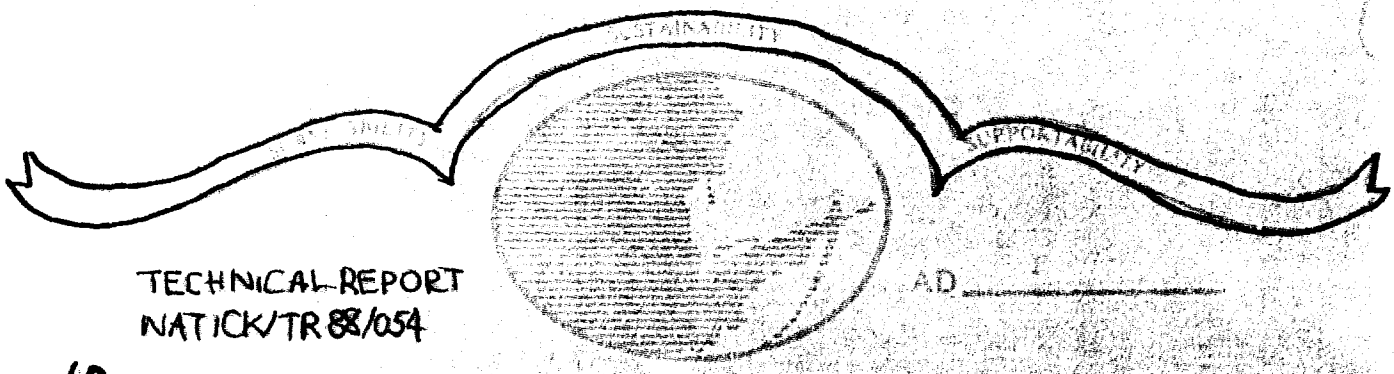

TECHNICAL REPORT
NATICK/TR-88/054

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MARINE CORPS DINING CONCEPTS IN THE 1990's VOLUME I: THE EXECUTIVE SUMMARY

BY
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AUGUST 1988
FINAL REPORT OCTOBER 1985 TO MARCH 1988

APPROVED FOR PUBLIC RELEASE;
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UNITED STATES ARMY NATICK
RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
NATICK, MASSACHUSETTS 01760-5000

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188
Exp. Date Jun 30, 1986

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) NATICK/TR-88/054	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION USA Natick RD&E Center 6b. OFFICE SYMBOL (If applicable) STRNC-AF	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Kansas Street Natick, MA 01760-5015	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER Intergovernmental Personnel Act (IPA) Assignment Agreement: Dr. John B. Knight
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. 78012 / PROJECT NO. O&MA / TASK NO .19 / WORK UNIT ACCESSION NO N/A

11. TITLE (Include Security Classification)
MARINE CORPS DINING CONCEPTS IN THE 1990's VOLUME I: THE EXECUTIVE SUMMARY

12. PERSONAL AUTHOR(S)
KEITH M. SCHROEDER with KATHY EVANGELOS and JOHN B. KNIGHT*

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM OCT 85 TO MAR 88	1988 AUGUST	20

16. SUPPLEMENTARY NOTATION
*Professional Affiliation: School of Hotel Management, Cornell University

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	MARINE CORPS; SURVEYS; FOOD SERVICE; FOOD INDUSTRY; ENLISTED DINING FACILITIES

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

To regain efficiency and excellence in its feeding facilities, the U.S. Marine Corps needs to renovate or build new mess halls with a long-term (15 to 20 years) plan in mind.

This report, Volume I of a four volume set, establishes the analysis, synopsizes conclusions and provides the overall recommendations. Volume II analyzes the demographic factors and food industry trends that may influence future food service and examines customer expectations through surveys and expert opinions. Volume III is the systems analysis, detailing how man and machine support the food service effort. Volume IV provides the physical layouts, decor recommendations, and equipment lists for suggested dining facility configurations.

These volumes culminate the investigations of numerous people over the course of the project and are offered as templates for future Marine Corps dining facilities.

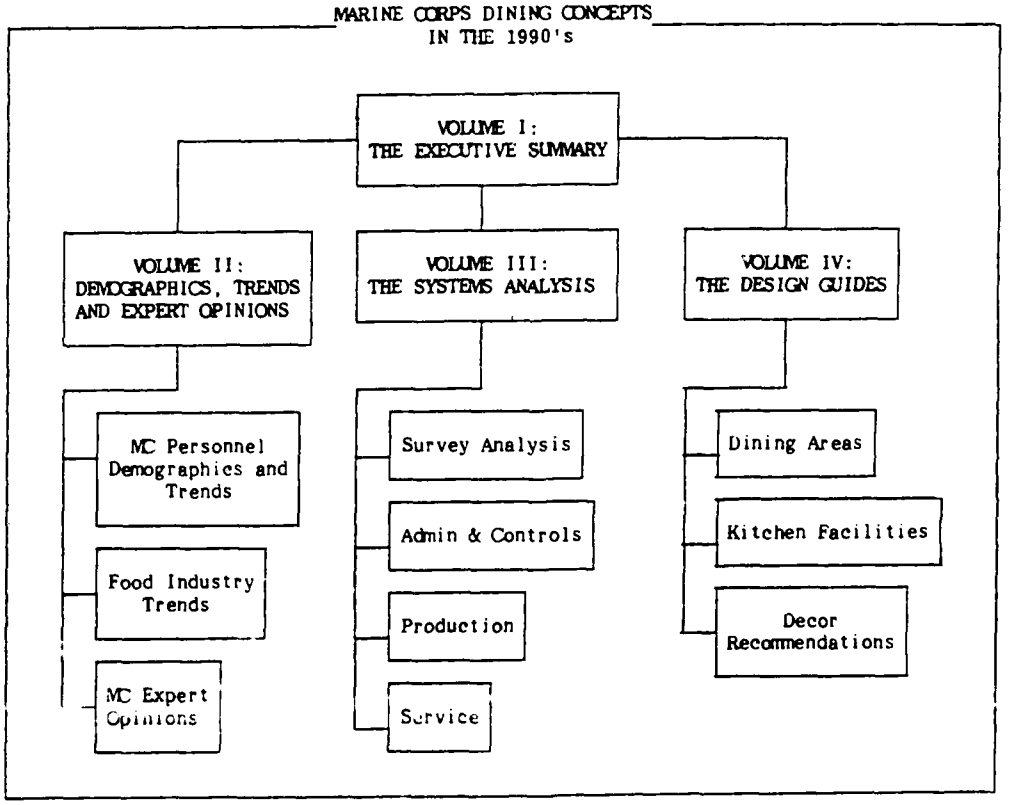
20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL KEITH M. SCHROEDER	22b TELEPHONE (Include Area Code) (617) 651-5074 22c OFFICE SYMBOL STRNC-AF

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

PREFACE

The majority of United States Marine Corps (USMC) Mess Halls that were built 30 to 40 years ago are now painfully obsolete in terms of equipment, furnishings, decor, facilities, and in providing for nutritional as well as psychological needs. Over the years, additions and improvements have not been enough to offset the battering ram of time. New information on nutrition, higher customer expectations, stricter definitions of quality food service, changing eating habits, and new trends in service and technology are just a few of the forces that make existing USMC mess halls inadequate and inefficient. To regain efficiency and excellence in its feeding facilities, the Marine Corps needs to renovate existing or build new mess halls with a long-term plan in mind. That is, problems and needs 15-20 years down the road must be anticipated as accurately as possible.

From October 1985 to March 1988, the Advanced Systems Concepts Directorate at the US Army Natick Research, Development and Engineering Center conducted this study under the project titled "Marine Corps Dining Concepts in the 1990's." Complete documentation of this effort will be provided in four volumes: Volume I: The Executive Summary; Volume II: Demographics, Trends and Expert Opinions; Volume III: The Systems Analysis; and Volume IV: The Design Guides. The structure of each of these volumes is depicted below. These volumes provide a plan for the construction or renovation of the physical and operational aspects of food service for the Marine Corps, now and into the next decade.



The authors wish to express their appreciation to the following individuals who were instrumental in the successful completion of this project: Mr. R. P. Richardson, Director, Advanced Systems Concepts Directorate (ASCD); Dr. D. Paul Leitch, Chief, Food Service Division, ASCD; and CPT R. S. Navarre, USMC, Marine Corps Liaison Officer to the Joint Technical Staff of the DoD Food Program, U. S. Army Natick RD&E Center. Without their overall technical guidance, encouragement, and support, this report would not have been possible.

The authors also wish to extend a special thanks to Ms. Maura Severance and Ms. Elaine Conley for their patience and exceptional secretarial support.

Finally, acknowledgment and appreciation is extended to Mr. Michael Statkus and Ms. Jane Benson for their invaluable editorial assistance.

TABLE OF CONTENTS

MARINE CORPS DINING CONCEPTS IN THE 1990's VOLUME I: THE EXECUTIVE SUMMARY

INTRODUCTION

Currently, Marine Corps dining facilities and renovation guidelines are outmoded and need to be updated to eliminate the gap between prior convention and today's concepts in food service operations. The objective of this project was to generate design concepts for Marine Corps dining facilities in the 1990's that incorporate recent advances in commercial food service systems and ultimately improve food service for all Marine personnel.

This report, Volume I of a four volume set, establishes the analysis, synopsizes conclusions, and provides the overall recommendations. Volume II analyzes demographic factors that may influence future food service and examines expectations of customers and industry through surveys and personal interviews. Volume III is the systems analysis, detailing how man and machine support the food service effort. Volume IV provides the physical layouts, decor recommendations, and equipment lists for suggested dining facility configurations. These volumes culminate the investigations of numerous people over the course of this project and are offered as templates for future Marine Corps dining facilities.

SUMMARY OF VOLUME II: DEMOGRAPHICS, TRENDS AND EXPERT OPINIONS

The establishment of a food service system concept for the Marine Corps for the next 5-20 years has to begin with the identification of projected environments (personnel, equipment, mission, etc.). For this effort, historical and projected trends in the user population and the commercial food industry were examined. Marine Corps food service personnel were also queried for opinions in such areas as menu selections, food quality, personnel, customer absenteeism, and facilities. The following three sections summarize this information: (1) Definition of the User Population; (2) Current and Projected Food Industry Trends; and (3) Marine Corps Food Service Personnel Opinions.

Definition of the User Population

This examination entailed the investigation of 15 years worth of Marine Corps enlisted personnel demographic data. Included in the statistics were the variables of marital status, age, gender, education level, home of record and race/ethnic background. These data were examined for trends that would help predict demographic characteristics of future Marine Corps food service customers and personnel.

Since 1971, the percentage of married enlisted Marines has increased from 27.8% to a 1985 level of 41.2%. It is projected that single marines will still represent over half of the enlisted population through the 1990's. The majority of the enlisted Marines are 18 to 26 years old, with the percentage fluctuating between 76% and 82% since 1971. This trend is expected to carry on into the 1990's and is important, along with the marital status information, when projecting the utilization of food service facilities. Females in the Marine Corps represent approximately 5% of the population. Current projections, supported by the Commandants' goals, stabilize this figure through the 1990's. In 1985, 94.8% of the enlisted Marine Corps possessed, at a minimum, a high school diploma or equivalency. This figure has grown steadily during the last few years to approximately 98 percent. With the emphasis of the Commandants' ALMar 308 program, the 1990's should see a Corps with every Marine having valid high school graduation credentials. Information collected regarding home of record and the race/ethnic backgrounds appears to be inconsequential when developing food service systems for the Corps in general.

The 1990's Marine will not differ much from today's Marine. He will be young, intelligent, and share his civilian counterpart's perceptions of food service. For instance, young singles lag behind the overall population in conforming to nutritional health trends. These same young singles also tend to be more sensitive (i.e., react more negatively) to poor service, poor food quality, and portion size than other age groups.

Current and Projected Food Industry Trends

This section presents trends in the commercial food service industry, specifically in food products and supporting equipment.

Fried chicken, roast beef, and baked ham were among the top five commercial entrees in 1971 and in 1984 and appear to be a stable part of the food preferences of mainstream America. However, seafoods and dinner salads are emerging as strong contenders for the night meals and may lend credence to a lighter, healthier menu in the Marine Corps mess hall.

Ethnic foods are gaining in popularity. Mexican entrees have shown a strong increase during the last 15 years, and it appears they will continue to make advances in popularity on American menus, particularly where the Spanish/American communities are increasing. The influence of Italian foods remains strong, with the popularity of pizza and pasta continuously growing. Both the traditional fare of pasta with red sauce or lasagna and more recent menu items, such as pasta salads and Pasta Primavera, are increasing in popularity. Oriental food consumption remains strong, especially among the younger age groups.

There really are no surprises when viewing the preference trends for non-potato side dishes over the past 15 years. Vegetables (i.e., carrots, green beans, and peas) have been in the majority of the top 5 items since 1971. However, it is interesting to note that onion rings have remained in the top five category since 1976 despite the trend toward lighter and less fried foods. This fact is also evident when viewing the preferences in potato items; four out of the top five in the 1984 survey were fried items.

Technological advancements in kitchen equipment have increased rapidly in the last few years. Operator demands for size reductions, easier maintenance, and increased efficiency have been incorporated into new equipment designs. Kitchen equipment has also become more flexible and will be expected to perform multiple tasks. For example, convection ovens that also utilize steam are already on the market as are combination refrigerators/oven units. The use of ultrasonic cleaning in which sound waves are used to vibrate water molecules may become the future "standard" for dishwashing. Thermoelectric refrigeration systems that are solid-state (no compressor or coils) may prove to be a wave of the future. For cooking surfaces the induction cooktop shows promise; an induction heater generates a magnetic field over the cooktop so that while the stove itself does not get hot, a pot placed on it does.

In the next 20 years, a more discriminating Marine will demand higher quality, better service, and more convenience. These preferences have been structured in the Marine's exposure to nonmilitary food service operations in his youth and will be used to formulate his perceptions on the daily offerings from the mess hall. Therefore, to maintain an acceptable environment and ensure continued customer satisfaction, the Corps must keep pace with industry advancements.

Marine Corps Food Service Personnel Opinions

Sixteen select Marine Corps food service experts from various locations and backgrounds were interviewed for their opinion on the food service requirements of the Marine Corps during the next 5 to 20 years. In addition, each individual answered a detailed questionnaire concerning the future Marine Corps food service customer, food service personnel, and dining/kitchen facilities. The questionnaire consisted of 163 items in the following areas:

- Food (e.g., preference, quality, variety, etc.);

- Service (e.g., food service styles, food preparation styles, length of service lines, etc.);

- Dining/kitchen environments (e.g., aesthetics, equipment design, temperature, etc.);

- Management (e.g., supervisory skills, personnel training, record keeping, etc.); and

- Customer absenteeism (e.g., monotony of facility, hours of operation, quality of food, etc.).

The responses to all inquiries are provided in Volume II. It is interesting to note that of the 163 items there was only 1 item on which the 16 raters were in total agreement as to its importance during the next 5 to 20 years: Good food quality. The taste, freshness, variety, proper temperature, and portion size of food were perceived to be the determining factors of the products quality.

Any one of these factors can drastically affect product acceptance. An additional point emphasized by all 16 experts was that management skills need to be improved. Only through better management would the food quality and level of service be increased, thereby increasing attendance rates and elevating customer satisfaction.

In summarizing the salient points of Volume II, we can make the following generalizations:

- The future enlisted Marine will be a young, single, educated male whose perceptions of quality food service and products relate closely to his civilian counterpart.

- Though trends may be moving toward a lighter, healthier diet, many of the food staples that have been the base of offerings will continue in favor.

- Advanced technologies will offer "better" means of preparation and afford the customer the product desired without compromising the diet.

- The expressed need for increased managerial capabilities with the necessary support base must be a large part of the total design of the Marine Corps Dining Concepts in the 1990's.

SUMMARY OF VOLUME III: THE SYSTEMS ANALYSIS

The objective of this phase of the project was to extrapolate the pertinent information from Volume II to determine which system of food service would best apply to the USMC in the 1990's. Extensive research resulted in the determination that the design could evolve in many different ways. For instance, included among the major food service systems in vogue in the mid-1980's are sit-down limited service, sit-down full service, fast food service (both counter and sit-down), straight-line cafeteria service, family-style service, scramble cafeteria style service, hollow square cafeteria style service, and vending service. Which method applies to the perceived Marine Corps requirements for the 1990's and what operational support would be necessary to effectively implement this system are identified in this volume. System recommendations are based upon the experience and insight of the study's authors, industry leaders, and Marine Corps food service personnel. This volume provides the result of these investigations and recommendations in the following four sections: (1) Industry Survey Analysis; (2) Administration and Controls; (3) Production; and (4) Service.

Industry Survey Analysis

During FY87, 166 industry practitioners participated in an extensive survey designed to determine which food service system they felt was best suited for the future. The respondents to this survey were from a variety of food service segments and backgrounds in the industry. They managed businesses of various sizes, with over 11 percent heading operations that served in excess of 10,000 meals per day. Though the survey was extensive and queried the respondents on a number of subject areas, the following statement offers the most salient conclusion from this study.

> Though the types of food service systems utilized by the respondents varied in large numbers, over 33% of these randomly selected survey participants used the "hollow square" cafeteria system in their operations and recommended its use for future Marine Corps dining facilities.

The "hollow square" system has been utilized in some form since the 1940's but has largely grown in use in recent years. The primary difference between this system and the basic straight line cafeteria style is the structure and operations of the serving line. This system eliminates the need for each patron to file past a selection of items in which he/she is has no interest in order to get to the desired menu item. Each person can move quickly and efficiently from station to station. The major disadvantage of the system is confusion of patrons who are unfamiliar with the system. Figure 1 provides a rough sketch of the "hollow square" serving line system.

- When designing a successful food service system, the survey participants felt there were several necessary ingredients. Foremost among these were speed of service and customer flow.

- Communication with the customer through direct contact with staff, food displays, menu displays, and posters/pictures was viewed as important but secondary to other operational areas of concern within the facility.

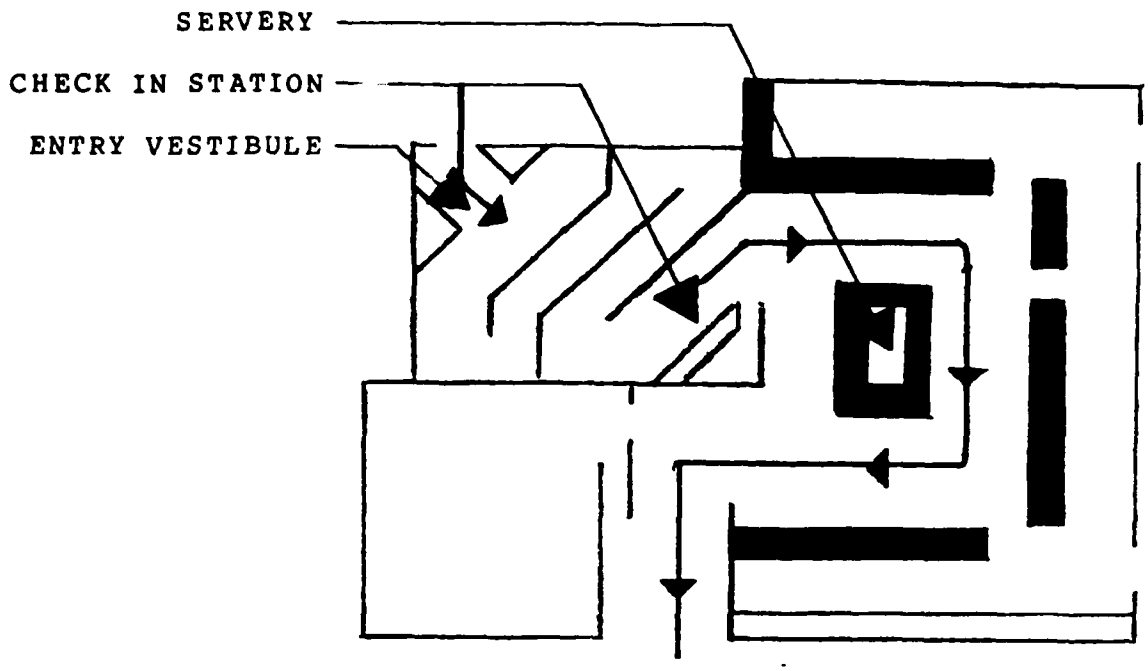


Figure 1. Hollow square servery system.

• Though significant strides have been made in the past few years in the area of food service robotics, respondents did not rank this as highly significant to operational design except in the areas of sanitation and inventory control.

• Training and service staff attitude were considered major factors in establishing efficient and effective food service operations.

The military food service system has one of the best, if not the best, training programs for staff personnel. Unlike their commercial counterparts, all Marines with food service positions receive formalized training with on-the-job instruction being secondary in the career process. However, staff attitudes may have greater impact on the Marine Corps mess hall operations than the commercial industry.

• A problem identified in the current system and supported by survey responses was the inadequate attention to nutrition and customer tastes.

Results from various inquiries indicated that nutrition is a much more important consideration today than in the past. The Marine Corps "fit to fight" attitude has been evident in operations and offerings for some time. This point requires consideration when planning equipment support and layouts for dining facilities (for example, the inclusion and location of salad bars or equipment support for menus requiring less frying and more broiling or steaming).

• According to respondents, their facilities underwent significant changes every 7 years.

Whether these relatively frequent changes were necessitated by customer demands, competition, or technological advancement is not certain. It is perceived that requirements for Marine Corps dining will not be as volatile as displayed in commercial markets. This does, however, bring up a planning consideration that was incorporated into the facility design guides--flexibility or the ability to react to changes affecting physical operations without mandating extensive renovation costs.

Administration and Controls

The primary administrative functions of food service operations have traditionally been defined as planning, organizing, directing, staffing, and controlling. The ultimate performance of a food service system depends upon effective management of these areas. The role of the food service manager is multidimensional, requiring the considerations of a number of different abilities. A successful manager must combine technical knowledge, human resource management, and conceptual thinking. To achieve objectives, food service managers have a number of resources: personnel, materials, facilities, and finances. Managers are also facilitators of change. In acting as a catalyst for change, a manager must also be able to communicate with the staff. All these abilities are used in the problem-solving and decision-making process.

The current system of administrative controls for the Marine Corps is inefficient. A significant portion of the manager's time is spent on paperwork rather than management. Productivity is also hampered by cramped work spaces and limited use of computers. This prevents an already overburdened staff from performing at optimal levels. The solution is to streamline daily documentation while maintaining current record keeping with a minimum of effort.

The use of computers by the Marine Corps for menu planning, food ordering, food storage, and recipe preparation is still in its infancy. It is strongly recommended that efforts be increased within the Corps to not only provide computer support for the typical data processing activities of food service but to take the lead in establishing artificial intelligence technology support systems that analyze data and instantaneously direct action based on the existence of certain conditions.

For instance, a computer may be tracking the number of Marines "signing" into the mess hall and on that basis direct the cook to start preparation of additional items in anticipation of demand. While doing this, the data base is updated and program conditions revised to enhance future decision-making capabilities. However, to satisfy current needs, off-the-shelf hardware and software is available to expand controls and afford the Marine food service manager the ability to devote his/her efforts toward planning for production, coordinating physical and human resources, and controlling the quality of the product.

Production

In creating a system to execute production, menu items must be prepared in the needed quantity with the desired quality and at a cost appropriate to the particular service. It is to this end that the established production methods and subsequent equipment support have been developed.

Methods of cooking that result in higher cholesterol consumption are fading rapidly from public favor (frying and sauteing), while methods that produce more natural products that are viewed as good for the cardiovascular system and for the reduction of carcinogens are increasing (broiling and steaming). Fresh meats, fresh vegetables and fresh fruits are replacing their processed counterparts in the military kitchens. New methods of food production/packaging (flash freeze, chill-heat, etc.) have been pioneered in recent years as a result of technological innovation.

The importance of cooking methods and food product usage relates directly to the design of the Marine Corps Dining Concept in the 1990's. Equipment chosen for use in the facility is determined by predicted future trends. The same is true for food storage areas because more fresh products will likely be used in the future, and the design of the facility will provide for increased cooler storage of various products.

Service

The Marine Corps food service facilities are faced with several service problems which require both immediate and long-term solutions. Among those problems are (1) the substantial competition created by the introduction of fast food franchises on the Marine bases; (2) antiquated, inefficient facilities; and (3) the pressing need to redefine "service" as it relates to the Marine Corps Dining Concepts in the 1990's.

This latter area of "service" can only be defined by the individual characteristics of the the two participants: the food service operation and its consumer, the Marine. Volume II has established the anticipated needs and desires of Marines and documented their views on the present food service system. These opinions depict a perception of low quality products and services. Though management is responsible for both of these factors, the amount of direct control over services is often limited, especially when service is viewed as a sum of personnel management and environmental aspects of the operation. These make up the image given to the customer even before product quality is considered in the decision process. Failure in any one area will result in a negative attitude towards the total food service operation.

This understanding has been incorporated into the facility designs for the Marine Corps Dining Concepts in the 1990's. In addition to the enhanced ambiance of the facilities, other service-related factors have been considered and implemented. For example, reduction in queueing times at the sign-in and serving areas will dispel the "hurry up and wait" perception that haunts all military operations. Also, the design of the dining areas has incorporated the necessities of the operation (seating requirements, size restrictions, durability, etc.) with the niceties of a pleasant dining experience (segmented areas, soothing colors, etc.). Facility designs also took the technological aspects of food service operations into effect and placed as many services as possible into the hands of the customer.

All operational designs and supporting equipment have been developed with the primary goal of customer satisfaction. Once this goal is achieved, the other "problems" facing Marine Corps food service operations will become solvable taskings of management.

The findings from the studies in this volume provided tremendous assistance in pinpointing the areas of food service facility operation and design that need to be addressed during the next 15 to 20 years.

SUMMARY OF VOLUME IV: THE DESIGN GUIDES

Atmosphere in the food service facility is the total environment to which customers or users are exposed. It includes the physical environment, such as furnishings and decor, as well as the intangibles, such as service. The type of atmosphere in a food service facility is important because it directly affects the overall quality of the dining experience. Good food can taste unpleasant in an uncomfortable atmosphere. Conversely, poorly prepared food can still be perceived as acceptable or enjoyable in an environment which is inviting and comfortable.

This volume examines the information provided in previous volumes of this report and assesses what direction should be taken in the renovation of existing facilities. Included in this report are proposed dining hall layouts according to different sizes of operation and decor schemes. These recommendations are supplemented with appendixes discussing the role and importance of color and acoustics in the final design. This report will not provide a specific, definitive answer to the ideal mess hall; such a goal is unrealistic and inflexible since every mess hall possesses circumstances that require unique solutions. Rather, its value lies in providing information and understanding that will encourage the user to find solutions that are obtainable within available resources. For instance, if the budget does not allow the ceiling in the dining hall to be dropped for aesthetic and acoustical reasons, then the manager can try other options, such as strategically placing carpet on selected walls to absorb sound and enhance the ambiance.

The renovation process begins with listing all the goals and objectives of the renovation. While many of the Marine Corps mess halls were built decades ago with similar designs, each mess hall has its own unique needs and circumstances which may extend beyond the general conditions of old and obsolete. These differences may be attributed to aberrations in design, location of the facility, or human-related causes such as maintenance and supervision of the facility. One facility might experience problems with cold, windy, and wet weather, while another might have problems with inadequate storage facilities due to unusual delivery schedules. In any case, it is up to the food service officer in charge of the mess hall to identify these problems and to highlight them so that they can be given particular attention during the overall renovation.

Before a problem can be quantified, the food service officer must first be aware that a problem exists. To do this, he must be familiar with operational and design issues. This guide should enhance the user's knowledge of the issues and components of design influencing the renovation.

The objective in establishing facility designs for the Marine Corps Dining Concepts in the 1990's was to provide the anticipated services and products at the lowest cost with the least amount of effort. Though specific costs are not provided due to constant price fluctuations and the extent of renovations necessary for each facility, care was taken to identify those pieces of equipment and supplies that satisfy the necessary requirements at the lowest present day cost.

The proposed dining hall layouts have been developed based on approximated customer population sizes (320, 940, and 1100) and remain within existing DoD space limits since these will be adequate as indicated by prior analyses. Whether the mess hall supports 100 or 1000 Marines, the general layout and concepts remain intact. The size of the parts will fluctuate according to design capacity of the facility. For brevity, the description will focus on the 320 seat mess hall.

Dining Areas

The layouts for the proposed Marine Corps food service facilities display the basic components and operations of the dining hall using the hollow square system previously described in the Summary of Volume III: The Systems Analysis. In this scheme, Marines enter an entry vestibule that automatically and efficiently queues them to the check-in station and into the hollow square servery. Once inside, the Marine goes to different food stations and makes selections. Immediately outside the servery are several condiment, salad, and beverage stations that are centrally located to help displace congestion outside of the servery.

The dining hall is subdivided into three main dining rooms. One dining room seats 140 and another holds 84. A third dining room is reserved for officers and seats 96. The divisions are accomplished by full height walls. This is necessary to create a complete visual and psychological separation. Portable partitions that are only 6 feet high fail to achieve this separation, and the diner is still aware that he is in a very large, overwhelming space. Overall, from entry to exit, the flow and function of this scheme is highly effective and efficient.

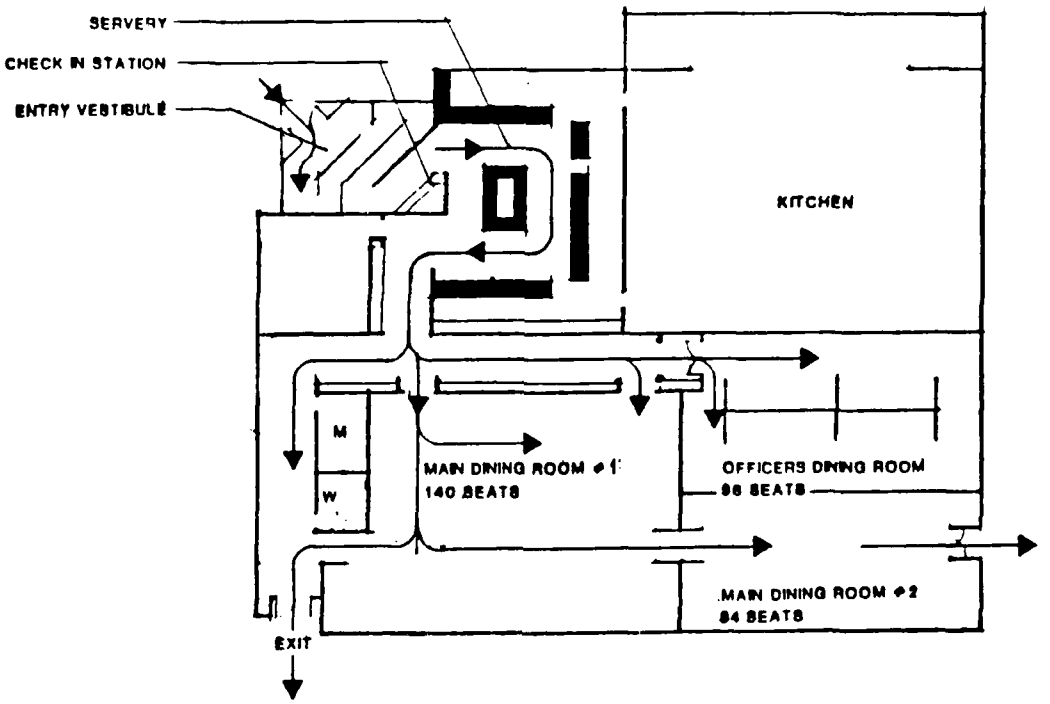


Figure 2. Dining hall flow chart - 320 seats.

Kitchen Facilities

The kitchen layout provides for adequate work space and minimizes unneeded employee crossover and unproductive movement while improving the service of the customer. Greater detail and equipment lists are provided in the Kitchen Design section of Volume IV: The Design Guides.

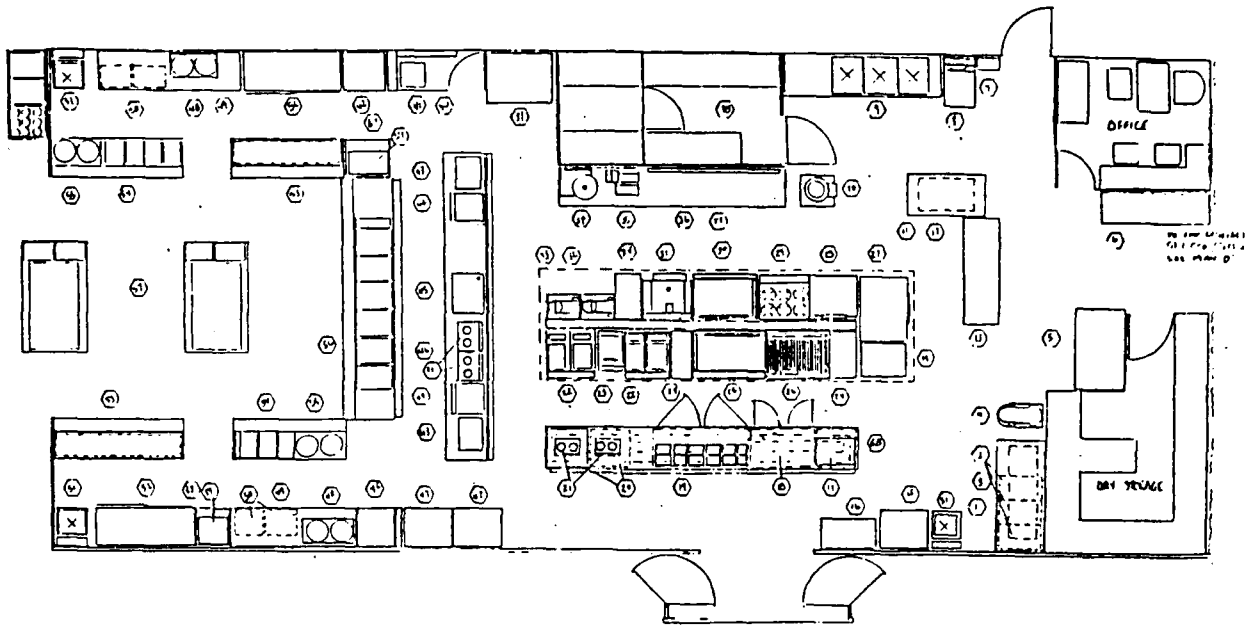


Figure 3. Kitchen layout - 320 seats.

CONCLUSION

This document provides a short summary to a multivolume report, "Marine Corps Dining Concepts in the 1990's." Further information is provided in Volumes II, III, and IV. It is recommended that the reader refer to these volumes for a detailed background of the proposed recommendations.