL C</p> <p>Lettuce and Tomato Salad (Lettuce 100 gms) (Tomatoes 100 gms) Roka Blue Cheese Dressing (30 gms) Filet Mignon Baked Potato (200 gms) SF Butter (20 gms) Biscuit Chocolate Ice Cream (130 gms) Orange Drink</p> <p>SNACKS: Lemonade Coffee</p> <p>SUPPLEMENTS NECESSARY: Calcium: 5 Sodium: 6, or 12 salt packets. MAY USE 9 EXTRA SALT PACKETS.</p>
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TABLE 60. PRE - POSTFLIGHT MENUS, DR. OWEN K. GARRIOTT, SPT, Skylab 3 (Continued)

Day 4
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bread Jam
SF Butter (10 gms)
Sausage Patties
Milk (240 ml)
Coffee

MEAL B

Pork and Potatoes
Biscuit
Strawberries
Vanilla Wafers
Coke (240 ml)

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms
(Tomatoes 100 gms)
Roka Blue Cheese Dressing (30 gms)
Turkey and Gravy
Baked Potato (200 gms)
SF Butter (15 gms)
Chocolate Ice Cream (130 gms)
Lemonade

SNACKS: Apricots
Coffee

SUPPLEMENTS NECESSARY:
Sodium: 9; or 18 salt packets.
MAY USE 9 1/2 EXTRA SALT PACKETS.

Day 5
MEAL A

Coffee Cake
SF Butter (5 gms)
Beef Hash
Grapefruit Drink
Coffee

MEAL B

Peanut Butter
Jam
Bread
Butterscotch Pudding
Coke (240 ml)

MEAL C

Lettuce Wedge Salad (150 gms)
Roka Blue Cheese Dressing (30 gms)
Prime Rib of Beef
Baked Potato (200 gms)
SF Butter (15 gms)
Green Beans
Chocolate Ice Cream (130 gms)
Orange Drink

SNACK: Coffee

SUPPLEMENTS NECESSARY:
Calcium: 2

Sodium: 4, or 8 1/2 salt packets
MAY USE 10 EXTRA SALT PACKETS.

Day 6
MEAL A

Rice Krispies
Sausage Patties
Bread Jam
SF Butter (15 gms)
Milk (240 ml)
Coffee

MEAL B

Sliced Tomato Salad
(Lettuce 10 gms)
(Tomato 100 gms)
Roka Blue Cheese Dressing (30 gm
Chicken and Rice
Biscuit
Pears
Grape Drink

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
French Dressing (40 gms)
Pork Loin with Dressing
Asparagus
Chocolate Ice Cream (130 gms)
Biscuit
Coffee

SNACKS: Coffee
Dried Beef

SUPPLEMENTS NECESSARY:
Phosphorus: 1

NO EXTRA SALT.

TABLE 61. PRE - POSTFLIGHT MENUS, MAJOR JACK LOUSMA, PLT, Skylab 3.

Day 1	Day 2	Day 3
MEAL A	MEAL A	MEAL A
Scrambled Eggs (80 gms) SF Butter (5 gms) Bacon Wafers Orange Drink Milk (240 ml)	Sugar Coated Cornflakes Sausage Patties Bread Jam SF Butter (10 gms) Milk (240 ml) Grapefruit Drink	Scrambled Eggs (80 gms) SF Butter (5 gms) Sausage Patties Milk (240 ml) Orange Drink
MEAL B	MEAL B	MEAL B
Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 50 gms) Roka Blue Cheese Dressing (45 gms) Tuna Salad Spread Bread Pork and Scalloped Potatoes Creamed Corn Peach Ambrosia Coke (300 ml)	Potato Soup Veal and BBQ Sauce Spaghetti and Meat Sauce Peaches Coke (360 ml)	Tuna Salad Spread Bread Cream of Potato Soup Chicken and Gravy Peach Ambrosia Coke (300 ml)
MEAL C	MEAL C	MEAL C
Salmon Salad Filet Mignon Baked Potato (200 gms) SF Butter (20 gms) Green Beans Strawberries Vanilla Ice Cream Orange Drink Milk (240 ml)	Shrimp Cocktail Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Pork Loin with Dressing Macaroni and Cheese Creamed Peas X 2 Chocolate Ice Cream (130 gms) Lemonade SNACKS: Peach Ambrosia Butterscotch Pudding SUPPLEMENTS NECESSARY: Calcium: 2 Phosphorus: 1 MAY USE 1 EXTRA SALT PACKET.	Shrimp Cocktail Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 150 gms) Blue-Cheese Dressing (30 gms) Filet Mignon Baked Potato (200 gms) SF Butter (20 gms) Creamed Corn X 2 Strawberries Vanilla Ice Cream Milk (240 ml) Orange Drink SNACKS: Lemon Pudding Apricots SUPPLEMENTS NECESSARY: Calcium: 3; Sodium 6; or 12 1/2 salt packets MAY USE 10 EXTRA

TABLE 61. PRE - POSTFLIGHT MENUS, MAJOR JACK LOUSMA, PLT, Skylab 3 (Continued)

Day 4 MEAL A	Day 5 MEAL A	Day 6 MEAL A
<p>Cornflakes Sausage Bread Jam SF Butter (15 gms) Grapefruit Drink Milk (240 ml)</p>	<p>Scrambled Eggs (80 gms) SF Butter (10 gms) Dried Beef Orange Drink Milk (240 ml)</p>	<p>Cornflakes Beef Hash Bread Jam SF Butter (15 gms) Strawberries Milk (240 ml) Orange Drink</p>
<p>MEAL B</p> <p>Pea Soup Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 150 gms) Roka Blue Cheese Dressing (30 gms) Veal and BBQ Sauce German Potato Salad Butterscotch Pudding Coke (240 ml)</p>	<p>MEAL B</p> <p>Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gms) Tuna Salad Spread Biscuit X 2 Turkey and Gravy Green Beans Pineapple Coke (300 ml)</p>	<p>MEAL B</p> <p>Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Salmon Salad Biscuit Veal and BBQ Sauce German Potato Salad Peaches Coke (300 ml)</p>
<p>MEAL C</p> <p>Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Shrimp Cocktail X 2 Pork Loin with Dressing Baked Potato (200 gms) SF Butter (20 gms) Creamed Peas Asparagus Chocolate Ice Cream (130 gms) Lemonade</p>	<p>MEAL C</p> <p>Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 100 gms) Roka Blue Cheese Dressing (30 gms) Filet Mignon Creamed Corn Creamed Peas Baked Potato (200 gms) SF Butter (30 gms) Chocolate Ice Cream (130 gms) Orange Drink Milk (240 ml)</p>	<p>MEAL C</p> <p>Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gm) Prime Rib of Beef Green Beans Baked Potato (200 gms) SF Butter (20 gms) Vanilla Ice Cream Grapefruit Drink</p>
<p>SNACKS: Vanilla Wafers</p> <p>SUPPLEMENTS NECESSARY: Calcium: 2 MAY USE 3 EXTRA SALT PACKETS.</p>	<p>SNACKS: Lemon Pudding Apricots</p> <p>SUPPLEMENTS NECESSARY: Calcium: 2 MAY USE 8 EXTRA SALT PACKETS.</p>	<p>SNACK: Butterscotch Pudding</p> <p>SUPPLEMENTS NECESSARY: Calcium: 2 MAY USE 5 EXTRA SALT PACKETS.</p>

TABLE 62. PRE-POSTFLIGHT MENUS, COL. G. P. CARR, CDR, Skylab 4

Day 1
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Bacon Wafers
Bread Jam
SF Butter (10 gms)
Strawberry Drink
Coffee with Sugar

MEAL B

Turkey and Rice Soup
Tuna Salad Spread
Bread
Vanilla Ice Cream
Coke (300 ml)

MEAL C

Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
Roka Blue Cheese Dressing (30 gms)
Prime Rib of Beef
Stewed Tomatoes
Chocolate Ice Cream (130 gms)
Coffee with Sugar

SNACKS: Coffee with Sugar X 2
Dried Apricots
Vanilla Wafers

SUPPLEMENTS NECESSARY:

Sodium: 1, or 1 salt packet
MAY USE 8 EXTRA SALT PACKETS.

Day 2
MEAL A

Sugar Coated Cornflakes
Sausage Patties
Bread Jam
SF Butter (10 gms)
Milk (240 ml)
Coffee with Sugar

MEAL B

Chili with Meat
Biscuit
Pears
Coke (240 ml)

MEAL C

Lettuce Wedge Salad (150 gms)
French Dressing (30 gms)
Filet Mignon
Baked Potato (200 gms)
SF Butter (15 gms)
Asparagus
Strawberries
Coffee with Sugar

SNACKS: Lemonade
Orange Drink X 2

NO SUPPLEMENTS NECESSARY.

MAY USE 8 EXTRA SALT PACKETS.

Day 3
MEAL A

Scrambled Eggs (80 gms)
SF Butter (5 gms)
Sausage Patties
Biscuit
Grapefruit Drink
Coffee with Sugar

MEAL B

Peanut Butter
Jam
Bread
Butterscotch Pudding
Coke (300 ml)

MEAL C

Sliced Tomato Salad
(Lettuce 10 gms)
(Tomato 100 gms)
Roka Blue Cheese Dressing (30g)
Shrimp Cocktail
Pork Loin with Dressing
Stewed Tomatoes
Chocolate Ice Cream (130 gms)
Coffee with Sugar

SNACKS: Peanuts
Coffee with Sugar
Lemonade

SUPPLEMENTS NECESSARY:

Calcium: 1
Sodium: 2; or 2 1/2 salt packet
MAY USE 8 1/2 EXTRA SALT PACKET

MEAL A

- Rice Krispies
- Coffee Cake
- SF Butter (10 gms)
- Strawberries
- Coffee with Sugar
- Milk (240 ml)

MEAL B

- Veal and BBQ Sauce
- Biscuit
- Peaches
- Grape Drink

MEAL C

- Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms)
- Roka Blue Cheese Dressing (30 gms)
- Turkey and Gravy
- Baked Potato (200 gms)
- SF Butter (25 gms)
- Green Beans
- Biscuit
- Pears
- Coffee with Sugar

SNACKS: Coffee with Sugar X 2
Lemon Pudding
Vanilla Wafers

SUPPLEMENTS NECESSARY:
Calcium: 1
Sodium: 2, or 3 1/2 Salt Packets
MAY USE 9 1/2 EXTRA SALT PACKETS.

POSTFLIGHT MENUS, COL. G.P. CARR, CDR, Skylab 4 (Continued)

Day 5
MEAL A

- Beef Hash
- Scrambled Eggs (80 gms)
- SF Butter (5 gms)
- Catsup
- Bread
- Jam
- SF Butter (15 gms)
- Coffee with Sugar

MEAL B

- Spaghetti and Meat Sauce
- Butterscotch Pudding
- Biscuit
- Coke (300 ml)

MEAL C

- Lettuce Wedge Salad (150 gms)
- Roka Blue Cheese Dressing (30 gms)
- Prime Rib of Beef
- German Potato Salad
- Asparagus
- Strawberries
- Vanilla Ice Cream
- Tea with Lemon and Sugar

SNACKS: Lemon Pudding
Coffee with Sugar
Grapefruit Drink

SUPPLEMENTS NECESSARY:
Calcium: 3

NO EXTRA SALT PACKET.

Day 6
MEAL A

- Sugar Coated Cornflakes
- Sausage Patties
- Biscuit X 2
- SF Butter (10 gms)
- Milk (240 ml)
- Coffee with Sugar
- Jam

MEAL B

- Turkey and Gravy
- Biscuit X 2
- SF Butter (10 gms)
- Applesauce
- Grape Drink

MEAL C

- Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 100 gms)
- French Dressing (30 gms)
- Lobster Newburg
- Creamed Corn
- Chocolate Ice Cream (130 gms)
- Grape Drink

SNACKS: Coffee with Sugar X 2
Lemon Pudding

NO SUPPLEMENTS NECESSARY.

MAY USE 3 1/2 EXTRA SALT PACKETS.

TABLE 63. PRE-POSTFLIGHT MENUS, EDWARD. G. GIBSON, Ph.D., SPT, SKYLAB 4.

Day 1

A Chocolate Instant Breakfast
Bread Jam
SF Butter (15 gms)
Orange Drink
Tea with Lemon and Sugar

B Turkey and Rice Soup
Spaghetti with Meat Sauce
Biscuit
Grape Drink

C Filet Mignon
Creamed Corn
Lettuce and Tomato Salad
(Lettuce 100 gms)
(Tomato 100 gms)
Blue Cheese Dressing (30 gms)
Peaches
Lemonade

SNACKS: Peanut Butter
Biscuit X 2
Coke (300 ml)

SUPPLEMENTS NECESSARY:
SODIUM: 8; OR 16 SALT PACKETS.

MAY USE 9 1/2 EXTRA SALT PACKETS.

Day 2

Bacon Wafers
Rice Krispies
Bread Jam
SF Butter (20 gms)
Tea with Lemon and Sugar

Veal and BBQ Sauce
Biscuit
Chocolate Ice Cream (130 gms)
Orange Drink

Pork Loin with Dressing
Asparagus
Lettuce Wedge Salad (150 gms)
Blue Cheese Dressing (30 gms)
Vanilla Ice Cream
Lemonade

SNACKS: Lemon Pudding
Orange Drink

SUPPLEMENTS NECESSARY:
PHOSPHORUS: 1

SODIUM: 6; or 11 1/2 SALT PACKETS.
MAY USE 9 EXTRA SALT PACKETS.

Day 3

Sausage Patties
Cornflakes
Bread Jam
SF Butter (10 gms)
Tea with Lemon and Sugar

Shrimp Cocktail
Macaroni and Cheese
Stewed Tomatoes
Vanilla Wafers
Orange Drink

Prime Rib of Beef
Green Beans
Sliced Tomato Salad
(Tomatoes 150 gms)
(Lettuce 10 gms)
Blue Cheese Dressing (30 gms)
Pre-Buttered Roll
SF Butter (10 gms)
Chocolate Ice Cream (130 gms)
Grape Drink

SNACK: Dried Beef

SUPPLEMENTS NECESSARY:
SODIUM: 2; OR 4 SALT PACKETS.

MAY USE 10 EXTRA SALT PACKETS.

TABLE 63. PRE-POSTFLIGHT MENUS, EDWARD G. GIBSON, Ph.D., SPT SKYLAB 4 (Continued)

Day 4

A Scrambled Eggs (80 gms)
 SF Butter (10 gms)
 Sausage Patties
 Tea with Lemon and Sugar

B Chicken and Gravy
 Stewed Tomatoes
 Applesauce
 Coke (300 ml)

C Filet Mignon
 Creamed Corn
 Lettuce and Tomato Salad
 (Lettuce 100 gms)
 (Tomato 100 gms)
 Blue Cheese Dressing (30 gms)
 Strawberries
 Vanilla Ice Cream
 Orange Drink

SNACKS: Butterscotch Pudding
 Lemonade
 Grape Drink

SUPPLEMENTS NECESSARY:
 CALCIUM: 2
 SODIUM: 8, OR 15 SALT PACKETS

MAY USE 8 1/2 EXTRA SALT PACKETS.

Day 5

Sugar Coated Cornflakes
 Bacon Wafers
 Bread Jam
 SF Butter (10 gms)
 Tea with Lemon and Sugar

Pork and Potatoes
 Biscuit
 SF Butter (10 gms)
 Pears
 Orange Drink

Turkey and Gravy
 Green Beans
 Lettuce Wedge Salad (150 gms)
 Blue Cheese Dressing (30 gms)
 Chocolate Ice Cream (130 gms)
 Grapefruit Drink

SNACKS: Peanut Butter
 Biscuit X 2
 Orange Drink

SUPPLEMENTS NECESSARY:
 SODIUM: 6, OR 10 1/2 SALT
 PACKETS.

MAY USE 8 EXTRA SALT PACKETS.

Day 6

Scrambled Eggs (80 gms)
 SF Butter (5 gms)
 Sausage Patties
 Bread Jam
 Tea with Lemon and Sugar

Chili with Meat
 German Potato Salad
 Biscuit
 Peaches
 Orange Drink

Lobster Newburg
 Asparagus
 Green Beans
 Sliced Tomato Salad
 (Lettuce 10 gms)
 (Sliced Tomatoes 150 gms)
 Bread
 Vanilla Ice Cream
 Lemonade

SNACKS: Lemonade
 Vanilla Wafers

SUPPLEMENTS NECESSARY:
 CALCIUM: 1

NO EXTRA SALT.

TABLE 64. PRE - POSTFLIGHT MENUS, COL. W. POGUE, PLT, Skylab 4

Day 1	Day 2	Day 3
MEAL A	MEAL A	MEAL A
Coffee Cake	Scrambled Eggs (80 gms)	Scrambled Eggs (80 gms)
SF Butter (10 gms)	SF Butter (5 gms)	SF Butter (5 gms)
Sausage Patties	Sausage Patties	Beef Hash
Rice Krispies	Orange Drink	Bread
Orange Drink	Coffee	SF Butter (10 gms)
Coffee		Milk (240 ml)
		Coffee
MEAL B	MEAL B	MEAL B
Lettuce and Tomato Salad	Lettuce Wedge Salad (150 gms)	Lettuce Wedge Salad (150 gms)
(Lettuce 100 gms)	Roka Blue Cheese Dressing (30 gms)	Roka Blue Cheese Dressing (30 gms)
(Tomato 50 gms)	Salmon Salad	Spaghetti and Meat Sauce
Roka Blue Cheese Dressing (30 gms)	Stewed Tomatoes	Green Beans
Chili with Meat	Biscuit X 2	Peaches
Biscuit	Chocolate Ice Cream (130 gms)	Coke (240 ml)
Strawberries	Grape Drink	
Coke (300 ml)		
MEAL C	MEAL C	MEAL C
Lettuce Wedge Salad (150 gms)	Sliced Tomato Salad	Lettuce and Tomato Salad
Roka Blue Cheese Dressing (30 gms)	(Lettuce 10 gms)	(Lettuce 100 gms)
Prime Rib of Beef	(Tomatoes 100 gms)	(Tomatoes 100 gms)
Macaroni and Cheese	Roka Blue Cheese Dressing (30 gms)	Roka Blue Cheese Dressing (30 gms)
Vanilla Ice Cream	Pork Loin with Dressing	Filet Mignon
Lemonade X 2	Asparagus	Baked Potato (200 gms)
	Creamed Peas	SF Butter (20 gms)
SNACKS: Peanut	Bread	Asparagus
Coffee X 3	SF Butter (10 gms)	Strawberries
	Peaches	Orange Drink
	Orange Drink	
SUPPLEMENTS NECESSARY:	SNACKS: Dried Apricots	SNACKS: Coffee X 3
Sodium: 1; or 2 salt packets	Coffee X 3	Lemon Pudding
MAY USE 10 EXTRA SALT PACKETS.		
	NO SUPPLEMENTS NECESSARY.	SUPPLEMENTS NECESSARY:
	MAY USE 5 1/2 EXTRA SALT PACKETS.	Calcium: 1
		Sodium: 1; or 2 salt packets.
		MAY USE 10 EXTRA SALT PACKETS.

TABLE 64. PRE - POSTFLIGHT MENUS, COL. W. POGUE, PLT, Skylab 4 (Continued).

Day 4 MEAL A	Day 5 MEAL A	Day 6 MEAL A
Rice Krispies Sausage Pears Biscuit SF Butter (5 gms) Coffee	Scrambled Eggs (80 gms) SF Butter (5 gms) Stewed Tomatoes Bread Jam SF Butter (10 gms) Orange Drink Coffee	Scrambled Eggs (80 gms) SF Butter (5 gms) Bacon Wafers Pineapple Milk (240 ml) Coffee
MEAL B	MEAL B	MEAL B
Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 150 gms) Roka Blue Cheese Dressing (30 gms) Salmon Salad Bread Chocolate Ice Cream (130 gms) Tea with Lemon and Sugar	Lettuce Wedge Salad (150 gms) Roka Blue Cheese Dressing (30 gms) Veal and BBQ Sauce Creamed Corn Peach Ambrosia Biscuit Grape Drink Catsup	Sliced Tomato Salad (Lettuce 10 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gm) Chicken and Gravy Biscuit Butterscotch Pudding Orange Drink
MEAL C	MEAL C	MEAL C
Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing (30 gms) Prime Rib of Beef German Potato Salad Vanilla Ice Cream Biscuit Tea with Lemon and Sugar Catsup	Sliced Tomato Salad (Lettuce 10 gms) (Tomatoes 100 gms) Roka Blue Cheese Dressing (30 gms) Turkey and Gravy Green Beans Asparagus Bread SF Butter (15 gms) Chocolate Ice Cream (130 gms) Tea with Lemon and Sugar X 2	Lettuce and Tomato Salad (Lettuce 100 gms) (Tomato 100 gms) Roka Blue Cheese Dressing(30 gms) Filet Mignon Green Beans Baked Potato (200 gms) SF Butter (20 gms) Peaches Tea with Lemon and Sugar X 2
SNACKS: Peanuts Coffee X 3	SNACKS: Coffee X 3 Dried Apricots	SNACKS: Dried Beef Lemon Pudding Coffee X 2 Tea with Lemon & Sugar
SUPPLEMENTS NECESSARY: Calcium: 2 Sodium: 4; or 7 1/2 salt packets. MAY USE 9 EXTRA SALT PACKETS.	SUPPLEMENTS NECESSARY: Calcium: 2 MAY USE 8 1/2 EXTRA SALT PACKETS.	NO SUPPLEMENTS NECESSARY. MAY USE 5 1/2 EXTRA SALT PACKETS.

TABLE 65. PRE-POSTFLIGHT MENUS,
MR. RUSSELL L. SCHWEICKART, BACKUP CDR,
SKYLAB 2

TO BE DETERMINED

TABLE 66. PRE-POSTFLIGHT MENUS, STORY MUSGRAVE, M.D., BACKUP SPT
SKYLAB 2

TO BE DETERMINED

TABLE 67. PRE-POSTFLIGHT MENUS, LT. CDR. BRUCE McCANDLESS, II, BACKUP PLT,
SKYLAB 2

TO BE DETERMINED

1947

TABLE 68. PRE-POSTFLIGHT MENUS, MR. VANCE BRAND, BACKUP CDR

SKYLAB 3

TO BE DETERMINED

TABLE 69. PRE-POSTFLIGHT MENUS, WILLIAM B. LENOIR, PH.D., BACKUP SPT
SKYLAB 3

TO BE DETERMINED

TABLE 70. PRE-POSTFLIGHT MENUS, DON L. LIND, PH.D., BACKUP PLT

SKYLAB 3

TO BE DETERMINED

TABLE 71. PRE-POSTFLIGHT MENUS, MR. VANCE BRAND, BACKUP CDR,
SKYLAB 4

TO BE DETERMINED

TABLE 72. PRE-POSTFLIGHT MENUS, WILLIAM B. LENOIR, Ph.D., BACKUP SPT
SKYLAB 4

TO BE DETERMINED

TABLE 73. PRE-POSTFLIGHT MENUS, DON L. LIND, Ph.D., BACKUP PLT

SKYLAB 4

TO BE DETERMINED

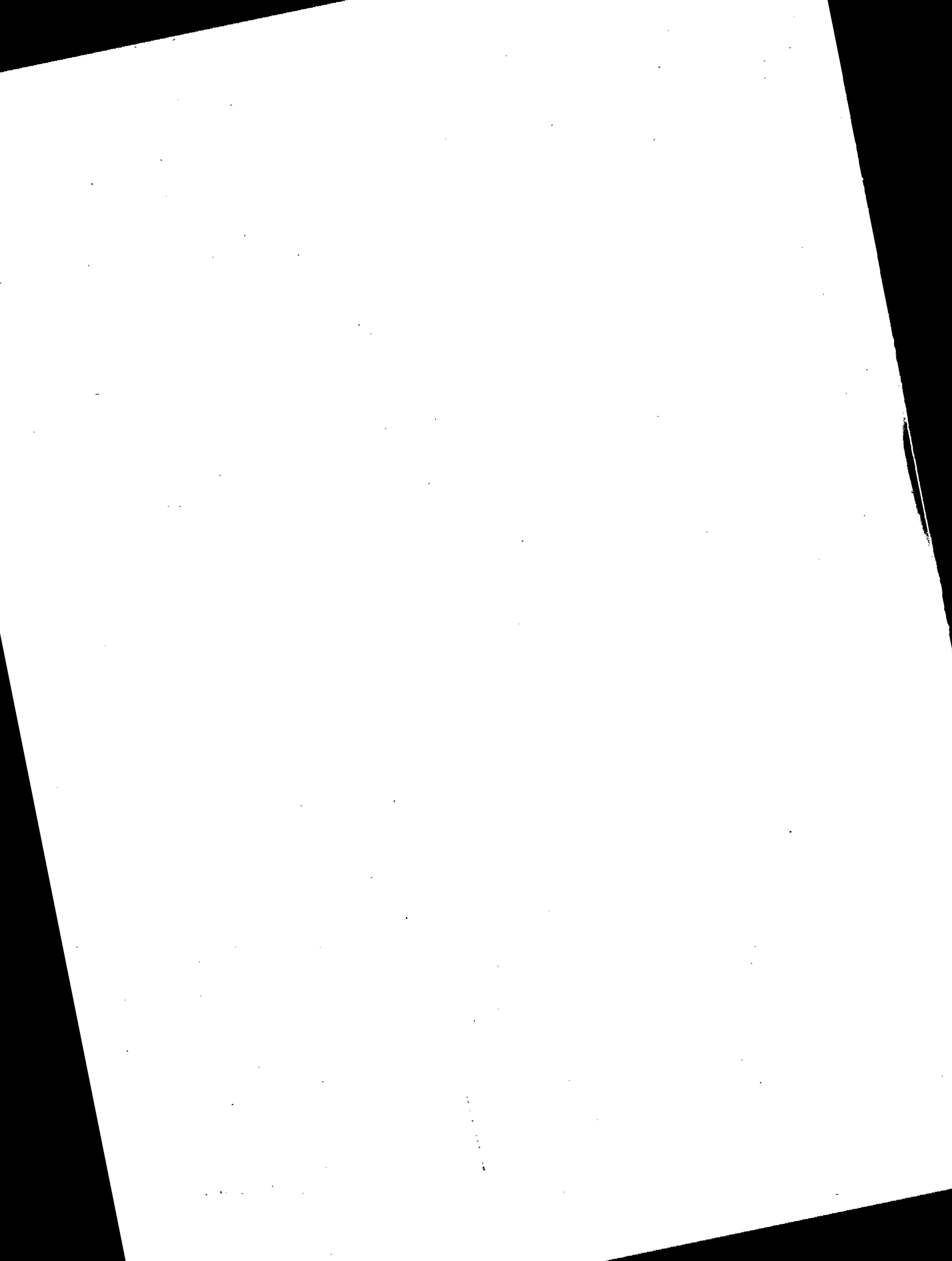


TABLE 75 ANALYSIS PRE-FLIGHT FECAL SAMPLES APOLLO 17

CREWMEMBER

Analysis Dry Weight Basis	CERNAN			EVANS			SCHMITT		
	F-2	F-1	F-0	F-2	F-1	F-0	F-2	F-1	F-0
	Moisture %	75.40*	76.73*	62.65*	78.21*	73.38*	65.72*	74.39*	88.35*
Crude Fiber %	3.35	4.01	IS	7.94	8.78	4.64	5.33	4.38	IS
Caloric Value Cal/100 g	628.70	603.21	IS	520.07	527.27	524.10	553.34	544.66	IS
Total Nitrogen %	5.38	6.01	6.12	6.18	6.03	6.02	5.87	6.24	6.15
Lipid %	21.43	10.02	IS	4.92	3.97	7.87	6.76	7.93	IS
Ash %	9.96	11.77	12.65	12.10	11.71	13.82	12.31	13.54	13.72
Chloride g/%	0.038	0.029	IS	0.105	0.963	0.395	0.093	0.065	IS
Phosphorus mg/100 g	1240	1700	IS	1270	1310	1150	2140	2250	IS
Calcium mg/100 g	1590	2270	2590	2300	1760	2230	1950	2250	2090
Magnesium mg/100 g	780	840	870	960	660	760	850	880	880
Sodium mg/100 g	210	290	150	190	1160	510	780	660	420
Potassium mg/100 g	1550	1360	1080	1640	1380	1820	1470	1340	1950
Nickel mg/100 g	1.6	1.3	1.6	1.2	1.1	1.9	1.6	1.4	1.8
Total Wt. g	156.45*	94.65*	10.60**	216.10*	337.00*	195.70*	142.40*	125.55*	10.90***
	44.95	24.26	3.39**	37.97	33.26	21.56	27.59	23.40	2.35**

IS = Insufficient Sample

* Wet Weight Basis
 ** Not Representative of Total Sample
 *** Approximately 25 cm Taken for Micro.

TABLE 76 ANALYSIS IN-FLIGHT FECAL SAMPLES APOLLO 17

CREWMEMBER: Eugene A. Cernan

Analysis Dry Weight Basis	FECAL BAG SERIAL NUMBER						
	1535	960	872	890	879	1608	
Moisture %	67.84* 3.64	69.01* I.S.**	74.32* 2.49	65.35* 1.85	66.85* 2.37	77.00* 2.32	
Crude Fiber %	4.68	5.82	3.00	2.90	3.59	3.19	
Caloric Value Cal/100 g	549.88	561.64	542.52	505.54	589.00	510.63	
Total Nitrogen %	5.98	5.37	5.78	7.03	6.72	6.19	
Lipid %	17.94	12.62	8.42	6.15	8.87	7.74	
Ash %	14.938	14.341	17.015	18.385	14.382	17.238	
Chloride g/%	0.050	I.S.**	0.198	0.212	0.059	0.364	
Phosphorus mg/100 g	2020.02	2621.73	2454.67	3078.43	1363.97	1782.22	
Calcium mg/100 g	2274.32	1638.08	2390.27	2600.49	2309.04	2667.17	
Magnesium mg/100 g	828.92	371.13	430.41	480.35	957.35	768.48	
Sodium mg/100 g	1729.55	2548.75	2490.50	1500.73	1646.38	2185.50	
Potassium mg/100 g	1129.71	1335.79	1758.86	2683.42	1129.07	1570.36	
Nickel mg/100 g	1.80	6.14	3.59	2.39	0.99	3.00	
Total Wt. g	47.96* 7.47	34.50* 4.04	91.04* 16.75	174.97* 40.27	96.57* 23.45	137.84* 32.77	

* Wet Weight Basis

** I.S. - Insufficient Sample

TABLE 77 ANALYSIS IN-FLIGHT FECAL SAMPLES APOLLO 17

CREWMEMBER: Harrison H. Schmitt

Analysis Dry Weight Basis	FECAL BAG SERIAL NUMBER			
	917	1014	1467	894
Moisture %	76.96* 1.99	63.65* 3.21	64.06* 1.46	69.74* 2.58
Crude Fiber %	2.01	4.74	3.33	2.95
Caloric Value Cal/100 g	620.25	609.91	596.69	603.71
Total Nitrogen %	5.87	4.48	5.85	6.63
Lipid %	14.29	15.91	15.10	16.12
Ash %	10.193	18.515	12.433	11.416
Chloride g/%	0.025	0.244	0.025	0.030
Phosphorus mg/100 g	1269.21	1375.57	1671.25	1636.21
Calcium mg/100 g	1935.90	1695.01	2779.25	2120.84
Magnesium mg/100 g	396.94	399.48	676.09	392.29
Sodium mg/100 g	702.81	4694.77	284.75	439.14
Potassium mg/100 g	137.29	869.03	1483.80	1605.11
Nickel mg/100 g	4.50	5.06	2.98	2.50
Total Wt. g	181.00* 43.21	36.71* 8.64	191.87* 55.76	254.86* 37.24

* Wet Weight Basis

TABLE 78 ANALYSIS IN-FLIGHT FECAL SAMPLES APOLLO 17

CREWMEMBER: Ronald E. Evans

Analysis Dry Weight Basis	FECAL BAG SERIAL NUMBER							
	882	1560	1600	983	284	895		
Moisture %	69.98* 2.10	68.15* 2.61	72.94* 3.19	68.87* 2.52	69.59* 2.73	68.27* 2.80		
Crude Fiber %	3.67	3.51	3.65	3.43	2.38	3.21		
Caloric Value Cal/100 g	573.33	576.67	576.30	582.65	539.35	549.25		
Total Nitrogen %	5.39	5.12	5.06	6.11	5.90	5.71		
Lipid %	11.00	18.76	19.52	12.34	9.36	13.04		
Ash %	13.577	14.584	13.640	15.240	15.011	14.738		
Chloride g/%	0.056	0.252	0.230	0.034	0.172	0.056		
Phosphorus mg/100 g	1813.12	1523.26	1592.29	1330.84	1869.29	1513.27		
Calcium mg/100 g	1941.16	2231.07	2067.47	2445.40	2208.09	2077.73		
Magnesium mg/100 g	445.72	629.95	450.93	580.17	526.61	407.24		
Sodium mg/100 g	1709.62	1679.93	2006.29	1034.00	1584.89	1974.71		
Potassium mg/100 g	1754.61	1842.67	1306.90	2102.47	2079.85	1836.67		
Nickel mg/100 g	7.70	3.68	8.17	9.85	1.05	8.45		
Total Wt. g	254.88* 45.21	223.00* 48.58	283.60* 22.77	191.01* 47.24	181.68* 40.86	66.21* 15.50		

* Wet Weight Basis

TABLE 79 ANALYSIS POST-FLIGHT FECAL SAMPLES APOLLO 17

CREWMEMBER

Analysis Dry Weight Basis	CERNAN		EVANS		SCHMITT	
	R+O	R+I	R+O	R+I	R+O	R+I
Moisture %	67.23* 2.70	58.11* 2.51	NO SAMPLE	65.50* 2.55	54.54* 1.78	79.84* 2.03
Crude Fiber %	3.20	3.15		3.01	2.78	2.85
Caloric Value Cal/100 g	563.66	521.18		498.13	576.08	610.64
Total Nitrogen %	6.67	6.94		6.35	6.88	6.50
Lipid %	5.96	5.22		9.17	8.60	10.14
Ash %	17.79	19.22		17.08	14.09	14.86
Chloride g/%	0.019	0.032		0.044	0.025	0.331
Phosphorus mg/100 g	2011.70	3373.53		2440.93	1465.64	
Calcium mg/100 g	2777.22	3095.92		2341.85	2489.12	2028.63
Magnesium mg/100 g	480.38	524.82		591.71	480.04	537.14
Sodium mg/100 g	705.59	571.20		715.09	396.26	1025.03
Potassium mg/100 g	1906.60	2245.05		2440.29	1624.69	1941.65
Nickel mg/100 g	5.00	4.47		6.50	5.91	2.46
Total Wt. g	306.98* 96.20	67.25* 17.08		319.53* 69.36	214.46* 58.56	236.15* 38.46

* Wet Weight Basis

TABLE 81

APOLLO 17 IN-FLIGHT FECAL FATTY ACID ANALYSIS

FATTY ACIDS %

Fecal Bag Serial Number	Crewmember	C12	C14	C16	C18	C18:1	C18:2	C18:3	C20	C22	C22:1	C24
882	Evans	2.81	2.16	13.64	11.66	50.85	12.53	4.23	2.12	-	-	-
1560	Evans	1.32	0.92	11.70	8.89	57.48	16.45	2.57	0.66	-	-	-
1600	Evans	3.40	2.72	14.57	11.81	53.21	13.26	1.03	trace	-	-	-
983	Evans	5.21	4.86	23.50	23.66	34.54	4.53	1.77	1.92	-	-	-
284	Evans	3.26	1.90	14.69	13.57	52.53	11.80	1.87	0.38	-	-	-
895	Evans	2.81	2.02	17.47	17.44	46.50	8.90	3.30	1.55	-	-	-
960	Cernan	5.73	4.91	21.69	26.54	33.39	4.48	1.82	1.44	-	-	-
872	Cernan	2.95	1.74	16.90	15.23	48.54	13.86	0.78	-	-	-	-
890	Cernan	4.11	2.23	17.22	14.66	40.79	13.90	5.28	1.81	-	-	-
1535	Cernan	2.87	4.01	26.18	23.21	25.94	9.80	5.19	2.81	-	-	-
879	Cernan	trace	3.95	35.77	29.88	18.74	8.75	trace	2.91	-	-	-
1608	Cernan	4.61	2.93	25.11	18.40	30.29	12.83	3.74	2.10	-	-	-
977	Schmitt	1.53	1.18	12.44	12.59	53.49	15.51	3.27	trace	-	-	-
1467	Schmitt	3.94	4.21	25.27	26.06	8.91	24.92	6.60	-	-	-	-
1014	Schmitt	-	3.13	18.12	10.55	46.92	21.10	0.18	-	-	-	-
894	Schmitt	0.76	0.74	12.95	10.14	57.59	14.79	3.05	-	-	-	-

APPENDIX A

POTENTIAL PUBLIC HEALTH APPLICATIONS OF
SPACE FOOD SAFETY STANDARDS

Potential Public Health Applications of Space Food Safety Standards

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SUMMARY

Food systems for manned space flight require definition and implementation of optimal food processing techniques and safety standards. Each space food processing technique and safety standard was selected after assessment of a benefit-penalty ratio elucidated by trade-off analyses. These assessments identified safety standards that have an optimal combination of practicality and idealism for spaceflight applications.

MANNED SPACE FLIGHT requires accurate control of the environment in spacecraft. Food is an indispensable part of that environment. Space flight programs include complex studies of the physiologic performance of man. Such studies reinforce the need for accurate definition and control of variables in space foods. Increase in the susceptibility of man to infection during stress further augments the need for complete definition and strict control of the food used during space flight.

Highly successful systematic procedures for production and safety of space foods have been developed for use in the U.S. Manned Space Program. These procedures include the strict control of raw materials, processing techniques and environments, storage, and end-item tests. The success of the space food program successfully demonstrates that variables in man's food supply can be accurately quantitated and controlled. Procedures and standards developed for space foods can serve as benchmarks against which the performance of public

health food safety programs can be compared.

This report is a brief description of some of the unique characteristics of space food, its processing techniques, and safety standards. Potential application for public health programs of these standards and methods by which they were derived is discussed.

Food for Spaceflight

The objective of a space food system is to provide the crew with safe, nutritious, easy to prepare, and highly acceptable foods. The engineering and biological constraints imposed on the food systems by the space vehicle and its mission have varied for different space programs. The Mercury, Gemini, Apollo, and future Skylab and Shuttle programs have distinctively different food systems requirements. These differences are characterized by an increase in the technical sophistication of the foods concomitant with the overall technical sophistication of the program hardware and mission objective.

The scope of the Apollo food system is indicated (Tables 1, 2, and 3) by means of sample menus for the Apollo XV flight. Foods for the most recent Apollo missions

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TABLE 1—Apollo XV Command Module Pilot Menu

Day 1,* 5, 9	Day 2, 6, 10	Day 3, 7, 11**	Day 4, 8
		MEAL A	
Peaches (RS)	Fruit cocktail (RS)	Peaches	Mixed fruit (T)
Scrambled eggs (RS)	Sausage patties (RS)	Scrambled eggs (RS)	Canadian bacon and applesauce (RS)
Bacon squares (IM)	Spiced fruit cereal (RS)	Bacon squares (8) (IM)	Cornflakes (RS)
Grapefruit drink (RB)	Orange drink (RB)	Grape drink (RB)	Pineapple-grapefruit drink (RB)
Cocoa (RB)	Cocoa (RB)	Cocoa (RB)	Cocoa (RB)
		MEAL B	
Hamburger (T)	Turkey and gravy (T)	Lobster bisque	Chicken and rice soup (RS)
Pea soup (RS)	Cranberry-orange sauce (RS)	Bread slices (2) (I)	Meatballs with sauce (T)
Salmon salad (RS)	Pineapple fruitcake (D)	Sandwich spread (T)	Lemon pudding (T)
Applesauce (RS)	Vanilla pudding (T)	Butterscotch pudding (RS)	Sugar cookie cubes (4) (D)
Cheese cracker cubes (4) (D)	Citrus beverage (RB)	Pineapple-orange drink (RB)	Grape punch (RB)
Orange-grapefruit drink (RB)			
		MEAL C	
Cream of tomato soup (RS)	Cream of chicken soup (RS)	Shrimp cocktail (RS)	Beef and gravy (T)
Spaghetti and meat (RS)	Frankfurters (T)	Beef steak (T)	Pork and scalloped potatoes (RS)
Peach ambrosia (RS)	Banana pudding (RS)	Peaches (IM)	Chocolate pudding (RS)
Chocolate bar (IM)	Brownies (4) (D)	Caramel candy (IM)	Apricots (IM)
Grape drink (RB)	Pineapple-grapefruit drink (RB)	Orange-grapefruit drink (RB)	Grapefruit drink (RB)
Total calories/day	2,372	2,550	2,314
			2,328

* Day 1 consists of meal C only. ** Day 11 consists of meal A only.
 RS = rehydratable solid/semisolid; IM = intermediate moisture; RB = rehydratable beverage; T = thermostabilized; I = irradiated; and D = dehydrated.

are categorized into 6 different groups: dehydrated, intermediate moisture, irradiated, rehydratable beverage, rehydratable solid/semisolid, and thermostabilized. In addition, the 1st meal after lift-off in Apollo flights consists of a frozen sandwich, which is prepared and packaged under Apollo system quality control and stowed for easy

access in a pocket of the crewmember's flight suit. This sandwich has been studied and found safe for consumption for up to 48 hours after preparation.

Dehydrated and intermediate moisture foods are consumed directly from the package without rehydration. These foods are protected by a sealed 4-ply laminated plas-

TABLE 2—Apollo XV Lunar Module Menu for Commander and Lunar Module Pilot

Day 5	Day 6	Day 7	Day 8
	Peaches (IM)	Apricots (IM)	Peaches (IM)
	Bacon squares (8) (IM)	Beef steak (T)	Bacon squares (8) (IM)
	Scrambled eggs (RS)	Sausage patties (RS)	Cinnamon toasted bread (6) (D)
	Graham cracker cubes (6) (D)	Cornflakes (RS)	Pork and scalloped potatoes (T)
	Orange-pineapple drink (RB)	Grapefruit drink (RB)	Beef and gravy (T)
	Cocoa (RB)	Cocoa (RB)	Orange-pineapple drink (RB)
			Cocoa
	EVA* I	EVA* II	EVA* III
	Food bar (IM)	Food bar (IM)	Food bar (IM)
Cream of tomato soup (RS)	Salmon salad (T)	Shrimp cocktail (RS)	Tuna salad (T)
Bread slice (2) (I)	Frankfurters (T)	Ham and applesauce (RS)	Chicken and rice (RS)
Ham salad spread (T)	Chocolate bar (IM)	Meatballs with sauce (RS)	Turkey and gravy (RS)
Caramel candy (IM)	Pecans (IM)	Brownies (6) (IM)	Chocolate pudding (T)
Pineapple-grapefruit drink (RB)	Peach ambrosia (RS)	Cheese cracker cubes (6) (D)	Grape punch (RB)
Grapefruit drink (RB)	Orange-grapefruit drink (RB)	Orange drink (RB)	
		Grape drink (RB)	

* EVA = Extravehicular activity.
 In-suit food bar assembly (1) 6 each; In-suit beverage assembly (2) 6 each; Spoon assembly (2) 1 each; and Germicidal tablets pouch (42) 1 each.
 D = dehydrated; IM = intermediate moisture; RB = rehydratable beverage; RS = rehydratable solid/semisolid; I = irradiated; and T = thermostabilized.

TABLE 3—Apollo XV Food Pantry Stowage

Day 6 through day 10			
BEVERAGES (REHYDRATABLE)	Quantity	SALADS/ SOUPS	Quantity
Cocoa (RB)	6	Chicken and rice soup (RS)	3
Coffee (RB)	16	Lobster bisque (RS)	3
Grape drink (RB)	3	Cream of chicken soup (RS)	3
Grapefruit drink (RB)	6	Shrimp cocktail (RS)	3
Grape punch (RB)	3	Tomato soup (RS)	3
Orange-grapefruit drink (RB)	3	Tuna salad (RS)	3
Orange juice (RB)	16	Salmon salad (RS)	3
Pineapple-grapefruit drink (RB)	3		21
Pineapple-orange drink (RB)	3		
Citrus (RB)	11	SANDWICH SPREADS/ BREAD	
	70	Bread (slice) rye (I)	6
BREAKFAST ITEMS		Chicken salad (T)	1
Bacon squares (8) (IM)	9	Cheddar cheese (IM)	3
Peaches (RS)	3	Jelly (IM)	3
Spiced fruit cereal (RS)	2	Peanut butter (IM)	3
Cornflakes (RS)	2	Ham salad (T)	1
Fruit cocktail (RS)	3		17
Sausage patties (RS)	2	MEAT ITEMS	
Scrambled eggs (RS)	3	Beef stew (RS)	2
Apricot (IM)	6	Beef and vegetables (RS)	2
Peaches (IM)	6	Chicken and rice (RS)	3
	36	Chicken stew (RS)	2
CUBES/CANDY		Pork and scalloped potatoes (RS)	3
Brownies (4) (IM)	3	Spaghetti with meat sauce (RS)	3
Caramel candy (4) (IM)	3		15
Chocolate bar (IM)	3	THERMOSTABILIZED FOOD	
Cheese cracker (4) (D)	6	Beef and gravy (T)	2
Cheese sandwiches (4) (D)	3	Beef steak (T)	2
Beef sandwiches (4) (D)	3	Frankfurters (T)	2
Jellied fruit candy (IM)	3	Hamburger (T)	2
Dry roasted peanuts (S/L Pkg) (IM)	3	Meatballs with sauce (T)	2
Pecans (6) (IM)	3	Turkey and gravy (T)	2
Date fruitcake (4) (IM)	2	Catsup (T)	3
Sugar cookies (4) (D)	3	Mustard (T)	3
	35		18
DESSERTS			
Applesauce (RS)	3		
Butterscotch pudding (RS)	3		
Chocolate pudding (RS)	3		
Peach ambrosia (RS)	3		
Lemon pudding (T)	3		
	15		

RB = rehydratable beverage; IM = intermediate moisture; RS = rehydratable solid/semisolid; D = dehydrated; T = thermostabilized; and I = irradiated.

tic package, which is opened by cutting with scissors. The intermediate moisture foods are those in which stability is controlled primarily by adjusting the water activity (a_w). Water activity of food is usually expressed as a decimal derived from



Fig. 1—Apollo rehydratable solid/semisolid food package showing spacecraft water dispenser inserted.

the ratio of water vapor pressure of the food compared to the vapor pressure of pure water at a given temperature. The irradiated food is restricted to bread processed from flour that was pasteurized by exposure to 5×10^6 rads of cobalt 60 gamma irradiation. Rehydratable solid and semisolid Apollo foods requiring addition of water for rehydration are packaged in the type of pouch shown (Fig. 1). This pouch allows convenient food preparation and eating in null gravity. Water is inserted from the spacecraft water dispenser into the pouch through a 1-way spring-loaded valve. After the food is completely rehydrated (5 to 10 minutes), the astronaut opens the pouch by cutting along the black cutting line. The pouch opens to form an entrance for a



Fig. 2—Full-panel pull-out space food can fitted with flexible inner cover and 1-way spring-loaded valve for food rehydration.

TABLE 4—Skylab Baseline Food List Development and Production Schedule Order

1) Ham sandwich spread (T)*	37) Pea soup (R)
2) Butterscotch pudding (T)*	38) Pineapple (T)
3) Tuna sandwich spread (T)	39) Lobster Newburg (F)*
4) Lemon pudding (T)	40) Turkey and gravy (T)*
5) Dry roasted peanuts (W)*	41) Hard candy (W)
6) Vanilla ice cream (F)*	42) Grape drink (B)
7) Dried apricots (W)*	43) Applesauce (T)
8) Orange crystals (B)*	44) Hot dogs (T)
9) Sugar cookie wafers (W)	45) Potato soup (R)
10) Grapefruit crystals (B)	46) Peaches (T)
11) Cheddar cheese cracker (W)	47) Pears (T)
12) Mints (W)	48) Biscuit (W)
13) Sausage patties (R)	49) German potato salad (R)
14) Ham and cheese cracker (W)	50) Cocoa-flavored instant breakfast (B)*
15) Sugar-coated cornflakes (R)*	51) Shrimp cocktail (R)
16) Scrambled eggs (R)	52) Cheddar cheese sandwich spread (T)*
17) Bacon wafers (W)	53) Turkey rice soup (R)
18) Mustard (T)*	54) Rice Krispies (R)
19) White bread (F) or (I)	55) Chicken and rice (R)
20) Catsup (T)	56) Creamed peas (R)
21) Filet mignon (F)*	57) Chicken and gravy (R)
22) Asparagus (R)*	58) Cocoa (B)
23) Lemonade (B)	59) Pork and scalloped potatoes (R)
24) Prebuttered roll (F)	60) Orange drink (B)
25) Salmon salad (R)	61) Mashed sweet potatoes (R)
26) Pork loin with dressing and gravy (F)	62) Black coffee (B)
27) Strawberries (R)	63) Beef hash (R)
28) Vanilla wafer (commercial cookie) (W)	64) Stewed tomatoes (T)
29) Ham (T)*	65) Cream style corn (R)
30) Canadian bacon and applesauce (R)*	66) Tea with lemon and sugar (B)
31) Coffee cake (F)	67) Sliced dried beef (W)
32) Mashed potato (R)*	68) Prime rib of beef (F)
33) Peanut butter (T)	69) Peach ambrosia with pecans (R)*
34) Chili with meat (T)	70) Fruit beverage (B)*
35) Cream of tomato soup (R)*	71) Veal and barbecue sauce (R)
36) Fruit jam (T)	72) Spaghetti and meat sauce (R)

* To be used for recovery analyses of nutrient reference standard.

(T) = thermostabilized; (W) = wafer or bite-sized or natural state; (F) = frozen; (R) = rehydratable; (B) = beverage; and (I) = irradiated.



Fig. 3—Collapsible beverage dispenser developed for the Skylab program.

spoon. Rehydratable beverages are packaged in a similar container except, instead of an opening to allow a spoon to enter, the containers are fitted with a drink spout. The thermostabilized foods for Apollo are packaged in drawn aluminum cans fitted with full-panel pull-out lids as shown (Fig. 2) or in flexible laminated aluminum foil plastic pouches that are cut open with scissors. Following the opening of the package, thermostabilized foods are consumed by using a spoon.

The scope of the Skylab foods is revealed by the list of 72 Skylab foods (Table 4). Skylab is scheduled for launch early in 1973. Each manned phase of the Skylab Program will have a crew of 3 astronauts. The 1st Skylab mission has a scheduled duration of 28 days, followed by 2 more flights of 56 days each. Each crewmember will have his individualized menu. The Skylab flight menus will be computer calculated and adjusted in real time as a function of crew selection in order to carefully control nutrient intake during the mission. Skylab foods will be packaged in drawn aluminum cans with full-panel pull-out lids (Fig. 2). At meal time, the astronaut will assemble these cans into meals in the Skylab food warmer/retainer tray. Skylab food, other than beverages, will be consumed in flight from the opened cans, using conventional tableware. Skylab beverages will be packaged in a new collapsible dispenser (Fig. 3) that will improve the convenience of consumption of liquid food in null gravity.

The Shuttle food system design studies are making maximum utilization of techniques of food processing, packaging, and in-flight handling learned from other space programs. Initial Shuttle launches are planned for the late 1970's. The Shuttle food system is designed for minimal overall weight and volume, maximal product quality and stability. In previous systems, such requirements favored the use of rehydratable and dehydrated foods. A preliminary design for the Shuttle food tray as it might attach to the crew couch at meal time is given (Fig. 4). This food tray configuration closely resembles the Skylab tray. For the Shuttle tray, however, initial studies favor food temperature control by circulating hot and cold water as opposed to the resistance heaters being built for Skylab.

The Shuttle food system design studies are an example of the analytic procedures

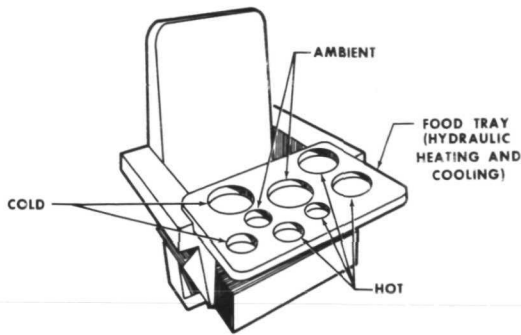


Fig. 4—Preliminary design concept for the Space Shuttle food tray shown attached to couch for mealtime use.

used to identify space food system characteristics and optimal benefit-penalty ratios in process and standard selection. The Shuttle food system analysis tree is shown (Fig. 5). Each segment of the tree undergoes interface definition and trade-off analyses to identify optimal criteria for each system element.

Space Processing Techniques

The Apollo and Skylab foods use a wide variety of modern food processing techniques. These include virtually all the techniques used in commercial food processing and some techniques beginning to be exploited commercially. The principal processing technique for production of space foods is freeze dehydration,^{5,6} although foam-mat drying and spray drying are also used to dehydrate foods for space flight.

Thermostabilization of space foods is performed by 1 of 3 methods. The methods are conventional retorting, high-temperature short-time (HTST) processing followed by aseptic packaging, or hyperbaric thermal processing. Preference for HTST processing is based primarily on the difference in tem-

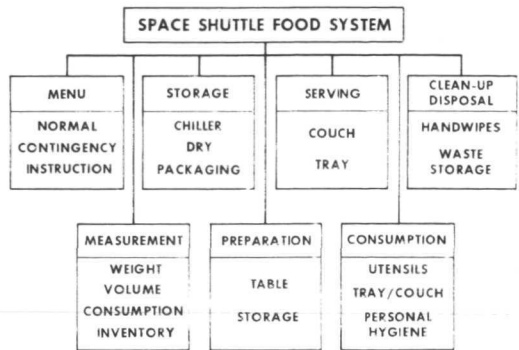


Fig. 5—A typical food systems analysis tree used to identify elements of food system and choose optimum benefit-penalty ratios.

perature dependence between microbial destruction and chemical reaction in foods. Typical activation energies for spores are about 3 times as great as those for important chemical deteriorative reactions such as nonenzymatic browning. Thus, by raising the processing temperature, one can "selectively" destroy microbial viability. This phenomenon is also applied in aseptic canning and processing in hyperbaric conditions. These modern thermostabilization techniques will be increasingly used by commercial food processors of the future.⁸

Food preservation by a_w control at the intermediate moisture level⁷ is the space food processing technique most rapidly gaining commercial application.² Intermediate moisture (IM) foods have an a_w between 0.2 and 0.7. This compares to dehydrated foods, which typically have an a_w below 0.2, and fresh foods, which characteristically have an a_w greater than 0.7. The a_w range of IM foods is attained by the addition of water-binding agents. Intermediate moisture foods are nutritious, highly acceptable, and easy to prepare. Most IM space foods have an a_w adjusted in the range of 0.2 to 0.5 to maximize

TABLE 5—Mean Total Viable Aerobic Bacteria Detected per Gram of White Bread after 70–75 F. Storage as Determined by Standard Plate Count

Irradiation treatment*	Initial	7 days' storage	14 days' storage	28 days' storage	56 days' storage	84 days' storage	112 days' storage	147 days' storage
Both flour and baked bread	300	100	2	5	<1	3,800	<1	<1
Flour only	50	3,000	1,300	95,000	130,000	116,000	117,000	<30
Baked bread only	50	600	160,000	150,000	120,000	121,500	67,000	<1
Control	250	430	60,000	310,000	140,000	51,500	51,500	84,000

* 5×10^6 rads cobalt 60 gamma irradiation.

TABLE 6—Percentage of White Bread Samples with Visible Mold Growth Following Storage at 70–75 F.

Irradiation treatment*	28 days' storage	42 days' storage	56 days' storage	84 days' storage	112 days' storage	140 days' storage
Both flour and baked bread	2.0**	2.0	2.1	2.8	2.9	3.6
Flour only	12.1	14.4	9.5	16.9	16.1	20.7
Baked bread only	11.0	14.5	17.8	26.0	27.1	30.9
Control	36.7	44.2	43.0	46.4	47.8	54.0

* 5×10^5 rads cobalt 60 gamma irradiation. ** Percentage with visible mold growth.

product stability. At ambient temperatures, apricots, sausages, bakery specialties, bacon wafers, and nutrient-defined candies are examples of IM space foods.

The freezing of food for space food systems utilizes the individual quick-freezing technique of freezing individual food particles such as strawberries and asparagus tips in liquid nitrogen. Frozen food will only be economical in space flights of extended duration such as the 28- and 56-day flights of Skylab.

Food processing by irradiation is presently limited to application for preservation of bread. Fresh bread is a highly desirable item for space crew nutrition. In-flight sandwich preparation is also a preferred way to vary the food system regimen and improve acceptance. Flights of longer than 48 hours' duration will require bread preserved either by refrigeration or irradiation. Data from studies of bread preservation by irradiation are given (Tables 5 and 6). These studies were conducted in support of the Apollo program to evaluate the benefits from 3 different bread irradiation treatments, which are (1) irradiation of flour only, (2) irradiation of the packaged bread after baking, and (3) irradiation of both flour and the packaged bread. A pasteurization

dose of 5×10^5 rads of cobalt 60 gamma irradiation was applied for each treatment.

Flour irradiation resulted in improved microbiologic stability of the bread and did not affect the baking quality of the flour. Taste panels were unable to distinguish any differences in the breads as the result of any of the 3 irradiation treatments. Trade-off analyses of these data indicated that the benefit-penalty ratio favored bread prepared from irradiated flour for use on Apollo. Similar conditions are expected for the Shuttle program for which bread prepared from irradiated flour is scheduled for use. Flights of longer duration will require irradiation of both the flour and baked bread.

Space Food Safety Standards

Safety standards for space foods are implemented by controls classified in 4 categories. The categories are personnel, environment, production controls, and end-item tests. Each of these control categories is further divided into manageable units for day-to-day implementation. For example, the personnel controls are comprised of high standards for personnel selection, training, routine physical examinations,

TABLE 7—Comparison of Principal Features of Environmental Control Applications

Features	Applications		
	Surgical operating room	Food processing plant	Spacecraft assembly clean room
Main contaminant	Microbes	Microbes and particles	Particles and vapors
Main source of contamination	Personnel, equipment	Raw materials, personnel, equipment	Raw materials, personnel, equipment
Monitoring criteria	Microbe counts	Microbe and particle counts	Particle counts
Personnel control	Dress, controlled access	Dress, controlled access	Dress, controlled access
Equipment control	Sterilization	Sanitation	Cleaning
Raw materials control	Cleaning	Selection and process procedures	Cleaning

TABLE 8—Nutrients Being Quantitated in Each Skylab Food

1) Vitamin A*	17) Total lipids
2) Carotene*	18) Carbohydrate (calculated by difference)
3) Thiamine*	19) Ash
4) Riboflavin*	20) Crude fiber
5) Folicin*	21) Phosphorus*
6) Niacin*	22) Chlorine*
7) Biotin*	23) Iodine*
8) Vitamin B ₁₂ *	24) Calories (bomb calorimeter)
9) Pyridoxine*	25) Calcium*
10) Ascorbic acid (total)*	26) Cobalt*
11) Ascorbic acid (reduced)*	27) Copper*
12) Vitamin D*	28) Iron*
13) Vitamin E*	29) Magnesium*
14) Vitamin K	30) Potassium*
15) Amino nitrogen	31) Sodium*
16) Nitrogen	32) Zinc*

* Nutrient also added in duplicate sample to measure recovery of reference standards.

clothing control, and continuous on-the-job monitoring by quality control inspectors.

Control of the production environment is accomplished mainly by the use of modified clean-room techniques. Clean-room techniques are implemented by production sequence selection, equipment sanitization, air filtration, temperature and humidity control, differential air pressures, and air/surface sampling.⁴ A comparison of the chief features of food processing clean rooms and other clean-rooms applications is given (Table 7). Most airborne contamination can be controlled by the use of clean-room techniques for food processing. An additional benefit of clean rooms in food processing is derived from the psychological impact instilled on the personnel by the clean-room operation and environment.

Production procedures for space foods are stipulated by written specifications for each space food. All raw materials are specified and selected with the intention of optimizing food quality and minimizing the need for additives. A typical food specification will identify 17 quality control stations in the production flow chart. Each of these stations has specified "go" and "no-go" decision criteria.

End-item testing is divided into acceptance testing, package testing, unintentional additive analyses, microbiologic testing, storage environment inspection, storage deterioration testing, and nutrient analyses. The acceptance testing consists of technical and flavor taste panel evaluation. Each product is required to rate at least 6.0 on a 9-point hedonic scale, which has a null point at 5.0. Package testing is performed on each package by physical examination

for visually apparent damage and for leaks at 29 inches of vacuum when vacuum packaging is specified.

Unintentional additive analyses are now being performed for arsenic, beryllium, boron, cadmium, lead, mercury, selenium, thallium, vanadium, and the common chlorinated insecticides. To date, the program has identified tuna fish containing 0.76 p.p.m. of mercury and shrimp with 0.38 p.p.m. Both of these foods were removed from processing. All of these analyses are being used to form a data bank for comparison with future space food production lots. Microbiologic specifications being applied in the Apollo program have been described.³ For the Skylab program, which involves in-flight food warming, a new set of microbiologic standards are being written.

Storage environment controls are routinely checked for specified temperature and humidity. These checks are augmented by in-storage degradation studies of samples collected at random for determination of peroxide values, accumulation of non-enzymatic browning pigments, and pepsin digestibility. Nutrient analyses of each Skylab space food are performed for the nutrients (Table 8). In addition, the storage degradation from time of production to time of consumption is monitored for all the vitamins.

Discussion

The space food program is successful in providing its consumers with safe and suitable foods. This is done, although the physical constraints on space foods are more severe than those imposed on any other unique food supply. A major factor in the success of the space food program is attributed to the procedure for selecting the optimal food processing technique and safety standard by evaluating the benefit-penalty ratio inherent in that technique or standard. The space food program is worthy of close scrutiny as potentially shedding light on the future of the commercial food industry, especially in regard to the public health aspects of food safety standards.

A good example of the use of advanced food processing technology in space food development is the decision to investigate the use of irradiated bread for the Apollo missions. No other food process is so thoroughly tested for safety as irradiation.

Future application of irradiation preservation of food for the general public no longer seems to depend on the development of technology. Progress now depends on a breakthrough in food safety standards selection. This breakthrough may lie in the area of adequate assessment of the benefit-penalty ratio. This is the approach taken in the space food program through the mechanism of trade-off analysis. Food irradiation is perhaps the first specific challenge that modern food technology has given to the doctrine of inflexible interpretation of requirements for food safety regardless of benefit-penalty ratios. To date, the proponents of rigid food safety standards have responded to the proponents of new food processes by claiming that the burden of proof falls primarily on those who propose the new technology.

In technologically advanced societies, many complex factors give rise to the impetus to apply new and technically complex food processing procedures. Among these factors are the remoteness of the food processor from the consumer, industrial competition, increased labor costs, new food processing technology, advertising, and the demand for convenience foods. This impetus in the food industry tends to centralize food processing in highly complex factories. It removes processing from the small institution and home kitchen. This trend generates problems and opportunities in quality control in the commercial food industry¹ which are analogous to those encountered in the space food program.

The success of the space food program stems largely from adherence to the philosophy that the best available technical solution is selected for each aspect of a

problem after detailed analyses of benefits and penalties. The success of the application of this philosophy bears implications for the food industry as a whole and especially for the apparent dilemma temporarily posed by modern food technology and problems of food safety.

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APPENDIX B

SOME FLOW PROPERTIES OF FOODS IN NULL GRAVITY

some ***FLOW PROPERTIES*** of foods in ***NULL GRAVITY***

*Rheological behavior of food differs in
space, requires special testing program*

PAUL C. RAMBAUT, CHARLES T. BOURLAND, NORMAN D.
HEIDELBAUGH, CLAYTON S. HUBER, and MALCOLM C. SMITH JR.

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some *FLOW PROPERTIES* of foods

Rheological behavior of food differs in space, requires special testing program

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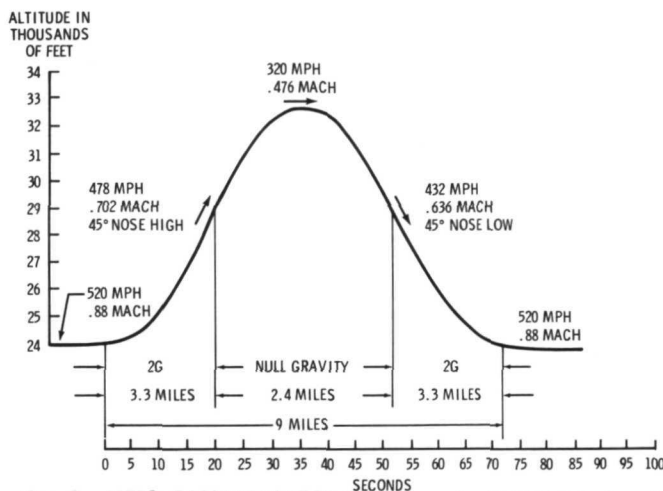


Fig. 1—KEPLERIAN TRAJECTORY flown by C-135 jet aircraft produces null-gravity conditions



Fig. 2—TESTING FOOD in C-135 jet aircraft

□ SINCE THE ADVENT of space flight, considerable attention has been paid to the flow of fluids under null-gravity conditions (weightlessness). Many experimental and theoretical studies have been performed on fluids in free fall to observe behavior under earth-bound null-gravity conditions (Benedikt, 1961; Neu and Good, 1963; Povitskii and Lyubin, 1963; Shuleikin, 1963).

Generally, these investigations showed that surface tension and surface adhesion, together with viscous and inertial forces, determine the behavior of a fluid after gravity force is removed. These studies also revealed that most fluids that wet their containers continue to spread under null-gravity conditions, as long as thermal differences or kinetic energy remains. In contrast, when gravity is removed from non-wetting fluids, they form globules that subsequently tend to minimize free energy by forming spheres.

COMPLEX GADGETRY DEVELOPED

These early studies were conducted primarily to identify problems involved in mechanical manipulation of fluid propellants in weightlessness. Solutions frequently involved the induction of positive force fields to prevent the pooling of propellants in inaccessible locations.

Such problems gave rise to apprehension on the part of personnel attempting to design food systems for manned space flight. Little credence was given to the ability of astronauts to compensate for the lack of gravity during food manipulation. This major concern with food handling in null gravity led to the development of complex feeding gadgetry and packages (Taylor, 1960; Michel, 1964; Richards et al., 1965; Nanz et al., 1967; Macklin, 1966).

CONCERN EXAGGERATED

Actual testing under null-gravity conditions, however, indicated that the original assessments of the magnitude of the problems were exaggerated. Astro-

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in *NULL GRAVITY*

nauts reported that they could adapt to drinking beverages in null gravity without elaborate procedures and could consume a wide variety of foods with spoon and fork by simply adapting their motions so as not to accelerate the food excessively (Smith and Berry, 1969; Smith, 1970). Astronauts Borman, Lovell, and Anders said that they enjoyed the Apollo 8 "around-the-moon" Christmas dinner that they consumed from an open flexible pouch with a spoon.

SYSTEMATIC STUDIES UNDERWAY

Seventy-two thermostabilized, frozen, or rehydratable foods and beverages were originally proposed for use in the Skylab Orbital Workshop (Table 1). Scheduled for launch in 1973, the Skylab will carry sufficient food for 3 crews of 3 men each—approximately 420 man-days of food. Prior to launch, each food item must be fully qualified for handling in null gravity.

Consequently, a systematic testing program is underway to evaluate the flow properties of all proposed space foods under null-gravity conditions. This program comprises 3 major steps:

- **Observation** of food handling under null-gravity conditions produced by aircraft flight.

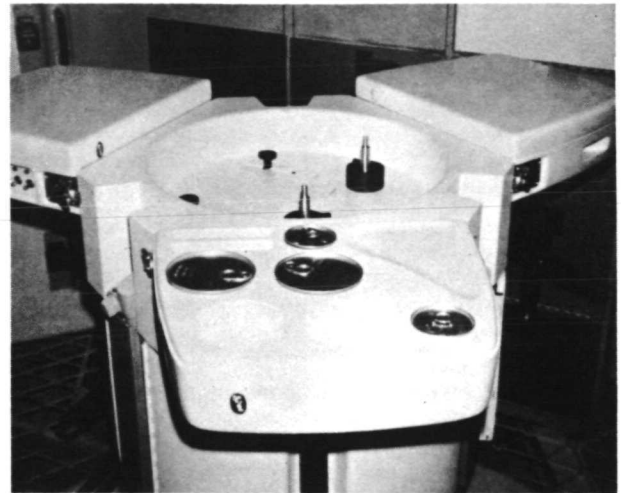


Fig. 3—**FOOD WARMER/RETAINER TRAY** on pedestal table in Skylab Orbital Workshop Ward Room

Table 1—**FOODS*** PROPOSED FOR USE in the Skylab Orbital Workshop scheduled for launch in 1973

Ham sandwich spread (T)	Salmon salad (R)	German potato salad (R)
Butterscotch pudding (T)	Pork loin with dressing and gravy (F)	Cocoa flavored instant breakfast (B)
Tuna sandwich spread (T)	Strawberries (R)	Shrimp cocktail (R)
Lemon pudding (T)	Vanilla wafer (commercial cookie) (W)	Cheddar cheese sandwich spread (T)
Dry roasted peanuts (W)	Ham (T)	Turkey rice soup (R)
Vanilla ice cream (F)	Canadian bacon and applesauce (R)	Crisped rice cereal (R)
Dried apricots (W)	Coffee cake (F)	Chicken and rice (R)
Orange crystals (B)	Mashed potato (R)	Creamed peas (T)
Sugar cookie wafers (W)	Peanut butter (T)	Chicken and gravy (R)
Grapefruit crystals (B)	Chili with meat (T)	Cocoa (B)
Cheddar cheese cracker (W)	Cream of tomato soup (R)	Pork and scalloped potatoes (R)
Mints (W)	Fruit jam (T)	Orange drink (B)
Sausage patties (R)	Pea soup (R)	Mashed sweet potatoes (T)
Ham and cheese cracker (W)	Pineapple (T)	Black coffee (B)
Sugar coated corn flakes (R)	Lobster Newburg (F)	Beef hash (R)
Scrambled eggs (R)	Turkey and gravy (T)	Stewed tomatoes (T)
Bacon wafers (W)	Hard candy (W)	Cream style corn (R)
Mustard (T)	Grape drink (B)	Tea with lemon and sugar (B)
White bread (F)	Applesauce (T)	Sliced dried beef (W)
Catsup (T)	Hot dogs (T)	Prime rib of beef (F)
Filet mignon (F)	Potato soup (R)	Peach ambrosia with pecans (R)
Asparagus (R)	Peaches (T)	Fruit beverage (B)
Lemonade (B)	Pears (T)	Veal and barbecue sauce (R)
Pre-buttered roll (F)	Biscuit (W)	Spaghetti and meat sauce (R)

* The foods are identified as follows:

(B) Beverage
(F) Frozen

(R) Rehydratable
(T) Thermostabilized

(W) Wafer or bite-size
or natural state

. . . . flow properties in null gravity

- **Verification** of the airborne findings during Apollo space flights.

- **Comparison** of the flow behavior of foods in 1 g (normal gravity) with flow in null gravity.

TESTING IN NULL-GRAVITY

The handling of Gemini and Apollo foods under null-gravity conditions has been the subject of extensive empirical airborne studies conducted by the U.S. Air Force (Vanderveen et al., 1970; Flentge et al., 1971).

By flying in Keplerian trajectory (Fig. 1), a C-135 jet aircraft can simulate space flight conditions, providing approximately 30 sec of null-gravity conditions. More than 300 such trajectories have been flown to test various foods and food systems. Figure 2 shows a typical test setup in the aircraft.

Following airborne studies, the foods are evaluated during actual space flight. These space flight tests are considered essential to the food evaluation program because airborne-induced null-gravity conditions differ somewhat from space flight null-gravity conditions. There is prolonged absence of gravity in orbital flight and during trans-lunar and trans-earth coasting flight.

DESIGNING FOOD SYSTEMS

The design goal of the food system for the Skylab is the use, as far as possible, of conventional eating modes. In particular, foods should be consumed from open vessels with standard utensils. This design goal is complicated by the additional requirements that all food-containing packages be completely emptied and that all food consumed be completely accounted for by determination of residual mass.

Astronauts in the Skylab will eat from a food warmer/retainer tray on a pedestal table in the Ward Room (Fig. 3). All non-beverage Skylab foods will be packaged in cans with full-panel pullout lids. The cans are retained in the Skylab tray at the time of meal assembly. Beverages will be packaged in collapsible accordion-shaped containers that also fit in the tray.

This tray concept will also be used in the Space Shuttle, which is scheduled for flight later in the decade. A preliminary design concept for the food tray being considered for the Shuttle is shown in Figure 4.

PACKAGING FOODS

The "spoon-bowl" package, which has been successfully used in Apollo flights since Apollo 10, is shown in Figure 5. Although this package facilitates food consumption from an open pouch, it is still somewhat inconvenient to handle.

Since rehydratable solid and semi-solid foods are considered to be the most desirable food items in space flight—because of weight advantages, long-term stability, and general high quality—a new package has

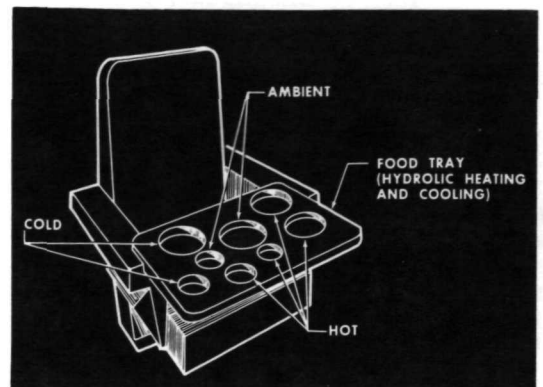


Fig. 4—PRELIMINARY DESIGN CONCEPT for food system for use in Space Shuttle

been designed to make these foods usable in the Skylab food system.

This new package consists of the full-panel pullout can with a flexible copolymer membrane bonded to the can (Fig. 6). The flexible membrane contains a one-way spring-loaded valve through which water is injected to rehydrate the food. The membrane is subsequently removed with scissors.

This rehydration system has worked well in the airborne studies, but the duration of airborne studies is not sufficiently long for complete evaluation of the

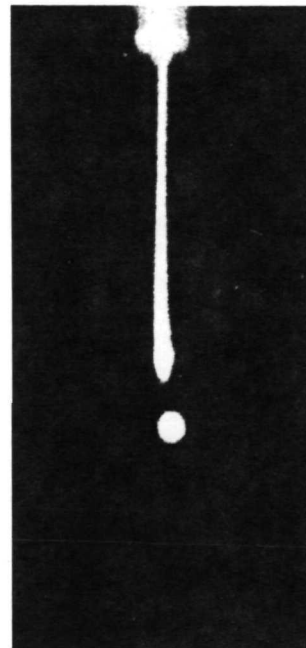


Fig. 8—WHEN MILK FALLS in normal gravity, a sphere forms (1/500-sec exposure frame from motion picture film)

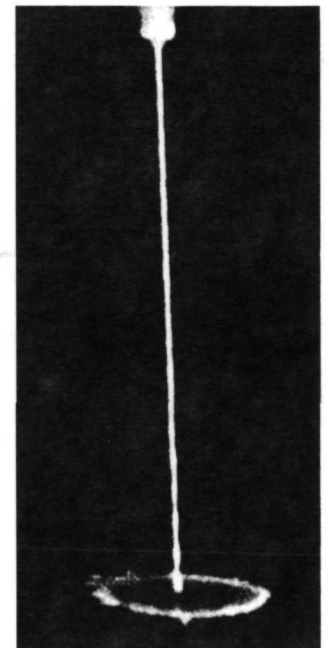


Fig. 9—SPLATTERING occurs when a milk stream impacts smooth metal surface in normal gravity (1/500-sec exposure frame from motion picture film, approximately 1/10 sec after impact)



Fig. 5—**SPOON-BOWL PACKAGE**, showing rehydrated food and opening through which spoon is manipulated, has been successfully used in Apollo flights since Apollo 10

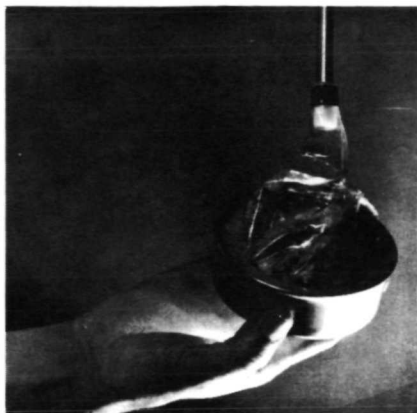


Fig. 6—**FULL-PANEL PULLOUT CAN** has a flexible inner cover and a one-way valve through which water is injected to rehydrate the food; the membrane is subsequently removed with scissors

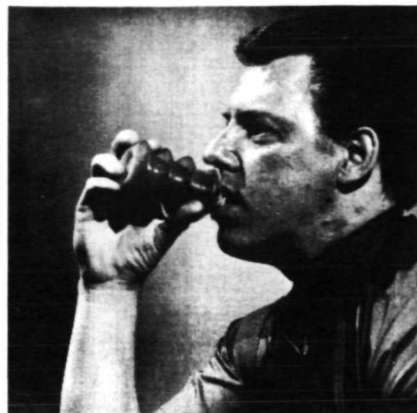


Fig. 7—**COLLAPSIBLE BEVERAGE BOTTLE** affords positive displacement of contained fluids by compression in one direction

rehydration phenomenon.

Beverages are easily handled in null gravity during rehydration from the powdered state and during consumption by use of the collapsible bottle shown in Figure 7. An improvement over the early Apollo flexible drink bags described by Smith (1970), this newly developed dispenser affords a positive displacement of contained fluids in null gravity by compression in one dimension.

For foods eaten with spoon or fork, $\frac{3}{4}$ -size utensils were found more convenient than regular-size utensils. Regular utensils tend to retain material on all surfaces in null gravity and give an oversized portion. The $\frac{3}{4}$ -size utensils deliver a portion that most nearly approximates the earthbound eating portion.

TESTING VARIOUS FOODS

To obtain information needed for food formulation changes, selected foods were manipulated under null-gravity conditions. The behavior of the foods was recorded by high-speed motion picture photography and by experienced observers. Thus far, 36 of the 72 proposed foods have been tested, with the following results.

- **Sandwich Spreads.** The ham sandwich spread and the tuna sandwich spread were thermostabilized by the "Flash 18" process in drawn aluminum cans with full-panel pullout lids. No difficulty in handling these foods was noticed during the null-gravity portion of the C-135 flights. These products were the first foods packed in full-panel pullout cans to be used in the Apollo program, and the Apollo crews report that they enjoy the opportunity to make sandwiches in flight with these spreads. No difficulty in manipulation of the spreads or the bread has been reported, and bread crumbs have not been a problem because free-floating crumbs in moderate quantities are easily avoidable.

- **Puddings.** Vanilla and lemon puddings have been satisfactory for handling in both the airborne flights and recent Apollo missions. These puddings adhere to the container so that even forcibly dislodging the product by vibration and shaking is difficult. Ice cream in the frozen state behaves in much the same way.

- **Bite-Size Foods.** Foods traditionally handled with the fingers or manufactured in small bite-size pieces are very convenient to handle with fingers in null gravity. These foods include such items as dried apricots, sugar cookie wafers, cheddar cheese crackers, etc. On the Apollo 14 flight, the crew found these foods highly acceptable, as 97.4% of all bite-size foods provided were consumed. For small foods, such as peanuts and after-dinner mints, airborne testing showed that expulsion of the contents would occur when the pullout lid was removed if the can was not solidly restrained and the contents were accelerated by the opening action. To prevent this, a special package was devised, consisting of the full-panel pullout can with a thin pre-slit plastic film trapped in the lid crimp of the can.

- **Beverages.** Orange and grapefruit crystals and lemonade were easily rehydrated and consumed by use of the compressible bottle mentioned above.

- **Entrees.** Thermostabilized and frozen foods packaged in full-panel pullout cans were also tested. Pork loin with dressing and gravy, ham, and chili with meat were evaluated under airborne null-gravity conditions. They were relatively easy to handle with various utensils, provided the juices were thickened with gums or starches. Frozen filet mignon has been easily handled under airborne null-gravity conditions, and no problems are anticipated in space flight.

- **Condiments.** No null-gravity problems have been observed with such condiments as mustard, catsup, peanut butter, and fruit jam. However, table salt—which will be provided on Skylab—has presented problems that are not yet fully solved. One problem is to provide sufficient velocity to propel the salt crystals from the dispenser to the target food without considerable scattering. The use of brine solutions is being investigated.

- **Canned Fruit.** Canned fruit was of some concern because it was suspected that the syrup would flow in weightlessness and would be difficult to manage. In airborne testing, some problems were encountered with spillage, which in retrospect has been attributed to minor perturbations in the aircraft during the null-gravity maneuver. The Apollo 14 astronauts volun-

. . . . flow properties in null gravity



Fig. 10—**IN NULL GRAVITY**, the milk impacting smooth metal surface tends to form a globule on the surface rather than splatter (1/64-sec exposure frame from motion picture film)



Fig. 11—**WHEN STREAM OF MILK** strikes the surface of milk in a container in null gravity, the milk stream rebounds as a globule (1/64-sec exposure frame from motion picture film)



Fig. 12—**GLOBULE** rebounding from surface of milk in container in null gravity rapidly forms a perfect sphere (1/64-sec exposure frame from motion picture film)

teered to try canned peaches in actual space flight. The syrup and peaches proved to be easy to handle. In fact, dislodging the syrup from the can even with gentle shaking was found to be difficult. Some products, however, proved difficult to manipulate with either spoon or fork and have been eliminated from the Skylab food list. Apparently, in some foods, too little surface adhesion is present to prevent the slightest acceleration from occurring even with carefully controlled eating motions.

FLOW PROPERTIES STUDIED

The behavior of milk under earthbound (1 g) conditions and under null-gravity conditions has been studied as the first part of the program designed to clarify some fundamental factors governing food flow.

• **Non-Splatter Phenomenon.** Figure 8 shows the separation of a column of milk, with the formation of a sphere, when milk is allowed to fall in 1 g from a syringe fitted with a 20-gage needle. Figure 9 shows this stream impacting a smooth surface, with resultant splattering.

In contrast, under null-gravity conditions, the milk tends to form a globule on the surface rather than splatter (Fig. 10). When the stream of milk impacts

into a container of milk, some of the stream rebounds as a globule (Fig. 11), which rapidly forms a perfect sphere (Fig. 12).

• **Non-Splash Phenomenon.** When milk contained in the Skylab food dish is impacted in 1 g with the underside of a teaspoon, the milk forms a characteristic splash upwards and out from the container (Fig. 13). In null gravity, however, the spoon merely penetrates the surface and enters the body of the milk without a splash (Fig. 14).

This non-splash phenomenon is attributed to the absence of fragmentation of the resultant wave caused by the absence of shear forces attributed to gravity—that is, in the absence of gravity, the wave is less subject to forces that cause wave fragmentation. Under null-gravity conditions, surface tension and adhesion forces predominate in determining the response of the material after flow has been initiated. The non-fragmented wave seen in null gravity is analogous to the effect on waves derived from covering the surface of water with a film of oil.

EATING IN SPACE

The flow behavior of foods in null gravity is distinctly different from their earthbound behavior. The

Fig. 13—**UPWARD AND OUTWARD SPLASH** occurs when a spoon strikes the surface of milk in a container in normal gravity (1/500-sec exposure frame from motion picture film)



Fig. 14—**NO SPLASH OCCURS** when a spoon strikes the surface of milk in a container in null gravity

observations that foods tend to splash and splatter less in null gravity than in 1 g explain how astronauts can adapt their eating modes and consume thickened foods under null-gravity conditions. Indeed, extended flights in space may allow astronauts time to perfect the slow and graceful movements that are associated with convenient food consumption under null-gravity conditions. The presence of gravity may be a deterrent to graceful movements during eating.

The first actual demonstration that foods could be used readily in space flights using conventional eating paraphernalia was derived from astronaut and cosmonaut experimentation. Much credit for the advances in the convenience of eating in space belongs to space flight crews who continue to critique space food systems.

FOODS FOR SPACE FLIGHT

The present state of knowledge supports the conclusion that proper selection and adaptation of food formulations and packages will allow most foods to be easily handled in space flight. The addition of thickening agents, such as soluble starches, is the most common formula change found necessary to make foods more adaptable to null-gravity eating.

After adaptation for null-gravity conditions, the principal remaining constraints on foods in space flight are the needs for optimum nutrition, wide variety, optimum quality, safety, minimum weight, convenient preparation, and extended storage life. These constraints tend to favor heavily the use of freeze-dried foods in future space food systems.

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