1995

Feasibility of a cook-chill system for medium sized, multi-site healthcare facilities

Nancy Leonard

Follow this and additional works at: http://scholarworks.rit.edu/theses

Recommended Citation
FEASIBILITY OF A COOK-CHILL SYSTEM 
FOR MEDIUM SIZED, MULTI-SITE 
HEALTHCARE FACILITIES 

by 
Nancy A. Leonard 

A project submitted to the 
Faculty of the School of Food, Hotel and Travel Management 
at 
Rochester Institute of Technology 
in partial fulfillment of the requirements 
for the degree 
of 
Master of Science 

August 1995
Name: Nancy Leonard Date: 6/15/99 SS#: 

Title of Research: Feasibility of a Cook-Chill System for Medium Sized Multi-Site Healthcare Facilities

Specific Recommendations: (Use other side if necessary.)

Thesis Committee: (1) Dr. Richard marecki (Chairperson)
(2) 

OR (3) 

Faculty Advisor: 

Number of Credits Approved: 

Date Committee Chairperson's Signature 

Date Department Chairperson's Signature 

Note: This form will not be signed by the Department Chairperson until all corrections, as suggested in the specific recommendations (above) are completed.

cc: Departmental Student Record File - Original Student
FORM K

ROCHESTER INSTITUTE OF TECHNOLOGY
School of Food, Hotel and Travel Management
Department of Graduate Studies

M.S. Hospitality-Tourism Management

Statement Granting or Denying Permission to Reproduce Thesis/Project

The author of a thesis or project should complete one of the following statements and include this statement as the page following the title page.

Title of thesis/project: Feasibility of a Cook Chill System for Medical-Surgical Multi-Use Healthcare Facilities

I, __________________, hereby (grant, deny) permission to the Wallace Memorial Library of R.I.T., to reproduce the document titled above in whole or part. Any reproduction will not be for commercial use or profit.

OR

I, __________________, prefer to be contacted each time a request for reproduction is made. I can be reached at the following address:

____________________________

Date

Signature
ABSTRACT

This research study examined the variables that a hospital foodservice director would analyze when considering the possibility of a Cook-Chill food production system for their facility. Data collection from 84 directors who had been involved in the decision making process, was obtained through the use of a specifically designed survey. Directors were asked questions regarding demographics, employee relations, customer satisfaction, manufacturer preference, and financial data.

Results indicated that the foodservice directors maintained or increased the level of customer satisfaction after implementing Cook-Chill. The financial aspects showed a return on investment in a relatively short period of time and in the great majority of cases, financial gain could be realized with the reduction of FTE's which is common when converting to Cook-Chill.

The volume of equipment can help to predict the success of Cook-Chill technology employed by each facility. A wide range of manufacturers are prevalent, yet it is apparent which ones are represented in the greatest amount of Cook-Chill facilities. The hospitals reported a significantly larger amount of blast chillers as compared to other equipment. This can be predicated upon the fact that they can be used with traditional cook-serve facilities, also.
The results suggest that there are many variables to consider when contemplating a Cook-Chill food production system for a hospital. Predicting the number of meals appears to be a significant factor, however the number of locations served by one system is also very critical. Concluded in this study are the major issues one would need to analyze their facility for Cook-Chill technology.
ACKNOWLEDGMENTS

This study was completed only with the combined effort, assistance, and encouragement of a great number of individuals. Each person influenced and contributed in their own distinctive manner, and to them I express my gratitude.

I am grateful to both Dr. Richard Marecki and Dr. Edward Kelly for their guidance throughout this period of research. Gratitude is also extended to Dr. Francis Domoy for his support and advisement early on with my survey.

Much appreciation is extended to Senior Management at Faxton Hospital. Mr. Keith Fenstemacher, Mr. James Bellinger, Mr. Joseph Neuman, and Mr. Arthur Pereira all assisted in their own way to help me achieve my goal. There are also co-workers including Grace O'Brien and Michelle Smith, that I sincerely extend my thanks to for their contribution to this research study.

I would like to also thank my family and friends for their support of my decision to return to school. To them I would like to say thank you for their continued love, support, and encouragement.
# TABLE OF CONTENTS

Title Page .................................................. i  
Abstract ...................................................... ii, iii  
Acknowledgements ........................................... iv  
List of Tables ............................................... vii  
List of Figures .............................................. ix  

**Chapter I**  
Introduction ............................................... 1  
Problem Statement ........................................ 1  
Background ................................................. 2  
Purpose ...................................................... 2  
Significance ............................................... 3  
Methodology ............................................... 3  
Literature Review ........................................ 3  
Hypothesis ............................................... 4  
Assumptions .............................................. 4  
Scope and Limitations .................................... 5  
Long Range Consequences ............................... 5  

**Chapter II**  
Review of Literature ...................................... 9  
Renovations of Older Facilities ......................... 10  
Reducing Labor ............................................ 11  
Merging Hospitals ........................................ 12  
Recipe Testing ............................................ 13  
Computerization ......................................... 14  
University of Virginia Hospital ....................... 15  
Comparison of Cook Chill  
vs Cook Freeze ........................................ 17
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>III.</td>
<td>Methodology and Research Design</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Research Instrument</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Sampling Procedures</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Research Design</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Demographic Data</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Manufacturers Data</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Customer Satisfaction Data</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Employee Relations Data</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Financial Data</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Methodology of Analysis</td>
<td>53</td>
</tr>
<tr>
<td>IV.</td>
<td>Conclusions</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Recommendations for Further Study</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Bibliography</td>
<td>85</td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>A. Survey</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>B. Cover Letter</td>
<td>91</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of Beds Served by Cook-Chill System</td>
<td>54</td>
</tr>
<tr>
<td>2. How Many Patient Meals per Day Served by Cook-Chill</td>
<td>55</td>
</tr>
<tr>
<td>3. How Many Cafeteria Meals per Day Served by Cook-Chill</td>
<td>56</td>
</tr>
<tr>
<td>4. Number of Locations Served by Production Facility</td>
<td>57</td>
</tr>
<tr>
<td>5. Cook-Chill Equipment Manufacturer Used</td>
<td>58</td>
</tr>
<tr>
<td>6. Manufacturer of Rethermalization Equipment Used</td>
<td>59</td>
</tr>
<tr>
<td>7. Manufacturer of Temperature Control Equipment Used</td>
<td>60</td>
</tr>
<tr>
<td>8. Cook-Chill Analysis: Customer Satisfaction</td>
<td>61</td>
</tr>
<tr>
<td>9. Change in Production FTEs after Cook-Chill Implementation</td>
<td>62</td>
</tr>
<tr>
<td>10. Square Footage (Production) of Hospitals using Cook-Chill</td>
<td>63</td>
</tr>
<tr>
<td>11. Type and Number of Equipment Used</td>
<td>64</td>
</tr>
<tr>
<td>12. Kettle Manufacturers Used &amp; Tumble Chiller Manufacturers Used</td>
<td>65</td>
</tr>
<tr>
<td>13. Blast Chiller Manufacturers Used</td>
<td>66</td>
</tr>
<tr>
<td>14. Primary Decision Makers When Implementing Cook-Chill</td>
<td>67</td>
</tr>
<tr>
<td>15. Effects on Employees During Transition</td>
<td>68</td>
</tr>
<tr>
<td>16. Percent of Modified Diets</td>
<td>69</td>
</tr>
<tr>
<td>17. Hours of Operation Per Day</td>
<td>70</td>
</tr>
<tr>
<td>18. Turnover Rate in Nutrition Services</td>
<td>71</td>
</tr>
<tr>
<td>19. Percent of Employees Full Time vs. Part Time</td>
<td>72</td>
</tr>
<tr>
<td>20. Manufacturers of Tray Delivery System Equipment</td>
<td>73</td>
</tr>
</tbody>
</table>
21. Manufacturers of Tray Delivery System Equipment.... 74
22. Percentage of Beds by Type.............................. 75
23. Percentage of Meals on Wheels and Adult Day Care... 76
24. Expected Return on Investment.......................... 77
25. Reduction of Solid Waste Using Cook-Chill......... 78
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cap-Kold Cook/Chill System</td>
<td>19</td>
</tr>
<tr>
<td>2. Flow diagram for Central Food Production Center</td>
<td>20</td>
</tr>
<tr>
<td>3. Cap-Kold System Advantages/Disadvantages</td>
<td>22</td>
</tr>
<tr>
<td>4. Cook &amp; Freeze Advantages/Disadvantages</td>
<td>23</td>
</tr>
<tr>
<td>5. The Cook/Chill Process</td>
<td>25</td>
</tr>
<tr>
<td>6. Parties Contracting with Hospital Food Service Operators</td>
<td>26</td>
</tr>
<tr>
<td>7. Lake Hospital System Consolidates Two Small Cook/Serve Kitchens into one Cook/Chill Production Area</td>
<td>28</td>
</tr>
<tr>
<td>8. Labor, Food Costs Comprise 90% of Food Service Budget</td>
<td>30</td>
</tr>
<tr>
<td>9. Who are the Cook/Water Bath Chill Customers?</td>
<td>32</td>
</tr>
<tr>
<td>10. Healthcare Foodservice Cook-Chill Sampled</td>
<td>42</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

How would you like to lower foodservice full time equivalents through attrition and cross training? What about the prospect of turning valuable in-house square footage (which is currently a hospital kitchen) into additional space for a true revenue producing department?

Can you imagine having beef stew on the menu every week, but only having to produce the product every two months? This can be a reality. What if all of this was possible, while at the same time increasing customer satisfaction?

PROBLEM STATEMENT:

Is Cook-Chill a feasible option for healthcare? Is there is a sufficient amount of beds to warrant the possibility? Would reducing F.T.E's help to strengthen financial gains? These questions could be answered by evaluating what a Cook-Chill food production system would offer.

This study will enable management to analyze their institution(s) for the feasibility of a Cook-Chill System. Healthcare reform is an imminent concern, and management must be knowledgeable of cost effective alternatives to the present way of conducting business. The Cook-Chill process itself is a relatively new technique for volume food production.
BACKGROUND:

As medium size healthcare institutions consolidate services, merge, or become affiliates of a healthcare network, choices between the traditional cook-serve method and the Cook-Chill method warrants serious evaluation.

In smaller facilities, under 300 beds, it is generally assumed that it is not cost effective to consider Cook-Chill as an option. However, when the possibility of a Cook-Chill operation is real, hospital administrators can entertain the prospect of decreasing full time equivalents in the foodservice department. Perhaps valuable in-house square footage occupied by a foodservice department can be better utilized by its relocation to an off-site location.

It is a creative possibility to relocate a hospital kitchen. Given the necessary equipment, meals can be delivered to off site locations whether only next door or twenty miles apart.

PURPOSE:

The purpose of this study is to analyze those factors which enable both middle and senior management to evaluate if Cook-Chill is a viable option for their facility.

Through the use of historical, and correlational research methods, the scope of all elements will be explained.
SIGNIFICANCE:

As the healthcare industry strives to offer superior levels of customer service, the most efficient systems should be adapted in service departments. The Cook-Chill system may be the efficiency that helps food service departments in the next decade.

METHODOLOGY:

This project will analyze present Cook-Chill systems in other healthcare facilities, and utilize surveys to determine the satisfaction of comparable systems in medium size facilities.

LITERATURE REVIEW:

The study will include topics pertaining to cost, labor equipment, space and adaptation of the new technology.

The resources used in this study will include of text, trade journals, and reference material published by both Groen and Cleveland, two of the companies which specialize in Cook-Chill equipment.

Periodicals and journals include, Food Management, Foodservice Director, Restaurants and Institutions, The Consultant, Journal of the American Dietetic Association, and Chilton's Food Engineering.
HYPOTHESIS:

This study is expected to demonstrate a feasibility that multi-site hospital systems might use in deciding which volume food production system best matches their facilities; cook-serve or Cook-Chill.

These strategies are inclusive of the following:

A) Senior management's commitment to procurement of capital resources.

B) Middle management's commitment to teamwork and quality improvement.

C) Food production staff's willingness to be flexible.

ASSUMPTIONS:

Ideological: An integral assumption to this study is that Cook-Chill operations offer a dramatic payback to the institution after a certain time period. I believe that customer satisfaction would not be decreased when using this process.

Procedural: It can be assumed that foodservice directors who have implemented the system will possess a knowledge of recommendations and pitfalls as well as guidelines for those considering the system.

Surveys will be composed of closed-ended questions to minimize bias. The surveys will be sent to healthcare institutions in the Northeastern states.
**SCOPE & LIMITATIONS:**

There are many cost effective volume food production methods available. This study will focus on the Cook-Chill method. The scope of the study will include healthcare facilities located in New York state, Massachusetts and Connecticut. Surveys will offer a qualitative assessment of decisions that influence a manager's decision as to whether to use the Cook-Chill process.

**PROCEDURES:**

The data for this study will be gathered by use of literature research, analyzing surveys, and collection of data from knowledgeable experts in the field (Groen and Cleveland representatives). The independent variables result in whether the traditional cook-serve method or technologically advanced Cook-Chill method is used by a healthcare facility. Dependent variables focus on the implicated cost savings which can result from implementation of Cook-Chill.

Intervening variables include the number of beds needed to justify a Cook-Chill system, the amount and expense of equipment, and the layout or square footage required for such a system.

**LONG-RANGE CONSEQUENCES:**

If the hypothesis is correct, a Cook-Chill system will prove to be the most efficient and pragmatic choice for
volume food production. If the result proves too costly to implement a Cook-Chill system, the null hypothesis will be accepted.
DEFINITION OF TERMS:

BLAST-CHILL: The process of quick chilling delicate foods from the cooking temperature to approximately 38 degrees in hours.

CROSS-TRAINING: Training of employees in other job classifications in the same or different departments.

COOK-CHILL: Volume food production process where cooked food is rapidly cooled and vacuum packed for chilled storage such as cook tanks, blast or tumble chiller and vacuum clipper.

INTEGRATED DELIVERY SYSTEM: Combining the delivery of health care with finance.

FULL-TIME EQUIVALENTS (F.T.E.): Specific amount of hours, i.e., 1950, 2080 that a full time employee's job requires during one year's time.

LONG-TERM CARE: Health care for the chronic or aged patient.
NETWORK: System where two or more separate facilities belong to one super system.

QUALITY IMPROVEMENT: Ongoing process where team members solve problems, make decisions, and allocate resources.

REThERMAlIZATION: The process of reheating frozen or chilled foods to the appropriate serving temperature.

SERVicE DEPARTMENT: Non-revenue producing department.

TUMBLE-CHILL: The process of quick chilling vacuum packed sauces, gravies, soups, etc. to 32-38 degrees in hours.
CHAPTER II

REVIEW OF LITERATURE

Health care reform is a reality. Many hospitals are decreasing inpatient beds. Outpatient services, long term care, adult day care, and Meals on Wheels services remain a viable part of the hospital.

As more and more hospitals become part of an integrated delivery system, alternatives to the present way of conducting business must be explored.

In researching information pertaining to healthcare food service systems, valuable information was discovered as stated in the following articles.

In Shelley Wilson's article, "More Choices, Better Labor Management with: Cook-Chill," in Foodservice Director magazine, a Cook-Chill system was installed in a 215 bed acute-care psychiatric facility.

Full-time equivalents were reduced by 38%. It is important to note, however, that enhanced safety in regard to foodborne illness ranked first and reducing labor costs was ranked second. Blast chilling was noted to significantly reduce the risk of foodborne illness.

At the Pennsylvania Hospital and The Institute for the Pennsylvania Hospital, a Cook-Chill system was added to their 1993 renovation. The two affiliated facilities
include a 505 bed acute care facility and a 265 bed psychiatric facility.

The challenges involved in renovating an old facility are many. Ventilation and power requirements are two that are not always carefully considered.

When contemplating the power requirements, there may have to be extensive rewiring or adding extra transformers to handle additional electrical requirements.

Ventilation, which can represent a problem in any kitchen facility, must be carefully planned when considering Cook-Chill. In using large kettles which produce a high volume of steam, a system of drawing away the undesired exhaust gases must be analyzed.

Also in Paul King's article, "Overcoming the Age Barrier," from Food Management journal, a third problem to consider in an older facility would be the original design of an existing kitchen. Where the equipment would be located must be carefully planned, and the outcome would be a deciding factor on whether to locate the new system in an existing kitchen or on another site.

Some important aspects regarding Cook-Chill at these facilities are, 1.) patient satisfaction rates were increased by 6% and 2.) a payback generally within two years, and 3.) no consultant was employed.

At Bronx Lebanon Hospital, in New York, many efficiencies were realized with the introduction of Cook-
In *Restaurant and Institutions*, Beth Lorenzini stated that a 50% reduction in labor was realized when converting from a conventional system to Cook-Chill system.

Due to union constraints, Bill Marks, the foodservice director, isn't able to schedule the production staff for four ten hour shifts, but it can be a consideration for other facilities. Four ten hour shifts is definitely perceived by foodservice employees as a greater, more flexible, work week. It can be an asset to the hospital for recruitment of foodservice employees.

Interesting comments noted were that, due to consistency, quality improves with the introduction of Cook-Chill. Also, as managers, there is better control of food costs due to an ingredient room.
Some examples of Do's and Don'ts from the journal article included:

**DO'S**

1) Send out food samples for microbiological testing.

2) Use liquid seasonings as they are more stable.

3) Mix hot cereals as ready to eat; use more liquid as cereals thicken in storage.

**DON'TS**

1) Season foods as heavily as you would hot-serve items.

2) Thaw chicken breasts; let them slow cook.

3) Experiment with small batches. Figure out effects of Cook-Chill production and storage on foods and adapt recipes. Get directions into computer so everyone can follow them.

From the trade journal *Foodservice Director*, an article authored by Marion Bond was informative in that it described the advent of Cook-Chill for two hospitals that consolidated services. "When Hospitals Merge," was an informative article that told about two hospitals on different sites with 674 total beds, being a strong candidate on different sites for a Cook-Chill operation.

The reduction of FTE's resulted in 5% by the time the kitchen was opened in April 1992. By January of 1993 another 4% was cut, and in February another 13% was reduced.

Rethermalization is handled on each of the hospital's 20 nursing units. At a pre-programmed time, heating pods, which are under the foods to be heated are switched on and in 36 minutes the food is heated to the proper temperature while the cold food remains cold.
"Growing into Cook-Chill," an article in Foodservice Director, also by Marion Bond, showed the efficiency of Cook-Chill in a smaller operation. Licensed for only 268 beds, and serving approximately 1000 meals per day, with the possibility of being licensed for 376 beds in the future, gave Mission Hospital Regional Medical Center in Mission Viejo, CA the need for Cook-Chill.

Their food cost is not among the lowest, but the food waste is minimal. Also, with elimination of the "last minute rush" extra time can be used in preparing garnishes which add to the aesthetics.

In Food Management, the article, "The Only Constant is Change," two hospitals, St. Lukes (780 beds) and Roosevelt (535 beds) merged fourteen years ago and formed St. Lukes-Roosevelt. Being a large, multi-site facility, Cook-Chill is used as a means of efficiency for foodservice.

Food is prepared in the renovated St. Lukes facility for both hospitals. The old cafeteria kitchen was transformed into a conference center.

Bill Moss, Assistant Director, reported that recipes were tested for nine months. Plating of meals is completed two to three meals in advance and trays move at a rate of 6 trays per minute.

In the article, "From Famine to Feast at VVMC," by Paul King in Food Management, Vanderbilt University in Nashville, TN employs a Cook-Chill system which allows for a volume of
over 6000 meals per day to be prepared on a tray line which produces trays at a rate of more than seven trays per minute.

The production system evolved in 1988, with tumble-chilling the primary method of cooling foods. Blast chilling is also a method of rapid-cooling of more delicate foods.

The computerization in the production system has allowed Foodservice Director, Glen Sching, better control of production, inventory, ordering and employee productivity. With the addition of menu and recipe management functions more time can be saved for both production and clinical areas. The best benefits, however, have been improved food quality, better product consistency, improved nutritional value, and reduction of food waste.

In the article, "Production for Profit," by Paul King, Food Management, Cook-Chill has enabled hospitals to empower their foodservice department to become a revenue generator as well as a cost saver. The 554 bed community hospital is using an off-site centralized food production center since 1984. They also prepare food for a 200 bed hospital 15 miles away. Additionally, they prepare soups, sauces and meats for local commercial restaurants as a revenue producer.

The Food Production Center is operated as a not-for-profit entity of Community Hospital. Cook-Chill did not
save much money in food costs or cooking time, but huge labor savings were realized. Full time equivalents were reduced by twelve with the advent of Cook-Chill.

The yield of meats was increased 15-20% as compared to a conventional roasting method. These efficiencies resulted in a $47,000 per year savings realized from a greater yield.

Both of the hospitals use a restaurant-style menu. Items are prepared as much as four weeks ahead of time and shipped to the hospitals as needed. It is conceivable that not saving dramatic amounts of money in food costs are due to the restaurant-style menu.

It is interesting to note that an estimate of a $530,000 savings in five years, and $3 million over 10 years was the estimated savings. In reality $922,000 was saved after only three years.

Paul King, in Food Management, "Reaping the Benefits of Construction," states that a new 622 facility at the University of Virginia Hospital in Charlottesville, opened in 1989. Hospital administrators saw that by increasing the amount of space allocated to foodservice, the bottom line could be improved. They were given triple the amount of space, namely 25,000 sq. ft., which included production, cafeteria and storage space. It also increases efficiencies for the foodservice department to have its own receiving dock. A grand total of 7700 meals, which are inclusive of patient meals, cafeteria meals and catered meals are
prepared daily. The Cook-Chill technology is used for 60% of their menu items.

The hospital's satellite units, a 122 bed rehab center, 30 bed children's rehab, two childcare centers and a Montessori school, are all users of this type of food production. The extensive computer system includes many labor saving functions including, maintaining a recipe file which is tied directly to inventory and accounts payable, a nutritional analysis function, accounting and payroll systems, and an inventory control system. Even their cash registers are linked to a program which reads debit cards.

Fifteen FTE's have been saved since the production center became operational one year ago. Revenue has tripled. However, this is partly due to a larger cafeteria which has 300 more seats.

Both product consistency and heightened morale have been recognized as benefits. Work schedules became more stable and employees developed pride in their work using the new technology.

The director of dietary services, Jerre Van Rensalaer is continually looking for other revenue sources such as nursing homes or retirement centers, where Cook-Chill technology can be profitably used.

In the article, "Cook & Refrigerate vs Cook & Freeze," from The Consultant by Russell Bean, the descriptions of centralized food production in regard to the type of "chill"
stage are differentiated in relation to freezing or cooling temperatures. With today's rising energy, labor and food costs, managers must plan for the future taking into account the economies of scale for their facilities and perhaps other facilities in close proximity. In a Cook-Chill system the centralized purchasing, storage and production is planned and initiated in one facility.

The cooking process of the Cook-Chill method can be accomplished with the new technology available today. Cooking in kettles is suitable for products that will be able to be pumped into plastic casings. Some examples of these are soups, sauces, gravies, and some casseroles.

The cook tank is used for the slow cooking of roasts and items that are too frangible to be prepared in large kettles. By reducing the shrinkage as much as 25%, and using the slow cook process, inexpensive cuts of meat can be tenderized.

A pump/filler is used to pump measured amounts of kettle cooked items into special cryovac casings which are sealed and labeled, without any human contact which minimizes bacteria. The filled casings are immediately loaded into a tumbling chilled water bath, also called a tumble-chiller. The agitation in this machine rapidly reduces the food temperature to 40 degrees in 20-60 minutes. After the rapid chilling process, the casings are loaded into standard walk-in coolers which are maintained at 28-32 degrees.
Due to the aseptic production, and rapid chill process, most products can have a 30-45 day shelf life.

As the products are needed, the casings are taken out of cold storage for rethermalization. See Figures one and two.
FIGURE 1

CAP-KOLD COOK/CHILL SYSTEM

1) Centralized Purchasing, Storage & Preparation

2) Kettle Cooking (All Portable Items)

3) Packaging

4) Rapid Cooling To 40°F (F) In Ice Water Bath (0-45 days)

5) Refrigeration Storage 28°C to 2°C (0-45 days)

6) Reheating at Remote Locations

Distribution From Inventory

Source: Green Manufacturing

FIGURE 1
It is also interesting to note that the following example represents the drastic energy savings realized by using a Cook-Chill system vs cook-freeze. See figures three and four.
<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor Savings</strong></td>
<td>Economies of scale and increase in efficiency may require staff reductions</td>
</tr>
<tr>
<td>Fewer people required for production. Single individual can</td>
<td>or reassignments.</td>
</tr>
<tr>
<td>prepare large quantities, fill all casings, load and</td>
<td></td>
</tr>
<tr>
<td>unload chiller. Less skill labor needed at remote</td>
<td></td>
</tr>
<tr>
<td>thermalization locations.</td>
<td></td>
</tr>
<tr>
<td><strong>Energy Savings</strong></td>
<td>Steam source required.</td>
</tr>
<tr>
<td>Steam heated kettles and Cook Tanks are extremely energy</td>
<td></td>
</tr>
<tr>
<td>efficient. Can operate from existing steam source.</td>
<td></td>
</tr>
<tr>
<td>Less cooking equipment required at thermalization locations.</td>
<td></td>
</tr>
<tr>
<td>(No scratch cooking done) Batch production allows for all</td>
<td></td>
</tr>
<tr>
<td>preparation during 5 day, 40 hour work week. Refrigerated</td>
<td></td>
</tr>
<tr>
<td>storage costs less than frozen storage. (See Table II)</td>
<td></td>
</tr>
<tr>
<td><strong>Sanitation</strong></td>
<td>(None)</td>
</tr>
<tr>
<td>No human or utensil contact between cooking and refrigerated</td>
<td></td>
</tr>
<tr>
<td>storage. Very rapid chilling retards bacterial growth. Special</td>
<td></td>
</tr>
<tr>
<td>casings resists abuse and protects product integrity.</td>
<td></td>
</tr>
<tr>
<td><strong>Food Quality</strong></td>
<td>Bakery goods, sandwiches, short order breakfast items, etc. still require</td>
</tr>
<tr>
<td>More control and uniformity of production techniques. No</td>
<td>scratch preparation.</td>
</tr>
<tr>
<td>cellular breakdown from freezing and thawing. Just cooked</td>
<td></td>
</tr>
<tr>
<td>flavor. Juicy more flavorful meat products. More control</td>
<td></td>
</tr>
<tr>
<td>over quality of ingredients. Rapid chilling arrests</td>
<td></td>
</tr>
<tr>
<td>cooking and over-cooking after packaging. No thawing or</td>
<td></td>
</tr>
<tr>
<td>tempering of product required before reheating.</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Capital equipment costs may be higher than cook &amp; freeze systems</td>
</tr>
<tr>
<td>Use of disposable plastic casings for preparation, storage</td>
<td>depending on existing refrigerator and/or freezer capacity, delivery truck</td>
</tr>
<tr>
<td>and even reheating saves on ware washing. Flexible plastic</td>
<td>requirements and amount of new continuous processing equipment may be</td>
</tr>
<tr>
<td>casings allow for higher effective storage density. 10 to</td>
<td>specified in cook &amp; freeze system.</td>
</tr>
<tr>
<td>25% higher meat yields with Cook Tank slow cooking. More</td>
<td></td>
</tr>
<tr>
<td>flexibility in packaging sizes.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Groen Manufacturing

22
**COOK & FREEZE ADVANTAGES/DISADVANTAGES**

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor Savings</strong></td>
<td>More people required for operation of ovens, broilers, etc. than Cap-Kold type system. More people required for plating and packaging.</td>
</tr>
<tr>
<td>Reduction of staff requirements at remote feeding point. Some overall staff reduction possible.</td>
<td></td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>Much higher gas and electric utility requirements to power production equipment. (Compared to Cap-Kold System) More costly &quot;frozen&quot; storage. (See Figure II)</td>
</tr>
<tr>
<td>Some savings from consolidation of production and use of new high volume continuous broilers, ovens or tunnel microwave.</td>
<td></td>
</tr>
<tr>
<td><strong>Sanitation</strong></td>
<td>Multiple handling of ingredients and prepared food during preparation and packaging. Possibility of improper thawing and tempering prior to reheating.</td>
</tr>
<tr>
<td>More control over ingredients and preparation at central location. (Compared to conventional methods.)</td>
<td></td>
</tr>
<tr>
<td><strong>Food Quality</strong></td>
<td>Product degradation from freezing and thawing process. Overcooking is possible after packaging unless product is blast frozen. Only food processors or very high volume operations can justify the cost of Blast Freezing equipment.</td>
</tr>
<tr>
<td>More control over production.</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>Longer term storage possible subject to packaging quality and nature of product.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Groen Manufacturing
With cook-freeze systems the centralized production and cooking is the same as with Cook-Chill.

However, the prepared item is pre-plated or packaged in bulk-size pans and then blast frozen instead of rapidly chilled before storing in conventional walk-in freezers. The shelf life, once frozen can be as long as 6 months-1 year. The shelf life of Cook-Chilled products is typically 30 days.

Once the pre-plates or bulk pans are pulled from the freezer, the rethermalization process takes place.

The following flow chart (Figure 5) from the proposal submitted to Baystate Medical Center displays the rapid chilling process in each capacity and the process of rethermalization.

Figure 6 presents some of the possibilities that a health care facility might find lucrative to contract with. Each of these potential customers would very likely welcome the prospect of purchasing these foods at a better price than from national manufacturers.
The Cook/Chill Process

Production

Blast Chill
- Solid Foods
  - Cooked Conventionally
    - Manually Portioned into Steam Table Plans
      - Chilled in Cold Air Blast Chiller
        - Refrigerated Storage 3-5 Days

Tumble Chill
- Soft Consistency Foods
  - Kettle Cooked
    - Pumped into Polyethylene Bags
      - Chilled in Rotational Ice Water Tumble Chiller
        - Refrigerated Storage 4-6 Weeks

Cook Tank
- Meat, Limited Other Foods
  - Sealed in Polyethylene Bags
    - Slow Cooked, then Chilled in Cook Tank

Meal Service
- Bulk Rethermalization (Conventional or Cook/Chill Specific Equipment)
  - Hot Tray Assembly
    - Meal Service
  - Chilled Tray Assembly
    - Meal Service

Cafeteria, Family Style

Source: Aladdin Synergistics, Inc.; Advisory Board Interviews.
### Parties Contracting with Hospital Food Service Operators

- Catering Customers
- Home Delivery Programs
- Corrections Facilities
- Grade Schools
- University Dining Services
- Nursing Homes
- Restaurants
- Day Care Centers
- Charity Organizations

**Source:** Pilot Study Baystate Medical Center
Figure 7 represents a case study in which a two hospital system consolidated into one Cook-Chill production area.
Conclusion #32  

**Strategy #2: Consolidate food production with other area hospitals to build meal volume, enhance viability; shared production area an option for hospitals of all sizes**

<table>
<thead>
<tr>
<th>Case-In-Point</th>
<th>Lake Hospital System Consolidates Two Small Cook/Serve Kitchens into One Cook/Chill Production Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital</strong></td>
<td>350-bed two-hospital system located in rural northeastern Ohio.</td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td>Prior to conversion to cook/chill, hospital system was operating two small cook/serve kitchens, one in 150-bed Lake East facility and one in 200-bed Lake West 15 miles away.</td>
</tr>
<tr>
<td><strong>Cook/Chill System</strong></td>
<td>Food production for both hospitals now centralized in cook/chill kitchen in Lake East. Meals transported to Lake West three times per day. Cook/chill system consists of tumble chill equipment, cold tray line, rethermalization carts and chillers.</td>
</tr>
<tr>
<td><strong>Total Savings</strong></td>
<td>Payback period on cook/chill investment was 1.6 years. Food service currently produces 2,000 meals daily with seven fewer cooks and six fewer tray assembly workers than would be necessary with a cook/serve approach. Hospital has also lowered meat costs by achieving greater yields.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Labor Savings</strong></td>
<td>$258,100</td>
</tr>
<tr>
<td><strong>Annual Food Savings</strong></td>
<td>+ $48,000</td>
</tr>
<tr>
<td><strong>Annual Transportation Costs</strong></td>
<td>$32,700</td>
</tr>
<tr>
<td><strong>Total Annual Savings</strong></td>
<td>$273,400</td>
</tr>
</tbody>
</table>

*Cost of food transportation from production area to Lake West three times per day; 365 days per year.

Source: Pilot Study Baystate Medical Center
Figure 8 displays the typical food service budget and also the conclusions that support a savings for the conversion to Cook-Chill.
Typical 400-bed hospital serving 2,000 meals daily spends $2.6 million to $3.7 million annually on food service operation; food service constitutes 4% to 6% of average institution's total budget.

Many hospitals now targeting food service for savings initiatives; only 5% to 10% of hospitals have "taken the plunge," completely revamped food preparation, storage by converting to cook/chill process.

Goal of cook/chill technology to maintain product quality, improve food service working environment while dramatically reducing labor, food, other operating costs.
Figure 9 demonstrates the characteristics of the average Cook-Chill customer.
FIGURE 9

WHO ARE THE COOK/WATER BATH CHILL CUSTOMERS?

- THOSE SERVING MORE THAN 600-800 MPD

- THOSE WHO HAVE MORE THAN ONE SERVING LOCATION

- THOSE WHO HAVE FOOD TEMPERATURE PROBLEMS BECAUSE OF DISTANCE
  THEY HAVE TO TRANSPORT OR THE TIME THAT IT MAY TAKE TO GET IT THERE

- THOSE WHO WANT TO CONTROL THE CONSISTENCY AND THE QUALITY OF THEIR
  PRODUCT FROM SERVING LOCATION TO SERVING LOCATION

- THOSE WITH LIMITED PRODUCTION SPACE WITH A LARGE NUMBER OF MEALS
  TO PRODUCE OR THOSE WHOSE NEEDS ARE EXPANDING RAPIDLY AND THE
  EXISTING KITCHEN CAN'T TAKE CARE OF THE NEEDS

- THOSE WHO HAVE A GREAT DEAL OF COMPETITION FOR LABOR, PARTICULARLY
  SKILLED COOKS

- THOSE WHO MUST CONSIDER OPTIONS FOR SAVING MONEY
REThERMAlIZATION:

In the article "System, System, Who's Got the System?" by Russell Bean, in The Consultant, the success of Cook-Chill systems is due to the centralization of food production and the separation of production from serving which offers employee morale advantages.

During the rethermalization process, the final step of the Cook-Chill process, the food is readied for the customer to eat. The Regethermic System was developed in Europe and involves the cold plating onto special plates with covers and delivery to the floors in special refrigerated carts. The actual reheating is accomplished in a radiant rethermalizing unit on the nursing unit.

Specialized equipment is necessary and consideration must be given to the additional labor required for retrieval of carts on the units.

The 3M Company has marketed a "retherm" system where the meals are plated cold onto special plates which are placed over heating elements. These carts, once delivered to a nursing unit, are then plugged in and power is transferred through metal contact points.

This is highly specialized equipment and is found to require high maintenance of the heating components. Aladdin also has developed a system which pre-plates meals cold. The trays are loaded into a cart which is rolled into a special refrigeration unit either on the nursing unit or
in the kitchen proper. At a pre-determined time, the refrigerator activates power to the cart which heats the hot food section of the trays while still in the refrigerator. Again the labor involved in retrieval and cleaning of the trays and covers must be considered.

United Service Equipment Co. (USBCO) has a system where the food is partially plated on a refrigeration assembly/conveyor system using regular china plates, standard covers, etc. However the plated foods are then loaded in insulated carts for transfer to the nursing unit. The hot food plates are then transferred to a special type of convection oven for heating.

This requires additional tray assembly of cold food items at the nursing unit. The consideration of additional labor must be dealt with when considering this system.

"A System with Room to Grow," by Paul King, (Food Management,) describes how central production systems can be feasible in approximately 1000 sq. ft. of space.

He cites the example of Essex County Hospital in Cedar Grove, New Jersey, as the site of central production system. The hospital utilizes a Cook-Chill system to prepare food for not only its 720 beds, but for a 325 bed geriatric center, 120 bed youth correctional facility, 600 bed inmate jail, and 1100 inmate jail annex! To prepare for 2865 meals daily in such a small facility is truly remarkable.
Menu items are prepared 7-10 days before they are served. Even though each kitchen is large enough to prepare entire meals, a three day inventory is maintained to prevent any problems due to delivery truck breakdown, etc.

The goal of using a central system was cost control. Both food and labor costs were dramatically reduced. Food costs dropped 13% and labor dipped 10%.

There are longer range plans to expand the production area and the possibility of gaining extra revenue by selling items to other institutions. "Giving Foodservice Its own Space." (Food Management,) by Paul King was an informative article. It illustrates how central food production can be utilized when hospitals merge into healthcare systems.

Freestanding Production Centers, sometimes called Service Centers, are centralized locations for storage, production and shipping of food to member facilities.

The Harris County Healthcare System in Houston, Texas has 874 beds which require nearly 4000 meals per day. A 75% Cook-Chill system is being used.

The rethermalization is done at each hospital site, as the food is delivered in bulk. The staff at the Production Center prepares menu items according to inventory rather than to meal period which keeps labor costs down. Food quality receives excellent comments from the patients, with texture and flavor showing improvement. In the research article, "Comparison of Conventional, Cook-Chill, and Cook
Freeze Foodservice Systems," by Karen Greathouse, PhD, RD, Journal of American Dietetic Association, there are some interesting observations.

The number of FTE's in any system is the highest contributor of operating costs. This was determined after operational and financial data were collected from conventional, Cook-Chill, and cook-freeze foodservice systems. A number of studies were summarized by Greathouse in which comparing hospital foodservice systems was compared.

Paul Hysen, a well known foodservice consultant, conducted a cost comparison study of conventional and cook-freeze systems for healthcare foodservice as mentioned in the study by Greathouse. He compared food cost, labor and capital investment, menu variety, quality control, inventory control, and purchasing. He studied a 350 bed facility which was planning to add 500 beds. The conclusion illustrated that cook-freeze would be less expensive than conventional, noting that the savings in labor and food were greater than the expenses derived from freezing and heating.

Also in this article, Herz and Souder compared the conventional, Cook-Chill, and cook-freeze systems on the basis of cost-effectiveness in regard to Army foodservice facilities. Labor, food, supply cost, energy requirements, equipment and space allotments were analyzed. In this
report, cook-freeze was the best choice for 100-550 bed hospitals.

In the research conducted by Greathouse, the foodservice department characteristics, equipment usage, square footage, modified diets, and operating hours were examined. It is interesting to note that an advantage of Cook-Chill as related to modified diets is that the modified food can be prepared in advance and used as needed. In relation to modified diets, the majority of the hospitals in each of the three systems had 31% or more modified diets. One important note is that of 309 hospitals cited, more than 24% stated modified diets is a major factor responsible for high labor hours.

Cook-Chill facilities require the most space allocation, with cook-freeze needing the second largest number of square feet, and the conventional system needed the least. Operating hours were reported in three areas, production, cafeteria and patient tray areas. The lower production hours in Cook-Chill and cook-freeze were less than but not significantly so.

In the review of the personnel factors, the opinions of Hysen, Herz and Souder, and Freshwater, were that the number of FTE's for Cook-Chill or cook-freeze would be less. Actual data in this study did not prove this.
Turnover rate showed no significant difference in all three systems. Reduced turnover can occur in the production area but may not be large enough to be significant.

Absenteism rate, also showed no appreciable difference in the comparison among the three systems, and the percentage of full time employees did not vary significantly either. Greathouse reported that in regard to tray delivery systems, the pellet is the most widely used in conventional systems, with the refrigerator car combination used most frequently in cook-freeze and Cook-Chill.

Salaries in Cook-Chill systems were higher but not significantly in the research reported. Data indicated that it may have been due to the foodservice directors not taking advantage of labor reduction potentials namely reducing the amount of FTE's.

Prior to 1983, six of twelve foodservice directors in New York City area surveyed regarding Cook-Chill and demonstrated that they wished to return to a conventional system. One reason was that they did not achieve the anticipated cost savings. Also, factors relating to quality of service, catered events, effectiveness of the management team and other functions of the department should have been considered.

In summary, there was a lack of "significant" differences among systems to support any valid conclusions. The variables such as FTE's, turnover rate, absenteeism
rate, salaries, need to be examined closely to be certain that cost reduction can be achieved. "The Analysis of the Decision to Select a Conventional or Cook-Chill System for Hospital Foodservice," by Mary Frances Nettles, noted significant differences in foodservice systems in hospitals of different sizes. In hospitals under 300 beds, conventional foodservice systems seem to be the most prevalent.

Her research cited that Cook-Chill systems, while found in hospitals of varying bed sizes, are most frequently found in hospitals consisting of 500 or more beds.

More research is needed when deciding on whether Cook-Chill is applicable to a facility. The unique characteristics, such as how hot food is plated, how patient trays would be delivered, and the satelliting of food to other facilities would have to be closely examined.
CHAPTER III

METHODOLOGY AND RESEARCH DESIGN

The focus of this chapter will be on the methodology used in conducting the study. The research design is comprised of three specific areas: (1) construction of research instruments (personal interviews, and survey), (2) the sampling procedure and administration of the research instrument, and (3) research design.

RESEARCH INSTRUMENT:

The survey was designed and pre-tested initially at a college/university who recently implemented a Cook-Chill operation. After refinement of the instrument, four personal interviews were conducted using the survey. Foodservice operators who had experience with researching a Cook-Chill process were the target of these interviews. One operator had experience in business and industry and three operators had healthcare experience.

SAMPLING PROCEDURES:

Healthcare foodservice operators with Cook-Chill experience were contacted by a pre-survey letter initially. The final survey was mailed 10 days later. The actual sample included the United States and Canada. Manufacturers of Cook-Chill equipment supplied the names of customers who
have experience with their equipment. This comprised the mailing lists.

Eighty four surveys were distributed to hospitals and long term facilities only, and a response rate of fifty eight percent was achieved.

Approximately three weeks after the initial survey was mailed, a thank you letter was mailed. This also served as a reminder for those who had not responded at that time.

See Figure 10.
**HEALTHCARE FOODSERVICE COOK-CHILL SAMPLED**

<table>
<thead>
<tr>
<th>CATEGORY OF OPERATION</th>
<th>NUMBER SAMPLED</th>
<th>NUMBER RETURNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOSPITALS (ACUTE)</td>
<td>80</td>
<td>48</td>
</tr>
<tr>
<td>GERIATRIC HOSPITAL</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>CENTRAL PRODUCTION CENTER</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>MEALS ON WHEELS PRODUCTION CENTER</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
RESEARCH DESIGN:

The measurement instrument (survey) was designed to gather information about the demographics of their respective facilities. Obtaining this information aids in classifying completed information that a foodservice operator would consider in determining the feasibility of a Cook-Chill process for their facility. See Appendix A for the measuring instrument (survey).

The first question on the survey is asked to help establish the minimum and maximum number of beds and patient and cafeteria meals in a facility which currently uses a Cook-Chill process.

Question 2 provides the reader with information on minimum and maximum levels of different numbers of off-site facilities served by one Cook-Chill system.

Questions 3, 4, and 5 were aimed at gathering data on the manufacturers of equipment used in Cook-Chill production centers.

The level of customer satisfaction before and after implementing Cook-Chill were what questions 6 and 7 were targeted at.

Question 8 was designed to determine if FTE's could be decreased after the implementation of Cook-Chill. This would represent a cost savings factor.
Question 9 sought to determine the total amount of space that realistically could be allocated to a Cook-Chill facility.

Question 10 was designed to determine the popularity of the common types of equipment used in Cook-Chill facilities. The name of the manufacturer was also asked. This will serve as a reference check on the popularity of certain brands.

Question 11 asked who would be the primary decision maker in contemplating the feasibility of a Cook-Chill process.

The effect on employee relations was the question that was asked on question 12.

Question 13 determined the percentage of modified diets.

The number of hours that both production and cafeteria operate was asked in question 14. It would have been helpful to also ask about the number of days of operation. There is a correlation between the number of hours a production facility is open and the number of days each week it is in operation. The hours of operation for the cafeteria can be translated into the volume of food produced.

Questions 15, 16, and 17 were asked to determine the composition of staff and their longevity in the nutrition services department.
The type of tray delivery system used was asked in question 18. This is the final component of a Cook-Chill system.

Questions 19, 20, 21, and 22 ask the participant about the composition of customers in their facilities.

Question 23 asked how long one could expect to get a return on the investment of capital required to implement a Cook-Chill system.

Question 24 asked respondents the effect that Cook-Chill would have on recycling or reducing solid waste. This may or may not add to financial implications.

One question was omitted and would be imperative for an operator who is contemplating a Cook-Chill system to know. This question would be relevant to the increase or decrease of food cost after implementation of Cook-Chill.

**DEMOGRAPHIC DATA:**

Question 1 on the survey asked specific data regarding demographics of patient and cafeteria meals as well as hospital bed size. This question was asked so as to determine a median range for facilities using Cook-Chill. The median number of beds served by a Cook-Chill system is 569. The median number of patient meals and cafeteria meals served by Cook-Chill is 1287, and 2118, respectfully.

Question 2 asked the number of locations served by one Cook-Chill production facility. This question was asked because it can be generally assumed that the greater the
locations served, the greater the return on investment. However 53% of the respondents stated that they had less than three locations.

Question 9 asked how much square footage was dedicated to the production and storage area. The variances were significant, ranging from 550 sq. ft - 24,000 sq. ft., with 13,772 sq. ft. being the median.

Total hours of operation per day concluded that fifty seven percent of the respondents reported that their facility operated twelve hours or less per day. Twelve to sixteen hours per day for cafeteria service were reported in twenty two percent of the respondents answers. It is important to note that the composition of the types of clientele served, was the purpose of questions 19, 20, 21, and 22.

Fifty three percent of the respondents reported acute care beds comprising 70-100% of their total. This is the greatest volume of patient meals.

Twenty nine percent of the respondents related that skilled nursing type of beds represented only 10-30% of their patients.

Only eighteen percent of the respondents reported 10-30% of their meals as Meals on Wheels service.

Ten percent of the respondents stated that adult day care represented 10-30% of their total population.
Both Meals on Wheels and adult day care comprising a low volume of patient meals, should not have an impact on deciding the question of whether or not to implement Cook-Chill.

It can be assumed that both acute care and L.T.C. patient meals represent the greatest proportion of modified diets. In Question 13 the report of 31-50% of modified diets comprised forty one percent of the respondents' facilities. The number of modified diets can be presumed to compose 31-50% of total Cook-Chill meals.

**MANUFACTURERS DATA:**

Question 3 asked what manufacturer of Cook-Chill equipment is used in each facility. Due to the fact that there are many different manufacturers, the primary one used, would give the greatest experience rating. Thirty one percent use Groen equipment. Twenty percent use Cleveland equipment.

Question 4 asks what manufacturer of rethermalization equipment is used more often in healthcare facilities. Alladin represents the greatest volume with 22% of the respondents reporting its use.

The type of temperature control, as asked in question 5, showed that Honeywell was represented 20% of the facilities responding.

Question 10 did ask for information on manufacturing data as well as information pertaining to the actual number
of pieces of equipment. The volume of equipment from the most popular manufacturer should show a track record for each respectively.

The type of tray delivery system will demonstrate the popularity among users of Cook-Chill operations as to the type of rethermalization process used.

Blast chillers represented use by the greatest number of respondents (84%). Tumble chillers also are used by 33% of the respondents. Kettles used for cooking are used by 61% of the respondents. Other types of equipment used was reported by 12% of the respondents. This could be inclusive of pump/fill stations or vacuum clipping.

The most popular kettle manufacturers reported are Groen and Cleveland. Groen is used in 29% of the respondents' facilities and Cleveland is used in 27% of facilities. Thirty five percent of the total respondents answered this question.

The most popular tumble chiller reported is Groen which is reported in 22% of the total facilities. Thirty five respondents answered this question.

Thirty nine percent of the total respondents reported use of blast chillers. No significant difference in manufacturers is noted.

Question 18 asked about the manufacturer of tray delivery systems. This also demonstrates which type of rethermalization takes place. The pellet, insulated tray
and insulated components are plated when the food is hot. This requires retherm to take place using the bulk foods. The roll-in refrigerator/cart technology has heating elements under aluminum pods which reheat the preplated items at a predetermined time. The food is plated while cold.

Twenty seven percent of the total respondents use the pellet system to distribute meals. No significant manufacturer was reported.

Fourteen percent of the respondents use an insulated tray. Alladin represented twelve percent of the respondents.

Insulated components are also used by fourteen percent of the respondents. No significant manufacturer was noted in this study.

The roll-in refrigerator/cart combination was reported used in thirty nine percent of the facilities. Alladin represented eighteen percent, Ala-cart represented six percent, and various others represented fourteen percent of the total.

CUSTOMER SATISFACTION DATA:

Question 6 and 7 asks the respondent to relay their level of customer satisfaction before implementing Cook-Chill, and again after implementation of Cook-Chill. One hundred percent of total respondents answered this question. An average rating was received by forty nine percent of the
respondents. Thirty five percent of the respondents rated above average as their level of customer satisfaction before initiating the process of Cook-Chill. Seventy eight percent of the respondents answered question 7 regarding customer satisfaction after implementing Cook-Chill. Fifty five percent reported an above average rating, while twenty nine percent recorded an average rating. It is interesting to note, however that both before and after implementation of Cook-Chill an average or above average rating was received by 84% of the respondents. Also it is important to note that an above average score before implementation amounted to only 35% but after implementation rose to 55%.

**EMPLOYEE RELATIONS DATA:**

Question twelve surveys the respondents as to the effect on the foodservice employees during the transition to a Cook-Chill operation. Eighty percent of the total respondents answered this question. Sixty two percent of the respondents reported a positive effect on employees during the transition. Twenty eight percent reported a neutral effect, and ten percent reported a negative effect.

Question 8 requests information regarding the increase or decrease of FTE's during the first year of implementation of Cook-Chill. Eighty percent of the total respondents answered this question. Seventy four percent of the respondents reported a decrease in the amount of FTE's during the first year. Twenty one percent of the
respondents reported no change in FTE's during the first year. Only five percent reported an increase of FTE's during the first year.

After the first year of implementation sixty one percent of the respondents reported a decrease in FTE's. Thirty one percent reported no change in FTE's and three percent reported an increase after the first year.

Question 15 requested information regarding the turnover rate in foodservice departments. One hundred percent of the total respondents answered this question. Thirty seven percent reported turnover rates under 10%. Twelve percent reported a 10% turnover rate. Forty three percent of the respondents reported an 11-30% turnover rate. Two percent reported their turnover statistics as 31-50%, and six percent reported greater than 51% as their turnover rate.

The percentage of full time employees was asked in question 16. Eighty four percent of the total respondents answered this question. Five percent reported less than two percent of their employees are employed on a full time basis. Fifteen percent of the respondents reported 20-40% of their employees as full time employees. Thirty two percent of the respondents reported that 41-60% of their employees are full time. Twenty four percent of the respondents reported 61-80% and 81-100% of their employees as full time workers.
Question 17 asked the respondent to answer the question as to the number of part time employees. Ninety six percent of the total respondents answered this question. Twenty six percent reported less than 20% of their employees are part time workers. Forty seven percent of the respondents reported part time workers as 20-40% of their total department. Thirteen percent of the respondents reported both 41-60%, and 61-80% of their workforce as part time. Only two percent of the respondents reported 81-100% of their employees as part time.

**FINANCIAL DATA:**

Question 23 asked the respondent to answer the question as to the return of investment (R.O.T.), in relation to the implementation of Cook-Chill. Forty one percent of the total respondents answered this question. Thirty five percent of the twenty respondents received a R.O.I. in 1-3 years. Fifty five percent of the twenty respondents reported a R.O.I. of 3-5 years. Ten percent of the twenty respondents reported more than five years to attain R.O.I.

Question 24 asked the question about the effect that Cook-Chill has on reducing solid waste. Thirty nine respondents answered this question. Twenty three percent of these respondents reported very little effect on reducing solid waste. Thirty eight percent reported little effect and eighteen percent of the respondents reported both a high and no effect at all on reducing solid waste. Three percent
of the respondents reported a very high effect on reducing solid waste at their facility.

The primary decision makers asked in question 11 seemed to be either the foodservice director (34%) or the foodservice director along with a member of administration (36%) in the highest majority of the respondents answering this question. Ninety percent of the total respondents replied. In eleven percent of the facilities it was the owner-administrator who solely made the decision to implement Cook-Chill. Seven percent reported a combination of foodservice director, owner and board making the decision. Two percent of the respondents reported the owner, foodservice director, and engineering, and also foodservice director, owner, member of finance and also foodservice director and legislative committee. In five percent of the respondents, the foodservice director and foodservice staff alone made the decision.

**METHODOLOGY OF ANALYSIS**

The data collected from the surveys was compiled using Harvard Graphics version 3.0 for Windows. The compilation of data displays the necessary areas that management must analyze when contemplating a Cook-Chill system.
Number of Beds Served by Cook-Chill System

Hospital A - 170 beds acute
Hospital B - 259 Acute; 292 Long Term Care, and 40 Adult Day Care
Hospital C - 35 Acute, and 120 Long Term Care

Total - 464 Acute, 412 Long Term Care, and 40 Adult Day Care

Table 1
How Many Patient Meals per Day Served by Cook-Chill

- Hospital A - 656 patient meals per day
- Hospital B - 957 patient meals per day
- Hospital C - 441 patient meals per day
- Total - 2054 patient meals per day

Pt Meals per Day:

<table>
<thead>
<tr>
<th>Survey</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Total A, B, &amp; C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range 300 - 6000</td>
<td>656</td>
<td>957</td>
<td>441</td>
<td>2054</td>
</tr>
</tbody>
</table>

(Average) 1287
How Many Cafeteria Meals per Day
Served by Cook - Chill

Hospital A - 255 Cafeteria meals served per day
Hospital B - 1260 cafeteria meals served per day
Total - 1515 cafeteria meals served per day

* The Cafeteria Meals for Hospital C cannot be determined. (Outside Contract)
**Number of Locations Served by Production Facility**

**Number of Locations**

**Less than 3 locations**: 26

**3 - 4 locations**: 5

**Greater than 4 locations**: 12

**Hospitals A, B, and C each have one location for a total of 3.**

(Does not include Adult Day Care)

Table 4
Cook-Chill Equipment Manufacturer Used

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groen</td>
<td>15</td>
</tr>
<tr>
<td>Cleveland</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
</tr>
<tr>
<td>Vulcan</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 5
Manufacturer of Rethermalization Equipment Used

Table 6

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alladin</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
<tr>
<td>Groen</td>
<td>3</td>
</tr>
<tr>
<td>Useco</td>
<td>2</td>
</tr>
<tr>
<td>3M</td>
<td>2</td>
</tr>
<tr>
<td>Alacarte</td>
<td>1</td>
</tr>
</tbody>
</table>
Manufacturer of Temperature Control Equipment Used

Number of Respondents

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honeywell</td>
<td>10</td>
</tr>
<tr>
<td>Partlow</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
<tr>
<td>Johnson</td>
<td>2</td>
</tr>
</tbody>
</table>

Name of Manufacturer

Table 7
Cook - Chill Analysis: Customer Satisfaction

Prior to Cook - Chill Implementation

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>1</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>24</td>
</tr>
<tr>
<td>Above Average</td>
<td>17</td>
</tr>
<tr>
<td>Very High</td>
<td>4</td>
</tr>
</tbody>
</table>

Post Cook-Chill Implementation

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>1</td>
</tr>
<tr>
<td>Low</td>
<td>11</td>
</tr>
<tr>
<td>Average</td>
<td>21</td>
</tr>
<tr>
<td>Above Average</td>
<td>5</td>
</tr>
<tr>
<td>Very High</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 8
Change in Production FTEs after Cook Chill Implementation

![Bar chart showing number of FTEs during and after 1 year with categories for increase, no change, and decrease.]

Table 9

62
Square Footage (Production) of Hospitals using Cook - Chill

Thousands Square Footage

Survey Average | Hospital A | Hospital B | Hospital C | Total A, B, & C
--- | --- | --- | --- | ---
21.022 | 5.241 | 5.486 | 3.003 | 13.73

Range: 550 - 250,000

Table 10
Blast Chiller Manufacturers Used

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groen</td>
<td>2</td>
</tr>
<tr>
<td>Victor</td>
<td>3</td>
</tr>
<tr>
<td>Useco</td>
<td>3</td>
</tr>
<tr>
<td>Vulcan</td>
<td>4</td>
</tr>
<tr>
<td>Williams</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 13
Primary Decision Makers when Implementing Cook Chill

Table 14

<table>
<thead>
<tr>
<th>Primary Decision Maker</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Service Director</td>
<td>38</td>
</tr>
<tr>
<td>Owner-Administrator</td>
<td>28</td>
</tr>
<tr>
<td>Board of Directors</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>
Effect on Employees During Transition

Respondents

Positive Neutral Effect Negative

Table 15

0 5 10 15 20 25 30
Percent of Modified Diets

Number of Respondents

<table>
<thead>
<tr>
<th>Percent Modified</th>
<th>Number of Diets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10%</td>
<td>0</td>
</tr>
<tr>
<td>11 - 30%</td>
<td>7</td>
</tr>
<tr>
<td>31 - 50%</td>
<td>20</td>
</tr>
<tr>
<td>Greater than 50%</td>
<td>16</td>
</tr>
</tbody>
</table>

** Hospital A - 47% Modified Diets  **
Hospital B - 60% Modified Diets
Hospital C - Cannot be Determined

Table 16
Turnover Rate in Nutrition Services

Number of Respondents

11 - 30% 31 - 50% Greater than 50%

Less than 10%

10%

Table 18
Percent of Employees - Full Time vs. Part Time

Table 19
Manufacturers of Tray Delivery System Equipment

Table 20

<table>
<thead>
<tr>
<th></th>
<th>Pellet</th>
<th>Insulated Tray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Respondents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Baxter</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Seco</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Manufacturers of Tray Delivery System Equipment

Insulated Components

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinex</td>
<td>4</td>
</tr>
<tr>
<td>Alladin</td>
<td>3</td>
</tr>
</tbody>
</table>

Roll-in Refrigerator/Cart Combination

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alladin</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
</tr>
<tr>
<td>Alacart</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 21
**Percentage of Beds by Type**

**Number of Respondents**

<table>
<thead>
<tr>
<th>Type of Beds</th>
<th>Percentage Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Care Beds</td>
<td>10 - 30% 30 - 50% 50 - 70% 70 - 100%</td>
</tr>
<tr>
<td>Long Term Care Beds</td>
<td>10 - 30% 30 - 50% 50 - 70% 70 - 100%</td>
</tr>
</tbody>
</table>

**Hospitals A, B, and C combined have 53% Acute Beds and 47% Long Term Care.**

Table 22
Percentage of Meals on Wheels and Adult Day Care

![Bar chart showing the number of respondents for Meals on Wheels and Adult Day Care.]

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Percentage of Meals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meals on Wheels</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>Adult Day Care</td>
<td>30 - 50%</td>
</tr>
<tr>
<td></td>
<td>50 - 70%</td>
</tr>
<tr>
<td></td>
<td>70 - 100%</td>
</tr>
</tbody>
</table>

** Hospital A - 23% Meals on Wheels, no Adult Day Care  Hospital B - no Meals on Wheels, 7% Adult Day Care  Hospital C - Not Available

Table 23
Expected Return on Investment

Number of Respondents

1 - 3 Years: 7
3 - 5 Years: 11
More than Five: 2

Number of Years
(20 Total Respondents)

Table 24
CHAPTER IV

CONCLUSIONS

The goal of this research was to determine whether the Cook-Chill method of food preparation is a feasible option for health care. Further, if Cook-Chill is to be considered; is there a number of beds to be considered before the option can be exercised? Also, the intent of the research was to determine if the reduction of full-time employees (FTE's) would reinforce the financial gains of using this method.

Cook-Chill is a feasible option for medium size, multi-site hospitals. Any facility over 300 beds would be appropriate. It should be examined as a potential cost reducing and revenue enhancing possibility for healthcare foodservice operations.

This study demonstrates the demographic data that should be considered when one is appraising their own facility and analyzing the possible conversion from a conventional cook-serve process to a Cook-Chill process. It is hypothesized that once given the capital investment and allocation of square footage, a Cook-Chill system could be cost effective for multi-site facilities.

Data from forty nine completed surveys were used in the analysis. Five personal interviews were also completed initially that encompassed business and industry, college
and universities, and healthcare. The questions asked on the interviews were to pre-test the actual survey. These interviews were not included in the findings. A letter was sent to all eighty four potential respondents before the actual survey and stamped envelope were mailed. Thirty five surveys were initially returned and a second letter inclusive of a second survey and stamped return envelope was mailed six weeks later. Hence, fourteen additional surveys were returned.

According to Cleveland, Range, Inc. the Cook-Chill customers are those:

- Serving more than 600-800 MPD.
- Who have more than one serving location.
- Who have food temperature problems because of distance they have to transport or the time that it may take to get it there.
- Who want to control the consistency and the quality of their product from serving location to serving location.
- With limited production space with a large number of meals to produce or those whose needs are expanding rapidly and the existing kitchen can't take care of the needs.
- Who have a great deal of competition for labor, particularly skilled cooks.
- Who must consider options for saving money.

The number of beds is used as a reference point in comparing a hospital to those who responded in the survey, however the amount of meals per day is a more accurate gauge. The amount of cafeteria meals also is an indicator of the volume that Cook-Chill requires.

In regard to the number of off-site locations served by Cook-Chill, the highest volume of operators reported less than three locations. It can generally be assumed that the number of locations is not the primary factor for considering Cook-Chill. The number of meals certainly has a much greater impact.

The amount of square footage reported in Cook-Chill facilities demonstrates high degree of variance. Some of this is due to all facilities not using a total Cook-Chill process.

The percent of modified diets can be assumed to be very high among hospitals as demonstrated by the respondents to this survey. Modified diets would adapt very well the Cook-Chill technology as precise ingredients are controlled in each standardized recipe. An ingredient room is essential
with Cook-Chill allowing for no variances in the standardized recipe.

The hours of operation for the production area demonstrate a correlation between the advent of Cook-Chill and decreasing labor hours. In comparing hospitals, it can be assumed Cook-Chill could decrease the production hours especially if one main production location is established. The hours of operation in the cafeteria may be service hours and therefore may not be affected by the implementation of Cook-Chill.

The percentage of acute and long term care beds is as significant as cafeteria meals due to the fact that this is the highest volume of customers. The impact of Meals on Wheels and adult day care meals is not substantial. These customers may or may not require modified diets and the number of meals required could easily be absorbed by the food production system.

In summarizing the information received about the most popular manufacturers represented, Groen, Cleveland, Alladin, Honeywell, Partlow, are all used in considerable volume. It is important to note, however that in respect to tumble-chillers, Groen is used in a significantly greater amount of facilities. However in respect to blast chillers, no considerable difference in manufacturer is noted.

The level of customer satisfaction in regard to foodservice is important because one would expect to
maintain the level, if its acceptable. To increase the level of satisfaction would be not only desirable but a great achievement given the notion to start a Cook-Chill process.

The effect on the foodservice employees during transition to a Cook-Chill system is important to note because morale problems can be inherent with entry-level employees. This is due to their low self esteem, scheduling inefficiencies, and lower wages in some cases. The positive effect communicated by the respondents is probably due to the fact that their schedules are more efficient and stable. Also, by involving them in the change process, they accept the new change readily.

In all Cook-Chill facilities, it is important to note that the turnover rates are relatively high. There seems to be a correlation, however between low turnover rates and the percentage of full time employees employed.

The primary decision makers were comprised of a team in the majority of respondents. It can be assumed that the total quality management process would lend itself well to the consideration of Cook-Chill.

The time that the respondents reported a R.O.I. seems to be an economically viable way to recoup the capital investment of equipment.

The reduction of solid waste does not seem to contribute significantly to the financial concerns when considering
Cook-Chill. Given the larger volume, however bulk packaging may have some effect on the reduction of waste at the landfill.

**RECOMMENDATIONS FOR FURTHER STUDY:**

On the basis of the research completed for this study, the following recommendations for further study are made:

1. The survey should include a definition of terms or detailed explanation of what answer is needed to minimize any confusion.

2. The survey should target food cost specifically, both before implementation of Cook-Chill and after implementation.

3. The survey should question the microbiological testing and H.A.C.C.P. procedures which is used among Cook-Chill facilities.

This study has displayed some of the considerations that middle and senior management must ponder, when considering the prospect of Cook-Chill.

The opportunity does exist to streamline services, create better efficiencies, increase customer satisfaction, and improve employee morale. It is indeed possible with the establishment of a Cook-Chill food production system.
BIBLIOGRAPHY

Bean, Russell (1983) Cook & Refrigerate vs Cook & Freeze
The Consultant XVI


Bond, Marian (1994) Growing into Cook Chill.
Foodservice Director, (February), 15, 89.

Bond, Marian (1993) When Hospitals Merge. Foodservice Director, (September), 15, 50

Cleveland Cook-Chill Systems. (Manufacturer's Specifications)

Cryovac Cook-Chill Systems for Chef Prepared Foods. (Video)


King, Paul (9/93) Central Production Scores in America's Heartland. *Food Management*, (September) 58.


King, Paul (1994) Overcoming the Age Barrier. *Food Management*, (October), 42.


Pilot Study on Cook-Chill, presented to Nancy Leonard, Peter Savenko (Baystate Medical Center).

Nettles, Mary Frances (1993) Analysis of the Decision to Select a Conventional or Cook-Chill System for Hospital Foodservice. UMI Dissertation Services University Microfilms International.


Temp Rite II Excel, Alladin Advanced Meal Systems, (Video).


APPENDIX A

SURVEY

1. HOW MANY BEDS/CUSTOMERS DOES YOUR PRODUCTION FACILITY SERVE? ____________
PATIENTS? ____ CAFETERIA? ____

2. HOW MANY LOCATIONS DOES YOUR PRODUCTION FACILITY SERVE? ______
<3 _____ 3-4 _____ >4 _____

3. WHAT MANUFACTURER OF COOK-CHILL EQUIPMENT DO YOU USE? ____________

4. WHAT MANUFACTURER OF RETHERM EQUIPMENT DO YOU USE? ____________

5. WHAT MANUFACTURER OF TEMPERATURE CONTROL DO YOU USE? (i.e., HONEYWELL, PARTLOW)? ____________

6. WHAT WAS YOUR LEVEL OF CUSTOMER SATISFACTION BEFORE IMPLEMENTATION OF COOK CHILL?
1-VERY LOW 2-LOW 3-AVERAGE 4-ABOVE AVERAGE 5-VERY HIGH

7. WHAT WAS YOUR LEVEL OF CUSTOMER SATISFACTION AFTER IMPLEMENTATION OF COOK CHILL?
1-VERY LOW 2-LOW 3-AVERAGE 4-ABOVE AVERAGE 5-VERY HIGH

8. WAS THERE AN INCREASE OR DECREASE IN FTE'S IN THE PRODUCTION AREA?
DURING 1st YEAR? INCREASE/SAME/DECREASE
AFTER 1 YEAR? INCREASE/SAME/DECREASE

9. HOW MUCH SQUARE FOOTAGE DO YOU DEDICATE TO PRODUCTION/STORAGE?
(DO NOT INCLUDE CAFETERIA) ____________

10. HOW MANY OF EACH DO YOU USE?:
     KETTLES: <3 _____ 3-4 _____ >4 _____ MANUFACTURER: ____________
     TUMBLE CHILLERS: <3 _____ 3-4 _____ >4 _____ MANUFACTURER: ____________
     BLAST CHILLERS: <3 _____ 3-4 _____ >4 _____ MANUFACTURER: ____________
     OTHER: <3 _____ 3-4 _____ >4 _____ SPECIFY: ____________

11. IN YOUR DECISION TO IMPLEMENT COOK-CHILL WHO WERE THE PRIMARY DECISION MAKERS?
     OWNER-ADMINISTRATOR _______ FOOD SERVICE DIRECTOR _______
     BOARD OF DIRECTOR _______ OTHER _______

12. WHAT WAS THE EFFECT ON YOUR EMPLOYEES DURING TRANSITION?
     POSITIVE _______ NEUTRAL _______ NEGATIVE _______

13. NUMBER OF MODIFIED DIETS IN YOUR FACILITY?
     <10% _____ 11-30% _____ 31-50% _____ 51% _____

14. HOW MANY HOURS DO YOU OPERATE PER DAY?
     PRODUCTION: 12 OR LESS ______ 12-16 ______ 16-24 ______
     CAFETERIA: 12 OR LESS ______ 12-16 ______ 16-24 ______

15. WHAT IS YOUR TURNOVER RATE IN NUTRITION SERVICES?
     UNDER 10% _____ 10-20% _____ 21-30% _____ 31-50% _____ OVER 51% _____

16. WHAT IS YOUR PERCENTAGE OF FULL TIME EMPLOYEES?
     LESS THAN 20% _____ 20%-40% _____ 41%-60% _____ 61%-80% _____ OVER 81% _____

17. WHAT IS YOUR PERCENTAGE OF PART TIME EMPLOYEES?
     LESS THAN 20% _____ 20%-40% _____ 41%-60% _____ 61%-80% _____ OVER 81% _____

89
APPENDIX B

November 9, 1994

Mr. Ronald Piche
Director Dietary Services
Dartmouth Hitchcock Medical Center
1 Medical Center Drive
Hanover, NH 03756-001

Dear Mr. Piche:

Please enjoy a cup of herbal tea, as a token of my appreciation for taking the time to fill out the enclosed survey. It should take you approximately 15 minutes.

The survey concerning the Cook-Chill process is an essential part of my research which is required for my final project at Rochester Institute of Technology.

I am requesting that foodservice directors who have implemented the process to respond to this survey. Only by obtaining this information can I accurately determine the process that was required to develop such a system.

The information will be held in strict confidence. If you would like a copy of an executive summary, I would be happy to send it to on or about March 1, 1995.

Please respond using the stamped self-addressed envelope by November 30, 1994.

My sincere thanks and appreciation.

Sincerely,

Nancy A. Leonard, AHCFA
Director, Nutrition Services

NAL/g