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A SURVEY OF QUALITY
ASSURANCE PRACTICES
IN MILITARY HOSPITALS

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APRIL, 1973

UNITED STATES ARMY NATION
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| REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS BEFORE COMPLETING FORM |
|--|--|---|
| 1. REPORT NUMBER NATICK/TR-83/024 | 2. GOVT ACCESSION NO. A134650 | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle) A SURVEY OF QUALITY ASSURANCE PRACTICES IN NONMILITARY HOSPITALS | | 5. TYPE OF REPORT & PERIOD COVERED Final |
| 7. AUTHOR(s) James Halkiotis, Carol P. Shaw | | 6. PERFORMING ORG. REPORT NUMBER |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Natick Research & Development Laboratories ATTN: DRDNA-WTA, Kansas St. Natick, MA 01760 | | 8. CONTRACT OR GRANT NUMBER(s) |
| 11. CONTROLLING OFFICE NAME AND ADDRESS US Army Natick Research & Development Laboratories ATTN: DRDNA-WTA, Kansas St. Natick, MA 01760 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 728012.1900 |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) | | 12. REPORT DATE April 1983 |
| | | 13. NUMBER OF PAGES 74 |
| | | 15. SECURITY CLASS. (of this report) Unclassified |
| | | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE |
| 16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. | | |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) | | |
| 18. SUPPLEMENTARY NOTES Support to Hospital Food Service MSR USA 83-14 | | |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) | | |
| FOOD SERVICE FOOD DISPENSING QUALITY ASSURANCE HOSPITALS | HOSPITAL FEEDING INSPECTION GUIDES SENSORY EVALUATION MENU(S) | TRAYS (PATIENT) SURVEYS |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A survey of quality assurance practices has been conducted on methods and procedures used to measure the quality of food and food services in 22 nonmilitary hospitals. Acceptability ratings, tray assessments, and sensory evaluations both formal and informal were the principal methods for determining food and food service quality. Recommendations are made to incorporate procedures for measuring quality into military hospital food service contracts. | | |

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PREFACE

The Food Engineering Laboratory of the US Army Natick Research and Development Laboratories has given support under requirement USA 8-9 in developing a food service contract for use by US Army procurement activities in contracting out the operations of government-owned dining facilities. This project was tasked by Health Service Command. However, methods for monitoring and measuring food quality in an effective quality assurance program have not been adequately addressed.

Project No. 728012.19000, Support to Hospital Food Service Contracting, required the determination and measurement of the quality of food and food service in military hospitals under commercial contracts. The first phase of this task was to survey existing hospital food service systems and to determine methods and procedures currently being used in quality assurance programs in nonmilitary hospitals. Results of this survey are published in this report.

The authors wish to thank the following for their assistance in this survey:

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The authors also wish to express their appreciation to Dr. O. Maller, Mrs. C.N. DuBose, and Dr. A. V. Cardello of the Science and Technology Laboratory (SATL) of NLABS for the use of the military food service opinion forms and other information used in the Draft Technical Report entitled "Consumer Opinions of Hospital Food and Food Service." The assistance and cooperation of Dr. Cardello, SATL, with the development of evaluation forms included in this report is especially appreciated.

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A SURVEY OF QUALITY ASSURANCE PRACTICES IN NONMILITARY HOSPITALS

INTRODUCTION

The US Army Natick Research and Development Laboratories, Animal Products Group of the Food Engineering Laboratory (FEL), as tasked through the Health Services Command, developed a Food Services Contract to be used when military food services are converted from an in-house activity to a commercial/industrial activity. The Statement of Work, Section C, of the Food Services Contract¹ states the contractor's duties (tasks) without prescribing how these duties are to be performed. Thus, the contractor is allowed maximum flexibility for using the most efficient approach to provide quality food service.

The quality assurance part of the US Army Medical Food Services Contract is Section E, which describes the quality assurance methods the government will use to evaluate the contractor's performance in meeting the contract requirements. It also describes the procedure the government will use in reducing the payment to the contractor when a standard for performance is determined to be in noncompliance. The unique feature of this section is that it contains a performance requirements summary with a table of liquidated damages.

To implement Section E, the Animal Products Group developed a Quality Assurance Inspection Plan. This quality control system is designed to aid the Contract Officer's Representative (COR) in providing effective and systematic inspection of all the aspects of the hospital's food service operation. The objective of this inspection plan is to evaluate a contractor's performance without the COR interfering with food production or food service. The principal method for evaluation is to inspect the most important services on a random-sample basis. Other services are evaluated on a periodic check or based on complaints. The plan provides the following guides and checklists:

1. Inspection Guides for Random Sample;
2. Inspection Guides for Periodic Inspections;
3. Quality Assurance checklists;
4. Quality Assurance Inspection Checklists.

However, methods for monitoring and measuring the final food quality are not included in this document. Maintaining the quality of the food and food service under contract becomes a vital concern for those military units that have relinquished the direct control of food operations and preparation.

¹J.G. Halkiotis, E.R. Baush, G.W. Shults. Full Food Service Contract for Army Dining Facilities. Technical Report, US Army Natick Research and Development Laboratories, NATICK/TR-83/013, 1982.

The first phase in developing methods to monitor and measure food quality was to survey the quality assurance practices currently in use in nonmilitary hospitals. The information from this survey will be used to establish a prototype program to measure food quality that can be monitored by government personnel and to improve the quality assurance plan of the contract.

The following is a list of the 22 hospitals visited:

| | |
|--|-----------------------|
| Bethany Medical Center | Kansas City, KA |
| Brattleboro Retreat | Brattleboro, VT |
| Central Wisconsin Center | Madison, WI |
| Exeter Hospital | Exeter, NH |
| Glover Memorial Hospital | Needham, MA |
| Hospital of University of Pennsylvania | Philadelphia, PA |
| Lahey Clinic | Burlington, MA |
| Madison General Hospital | Madison, WI |
| Massachusetts General Hospital | Boston, MA |
| McLean Hospital | Belmont, MA |
| Medical Center of South Carolina | Charleston, SC |
| Memorial Hospital | Pawtucket, RI |
| Mercy Hospital | Des Moines, IA |
| Middletown Memorial Hospital | Middletown, CN |
| Norwood Hospital | Norwood, MA |
| Portsmouth Hospital | Portsmouth, NH |
| University of Kansas Medical Center | Kansas City, KA |
| University of Wisconsin Medical Center | Madison, WI |
| Women's and Children's Hospital | Providence, RI |
| West Jersey Hospital | Voorhees Township, NJ |
| Veterans Administration Hospital | Boston, MA |
| Veterans Administration Hospital | Brockton, MA |

PROCEDURE

A form entitled "Quality Parameters Currently Used in Hospital Feeding" (Figure 1) was developed by the investigators. This form outlines areas that are considered to be relative to an effective quality assurance program and also includes background questions for each hospital. A form was completed at each hospital visited.

The authors made telephone calls and personal visits to the 22 hospitals and contacted the four food service contract companies listed below for information on their quality assurance programs. The hospitals visited were selected to include a representative sample of nonmilitary hospitals. Factors considered in making the list include the following:

1. **Size:** Small (under 200 beds), medium (200 to 500 beds), and large (over 500 beds) hospitals;

QUALITY PARAMETERS CURRENTLY USED IN NONMILITARY HOSPITAL FEEDING

Background Information on Hospital

Persons contacted _____
Hospital name _____
Hospital locations _____
Hospital type _____
Type of ownership _____
Food service operator _____
Number of beds _____
Percent modified diets _____
Number of cafeteria meals per day _____
Number of patient meals per day _____
Type of cafeteria menu _____
Type of patient menu _____
Length of menu cycle (patient) _____
Number of ambulatory patients eating in cafeteria _____
Type of food service operation _____

Quality Assurance Parameters Currently In Use

Ingredient specifications _____
Ingredient control section _____
Ingredient inspection steward _____
Standardized recipes _____
Microbiological testing _____
Nutritional data of recipes _____
Patient acceptability surveys (in-house) _____
Cafeteria acceptability surveys _____
Other sensory evaluations _____
Sampling before patient tray assembly _____
Test tray assessments _____
Responsibility for tray accuracy _____

Figure 1. Quality parameters currently used in
nonmilitary, hospital feeding

2. **Ownership:** Private, community, state, or federal (Veterans Administration) hospitals;
3. **Management:** In-house and contractor-operated hospitals;
4. **Type:** General medical and surgical hospitals, teaching hospitals, psychiatric hospitals, children's and maternity hospitals, and long-term care hospitals and clinics;
5. **Food System:** Hospitals using conventional, cook/chill, cook/freeze systems and combinations of these systems;
6. **Location:** Urban, suburban and small community hospitals;
7. **Geographical Distribution:** Due to economic considerations, only hospitals in New England along the eastern seaboard, and in the Midwest were surveyed.

The following food service contractors were contacted:

ARA Services;
Custom Management Corporation;
Saga Corporation;
Seiler's Corporation.

Data collected during the period of the survey are presented in Tables 1 and 2. Table 1 provides the background data for each hospital visited. Table 2 lists the quality assurance practices followed at each of these hospitals.

In the hospitals operated by a food service contractor, the contractor was contacted, the purpose of the project explained, and arrangements made to visit the specific hospital. In most instances, a contractor's representative was present during the visit. For the in-house-operated hospitals, the Food Service Director or Chief Dietitian was contacted by telephone. The purpose of the survey was explained, and arrangements for a visit made. NLABS food technologists with commercial food service and hospital feeding backgrounds visited each hospital. Interviews were usually held with the food service director or manager and the chief clinical dietitians. The number of people interviewed was somewhat dependent on the size of the hospital and the size and organization of the food service staff. Topics outlined in the survey questionnaire (Figure 1) were discussed along with other areas pertinent to the specific hospital. A tour of the food service facility was made and in-house quality assurance procedures were observed in operation. Forms used by the individual hospitals in recording quality information were collected when available.

Table 1. Description of Hospitals in Survey

| Hospital Name | Hospital Location | Hospital Type | Type of Ownership | Food Service | No. of Beds | Type of Food Service | Percent Modified Diets | No. Cafeteria Meals/day | No. Patient Meals/day | Type Cafeteria Menu | Type Patient Menu | Length of Menu Patient |
|-------------------------------------|---------------------|-----------------------|-------------------|--------------------|-------------|----------------------|------------------------|-------------------------|-----------------------|---------------------|---------------------------|------------------------|
| Berthony Medical Center | Kansas City, KA | Medical, Surgical | Religious | In-house | 1125 | Conventional | 40 | 1100 | 1275 | Cycle Select | Cycle Select | 2 Weeks |
| Brattleboro Retreat | Brattleboro, VT | Psychiatric, Nursing | Private | ARA | 180 | Convenience | 50 | 530 | 480 | Cycle Select | Cycle Select | 4 Weeks |
| Central WI Center | Madison, WI | Disabled Children | State | In-house | 793 | Conventional | 50 | 0 | 2370 | None | Non Selected | --- |
| Exeter Hospital | Exeter, NH | Medical, Surgical | Private | SAGA | 200 | Conventional | 50 | 600 | 600 | Cycle Select | Cycle Select | 3 Weeks |
| Glover Memorial Hospital | Needham, MA | Medical, Surgical | Private | ARA | 102 | Conventional | 50 | 250 | 300 | Cycle Select | Cycle Select | 5 Weeks |
| Hospital of U. of PA | Philadelphia, PA | Medical, Surgical | Private | Custom Mgmt. Corp. | 700 | Cook/chill | 55 | 3000 | 2100 | Cycle Select | Restaurant | --- |
| Lahey Clinic | Burlington, MA | Medical, Surgical | Private | Seller's Corp. | 200 | Conventional | 60 | 3000 | 600 | Cycle Select | Restaurant | --- |
| Madison General Hospital | Madison, WI | Medical, Surgical | Community | In-house | 500 | Conventional | 33 | 1700 | 1500 | Cycle Select | Cycle Select | 3 Weeks |
| MA General Hospital | Boston, MA | Medical, Surgical | Private | In-house | 1092 | Conventional | 48 | 5000 | 2550 | Cycle Select | Cycle Select | 3 Weeks |
| McLean Hospital | Belmont, MA | Psychiatric | Private | In-house | 328 | Conventional | 25 | 2000 ^a | 900 | Non Select | Non Select | 16 Weeks |
| Med. Center of SC | Charleston, SC | Medical, Surgical | State | State | 550 | Conventional | 50-55 | 1200 | 1650 | Cycle Select | Cycle Select | 2 Weeks |
| Memorial Hospital | Pawtucket, RI | Medical, Surgical | Private | ARA | 312 | Conventional | 55 | 1100 | 900 | Cycle Select | Cycle Select | 3 Weeks |
| Mercy Hospital | Des Moines, IA | Medical, Surgical | Religious | In-house | 500 | Cook/freeze | 30 | 2000 | 1500 | Cycle Select | Cycle Select | 2 Weeks |
| Middletown Memorial Hospital | Middletown, CT | Medical, Surgical | Private | ARA | 380 | Conventional | 55-60 | 850 | 912 | Cycle Select | Cycle Select ^c | 2 Weeks |
| Norwood Hospital | Norwood, MA | Medical, Surgical | Community | In-house | 287 | Conventional | 40 | 800 ^b | 520 | Cycle Select | Cycle Select ^c | 3 Weeks |
| Portsmouth Hospital | Portsmouth, NH | Medical, Surgical | Private | SAGA | 145 | Cook/freeze | 50 | 300 ^b | 435 | Cycle Select | Cycle Select ^c | 5 Weeks |
| U. of KA Medical Center | Kansas City, KA | Medical, Surgical | State | In-house | 780 | Cook/chill | 40 | 2000 | 2340 | Cycle Select | Restaurant | --- |
| U. of WI Medical Center | Madison, WI | Medical, Surgical | State | In-house | 555 | Conventional | 45 | 3000 | 1650 | Cycle Select | Cycle Select | 2 Weeks |
| Women's & Infants Hospital | Providence, RI | Maternity, Medical | Private | SAGA | 163 | Conventional | 10 | 500 | 480 | Cycle Select | Restaurant | --- |
| Veterans Admin. Hospital (Boston) | Boston, MA | Med/Surg, Psychiatric | Federal | VA | 801 | Conventional | 50 | 270 ^d | 1650 | Cycle Select | Ltd Cycle Select | 5 Weeks |
| Veterans Admin. Hospital (Brockton) | Brockton, MA | Med/Surg, Psychiatric | Federal | VA | 916 | Conventional | 60 | 2628 | 120 | Cycle Select | Ltd Cycle Select | 5 Weeks |
| West Jersey Hospital | Voorhees County, NJ | Medical, Surgical | Community | In-house | 236 | Cook/freeze | 65 | 836 | 336 | Cycle Select | Cycle Select | 12 Days |

a. Patients not permitted in cafeteria Mon-Fri.

b. Open only to employees.

c. Changing to restaurant-type menu.

d. Open only to ambulatory patients.

Table 2. Quality Assurance Procedures Used

| Hospital Name | Ingredient Specifications | Patients Eat/Cafeteria | Microbiological Testing | Nutritional Data/Recipes | Ingredient Control Section | Standardized Recipes | Ingredient Inspection Standard (Weight, Count, Condition) | Sanitation Audits |
|-------------------------------------|---------------------------|------------------------|-------------------------------|----------------------------|----------------------------|----------------------|---|--|
| Bethany Medical Center | Yes | No | Monthly, dishes and equipment | Doctor's request | Partially controlled | Yes | Yes | Daily inspection |
| Brettleboro Retreat | ARA | Yes | Yes | Yes | No | ARA | Yes | ARA procedures |
| Central WI Center | State | No | Occasionally | Yes | No | Yes | Yes | Daily inspection |
| Easton Hospital | SAGA | No | No | SAGA Program | No | SAGA | Yes | SAGA procedures |
| Glover Memorial Hospital | ARA | No | No | ARA Program | No | ARA | Yes | ARA procedures |
| Hospital of U. of PA | Custom Mgmt. Corp. | Yes | No | Custom Mgmt. Corp. Program | Yes | Custom Mgmt. Corp. | Yes | In-house check lists |
| Lafayette Clinic | Seller's Corp. | No | No | Seller's Corp. Program | No | Seller | Yes | In-house check lists |
| Madison General Hospital | Yes | Yes | No | Yes | No | Yes | Yes | Not formalized |
| MA General Hospital | Mass General Program | No | Yes | Yes | No | Yes | Yes | Independently by each unit |
| McLean Hospital | New England Hospital Ser. | Yes | Yes | No | No | No | Yes | In-house check lists |
| Med. Center of SC | ARA | No | Yes by staff & students | ARA Program | Yes | ARA | Yes | ARA procedures |
| Memorial Hospital | ARA | No | No | ARA Program | No | ARA | Yes | ARA procedures |
| Mercy Hospital | None | No | Weekly, using Millipore Kit | Upon request | Yes | Yes | Yes | Irregularly in production area, weekly in pastries |
| Middlemore Memorial Hospital | ARA | No | No | ARA Program | Yes | ARA | Yes | ARA procedures |
| Nonewood Hospital | Being developed | No | No | No | No | Yes | By procurement dept. | Not formalized |
| Portsmouth Hospital | SAGA | No | Yes | Yes | No | SAGA | Yes | SAGA procedures |
| U. of KA Medical Center | Yes | No | No | Yes on certain items | Yes | Yes | Yes | Irregularly |
| U. of WI Medical Center | State | No | Occasionally | Yes | Yes | Yes | Yes | Once monthly, unannounced |
| Women's & Infants Hospital | SAGA | No | Yes, equipment surfaces | SAGA Program | No | SAGA | Yes with manager or supervisor | SAGA procedures |
| Veterans Admin. Hospital (Boston) | VA | Yes | Occasionally | VA Program | Yes | Yes | Yes | Weekly |
| Veterans Admin. Hospital (Brookton) | VA | Yes | Yes, equipment only | VA Program | Yes | Yes | Yes | Kitchens weekly; units monthly; food trucks weekly |
| West Jersey Hospital | Yes | Yes | No, discontinued | Yes | No | Yes | Yes | 3 audits annually |

Table 2 (continued)

| Hospital Name | Sampling Before Patient Tray Assembly | Tray Tray Assessments | Responsibility for Tray Assembly | Patient Acceptability Surveys (in-house) | Celebrity Acceptability Surveys | Purpose | Other Sensory Evaluations No. Panelists | Composition of Panel |
|-------------------------------------|---------------------------------------|---|---------------------------------------|--|--|----------------------------------|---|-----------------------------------|
| Bethany Medical Center | Dietitian | None | Tray line supv. | Discontinued monthly surveys for dismissal questionnaires and interviews | Irregularly | New Products | 10-11 | Employees, varied backgrounds |
| Brattleboro Retreat | Tray line supv. | 4 trays, weekly | Tray line supv. | Monthly | Comment cards irregularly | New Items | 3 | Manager, clinical dietitians |
| Central WI Center | Test tray by all cooks | Project oriented | Tray line supv. & nursing staff | Informal feedback | | New Items | 3-5 | Manager, clinical dietitians |
| Exeter Hospital | Clinical dietitian | Once weekly 3 assessors one non dietary | Tray line supv. | Monthly, quarterly | Comment cards quarterly | New Items | 3 | Clinical, supervisory |
| Glover Memorial Hospital | Tray line supv. | 1 tray, weekly | Tray line supv. | Monthly | Comment cards monthly | New Items | 3 | Manager, clinical dietitians |
| Hospital of U. of PA | | 1 per month and by project | Tray line supv. | Monthly | Questionnaires left out quarterly | New products, proposed new items | 3-5 | Dietary employees |
| Lakey Clinic | Clinical dietitian | 3-4 times, weekly | Clinical dietitians | 10% interviewed daily by clinical staff | None | New products | 4 | Clinical and management staff |
| Madison General Hospital | Each item by tray line supervisor | Irregularly | Tray line supv. | Twice a month | Only new item survey | Informal - new products | 4-6 | Cooks and supervisors |
| MA General Hospital | Dietitians | Irregularly | Tray line supv. & diet aids on floors | 25% quarterly | None | New items, comment cards vendors | 20-25 | Dietitians, interns, chef |
| McLean Hospital | Cooks | None | Nursing staff | Quarterly | Discontinued | Varied, informal | 3-5 | Cooking staff |
| Med. Center of SC | Production Manager | 4 trays, weekly | Tray line supv. | Monthly | Comment cards periodically | New products | 4-6 | Assist mgr., supervisors |
| Memorial Hospital | Each item by 2 dietary personnel | 4 trays, weekly | Tray line supv. | Monthly | None | New products, informal | 2 | Production manager |
| Mercy Hospital | | None | Nursing staff | No formal procedures | Suggestion box | Test tray evaluation daily | 6-7 | Dietitians and cooks |
| Middletown Memorial Hospital | Cooking staff and supervisor | 1 tray, weekly | Tray line supv. | Monthly | Comment cards quarterly | New items | 3 | Manager and dietitians |
| Norwood Hospital | Five items at random by exec. chef | None | Nursing staff | None presently | Suggestion box | Procedure, decisions | 6 | Admin. and dietary staff |
| Portsmouth Hospital | Cooking staff and dietitian | 1 tray weekly, 2 assessors | Tray line supv. | Monthly | Employee satisfaction survey monthly | Daily evaluation | 2 | Manager, dietitians |
| U. of KA Medical Center | | 10 trays at irregular intervals | Diet technicians on floors | Monthly | None | Daily evaluation | 2-4 | Diet. employees |
| U. of WI Medical Center | Tray line supervisor and cooks | Project oriented 6 persons incl. 4 non-dietary | Nursing staff | Each patient surveyed | None | Daily evaluation | 6 | 2, clinical sup's 4, other depts. |
| Women's & Infants Hospital | Dietitian | One weekly, 2 assessors one non-dietary | Tray line supv. | 10% interviewed daily survey quarterly | Comment cards twice yearly, tray assessment weekly | Daily evaluation | 3 | Supervisor, dietitians |
| Veterans Admin. Hospital (Boston) | One diet daily by 4 member panel | Weekly | Tray line supv. | Semi-annually | 1/3 th patient acceptability | New product complaint items | 10-12 | Employees, varied backgrounds |
| Veterans Admin. Hospital (Brookton) | Cooking staff and dietitians | None | Tray line supv. | Each patient two weeks after admission and annually | 1/3 th patient acceptability | New product | 10 | Employees and patients |
| West Jersey Hospital | | 1 tray daily, 3 assessors, mgmt, clinical, & production | Tray line supv. | Monthly, in depth questionnaire annually | None | None | | |

RESULTS

Standards. Providing quality food to hospital patients and cafeteria patrons was the acknowledged goal of every Food Service Director and Dietitian interviewed. However, what constitutes quality food and how it is obtained or measured were not as easily defined. There was general agreement among those interviewed that quality food should be attractively served, nutritious and flavorful; that hot foods should be served hot; that cold foods should be served well chilled; that the patient should receive the food that was selected and prescribed for his or her specific diet; and that foods should be prepared and served under proper sanitary conditions, microbiologically safe, and served by courteous personnel. It was also agreed that the patient or consumer is the ultimate judge of food quality and that consumer satisfaction must be of primary importance in assessing food quality.

Quality Assurance. In the contractor-fed hospitals, the quality assurance programs were more formalized than most in-house feeding operations, had many more audit-type forms, and were more structured in such factors as how, when, and by whom audits were to be performed. Quality assurance for a military hospital begins with the prospective contractor submitting quality control and quality assurance programs to the contracting officer, prior to contract start date. Once these programs are accepted, it becomes the COR's responsibility to check on the contractor for compliance.

The cook-freeze and cook-chill operations observed also had a greater emphasis on quality assessments than conventional operations. This emphasis is probably due partly to the unique problems involved in the extended storage of food items. Two hospitals visited, the University of Kansas Medical Center and Mercy Hospital, each employ a person whose primary responsibility is quality assurance in cook-freeze operations.

Although the structure of a quality assurance program is important, it alone does not guarantee quality food. The emphasis by food service management in correcting deficiencies and enforcing quality standards is important. Many hospitals with loosely structured quality assurance programs nevertheless carried out effective techniques to insure quality food. Certain hospital personnel reflected that, prior to the NLABS survey, they were not really aware of the emphasis on quality that they had incorporated in their over-all management effort.

All but two of the hospitals visited had a selective patient menu. Those that did not included McLean Hospital, a psychiatric hospital, and the Central Wisconsin Center for severely disabled children. A Veterans Administration Hospital reported a large percentage of patients not making a selection. It was felt that this was largely due to the method of selection whereby patients were asked to make a week's selection at one time. Four hospitals were using a restaurant-type menu, and two were planning to adopt this type of menu.

With the exception of one long-term facility using a 16-week cycle menu, the cycle ranged from 2 to 5 weeks with a mean length of 3.25 weeks. With the exception of those hospitals with a long patient stay, most hospitals preferred a relatively short-cycle menu. A short-cycle menu allows the cooks to become more familiar with each item prepared and emphasizes the

most popular menu items. A long-cycle menu generally has the most popular items repeated often in the cycle. The hospitals using a restaurant menu reported satisfaction with it. The most popular items were placed on the menu and variety was enhanced by adding daily specials. It was obvious that many quality control functions were more easily monitored when a restaurant menu was used. It is suggested that the use of the 42-day menu cycle for military hospital feeding be reviewed and the options of changing to a 2- or 3-week cycle or a restaurant menu be considered.

Ingredient Specifications. Most of the hospitals had ingredient specifications although they found them relatively unnecessary when dealing with suppliers on a regular basis. The leverage of being able to terminate a supplier if it delivered unsatisfactory ingredients was considered important. The difference in governmental regulations in the states of Kansas and Wisconsin institutions was interesting. One state university medical center felt hindered by buying ingredients using state specifications with little or no allowable deviations. In another state, the Food Service Administration had formed a committee that gave input into purchase decisions and could reject or refuse to purchase ingredients considered substandard.

Ingredient Verification. Most of the hospitals had receiving or stock stewards responsible for checking weight, count, and quality of incoming ingredients and for verifying the goods received against the orders and invoices. In two hospitals this responsibility was not under the control of the food service department. In one hospital, this procedure of checking ingredients was considered of such importance that it was the responsibility of the food service manager. A procedure for documenting and inspecting incoming ingredients is important in an effective quality assurance program. Figure 2 illustrates an audit form for incoming ingredients used by the University of Kansas Medical Center.

Ingredient Control. Most of the hospitals employing the cook-freeze system, the cook-chill system, and three other hospitals had ingredient control rooms or areas for weighing and measuring ingredients. Those hospitals using restaurant menus generally had fewer ingredient control measures probably due to the constant repetition. In several of the larger hospitals, the use of metric rather than U.S. customary weights was encouraged for weighing ingredients and these hospitals emphasized the use of weights rather than volume.

Recipes. All hospitals except one used standardized recipes. Those hospitals operated by food service contractors used the contractor's recipes, but often varied these with items having regional and ethnic preference. The one hospital using no recipes was McLean Hospital. This facility encouraged their cooks to vary the products, largely because of the long patient stay. The hospital also felt that the cooks were well trained and capable of producing high quality food with a minimum of regulations. Those hospitals emphasizing the use of metric weights in ingredient preparation also encouraged their recipes to be written to a final cooking temperature and volume. It is suggested that the standardized Armed Forces recipes be used to develop a two-to-three week cycle menu for military hospital feeding programs, along with the modified diet recipes now under development.

RECEIPT OF RAW MATERIALS AUDIT FORM

DATE _____

FOOD CATEGORY BEING AUDITED _____

| | YES | NO | COMMENTS |
|--|-----|----|----------|
| A. Receiver checked | | | |
| 1. item as specified | | | |
| 2. quality standards as specified | | | |
| 3. size as specified | | | |
| 4. weight or count amount recv'd | | | |
| 5. amount of weight against Purchase Order (PO) | | | |
| 6. record amount or weight on Purchase Order (PO) | | | |
| 7. items from proper vendor | | | |
| 8. deviations (1-7) -- contacted proper authority | | | |
| 9. noncompliance and returns documented on proper form | | | |
| B. Maximum time delay from track to storage release is one hour for perishables | | | |
| C. Meats Only -- monthly report on file | | | |
| Dairy Only -- records expiration date on Purchase Order for milk, cottage cheese, cream and yogurt | | | |

| Item Received-Vendor | Item Received-Vendor | Item Received-Vendor |
|----------------------|----------------------|----------------------|
| 1. _____ | 6. _____ | 11. _____ |
| 2. _____ | 7. _____ | 12. _____ |
| 3. _____ | 8. _____ | 13. _____ |
| 4. _____ | 9. _____ | 14. _____ |
| 5. _____ | 10. _____ | 15. _____ |

**Figure 2. Receipt of raw materials audit form,
University of Kansas Medical Center**

Food Production. The production of food according to the recipes provided was often loosely structured. Those on a restaurant menu were quite familiar with production times needed. All conventional systems stressed preparing short-order items as close in time to plating as possible. The ARA corporation food production order and menu guide (Figure 3) is typical of the food production records kept by most hospitals. A production schedule posted at Bethany Medical Center has more specific cooking times and instructions (Figure 4). The actual yield of each item produced was required to be recorded in most hospitals, but a determination of enforcement of this procedure could not be made at most hospitals.

The cook-freeze and cook-chill systems were more structured in production scheduling than conventional systems. In the cook-chill systems, most standard items were prepared two or three times weekly. The cook-freeze systems generally produced as inventory warranted. While a two-week inventory for frozen items was common, lack of frozen storage space usually dictated the size of inventory that could be maintained.

Modified Diet Items. Despite the large number of patients on modified diets (mean 45.5%, median 50%), the modified-diet production was generally handled by one or two people in a small diet-preparation area. The facility giving the greatest attention to modified diet items appeared to be the Central Wisconsin Center, a facility for the developmentally handicapped. Here, many textural modifications were necessary. Each item prepared was sampled from a test tray by each cook before patient tray assembly and comments and suggestions made. Those hospitals using a restaurant menu usually had six to eight types of modified diet menus, as well as the regular menu. One hospital included low-sodium items on its regular menu.

The presence of many cases or jars of baby food, liquid nutritional supplements, and ready special diet items in storerooms suggested that many hospitals relied heavily on commercially prepared items or convenience type items for many of their modified diets. The final quality of the modified diets in many situations appeared not to be as carefully monitored as the regular diet items. This is probably brought about by the production of only small amounts of a variety of diet items. There was a tendency to monitor the production of larger volume items more carefully.

Time-Temperature Controls. Time-temperature controls throughout the various stages of production are critical to quality assurance. Nutritional and sensory values of food are retained through the use of optimum time-temperature controls, and many in the food service field believe these to be the most important of critical control points. Most hospitals surveyed did not have time-temperature controls well delineated in a written, structured manner but were aware of their importance. Areas that need to be monitored include:

1. Storage times and temperatures for perishable ingredients;
2. Cooking times and temperatures;
3. Holding times and temperatures;
4. Chilling times and temperatures;
5. Freezing times and temperatures;
6. Serving times and temperatures;
7. Tray assembly times and temperatures;

8. Tray delivery times and temperatures;
9. Tempering times and temperatures (cook-freeze);
10. Rethermalization times and temperatures (cook-chill).

Figures 5 and 6 list temperature checks at Mercy Hospital.

Plating and Serving Temperatures. Serving temperatures were closely monitored at most hospitals. Several admitted an inability to deliver food to the patient at desired temperatures or those required by public health regulations. Although temperatures were spot-checked in some hospitals, temperatures usually were taken of each item on the patient tray assembly line, usually by the tray line supervisor. Temperatures of cafeteria food were usually taken at the start of service and spot-checked during the meal time. Hospitals managed by food service companies were generally the most structured in requirements for monitoring plating and serving temperatures. The actual reheating of food to below required temperature was noticed in only one instance. The use of thermometers by those required to monitor temperatures was in itself somewhat of an indication of adherence to procedure. Figure 7 illustrates patient tray temperature records as prescribed by ARA. Figure 8 shows the serving temperature and "palatable" temperatures recommended at the West Jersey Hospital.

The hospitals visited had a wide range of tray delivery systems and a wide range of distances to deliver the food. Several hospitals provided food to more than one building. Thermal-trays, pellet bases, and hot and cold delivery trucks were the most common methods of retaining proper food temperatures. Most of the cook-freeze and cook-chill facilities rethermalized in microwave ovens; one used a microwave tunnel, and one hospital used the Regithermic method for rethermalization. There was quite a wide variation in monitoring temperatures on the patient floors. One hospital with microwave rethermalization (Mercy Hospital) required temperatures to be taken of each individual food item to each patient. Most hospitals relied on spot-checking and dummy trays sent to the floors. It was not possible to obtain a valid time of delivery from plating to patient at most hospitals. Procedures for monitoring plating and serving temperatures must be incorporated into a quality assurance program based not only on public health and AR 40-5 standards, but the most desirable serving temperatures of each meal served.

Tray Accuracy. Tray accuracy was usually the prime responsibility of the tray line supervisor on the production staff. However, at three hospitals, members of the nursing staff delivered the trays and had the final responsibility for the accuracy of the diet and the food items. In several other hospitals, tray delivery came under the supervision of the clinical dietitians and they assumed responsibility for tray accuracy. Test trays were used extensively for checking tray accuracy.

Patient Tray Assembly. Other factors that are monitored in the patient tray assembly area include portion control and plating techniques. In general, hospitals with restaurant menus had more standard diagrams for plating. Contractors also were highly aware of portion control as were the hospitals on cook-freeze and cook-chill systems. One hospital had a large sign over the tray assembly area so that the tray assemblers had a ready reference to the number of each item being plated.

MONDAY DINNER – WK. II and THURSDAY LUNCH – WK. I

Item: Meat Loaf

Oven Temperature: 350 Degrees

Cooking Time: 30–40 Minutes

Serving per pan: 12

| Schedule No. of Pans | Time In | Time Out |
|-------------------------|---------|----------|
| 4 | 9:45 | 10:25 |
| 4 | 10:00 | 10:40 |
| 4 | 10:30 | 11:10 |

MONDAY LUNCH – and CAFETERIA WK. II

Item: Stuffed Shells – Lumache with Sweet Italian Sausage and Tomato Sauce

Oven Temperature: 350 Degrees

Cooking Time: 50 Minutes

Serving per pan: 12 – Dietary Product

| Schedule No. of Pans | Time In | Time Out |
|-------------------------|---------|----------|
| 4 | 9:40 | 10:30 |
| 4 | 10:00 | 10:50 |
| 4 | 10:30 | 11:20 |

TUESDAY LUNCH WK. II

Item: Hash Brown Potatoes Simplot 101's

Oven Temperature: 375 Degrees

Cooking Time: 8–10 Minutes

Serving per pan: 16

| Schedule No. of Pans | Time In | Time Out |
|-------------------------|---------|----------|
| 2 sheet pans | 10:30 | 10:40 |
| 2 | 10:40 | 10:50 |

Cook as needed. Don't cook too soon as they harden.
20 per carton
13 cartons per box

Figure 4. Production schedule form, Bethany Medical Center

[illegible]

Figure 5. Temperature check form, equipment, Mercy Hospital

Menu Day _____
Meal _____
Date _____

TEMPERATURE CHECK FOR TRAY LINE FOODS

| Item to Be Checked | Before Tray Line | Tray Line Foods | Before Leaving Kitchen | When Cart Arrives at Galley | After Refrig. in Galley | Temp. on Spec. Heating #'s | When Nurses Pick Up |
|--------------------|------------------------|-------------------------|------------------------------|-----------------------------|-------------------------|----------------------------|---------------------|
| | Temp. Prior to Serving | Temperature After Serv. | Temp. of Sample Tray on Cart | Temp. of Tray Foods at Gal. | Temp. Prior to Serv. | Temp. After Htg on Spec. | When Served |
| Broth | | | | | | | |
| Cream Soup | | | | | | | |
| Entree 1 | | | | | | | |
| Entree 2 | | | | | | | |
| Entree 3 | | | | | | | |
| Starch 1 | | | | | | | |
| Starch 2 | | | | | | | |
| Gravy | | | | | | | |
| Veg 1 | | | | | | | |
| Veg 2 | | | | | | | |
| Veg 3 | | | | | | | |
| Puree | | | | | | | |
| Milk | | | | | | | |
| Gelatin | | | | | | | |
| Juice | | | | | | | |
| Coffee | | | | | | | |
| Tea | | | | | | | |

Figure 6. Temperature check for tray line foods, Mercy Hospital

Patient Tray Line Temperatures

| | | Date _____ | | | |
|-------------------|----------------|----------------------|-------|-----------------|-------------------------|
| | | Dishroom Temperature | | | Corrective Action Taken |
| | | 7AM | 8AM | | |
| Breakfast | | | | | |
| Cereal | (160°) | | | Wash (140–160°) | |
| SF Cereal | (160°) | | | Power (160°) | |
| Scrambled Egg | (145°) | | | Final | |
| SF Scrambled Egg | (145°) | | | Rinse (190°) | |
| Broth | (190°) | | | | |
| Hot Beverage | (185°) | | | | |
| Juices | (40–45°) | | | | |
| Milk | (38–45°) | | | | |
| Garnishes: | | | | | |
| Yes | _____ | | | | |
| No | _____ | | | | |
| Lunch | | 10:50 | 11:30 | 12:10 | |
| Broth | (190°) | | | | Wash (140–160°) |
| SF Broth | (190°) | | | | |
| Broth Base Soup | (190°) | | | | Power (160°) |
| Cream Soup | (175°) | | | | |
| Entrees: | | | | | Final |
| 1 | _____ (160°) | | | | Rinse (190°) |
| 2SF | _____ (160°) | | | | |
| 3 | _____ (160°) | | | | |
| 4SF | _____ (160°) | | | | |
| Mashed Potato | (160°) | | | | |
| SF Mashed Potato | (160°) | | | | |
| Potato Substitute | (160°) | | | | |
| SF Pot Substitute | (160°) | | | | |
| Vegetables | _____ (160°) | | | | |
| Vegetables | _____ (160°) | | | | |
| SF Vegetables | _____ (160°) | | | | |
| SF Gravy/Sauces | (175°) | | | | |
| Gravy/Sauces | (175°) | | | | |
| Ground Meat | (160°) | | | | |
| Pureed Vegetables | (160°) | | | | |
| Dessert | _____ (40–50°) | | | | |
| Dessert | _____ (40–50°) | | | | |
| Juice | (40–50°) | | | | |
| Milk | (50°) | | | | |
| Hot Beverage | (185°) | | | | |
| Garnishes: | | | | | |
| Yes | _____ | | | | |
| No | _____ | | | | |

Figure 7. Patient tray line temperatures, ARA

| Dinner | | 3:50 | 4:30 | 5:10 | Dishroom Temperature | Corrective Action Taken |
|---------------------|----------|------|------|------|-------------------------|----------------------------|
| Broth | (190°) | | | | Wash (140–160°) | |
| SF Broth | (190°) | | | | | |
| Broth Base Soup | (190°) | | | | Power (160°) | |
| Cream Soup | (175°) | | | | | |
| Entrees: | | | | | Final Rinse (190°) | |
| 1 _____ | (160°) | | | | | |
| 2SF _____ | (160°F) | | | | | |
| 3 _____ | (160°) | | | | | |
| 4 _____ | (160°) | | | | | |
| Mashed Potato | (160°) | | | | | |
| SF Mashed Potato | (160°) | | | | | |
| Pot Substitute | (160°) | | | | | |
| SF Pot Substitute | (160°) | | | | | |
| Vegetables _____ | (160°) | | | | | |
| SF Vegetables _____ | (160°) | | | | | |
| Vegetables _____ | (160°) | | | | | |
| Gravy/Sauces | (175°) | | | | | |
| SF Gravy/Sauces | (175°) | | | | | |
| Ground Meat | (160°) | | | | | |
| Pureed Vegetables | (160°) | | | | | |
| Dessert _____ | (40–50°) | | | | | |
| Dessert _____ | (40–50°) | | | | | |
| Juice | (40–50°) | | | | | |
| Milk | (50°) | | | | | |
| Hot Beverage | (185°) | | | | | |
| Garnishes: | | | | | | |
| Yes _____ | | | | | | |
| No _____ | | | | | | |

Figure 7. (continued)

| | Serving Temperature (Coming out of Oven) | Palatable Temperature (Bedside) |
|---|---|------------------------------------|
| Hot Liquids | | |
| Soups | 170° F | 145° F |
| Coffee — Tea | 180° F | 170° F |
| Solid Foods | | |
| Chicken | 170° F | 145° F |
| Pork | 170° F | 145° F |
| Turkey | 156° F | 140° F |
| Stewed — Braised Meats | 165° — 170° F | 140° F |
| Lamb | 155° F | 135° F |
| Rare Beef (Steaks — Roast) | 145° F | 130° F |
| Fish | 170° — 180° F | 155° F |
| Veal | 165° F | 145° F |
| Vegetables — Starches | 165° — 175° F | 150° F |
| Chilled Foods | 40° F | 45° F |
| Marginal Temperatures (At Bedside) | | |
| Hot Food | 130° F | |
| Cold Food | 55° F | |
| Hot Liquids | 135° F | |
| Hot Beverages | 160° F | |
| Cold Beverages | 50° F | |
| Unsatisfactory Temperatures (At Bedside) | | |
| Hot Food | 125° F or Below | |
| Cold Food | 60° F or Above | |
| Hot Liquids | 130° F or Below | |
| Hot Beverages | 155° F or Below | |
| Cold Beverages | 55° F or Above | |

Figure 8. Recommended temperatures,
West Jersey Hospital

Figure 9 is an entree assembly form used at the University of Kansas Medical Center.

Nutritional Assessments. Most hospitals had calculated the nutritional values of their menus and/or menu items. Those serviced by contractors had nutritional assessments run by the contractors' centralized computer. However, it was agreed that these calculations were of little practical value unless accompanied by a study of the patient's food intake, and this was generally done only at the request of the medical staff. Hospitals affiliated with universities seemed to carry out more nutritional based studies than independent hospitals. In the military program, the Armed Forces recipes to be used by the contractor have back-up nutritional data that can be used by the clinical dietitians. Any further nutritional assessment of items prepared should be the responsibility of the clinical dietetic staff.

Microbiological Testing. Most hospitals surveyed did not do routine microbiological testing. Many reported having done some testing in the past but discontinued testing because of expense and continuous negative results. Those doing any microbiological testing now usually have it performed by the hospital's laboratory on an irregular basis. Surfaces and equipment testing is done more frequently than the testing of food items. Three facilities retained samples of all food items served for 24 or 48 hours in case of a possible occurrence of foodborne illness.

Simple testing kits, available commercially, were used by dietary personnel in one hospital. They felt that these kits were useful not only in checking potential microbiological problems, but also as a training and educational tool for employees.

In the military feeding program, responsibility for microbiological testing would come under the Deputy for Preventive Medicine and would vary from hospital to hospital. The kinds of tests and frequency of microbiological testing should be determined by the deputy for each hospital.

Sanitation. The sanitation audits and procedures were very detailed in most hospitals and often included daily, weekly, monthly, and quarterly inspections. The food service contractors were very specific about sanitation requirements. However, the degree of enforcement of sanitary conditions varied greatly from hospital to hospital and was very dependent on the enforcement by management personnel. Most of the food service contractors had audits conducted by their district managers semi-annually. A few hospitals reported having two supervisors conduct the same sanitation audits independently and comparing the results.

In addition to audits by their own food service personnel, several hospitals were audited by the hospital administration. Moreover, outside audits were often numerous and included the Joint Commission on the Accreditation of Hospitals (JCAH), state, county, and municipal public health departments, state residential living commissions, the insurer of the hospital's liability policy, the Health, Education and Welfare Administration, and Medicare-Medicaid inspection teams.

ENTREE ASSEMBLY AUDIT FORM

Form #1A

Date _____ Line # _____ Prepared Food # _____

Name of Entree _____

Estimated Production _____ Plates

1. Portion Size

| Item | Weight | Average Weight | Range |
|------|--------|----------------|-------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

2. Portioning utensil as stated in A.1 _____ Yes ___ No ___
3. Proper label and date (check one rack) _____ Yes ___ No ___
missing _____
4. Use of appropriate dishes _____ Yes ___ No ___
5. Sanitary handling of dishes and utensils _____ Yes ___ No ___
6. All positions manned according to A.1 _____ Yes ___ No ___
7. Completeness of vinyl seal (Check one basket) _____ Yes ___ No ___
defective _____
A. Product is not squashed and juice not running over _____ Yes ___ No ___
8. Stacking of plates in single layer (Check one complete rack) _____ Yes ___ No ___
9. Supply — not to exceed 1½ pans _____ Yes ___ No ___
10. Rate of racks into refrigerator and/or freezer not to exceed 30 min _____ Yes ___ No ___
11. Actual count for one entree _____ plates.
12. Record count for above entree _____ plates.
13. Previous days record
A. All produced items have a recorded count _____ Yes ___ No ___
B. Calculate # of plates/minute for each entree made previous day

_____ plates/minute for
 _____ plates/minute for
 _____ plates/minute for
 _____ plates/minute for
 _____ plates/minute for
 _____ plates/minute for

Comments: _____

Figure 9. Entree assembly audit form, University of Kansas Medical Center

The model food service contract is quite detailed in sanitation requirements. Adherence to this contract and the Public Health and AR 40-5 regulations the authors believe are adequate for the sanitation section of the military hospital quality assurance program.

Sensory Evaluation. The formal and informal sensory evaluations varied greatly from hospital to hospital. Informal test sampling of prepared items before patient tray assembly was usually the responsibility of the tray line supervisor. Those hospitals with a restaurant menu de-emphasized tray-line sampling of each item and largely relied upon sampling by the cooks and supplemented the evaluations by spot-checking and dummy tray assessment. In two facilities with a strong emphasis on product quality, a test tray was used and each item was sampled by the cooks. Suggestions for item correction and for recipe improvements were made at this time and the group testing re-enforced the importance of end-product quality. Most dietitians reported good cooperation from their cooks in improving substandard items when the cooks were involved in product evaluations and constructive suggestions tactfully made.

While the conventional systems rely primarily on informal sensory sampling prior to serving time, cook-chill and cook-freeze facilities lend themselves more easily to formalized sensory panels. In the cook-chill system at the University of Wisconsin Medical Center, all items were tested informally by individual cooks prior to chilling. After chilling, they were reheated and resampled by a supervisor and production employee. In the cook-freeze operations, products were sampled after freezing but prior to serving. At the University of Kansas Medical Center, two panels were held daily to monitor the products prepared the day before. The panels were comprised of dietitians, cooks, and ingredients room personnel. Ratings were made according to end-item descriptions (Figure 10) to obtain more objective ratings. At Mercy Hospital, another cook-freeze facility, test tray evaluations of food are made daily by a panel of six or seven dietitians and a cook.

Other formal sensory evaluations are used in some hospitals for the evaluation of new products, evaluation of complaint items, and more objective evaluations of food served. These panels were usually comprised of 10 to 12 nondietary employees. One hospital included long-term patients in these evaluations. Samples were presented without identification and usually rated for appearance, odor, flavor, and texture. Results were used for procurement decisions and improvement of food quality. Figure 11 depicts an evaluation form used by the Veterans Administration Hospitals, and Figure 12 one used by the Bethany Medical Center. In a military quality assurance program, sensory evaluations are critical to the determination of food quality and for the development and maintenance of high quality standards. It is recommended that sensory evaluations be included in the quality assurance section and results used to document the presence or absence of problems and to assist the contractor and the COR in resolving food quality problems.

Some of the basic requirements for sensory testing should be:

1. All food items should be sampled as specified in the quality assurance section of the military contract before being sent to patients or cafeteria;

P008

ROAST RIBEYE BEEF — Salt free

Appearance

1. Medium brown color with no pink, grey or green tint present.
2. Marbling may be evident, but gristle is not evident. No pieces of fat wider than 1/4 inch.

Texture

1. Fork tender.
2. Easily chewed with no stringiness evident. Moist to the taste.

Flavor

1. Mild characteristic flavor with no old, rancid or off flavors present.

Temperature

140 — 160° F.

Portion Size

.060 kg.

PEAS/ONIONS

Appearance

1. Fairly uniform bright green color; no white or yellow evident. Opaque white onions.
2. No discoloration or spoiled pieces.
3. Less than 25% of peas wrinkled or shriveled. Intact, plump pieces present.
4. Fairly uniform pea size and onion size.

Texture

1. Able to be pierced with fork and hold shape. No crispness or mushiness.
2. Tender to chew. Juicy, not dry.

Flavor

1. Mildly sweet characteristic flavor for both peas and onions.
2. No bitter or old flavors.

Temperature

130 — 150° F.

Portion Size

90 g.

CARROTS

Appearance

1. Bright orange, fairly uniform color. No yellow or other discolorations.
2. Fairly uniform cubed shape.
3. No foreign matter present.

Texture

1. Juicy, not dry. Tender but not crispy, mushy or spongy.
2. Fork tender; easily pierced with a fork.

Flavor

1. Characteristic mild sweet flavor, not bitter.

Temperature

130 — 150° F.

Portion Size

.075 kg.

Figure 10. End-item description, University of Kansas Medical Center

| SENSORY EVALUATION OF CONVENIENCE FOODS | | | | |
|---|--|-----------------|--------|-------------------------|
| PANELIST | | PRODUCT | | DATE |
| RATING SCALE | | CHARACTERISTICS | | |
| | | APPEARANCE | FLAVOR | TEXTURE/ CONSISTENCY |
| OVERALL ACCEPTABILITY | | | | |
| 7 LIKE EXTREMELY | | | | |
| 6 LIKE VERY MUCH | | | | |
| 5 LIKE MODERATELY | | | | |
| 4 NEITHER LIKE NOR DISLIKE | | | | |
| 3 DISLIKE MODERATELY | | | | |
| 2 DISLIKE VERY MUCH | | | | |
| 1 DISLIKE EXTREMELY | | | | |
| COMMENTS | | | | |

VA FORM 10-7983
DEC 1974

Figure 11. Sensory evaluation of convenience foods, Veterans Administration Hospital

2. Cooks should be included in some aspects of sampling to be aware of product quality desired and obtained;
3. Formal sensory panels including 10 to 12 panelists from various areas of the hospital including nonfood areas should be conducted;
4. Use of end product descriptions should be encouraged for objective evaluations;
5. Results from sensory panels should be summarized and discussed with cooks and management personnel.

Test Tray Assessments. Many of the hospitals conducted assessment of test or "dummy" trays sent to patient floors. The number and frequency of this assessment varied from one tray once a week to 10 trays at irregular intervals. In most instances, tray evaluations were done on the patient floors, but a few brought the trays back to the production area. The hospitals operated by food service contractors relied heavily on test tray assessment as a means for evaluating quality and temperature of each item as it would appear before the patient. The tray assessments were conducted by different personnel in different hospitals, but most commonly involved a clinical or production dietitian, and sometimes a nondietary employee such as a nurse or doctor. The trays were usually assessed for appearance, accuracy, and cleanliness, and for temperature, flavor, and texture of the food. Figure 13 is an evaluation form used by the West Jersey Hospital. Figure 14 shows the evaluation form and Figure 15 the corrective action plan used by Saga Corp. Figure 16 shows the individual evaluation form used by ARA and Figure 17 their summary of four individual tray assessments. Test tray examinations are a valuable quality measurement tool when they are carefully and objectively performed, when results are related back to production employees and when follow-up action is taken. It is recommended that the test tray assessments be incorporated in the quality measurement plan to be performed by the dietitians and/or the COR.

Patient Acceptability Ratings. Patient acceptability ratings are the final assessment of whether the food being produced and served satisfies the patient. Most hospitals used a questionnaire to determine patient acceptability. Most commonly the ratings were conducted monthly although some were done quarterly, semi-annually, or yearly. Results were often sent not only to food service management personnel but to hospital administration personnel. Samples of patient questionnaires were collected from most hospitals and although designs varied considerably, the types of questions asked were usually similar. Opinions on food temperature, variety, flavor, and appearance of food and courtesy of servers were collected. Respondents usually were asked to rate these categories as very good, good, fair, or poor. Although several hospitals would relate their results as "85%" acceptability, the basis considered acceptable varied and no valid comparison of patient acceptability was possible in this survey.

Figure 18 is a patient acceptability rating form used by the University of Wisconsin Medical Center. Figures 19 and 20 show a SAGA and Custom Management Corp. form, Figure 21 shows a detailed questionnaire used annually by the West Jersey Hospital and Figure 22 a briefer one used monthly.

WEST JERSEY HOSPITAL

Department of Food Service & Dietetics
Food Quality Control and Taste Test Panel

N S E

BREAKFAST LUNCH NON PATIENT DINNER SPECIAL SIGNATURES: MGT. REP. PROD. REP. DIET. REP.

| Ref. | Food Item Select 5 | Panel Member | Serving Time/Temp. | S | U | Bedside Time/Temp. | S | U | Appearance S | U | Taste S | U | Texture S | U | Odor S | U |
|------|--------------------|---|--------------------|---|---|--------------------|---|---|--------------|---|---------|---|-----------|---|--------|---|
| A. | | Management Rep. Production Rep. Dietetic Rep. | | | | | | | | | | | | | | |
| B. | | Management Rep. Production Rep. Dietetic Rep. | | | | | | | | | | | | | | |
| C. | | Management Rep. Production Rep. Dietetic Rep. | | | | | | | | | | | | | | |
| D. | | Management Rep. Production Rep. Dietetic Rep. | | | | | | | | | | | | | | |
| E. | | Management Rep. Production Rep. Dietetic Rep. | | | | | | | | | | | | | | |

| Ref. | Special Diets (5) | Accuracy S | U | Appearance S | U |
|------|-------------------|------------|---|--------------|---|
| F. | | | | | |
| G. | | | | | |
| H. | | | | | |
| I. | | | | | |
| J. | | | | | |

| Ref | Comments for Unsatisfactory Ratings |
|-----|-------------------------------------|
| | |
| | |
| | |
| | |
| | |

Signature (Dietetic Rep.):

Total Ratings: Satisfactory Unsatisfactory

For additional comments, use reverse side

Figure 13. Food quality control and taste test panel, West Jersey Hospital

QUALITY ASSESSMENT OF A PATIENT'S TRAY

Sent to: _____
 Date: _____
 Meal: _____
 Diet: _____

(Staple copy of actual menu to this form)

| HOT FOOD | | | | | | COLD FOOD | | | | | |
|-----------------------------------|-------------|-------------|-------------|-------------|-------------|------------|---------------|-------|--------|-----------|--|
| Menu Item | Soup | Entree | Pot. | Veg. | Hot Bev. | Salad | Dessert* | Fruit | Butter | Cold Bev. | |
| 1. Temp. standard on serving line | 170° | 160° | 150° | 160° | 170° | Cool Crisp | Cool/ Firm | Cool | Firm | 45° | |
| a. On serving line | | | | | | | | | | | |
| 2. Temp. standard of food on tray | 150° – 170° | 130° – 160° | 130° – 150° | 120° – 160° | 150° – 170° | Cool Crisp | Cool/ Firm | Cool | Firm | 45° – 50° | |
| a. Temp. of food on tray | | | | | | | | | | | |
| 3. Portion size | | | | | | | | | | | |
| 4. Appearance of food | | | | | | | | | | | |
| 5. Garnish & Decoration | | | | | | | | | | | |
| 6. Taste & Aroma | | | | | | | | | | | |
| 7. Missing Items | | | | | | | | | | | |

8. Tray completeness & cleanliness: TRAY _____ FLATWARE _____ GLASSWARE _____ PLATE COVER _____
 NAPKIN _____ DISHES _____

PERTINENT ITEMS:

- Time food temps. are taken in kitchen: _____
- Time cart leaves kitchen: _____
- Time cart arrives on floor: _____

d. Time tray passing begins: _____

e. Time test tray is delivered to patient (or test area): _____

OVERALL QUALITY:

VERY GOOD GOOD

11. RECOMMENDED CORRECTIONS: Attach and complete Action Plan.

cc: Hospital Administration
 Food Service Director
 District Manager

Evaluation Team Signatures: _____

*Temperature Standard for a Potentially Hazardous Dessert is 45°

Figure 14. Quality assessment of a patient's tray, Providence Hospital, Saga Corp.

Account: _____

Date: _____

[illegible]

Signature:

Food Service Director

Chief Dietitian

Food Service Manager

INDIVIDUAL EVALUATION SHEET

(Please underline or circle appropriately)

I. COMPLETENESS

YES _____ NO _____

II. APPEARANCE

- | | | |
|------------------|----|-------------------------|
| 1. Attractive | or | Unattractive |
| 2. Clean & Dry | or | Wet with spills |
| 3. Well arranged | or | Scrambled and cluttered |

III. TASTE

If modified diet, therapeutically correct (without salt, sugar and/or fat as dictated by diet or incorrect)

IV. TEMPERATURE

| | | | |
|-----------|------|----|------|
| HOT FOOD | HOT | or | COOL |
| COLD FOOD | COLD | or | WARM |

V. PORTION SIZE

| | | |
|----------|-----------|-----------|
| SUITABLE | TOO LARGE | TOO SMALL |
|----------|-----------|-----------|

VI. OVERALL EVALUATION

| | | | |
|-----------|------|------|------|
| EXCELLENT | GOOD | FAIR | POOR |
|-----------|------|------|------|

Figure 16. Individual evaluation sheet, ARA Corp.

PATIENT TEST TRAY EVALUATION

HOSPITAL _____ ROOM # _____

DATE _____ DAY _____

MEAL: (Circle one) BREAKFAST LUNCH DINNER

DIET: REGULAR _____ THERAPEUTIC (Specify) _____

APPEARANCE OF TRAY: COMPLETE: YES NO

MENU ITEM: TEMP. _____

APPETIZER _____ SUMMARY INDIVIDUAL
EVALUATION SHEETS

SOUP _____

ENTREE _____

GARNISH: YES ___ NO ___

POTATO/SUB _____

VEGETABLE _____

SALAD _____

GARNISH: YES ___ NO ___

DESSERT _____

BEVERAGE: HOT _____

COLD _____

OVERALL EVALUATION (Circle one)

EXCELLENT GOOD FAIR POOR

COMMENTS: _____

HOSPITAL STAFF ASSISTING WITH EVALUATION (Name and Position)

1. _____

2. _____

3. _____

POLICY #30.40.02

Director of Food Service

Figure 17. Patient test tray evaluation, summary form, ARA Corp.

**UNIVERSITY OF WISCONSIN HOSPITAL & CLINICS
FOOD SERVICE DEPARTMENT
PATIENT QUESTIONNAIRE**

THE FOOD SERVICE DEPARTMENT IS INTERESTED IN YOUR COMMENTS ABOUT MEAL SERVICE IN THE HOSPITAL. YOUR COOPERATION IN COMPLETING THIS QUESTIONNAIRE WILL BE MOST HELPFUL AND APPRECIATED. KEEP THE COMPLETED FORM WITH YOUR MENU AND A DIETITIAN OR A DIET CLERK WILL PICK IT UP AT 11:30 A.M. THANK YOU.

DATE: _____

1. NAME _____ ROOM NO. _____ UNIT _____
2. DID A DIETITIAN OR DIET CLERK VISIT YOU? YES _____ NO _____
3. ARE YOU ON A MODIFIED DIET? YES _____ NO _____
NAME OF DIET _____
IF YOU ARE ON A MODIFIED DIET, HAS IT BEEN EXPLAINED TO YOU BY A DIETITIAN?
YES _____ NO _____
4. FOR EACH TOPIC, CHECK (X) THE PHRASE THAT BEST DESCRIBES YOUR OPINION OF THAT ASPECT OF FOOD SERVICE. PLEASE FEEL FREE TO MAKE ANY ADDITIONAL COMMENTS IN THE SECTION BELOW:

| | GOOD | FAIR | POOR | COMMENTS |
|-----------------------|------|------|------|----------|
| TRAY APPEARANCE | | | | |
| QUALITY OF FOOD | | | | |
| FLAVOR OF FOOD | | | | |
| HOT FOOD TEMPERATURE | | | | |
| COLD FOOD TEMPERATURE | | | | |
| PORTION SIZES | | | | |
| MENU VARIETY | | | | |

5. GENERAL COMMENTS: _____

UWH: 3423 I.D. 028

WHITE — GENERAL

Figure 18. Patient questionnaire, University of Wisconsin Hospital & Clinics

PATIENT SATISFACTION SURVEY

This survey is being conducted as part of a continuing effort to provide good food service. Your cooperation in completing this questionnaire will be most appreciated.

In completing this questionnaire, be sure to circle clearly the appropriate numbers. Erase completely any circles you wish to change.

We are interested in learning your general opinions toward each of the following food service topics as they apply to the present food service here. For each topic *circle one number* to indicate the phrase that best describes your opinion of that aspect of the food service.

| | Very Good | Good | Fair | Poor | Very Poor |
|-----------------------------------|--------------|------|------|------|--------------|
| Temperature of Food | 1 | 2 | 3 | 4 | 5 |
| Variety of Food | 1 | 2 | 3 | 4 | 5 |
| Appearance of Food | 1 | 2 | 3 | 4 | 5 |
| Salads | 1 | 2 | 3 | 4 | 5 |
| Desserts | 1 | 2 | 3 | 4 | 5 |
| Main Dish | 1 | 2 | 3 | 4 | 5 |
| Cleanliness of dishes, silverware | 1 | 2 | 3 | 4 | 5 |
| Completeness and accuracy of tray | 1 | 2 | 3 | 4 | 5 |
| Quantity served (portion size) | 1 | 2 | 3 | 4 | 5 |
| Arrangement of tray | 1 | 2 | 3 | 4 | 5 |
| Overall food service | 1 | 2 | 3 | 4 | 5 |

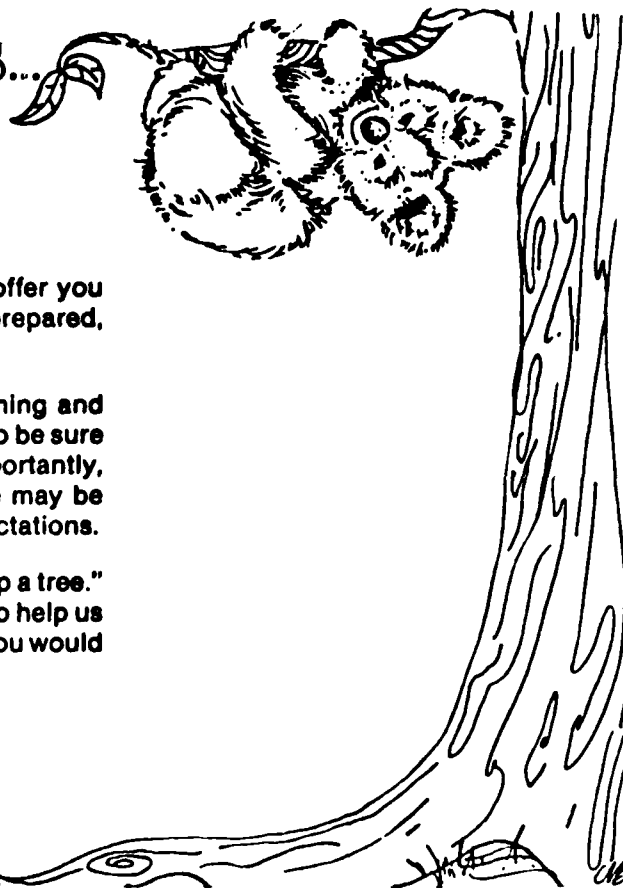
If there are any other aspects not mentioned above that are important to you, list them below and rate each one as you did above.

| | Very Good | Good | Fair | Poor | Very Poor |
|-------|--------------|------|------|------|--------------|
| _____ | 1 | 2 | 3 | 4 | 5 |
| _____ | 1 | 2 | 3 | 4 | 5 |
| _____ | 1 | 2 | 3 | 4 | 5 |

Thank you

Figure 19. Patient satisfaction survey, Providence Hospital, Saga Corp.

Help keep us on our Toes...



As your Dining Services Team, our aim is to offer you meals which are nutritionally sound, carefully prepared, attractive, varied and enjoyable.

To make our best possible effort toward attaining and maintaining that goal, we need your help. We need to be sure about the things you feel we're doing right. More importantly, we need to know if there are any areas where we may be "falling down" rather than "rising up" to your expectations.

Without knowing what you think, we're really "up a tree." Won't you please take a few moments of your time to help us keep "on our toes?" We really would appreciate it if you would respond candidly and thoughtfully to our survey.



Please place a checkmark under each rating which best describes your level of satisfaction.

| | Very Good | Good | Fair | Poor |
|--------------------------------------|-----------|------|------|------|
| Menu Variety | | | | |
| Portion Size | | | | |
| Attractiveness of Food | | | | |
| Flavor of Food | | | | |
| Hot Food Temperature | | | | |
| Cold Food Temperature | | | | |
| Cleanliness of Dinnerware & Utensils | | | | |
| Promptness of Service | | | | |
| Courtesy of Service | | | | |
| Overall Service | | | | |

- Which food items do you enjoy the most?
- Which food items do you enjoy the least?
- List any specific item(s) which you would like to see added to our menu selections:
- Which meal do you eat most frequently in the cafeteria?
- Please feel free to make additional comments or suggestions concerning any aspect of the Food Service Program.

Thank you for taking time to complete this questionnaire.
Have a nice day!

Your Dining Service Team

Figure 20. Patient satisfaction form, Custom Management Corp.

**WEST JERSEY
HOSPITAL**

Northern Division Camden, NJ 08104
Southern Division Berlin, NJ 08009
Eastern Division Voorhees, NJ 08043

MEAL — B L D

DATE _____ **DIETARY — QUALITY CONTROL SURVEY** **MENU #** _____

| NAME | ROOM | DIET |
|-------------|-------------|-------------|
|-------------|-------------|-------------|

THE DIET

- | | | |
|---|-----|----|
| 1. Did Doctor prescribe a special diet? | Yes | No |
| 2. What Diet are you on? Describe: | | |
| 3. How long? | | |
| 4. Did Doctor explain diet limitations? | | |
| 5. Comments on the Diet? | | |
-

THE TRAY

- | | | | |
|---|--------------|---------------|--|
| 1. Do you find it | Attractive? | Unattractive? | |
| 2. What is your opinion of Disposable Ware: | No objection | Object | |
| 3. Comments: | | | |
-

THE MENU

- | |
|---|
| 1. Are you satisfied with the menu? |
| 2. Are there enough selections? |
| 3. Within the restrictions imposed by your diet, do you feel that the selectivity is varied enough? |
| 4. Comments: |
-

Figure 21. Dietary — quality control survey, West Jersey Hospital

SEE PAGE —2—

PAGE -2- DIETARY QUALITY CONTROL SURVEY

THE FOOD - PORTION SIZE

1. Are the portions Too Small _____ Too Large _____ Adequate _____

QUALITY

1. Are the Entrees Under cooked _____ Over cooked _____ Adequate _____

2. Are the Vegetables Under cooked _____ Over cooked _____ Adequate _____

3. Are the Cold Foods Good _____ Poor _____ Adequate _____

4. Are the Beverages Good _____ Poor _____ Adequate _____

Comments:

THE FOOD - TASTE

Entree: Good _____ Poor _____ Adequate _____

Vegetables: Good _____ Poor _____ Adequate _____

Cold Foods: Good _____ Poor _____ Adequate _____

Beverages: Good _____ Poor _____ Adequate _____

Comments:

APPEARANCE

Entree: Attractive _____ Unattractive _____

Vegetables: Attractive _____ Unattractive _____

Cold Foods: Attractive _____ Unattractive _____

Beverages: Attractive _____ Unattractive _____

Comments:

Figure 21. (continued)

SEE PAGE -3-

PAGE -3- DIETARY QUALITY CONTROL SURVEY

FOOD TEMPERATURE

| | | | |
|-----------------|------------|------------|------------|
| Hot Entrees: | Hot _____ | Warm _____ | Cold _____ |
| Hot Vegetable: | Hot _____ | Warm _____ | Cold _____ |
| Hot Beverage: | Hot _____ | Warm _____ | Cold _____ |
| Cold Foods: | Cold _____ | Warm _____ | |
| Cold Beverages: | Cold _____ | Warm _____ | |

Comments:

ACCURACY

1. Did you receive everything ordered on the tray? Yes _____ No _____

2. Missing:

Comments:

SERVICE

On Time? _____ Courteous? _____

General Opinion of the Food Service:

Suggestions to improve service:

Figure 21. (continued)

Dietary Patient Survey

Note: Before Patients fill in this survey Hospital Staff should fill in this section:


Meal ☐ Breakfast Floor _____ Date _____, 19____
☐ Lunch Ward _____
☐ Dinner

For Patients Eating Normal Food

First may we have some personal information please:

Sex ☐ male Age ☐ 15 - 25
☐ female ☐ 25 - 40
 ☐ 40 - 60
 ☐ over 60

exceptionally
bad
somewhere
in between
exceptionally
good



Please answer the following questions by marking the appropriate box.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|
| 1. How was your tray delivered to you? | | | | | | | | | | |
| 2. How well did the food on your tray match what you ordered? | | | | | | | | | | |
| 3. How attractive was the tray and food to look at? | | | | | | | | | | |
| 4. How was the temperature of the hot food and beverages? | | | | | | | | | | |
| 5. How was the temperature of the cold foods and beverages? | | | | | | | | | | |
| 6. How fresh were the fresh foods and beverages? | | | | | | | | | | |
| 7. How satisfactory were the sizes of the helpings of food and beverages? | | | | | | | | | | |

Please give comments that might help to improve service.

MCM Form D10

THANK YOU

Figure 22. Dietary patient survey, West Jersey Hospital

Other tools used for determining the patient's attitude towards the food served included interviews by clinical dietitians and dismissal questionnaires. The direct interview was felt by many to be the most informative. Figure 23 is a patient visitation form used by Seiler's Corp. Dismissal questionnaires used in most hospitals had a relatively low response rate and many felt that only unsatisfied patients were apt to respond.

Patient acceptability studies in hospital feeding have been conducted by NLABS personnel for various projects. The most comprehensive is one reported by Maller, Dubose and Cardello in *Consumer Opinions of Hospital Food and Food Service*.² It is suggested that the survey forms (Appendixes A, B and C) be adopted for use in assessing patient acceptability approximately three months before and three months after the food service contractor assumes the food service responsibilities. This approach will allow for a comparative basis to judge patient acceptability under military and civilian management. A less detailed questionnaire could also be used before and after the contractor assumes control. Summaries of results of both surveys should be made available to the contractor, the contracting officer, and the clinical dietetic staff. Patient interviews should also be conducted regularly, results summarized, and follow-up procedures developed.

Cafeteria Acceptability Ratings. Less emphasis was placed on cafeteria acceptability ratings than on patient ratings. Many hospitals reported that an increase or decrease in sales was their primary source of information relative to the acceptability information regarding food and service. Some hospitals periodically left comment cards near the cash register so those desiring to could write in comments. Some used a suggestion box; a few conducted surveys monthly or quarterly. Figures 24 to 27 are samples of such questionnaires. In some hospitals, a dietitian would ask a client if he or she would like to cooperate in an evaluation, and if agreed to, the client would evaluate a free meal. The dietitian would then sit with the patron and conduct a tray assessment much like those conducted on test trays on the floors. In the military hospital feeding program, cafeteria acceptability ratings are of special importance not only to insure satisfied employees, but also because of the many ambulatory patients. It is recommended that questionnaires used in *Consumer Opinions of Hospital Food and Food Service* as adapted (Appendix A, B, and C) be used three months before and again three months after a food service production at any installation. It is recommended that the staff questionnaires used in *Consumer Opinions of Hospital Food and Food Service* as adapted (Appendix D) be used before and after a food service contractor assumes food service production at any installation.

²O. Maller, C.N. DuBose, and A.V. Cardello. *Opinions of Food Service at Military Hospitals*. *J. Am. Diet. Assoc.*, 236-242, 1980.



dietary management

Date / /

PATIENT VISITATION REPORT

| PATIENT CONTACT | | EXCELLENT — E | | GOOD — G | | FAIR — F | | POOR — P | |
|-----------------|--------|---------------|-------|----------|------|----------|-------|----------|--|
| NAME | ROOM # | TASTE | TEMP. | APPEAR. | SIZE | DIET | SPEED | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

ADDITIONAL PATIENT COMMENTS (Indicate Name):

Visitation
by _____

ACTION:

Reviewed and Approved { Dietitian _____
Manager _____

FORM NO. 20-58 11/78 60M

Figure 23. Patient visitation report, Seiler's Corp.



MAY WE HAVE YOUR OPINION?

THE FOOD SERVICE STAFF IS HERE TO SERVE YOU

You can help us by answering the following questions:

What meals do you normally eat here?

☐ Breakfast ☐ Lunch ☐ Dinner

☐ Yes ☐ No Do you enjoy your meals here?

☐ Yes ☐ No Is there enough variety in the menus?

☐ Yes ☐ No Is food served at a suitable temperature?

Is food served:

☐ Yes Attractively

☐ Yes Courteously

☐ Yes Fast Enough

☐ No

☐ No

☐ No

We would appreciate your additional comments and suggestions.

THANK YOU

450-38A

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Figure 24. Cafeteria comment card, ARA



CM-403

The aim of the Dietary Department is to offer you meals which are nutritionally sound, carefully prepared, varied and enjoyable! To make our best possible effort toward attaining and maintaining that goal, we need your help!

Won't you please take a few moments to help us keep "on our toes?" Without knowing what you think, we're really "up a tree."

Please place a checkmark under each rating which best describes your level of satisfaction.

| | Very Good | Good | Fair | Poor |
|------------------------|-----------|------|------|------|
| Menu Variety | | | | |
| Portion Size | | | | |
| Attractiveness of Food | | | | |
| Flavor of Food | | | | |
| Hot Food Temperature | | | | |
| Cold Food Temperature | | | | |
| Overall Service | | | | |



- Which food item(s) did you enjoy the most?
- Which food item(s) did you enjoy the least?
- Did you receive all your menu selections at each meal?
☐ Yes ☐ No
- Have you been visited by a Dietitian or Representative of the Dietary Department?
☐ Yes ☐ No
- What type of diet have you been following during your hospital stay?
☐ Regular Diet ☐ Modified Diet _____ please specify
- How would you rate your appetite during your hospital stay?
☐ Good ☐ Fair ☐ Poor
- Please feel free to make additional comments or suggestions concerning any aspect of the Food Service Program. Use back page if necessary.

Thank you for taking time to complete this questionnaire.
Have a nice day!

Your Dietary Staff

Figure 25. Cafeteria comment card, Custom Management Corp.

EMPLOYEE SATISFACTION SURVEY

This survey is being conducted as part of a continuing effort to provide good food service. Your cooperation in completing this questionnaire will be most appreciated.

In completing this questionnaire, be sure to circle clearly the appropriate numbers. Erase completely any circles you wish to change.

We are interested in learning your general opinions toward each of the following food service topics as they apply to the present food service here. For each topic *circle one number* to indicate the phrase that best describes your opinion of that aspect of the food service.

| | Very Good | Good | Fair | Poor | Very Poor |
|-----------------------------------|--------------|------|------|------|--------------|
| Temperature of Food | 1 | 2 | 3 | 4 | 5 |
| Variety of Food | 1 | 2 | 3 | 4 | 5 |
| Appearance of Food | 1 | 2 | 3 | 4 | 5 |
| Salads | 1 | 2 | 3 | 4 | 5 |
| Desserts | 1 | 2 | 3 | 4 | 5 |
| Main Dish | 1 | 2 | 3 | 4 | 5 |
| Cleanliness of dishes, silverware | 1 | 2 | 3 | 4 | 5 |
| Completeness and accuracy of tray | 1 | 2 | 3 | 4 | 5 |
| Quantity served (portion size) | 1 | 2 | 3 | 4 | 5 |
| Arrangement of tray | 1 | 2 | 3 | 4 | 5 |
| Overall food service | 1 | 2 | 3 | 4 | 5 |

If there are any other aspects not mentioned above that are important to you, list them below and rate each one as you did above.

| | Very Good | Good | Fair | Poor | Very Poor |
|-------|--------------|------|------|------|--------------|
| _____ | 1 | 2 | 3 | 4 | 5 |
| _____ | 1 | 2 | 3 | 4 | 5 |
| _____ | 1 | 2 | 3 | 4 | 5 |

Figure 26. Employee satisfaction survey, Portsmouth Hospital, Saga Corp.

Thank you

FOOD PREFERENCE SURVEY

Hospital Division 2

This survey is being conducted as part of a continuing effort to provide good food service. Your cooperation in completing this questionnaire will be most appreciated.

As you complete the questionnaire, be sure to circle clearly the appropriate numbers. Erase entirely any circles you wish to change.

We are interested in learning how often the various items listed on this form should be included in our menus. For each item, CIRCLE ONE NUMBER that indicates the words that best describe how frequently you would like that item served.

To assist you in choosing the words which best describe how frequently you would like to have a particular item served, the following definitions have been added:

| | |
|--------------|--|
| very often | — served once a week |
| often | — served two or three times a month |
| occasionally | — served once a month |
| seldom | — served once every two months |
| rarely | — served once every three or four months |

In addition, please indicate your sex by circling the appropriate name before starting on the actual survey.

| LUNCHEON ENTREES | MALE | | FEMALE | | |
|---------------------------------|------------|-------|--------------|--------|--------|
| | Very Often | Often | Occasionally | Seldom | Rarely |
| Bacon, lettuce, tomato sandwich | 1 | 2 | 3 | 4 | 5 |
| Meat loaf | 1 | 2 | 3 | 4 | 5 |
| Fruit salad plate | 1 | 2 | 3 | 4 | 5 |
| Grilled cheeseburger | 1 | 2 | 3 | 4 | 5 |
| Beef stew | 1 | 2 | 3 | 4 | 5 |
| Baked lasagna | 1 | 2 | 3 | 4 | 5 |
| Hot roast beef sandwich | 1 | 2 | 3 | 4 | 5 |
| Vegetable plate | 1 | 2 | 3 | 4 | 5 |
| Baked macaroni & cheese | 1 | 2 | 3 | 4 | 5 |
| Cold meat plate | 1 | 2 | 3 | 4 | 5 |
| Julienne salad bowl | 1 | 2 | 3 | 4 | 5 |

Figure 26. (continued)

| LUNCHEON ENTREES (continued) | Very Often | Often | Occasionally | Seldom | Rarely |
|-----------------------------------|------------|-------|--------------|--------|--------|
| Beef or chicken turnover | 1 | 2 | 3 | 4 | 5 |
| Hot dogs & baked beans | 1 | 2 | 3 | 4 | 5 |
| Fritters & sausage links or bacon | 1 | 2 | 3 | 4 | 5 |
| Barbecued beef sandwich | 1 | 2 | 3 | 4 | 5 |
| Egg & tuna salad sandwiches | 1 | 2 | 3 | 4 | 5 |
| Beef & noodle casserole | 1 | 2 | 3 | 4 | 5 |
| Grilled ham & cheese sandwich | 1 | 2 | 3 | 4 | 5 |
| Spaghetti & meat sauce | 1 | 2 | 3 | 4 | 5 |
| Grilled hamburger | 1 | 2 | 3 | 4 | 5 |
| Hot turkey sandwich | 1 | 2 | 3 | 4 | 5 |
| Swedish meatballs | 1 | 2 | 3 | 4 | 5 |
| Stuffed green pepper | 1 | 2 | 3 | 4 | 5 |
| Chicken pot pie | 1 | 2 | 3 | 4 | 5 |
| Corned beef hash | 1 | 2 | 3 | 4 | 5 |
| Chow Mein | 1 | 2 | 3 | 4 | 5 |
| Gourmet casserole | 1 | 2 | 3 | 4 | 5 |
| Spanish rice | 1 | 2 | 3 | 4 | 5 |
| Spanish macaroni | 1 | 2 | 3 | 4 | 5 |
| Sheperd's pie | 1 | 2 | 3 | 4 | 5 |
| Tuna noodle casserole | 1 | 2 | 3 | 4 | 5 |
| Fish stick sandwich | 1 | 2 | 3 | 4 | 5 |
| Fish 'n chips | 1 | 2 | 3 | 4 | 5 |
| Cream chipped beef | 1 | 2 | 3 | 4 | 5 |
| Beef biscuit roll | 1 | 2 | 3 | 4 | 5 |
| Creamed chicken | 1 | 2 | 3 | 4 | 5 |
| Welsh rabbit | 1 | 2 | 3 | 4 | 5 |
| LUNCHEON DESSERTS | | | | | |
| Frosted cupcake | 1 | 2 | 3 | 4 | 5 |
| Apple crisp | 1 | 2 | 3 | 4 | 5 |
| Chilled pear halves | 1 | 2 | 3 | 4 | 5 |
| Chocolate brownies | 1 | 2 | 3 | 4 | 5 |
| Ice cream | 1 | 2 | 3 | 4 | 5 |
| Gingerbread/Whipped cream | 1 | 2 | 3 | 4 | 5 |
| Oatmeal cookies | 1 | 2 | 3 | 4 | 5 |
| Chocolate pudding | 1 | 2 | 3 | 4 | 5 |
| Applesauce bars | 1 | 2 | 3 | 4 | 5 |

Figure 26. (continued)

| LUNCHEON DESSERTS (continued) | Very Often | Often | Occasionally | Seldom | Rarely |
|-------------------------------|------------|-------|--------------|--------|--------|
| Fresh fruit cup | 1 | 2 | 3 | 4 | 5 |
| Bread pudding | 1 | 2 | 3 | 4 | 5 |
| Cake square with icing | 1 | 2 | 3 | 4 | 5 |
| Apple brown betty | 1 | 2 | 3 | 4 | 5 |
| Sherbet | 1 | 2 | 3 | 4 | 5 |
| Fresh fruit | 1 | 2 | 3 | 4 | 5 |
| Chocolate chip cookies | 1 | 2 | 3 | 4 | 5 |
| Whipped fruited gelatin | 1 | 2 | 3 | 4 | 5 |
| Gelatin cubes/Whipped cream | 1 | 2 | 3 | 4 | 5 |
| Strawberry crunch | 1 | 2 | 3 | 4 | 5 |
| Peanut butter brownies | 1 | 2 | 3 | 4 | 5 |
| Peach slices | 1 | 2 | 3 | 4 | 5 |

Figure 26. (continued)

Cafeteria Customer Survey

Note: Before Cafeteria Customers fill in this survey Hospital Staff should complete this section.

Meal ☐ Breakfast

Date _____, 19____

Time Customer Served:

☐ Lunch☐ Dinner

AM

PM

First may we have some personal information please:

Sex

☐ male
☐ female

Age

☐ 15 - 25
☐ 25 - 40
☐ 40 - 60
☐ over 60

exceptionally
bad

somewhere
in between

exceptionally
good

Please answer the following questions by marking the appropriate box.

1

2

2

4

5

6

7

8

1

[illegible]

Please give comments that might help to improve service.

[illegible]

MCM Form D11

THANK YOU

Figure 27. Cafeteria customer survey, West Jersey Hospital

CONCLUSIONS

Many methods of monitoring quality were noted in the study that will be useful for the measuring of quality in military hospital food service contract situations. There are three basic approaches to quality assurance in the nonmilitary hospitals:

1. A fixed schedule of quality assurance audits;
2. Audits on an as-needed basis;
3. No structured quality assurance schedule.

The food service contract operators generally had a fixed schedule of audits; internal audits were frequent and outside audits by district food service managers were conducted once or twice a year. In those hospitals with irregular audits, the audits were often conducted on a project or "as-needed" basis. If a problem area was noticed, an audit was conducted to determine and document the cause, corrective action would be recommended, and follow-up checks made. In many hospitals with few structured quality assurance procedures, effective quality was obtained by good supervisory and managerial practices. Quality assurance audits do not necessarily result in high quality food and food service, unless there is a commitment by management to take follow-up action.

RECOMMENDATIONS

The following quality assurance parameters are recommended for measuring food service quality at military hospitals operating under a commercial/industrial type food service contract.

I. Acceptability Ratings

A. Patient acceptability

The patient is the final arbiter of quality in a patient feeding situation. The military has background data on military hospital feeding obtained from the work of Maller, DuBose, and Cardello performed by NLABS at five military hospitals. The adaptation of the survey forms used in that study should be used to assess patient acceptability under the hospital food service contract (Appendix A).

B. Cafeteria acceptability

Just as the bed patient is the final judge of foods served in the rooms, cafeteria patrons, both employees and ambulatory patients, are the consumers and final judges of the quality of cafeteria food. Again, an adaptation of the forms used in the Maller study should be a basis for cafeteria patient food acceptability. Appendix B shows survey forms for nonpatient cafeteria patrons. The survey questionnaire in Appendix A is also designed to be used by ambulatory patients eating in the cafeteria.

II. Test Tray Evaluations

Test trays/dummy trays allow for the evaluations of typical meals as they would reach the patient. The trays should be sent to the floors on a random basis and evaluated for:

1. Food temperature;
2. General appearance of tray;
3. Portion size;
4. Flavor;
5. Texture;
6. Tray accuracy;
7. Tray food arrangement;
8. Completeness.

It is recommended that three people be on the test panel making the test tray assessments. These should include the COR, the contractor's manager or supervisor, and one other professional person not directly aligned with either the contractor or the COR. A test tray evaluation form developed for this purpose is included in Appendix F.

III. Sensory Evaluation

A. Informal

The informal tasting by the cooks of the range of food items prepared should be encouraged and each food item should be tasted before portioning as specified in the contract.

B. Formal

A sensory panel made up of 8 to 12 members including technical and nontechnical participants should be used to evaluate specific items. This panel should function on a regular or irregular basis depending on the size and system of the hospital or on the number and type of food problems to be resolved. The sensory panel should be used to evaluate items that are sources of serious complaints from tray assessments and acceptability results and other feedback (such as excessive waste) from consumers, clinical dietitians, production staff members, the contractor or his employees, and other hospital staff members. A form should be developed for these sensory evaluations and procedures to evaluate quickly, identify, and resolve problems. Care must be taken in the selection of panel members to insure a broad representation of participants and avoid bias towards or against the contractor. Appendix G contains a form developed for these sensory analyses.

IV. Objective Measurements

Although subjective/objective testing of food quality is necessary as described above, the development of reliable objective testing methods should be a goal of any quality assurance

program. Thus, monitoring of product temperatures, use of end product descriptions, weighing of portion sizes, determinations of plate waste, and other determinations that can provide objective quality measurements should be investigated and incorporated into the quality assurance plan.

The results of the quality assurance evaluation must be used as a tool for monitoring the contract operation results. If quality measurements indicate that high-quality food is being served, no further action is needed. If, however, the measurements show food quality below that of other military hospitals or below that of the quality that existed prior to the contract conversion, the reasons for the lower quality must be determined and resolved.

Action Plan. The Inspection and Acceptance (Section E) of the Hospital Food Service Contract states the Government's requirements and standards necessary for the contractor to produce acceptable food quality to meet military hospital requirements. This Section describes the quality assurance methods that the Government will use to evaluate the contractor's performance. This document, however, does not provide for a method that will evaluate the results of his performance according to the quality and acceptability of the food on the consumer's plate or the patient's tray.

A standard format and methodology will be developed for use by the COR to measure quality parameters of food and food service. These will include methods and frequency of consumer acceptance appraisals and for sensory evaluation techniques. A prototype format will be developed and tested. Because of the importance of being able to assess quality parameters under contract feeding with in-house operations prior to contractor conversion, it is recommended that identical quality assessments be made at each hospital prior to conversion and at quarterly intervals following conversion to a contractor-operated activity. Summaries of results and comments of both the pre and post start of contract surveys should be made available to the contractor, the contracting officer and the clinical dietetic staff.

After initial testing of the food acceptability and quality methodology is performed, the quality assurance section (Section E) of the US Army Medical Services Contract will be reviewed to insure that areas of food production and food service necessary to provide quality food are adequately addressed.

APPENDIXES

- A. Military Hospital Food Service Survey (Ward)**
- B. Military Hospital Food Service Survey (Staff)**
- C. Military Hospital Food Service Survey (Ambulatory)**
- D. Patient Tray Evaluation**
- E. Sensory Evaluation**

APPENDIX A

MILITARY HOSPITAL FOOD SERVICE SURVEY (Ward) U.S. ARMY NATICK R&D LABORATORIES NATICK, MASSACHUSETTS 01760

We are from the U.S. Army Research & Development Laboratories at Natick, MA. The Army has asked us to evaluate the quality of the food service it provides. We would like you to fill out this questionnaire. Your responses will be kept confidential and your name is not required. Your participation is voluntary and will be of value in improving the food service. If you have any questions about how to fill out this form, the person who distributed the questionnaire will be glad to answer them.

Please do not discuss your responses to the questionnaire with others.

SAMPLE: If your age is 24, mark box "2"

| | | | | |
|-----------------|----------------|----------------|----------------|----------------|
| <u>Under 18</u> | <u>18 - 25</u> | <u>26 - 50</u> | <u>51 - 65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

1. What is your current status?

- 1) Military person
- 2) Dependent of military person
- 3) Retired military person
- 4) Dependent of retired military person
- 5) Other

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Age?

| | | | | |
|-----------------|--------------|--------------|--------------|----------------|
| <u>Under 18</u> | <u>18-25</u> | <u>26-50</u> | <u>51-65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. Sex?

| | |
|-------------|---------------|
| <u>Male</u> | <u>Female</u> |
| 1 | 2 |

| | |
|--------------------------|--------------------------|
| 1 | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> |

4. How many days have you eaten meals at this hospital?

| | | | | |
|-----------------|-----------------|------------------|-------------------|---------------------|
| <u>1-3 days</u> | <u>4-6 days</u> | <u>7-13 days</u> | <u>14-30 days</u> | <u>Over 30 days</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. What is your current diet?

| | |
|----------------|----------------------------|
| <u>Regular</u> | <u>Special or Modified</u> |
| 1 | 2 |

| | |
|--------------------------|--------------------------|
| 1 | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> |

*This survey form is a modified version of the questionnaire "Opinions of Food Service at Military Hospitals" (Maller, Dubose and Cardello, J. Amer. Diet. Assoc., 1980, 76, 236-242).

6. Do you understand your diet?

Yes No
1 2

1 2
☐ ☐

7. Which meal did you just finish eating?

Breakfast Mid-day meal Evening meal
1 2 3

1 2 3
☐ ☐ ☐

8. How much of your meal did you eat?

None Some Most All
1 2 3 4

1 2 3 4
☐ ☐ ☐ ☐

9. How do you feel about the courtesy and cheerfulness of the people serving your food?

Very Dissatisfied Moderately Dissatisfied Neither Dissatisfied nor Satisfied Moderately Satisfied Very Satisfied
1 2 3 4 5

1 2 3 4 5
☐ ☐ ☐ ☐ ☐

Indicate your opinion of the meal you have just finished by responding to the following items.

10. Appearance of Food Served

Very Attractive Moderately Attractive Neither Attractive nor Unattractive Moderately Unattractive Very Unattractive
5 4 3 2 1

5 4 3 2 1
☐ ☐ ☐ ☐ ☐

11. Aroma of Food

Very Unpleasant Moderately Unpleasant Neither Pleasant nor Unpleasant Moderately Pleasant Very Pleasant
1 2 3 4 5

1 2 3 4 5
☐ ☐ ☐ ☐ ☐

12. Variety of Items to Select

Too Large Moderately Large Neither Large nor Small Moderately Small Too Small
5 4 3 2 1

5 4 3 2 1
☐ ☐ ☐ ☐ ☐

13. Seasoning of Food

| | | | | | |
|------------------|-------------------------|-------------------|-------------------------|------------------|--|
| <u>Too Bland</u> | <u>Moderately Bland</u> | <u>Just Right</u> | <u>Moderately Spicy</u> | <u>Too Spicy</u> | |
| 1 | 2 | 3 | 4 | 5 | |
| | | | | | 1 2 3 4 5 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

14. Size of Food Portions

| | | | | | |
|------------------|-------------------------|-------------------|-------------------------|------------------|--|
| <u>Too Large</u> | <u>Moderately Large</u> | <u>Just Right</u> | <u>Moderately Small</u> | <u>Too Small</u> | |
| 5 | 4 | 3 | 2 | 1 | |
| | | | | | 5 4 3 2 1 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

15. Cleanliness of Dishes and Silverware

| | | | | | |
|-------------------|-------------------------|--------------|-------------------------|-------------------|--|
| <u>Very Clean</u> | <u>Moderately Clean</u> | <u>Clean</u> | <u>Moderately Dirty</u> | <u>Very Dirty</u> | |
| 5 | 4 | 3 | 2 | 1 | |
| | | | | | 5 4 3 2 1 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

16. Attractiveness of Dishes, Silverware and Tray

| | | | | | |
|--------------------------|--------------------------------|--|------------------------------|------------------------|--|
| <u>Very Unattractive</u> | <u>Moderately Unattractive</u> | <u>Neither Attractive nor Unattractive</u> | <u>Moderately Attractive</u> | <u>Very Attractive</u> | |
| 1 | 2 | 3 | 4 | 5 | |
| | | | | | 1 2 3 4 5 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

17. Thoroughness of Cooking Vegetables

| | | | | | |
|-----------------------|------------------------------|---|-------------------------------|------------------------|--|
| <u>Too Overcooked</u> | <u>Moderately Overcooked</u> | <u>Neither Overcooked nor Undercooked</u> | <u>Moderately Undercooked</u> | <u>Too Undercooked</u> | |
| 5 | 4 | 3 | 2 | 1 | |
| | | | | | 5 4 3 2 1 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

18. Tenderness of Meat

| | | | | | |
|------------------|-------------------------|---------------------------------|--------------------------|-------------------|--|
| <u>Too Tough</u> | <u>Moderately Tough</u> | <u>Neither Tough nor Tender</u> | <u>Moderately Tender</u> | <u>Too Tender</u> | |
| 1 | 2 | 3 | 4 | 5 | |
| | | | | | 1 2 3 4 5 |
| | | | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

19. Were your hot food items the temperature you like them when you ate them?

| | | |
|------------|-----------|---|
| <u>Yes</u> | <u>No</u> | |
| 1 | 2 | |
| | | 1 2 |
| | | <input type="checkbox"/> <input type="checkbox"/> |

20. Were your cold food items the temperature you like them when you ate them?

Yes No
1 2

1 2
☐ ☐

21. How do you feel right now?



5 4 3 2 1
☐ ☐ ☐ ☐ ☐

22. What is your opinion of all the meals you have eaten in this hospital?

Very Good Good Neither Bad Very Bad
5 4 Good 2 1
 nor
 Bad

5 4 3 2 1
☐ ☐ ☐ ☐ ☐

23. Did you have enough spoons, forks, knives, napkins?

Yes No
1 2

1 2
☐ ☐

24. If No, what items were you missing: (You may indicate more than one.)

Knife ☐ 1
Fork ☐ 2
Spoon ☐ 3
Napkin ☐ 4

25. Did you receive all the food items which you ordered?

Yes No
1 2

1 2
☐ ☐

In order to give you an opportunity to make some specific suggestions to improve the food service, please answer the following items. Write your suggestions directly on the questionnaire.

26. Which food item(s) from today's meal did you not finish and/or touch?

Did not finish

Why did you not eat or finish?

a. _____

a. _____

b. _____

b. _____

27. What changes in the food service would make your stay in the hospital a more pleasant one? Please list them below.

a. _____

b. _____

Thank you for your assistance.

APPENDIX B

MILITARY HOSPITAL FOOD SERVICE SURVEY (Staff)

U.S. ARMY NATICK R&D LABORATORIES
NATICK, MASSACHUSETTS 01760

We are from the U.S. Army Research & Development Laboratories at Natick, MA. The Army has asked us to evaluate the quality of the food service it provides. We would like you to fill out this questionnaire. Your responses will be kept confidential and your name is not required. Your participation is voluntary and will be of value in improving the food service. If you have any questions about how to fill out this form, the person who distributed the questionnaire will be glad to answer them.

Please do not discuss your responses to the questionnaire with others.

Sample: If your age is 24, mark box "2".

| | | | | |
|-----------------|----------------|----------------|----------------|----------------|
| <u>Under 18</u> | <u>18 - 25</u> | <u>26 - 50</u> | <u>51 - 65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

1. What is your current status?

- | | |
|------------------------|-------------------------|
| 1) Doctor | 5) Administrative staff |
| 2) Nurse | 6) Guest |
| 3) Food service worker | 7) Medic |
| 4) Technician | 8) Other |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Age?

| | | | | |
|-----------------|--------------|--------------|--------------|----------------|
| <u>Under 18</u> | <u>18-25</u> | <u>26-50</u> | <u>51-65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. Sex?

| | |
|-------------|---------------|
| <u>Male</u> | <u>Female</u> |
| 1 | 2 |

| | |
|--------------------------|--------------------------|
| 1 | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> |

4. How long have you worked at this hospital?

| | | | | |
|---------------------------|------------------------|------------------|-------------------|----------------------|
| <u>Less than 6 months</u> | <u>6 months-1 year</u> | <u>1-3 years</u> | <u>3-10 years</u> | <u>Over 10 years</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

*This survey form is a modified version of the questionnaire "Opinions of Food Service at Military Hospitals" (Maller, Dubose and Cardello, J. Amer. Diet. Assoc., 1980, 76, 236-242).

- Never 1-2 days 3-4 days 5 days 6-7 days
- 1 2 3 4 5
- ☐ ☐ ☐ ☐ ☐

- Never 1-2 days 3-4 days 5 days 6-7 days
- 1 2 3 4 5
- 1 2 3 4 5
- ☐ ☐ ☐ ☐ ☐

- | <u>Never</u> | <u>1-2 days</u> | <u>3-4 days</u> | <u>5 days</u> | <u>6-7 days</u> | | | | | |
|--------------|-----------------|-----------------|---------------|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 | | | | | |
| | | | | | 1 | 2 | 3 | 4 | 5 |
| | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |






- | <u>Breakfast</u> | <u>Mid-day meal</u> | <u>Evening meal</u> | |
|------------------|---------------------|---------------------|--|
| 1 | 2 | 3 | |
| | | | 1 2 3 |
| | | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

- | <u>None</u> | <u>Some</u> | <u>Most</u> | <u>All</u> |
|-------------|-------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | | | |

- | Very Good | | Good | Neither Good nor Bad | Bad | Very Bad | | | | | | |
|-----------|--|------|----------------------|-----|----------|--|---|---|---|---|---|
| 5 | | 4 | 3 | 2 | 1 | | 5 | 4 | 3 | 2 | 1 |
| | | | | | | | | | | | |

- | | | | | | | | | | |
|-----------------------|-----------------------------|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <u>Very Satisfied</u> | <u>Moderately Satisfied</u> | <u>Neither Satisfied nor Dissatisfied</u> | <u>Moderately Dissatisfied</u> | <u>Very Dissatisfied</u> | | | | | |
| 5 | 4 | 3 | 2 | 1 | | | | | |
| | | | | | 5 | 4 | 3 | 2 | 1 |
| | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Indicate your opinion of the meal you have just finished by responding to the following items.

| | | | | | | | | | | |
|--------------------------------|---|---|---|---|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 12. Appearance of Food Served | Very Attractive 5 | Moderately Attractive 4 | Neither Attractive nor Unattractive 3 | Moderately Unattractive 2 | Very Unattractive 1 | | | | | |
| | | | | | | 5 | 4 | 3 | 2 | 1 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Aroma of Food | Very Unpleasant 1 | Moderately Unpleasant 2 | Neither Pleasant nor Unpleasant 3 | Moderately Pleasant 4 | Very Pleasant 5 | | | | | |
| | | | | | | 1 | 2 | 3 | 4 | 5 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Variety of Items to Select | Too Large 5 | Moderately Large 4 | Neither Large nor Small 3 | Moderately Small 2 | Too Small 1 | | | | | |
| | | | | | | 5 | 4 | 3 | 2 | 1 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Seasoning of Food | Too Bland 1 | Moderately Bland 2 | Just Right 3 | Moderately Spicy 4 | Too Spicy 5 | | | | | |
| | | | | | | 1 | 2 | 3 | 4 | 5 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Size of Food Portions | Too Large 5 | Moderately Large 4 | Just Right 3 | Moderately Small 2 | Too Small 1 | | | | | |
| | | | | | | 5 | 4 | 3 | 2 | 1 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. How do you feel right now? |  |  |  |  |  | | | | | |
| | 5 | 4 | 3 | 2 | 1 | | | | | |
| | | | | | | 5 | 4 | 3 | 2 | 1 |
| | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

18. Cleanliness
of Dishes
and
Silverware

Very Clean Moderately Clean Clean Moderately Dirty Very Dirty
5 4 3 2 1

5 4 3 2 1
☐ ☐ ☐ ☐ ☐

19. Attractiveness
of Dishes,
Silverware
and Tray

Very Unattractive Moderately Unattractive Neither Attractive nor Unattractive Moderately Attractive Very Attractive
1 2 3 4 5

1 2 3 4 5
☐ ☐ ☐ ☐ ☐

20. Thoroughness
of Cooking
Vegetables

Too Overcooked Moderately Overcooked Neither Overcooked nor Undercooked Moderately Undercooked Too Undercooked
5 4 3 2 1

5 4 3 2 1
☐ ☐ ☐ ☐ ☐

21. Tenderness
of Meat

Too Tough Moderately Tough Neither Tough nor Tender Moderately Tender Too Tender
1 2 3 4 5

1 2 3 4 5
☐ ☐ ☐ ☐ ☐

22. Were your hot food items the temperature you like them when you ate them?

Yes No
1 2

1 2
☐ ☐

23. Were your cold food items the temperature you like them when you ate them?

Yes No
1 2

1 2
☐ ☐

In order to give you an opportunity to make some specific suggestions to improve the food service, please answer the following items. Write your suggestions directly on the questionnaire.

24. What food item(s) from today's meal did you not finish and/or touch?

Did not finish

Why did you not eat or finish?

a. _____

a. _____

b. _____

b. _____

c. _____

c. _____

25. What changes in the food service would make you eat more of your meals at the hospital dining room?

Please list them below.

a. _____

b. _____

c. _____

d. _____

Thank you for your assistance.

APPENDIX C

MILITARY HOSPITAL FOOD SERVICE SURVEY (Ambulatory)

U.S. ARMY NATICK R&D LABORATORIES
NATICK, MASSACHUSETTS 01760

We are from the U.S. Army Research & Development Laboratories at Natick, MA. The Army has asked us to evaluate the quality of the food service it provides. We would like you to fill out this questionnaire. Your responses will be kept confidential and your name is not required. Your participation is voluntary and will be of value in improving the food service. If you have any questions about how to fill out this form, the person who distributed the questionnaire will be glad to answer them.

Please do not discuss your responses to the questionnaire with others.

SAMPLE: If your age is 24, mark box "2"

| | | | | |
|-----------------|----------------|----------------|----------------|----------------|
| <u>Under 18</u> | <u>18 - 25</u> | <u>26 - 50</u> | <u>51 - 65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

1. What is your current status?

- 1) Military person
- 2) Dependent of military person
- 3) Retired military person
- 4) Dependent of retired military person
- 5) Other

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Age?

| | | | | |
|-----------------|--------------|--------------|--------------|----------------|
| <u>Under 18</u> | <u>18-25</u> | <u>26-50</u> | <u>51-65</u> | <u>Over 65</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. Sex?

| | |
|-------------|---------------|
| <u>Male</u> | <u>Female</u> |
| 1 | 2 |

| | |
|--------------------------|--------------------------|
| 1 | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> |

4. How many days have you eaten meals at this hospital?

| | | | | |
|-----------------|-----------------|------------------|-------------------|---------------------|
| <u>1-3 days</u> | <u>4-6 days</u> | <u>7-13 days</u> | <u>14-30 days</u> | <u>Over 30 days</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

*This survey form is a modified version of the questionnaire "Opinions of Food Service at Military Hospitals" (Maller, Dubose and Cardello, J. Amer. Diet. Assoc., 1980, 76, 236-242).

5. What is your current diet?

Regular

1

Special or Modified

2

1

2

☐☐

6. Which meal did you just finish eating?

Breakfast

1

Mid-day meal

2

Evening meal

3

1

2

3

☐☐☐

7. How much of your meal did you eat?

None

1

Some

2

Most

3

All

4

1

2

3

4

☐☐☐☐

8. How do you feel about the courtesy and cheerfulness of the people serving your food?

Very
Dissatisfied

1

Moderately
Dissatisfied

2

Neither
Dissatisfied
nor
Satisfied

3

Moderately
Satisfied

4

Very
Satisfied

5

1

2

3

4

5

☐☐☐☐☐

Indicate your opinion of the meal you have just finished by responding to the following items.

9. Appearance
of Food
Served

Very
Attractive

5

Moderately
Attractive

4

Neither
Attractive
nor
Unattractive

3

Moderately
Unattractive

2

Very
Unattractive

1

1

2

3

4

5

☐☐☐☐☐

10. Aroma of
Food

Very
Unpleasant

1

Moderately
Unpleasant

2

Neither
Pleasant
nor
Unpleasant

3

Moderately
Pleasant

4

Very
Pleasant

5

1

2

3

4

5

☐☐☐☐☐

11. Variety
of Items
to Select

Too Large

5

Moderately
Large

4

Neither
Large
nor
Small

3

Moderately
Small

2

Too Small

1

1

2

3

4

5

☐☐☐☐☐

12. Seasoning
of Food

| | | | | |
|------------------|-------------------------|-------------------|-------------------------|------------------|
| <u>Too Bland</u> | <u>Moderately Bland</u> | <u>Just Right</u> | <u>Moderately Spicy</u> | <u>Too Spicy</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

13. Size of
Food
Portions

| | | | | |
|------------------|-------------------------|-------------------|-------------------------|------------------|
| <u>Too Large</u> | <u>Moderately Large</u> | <u>Just Right</u> | <u>Moderately Small</u> | <u>Too Small</u> |
| 5 | 4 | 3 | 2 | 1 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5 | 4 | 3 | 2 | 1 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

14. Cleanliness
of Dishes
and
Silverware

| | | | | |
|-------------------|-------------------------|--------------|-------------------------|-------------------|
| <u>Very Clean</u> | <u>Moderately Clean</u> | <u>Clean</u> | <u>Moderately Dirty</u> | <u>Very Dirty</u> |
| 5 | 4 | 3 | 2 | 1 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5 | 4 | 3 | 2 | 1 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

15. Attractiveness
of Dishes,
Silverware
and Tray

| | | | | |
|--------------------------|--------------------------------|--|------------------------------|------------------------|
| <u>Very Unattractive</u> | <u>Moderately Unattractive</u> | <u>Neither Attractive nor Unattractive</u> | <u>Moderately Attractive</u> | <u>Very Attractive</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

16. Thoroughness
of Cooking
Vegetables

| | | | | |
|-----------------------|------------------------------|---|-------------------------------|------------------------|
| <u>Too Overcooked</u> | <u>Moderately Overcooked</u> | <u>Neither Overcooked nor Undercooked</u> | <u>Moderately Undercooked</u> | <u>Too Undercooked</u> |
| 5 | 4 | 3 | 2 | 1 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5 | 4 | 3 | 2 | 1 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

17. Tenderness
of Meat

| | | | | |
|------------------|-------------------------|---------------------------------|--------------------------|-------------------|
| <u>Too Tough</u> | <u>Moderately Tough</u> | <u>Neither Tough nor Tender</u> | <u>Moderately Tender</u> | <u>Too Tender</u> |
| 1 | 2 | 3 | 4 | 5 |

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

18. Were your hot food items the temperature you like them when you ate them?

| | |
|------------|-----------|
| <u>Yes</u> | <u>No</u> |
| 1 | 2 |

| | |
|--------------------------|--------------------------|
| 1 | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> |

19. Were your cold food items the temperature you like them when you ate them?

Yes No
1 2

1 2
□ □

20. How do you feel right now?



5



4



3



2



1

5 4 3 2 1
□ □ □ □ □

21. What is your opinion of all the meals you have eaten in this hospital?

Very Good
5

Good
4

Neither
Good
nor
Bad
3

Bad
2

Very Bad
1

5 4 3 2 1
□ □ □ □ □

In order to give you an opportunity to make some specific suggestions to improve the food service, please answer the following items. Write your suggestions directly on the questionnaire.

22. Which food item(s) from today's meal did you not finish and/or touch?

Did not finish

Why did you not eat or finish?

a. _____

a. _____

b. _____

b. _____

c. _____

c. _____

d. _____

d. _____

23. What changes in the food service would make you stay in the hospital a more pleasant one: Please list them below.

a. _____

b. _____

c. _____

d. _____

e. _____

Thank you for your assistance.

PATIENT TRAY EVALUATION

Sent to: _____

Diet: _____

Meal: _____

Date: _____

If all evaluators agree an item is satisfactory check "S" box. Evaluators who find an item to be unsatisfactory should put their number in the proper "U" box.

| Food Items | Temp °F | Appearance | | Flavor | | Texture | | Portion Size | |
|---------------------|------------|---------------------|-----|---------------------|---|---------------------|---|--------------|---|
| | | *S | U** | S | U | S | U | S | U |
| Soup | | | | | | | | | |
| Entree | | | | | | | | | |
| Starch | | | | | | | | | |
| Vegetable | | | | | | | | | |
| Hot Beverage | | | | | | | | | |
| Salad | | | | | | | | | |
| Dessert | | | | | | | | | |
| Cold Beverage | | | | | | | | | |
| Other | | | | | | | | | |
| Overall Tray | | Evaluator #1 S U | | Evaluator #2 S U | | Evaluator #3 S U | | | |
| Appearance | | | | | | | | | |
| Completeness | | | | | | | | | |
| Correctness of Diet | | | | | | | | | |
| Cleanliness | | | | | | | | | |
| Overall Rating | | Evaluator #1 | | Evaluator #2 | | Evaluator #3 | | | |
| Excellent | | | | | | | | | |
| Good | | | | | | | | | |
| Fair | | | | | | | | | |
| Poor | | | | | | | | | |

Reasons for unsatisfactory ratings. _____

Copies to: _____

Evaluator's Signature

Evaluator #1 _____

Evaluator #2 _____

Evaluator #3 _____

*satisfactory
**unsatisfactory

APPENDIX D

APPENDIX E **SENSORY EVALUATION**

Panelist's Name _____ Date _____

Product _____

Please rate this product by checking the appropriate boxes.

| | Excellent (1) | Good (2) | Fair to Good (3) | Fair (4) | Poor (5) |
|---------------------------|------------------|-------------|---------------------|-------------|-------------|
| Appearance _____ | | | | | |
| Flavor _____ | | | | | |
| Texture/Consistency _____ | | | | | |
| Overall Quality _____ | | | | | |

Comments (Why did you rate this product the way you did?)
