

AD-A194 668

COST DRIVER ANALYSIS FOR TANK PACK FOODS

U.S. ARMY

DEPARTMENT OF MASSACHUSETTS

RESEARCH AND DEVELOPMENT CENTER

OPERATIONS RESEARCH

WATERBURY, MA 01506

REPORT NO.

FINAL REPORT

JANUARY 1985-JUNE 1987

DTIC

SELECTED

MAY 1988

NOT FOR PUBLICATION

DISTRIBUTION UNLIMITED

Prepared for

U.S. ARMY NATICK

RESEARCH AND ENGINEERING CENTER

WATERBURY, MASSACHUSETTS 01760-5000

ENGINEERING DIRECTORATE

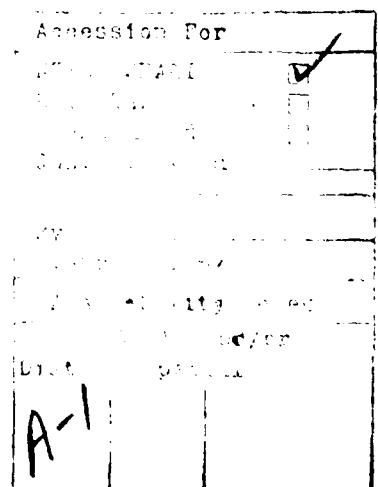
ADA194668

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)			5. MONITORING ORGANIZATION REPORT NUMBER(S) NATICK/TR-88/034		
6a. NAME OF PERFORMING ORGANIZATION University of Massachusetts		6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION US Army Natick RD&E Center		
6c. ADDRESS (City, State, and ZIP Code) Department of Industrial Engineering and Operations Research Amherst, MA 01003			7b. ADDRESS (City, State, and ZIP Code) Kansas Street Natick, MA 01760-5018		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION US Army Natick RD&E Center		8b. OFFICE SYMBOL (if applicable) STRNC-WES	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER Title IV IPA (Smith) 14 January 1985		
8c. ADDRESS (City, State, and ZIP Code) Natick, MA 01760-5018			10. SOURCE OF FUNDING NUMBERS		
	PROGRAM ELEMENT NO. 612724	PROJECT NO. 1L162724AH 99	TASK NO.	WORK UNIT ACCESSION NO.	
11. TITLE (Include Security Classification) Cost Driver Analysis for Tray Pack Foods					
12. PERSONAL AUTHOR(S) J. MacGregor Smith					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM Jan 85 TO Jun 87		14. DATE OF REPORT (Year, Month, Day) 1988 March	
15. PAGE COUNT 61					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	FIELD FEEDING SYSTEM MANUFACTURING RATIONS		
			COST ANALYSIS PRODUCTION COSTS		
			QUALITY CONTROL TRAY PACKS MENU(S)		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) * This project report identifies and quantifies the major cost factors of the manufacturing process of Tray Pack foods. The purpose of this project is to conduct a cost driver analysis of the manufacturing process so that a system-wide data base of the production, manufacturing and distribution costs of Tray Packs would enable researchers to pinpoint problem areas. The goal of the analysis is to suggest possible cost saving to reduce and control overall costs of manufacturing Tray Packs.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Robert G. Bernazzani			22b. TELEPHONE (Include Area Code) (617) 651-5203		22c. OFFICE SYMBOL STRNC-WES

**BLANK PAGES
IN THIS
DOCUMENT
WERE NOT
FILMED**

1

1190



ACKNOWLEDGEMENTS

I wish to thank Joe Szczebrowski and Bob Bernazzani and the other staff members of Natick Research, Development & Engineering Center (Natick) for their support, comments, directions and criticism throughout this project. I also wish to thank all the manufacturers who have donated their valuable time, information and comments as the Cost Driver Analysis developed.

J. MacGregor Smith
Department of Industrial Engineering
and Operations Research
University of Massachusetts
Amherst, MA 01003

TABLE OF CONTENTS

	Pages
PREFACE	iii
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
1. INTRODUCTION	1
A. Purpose	1
B. Assumptions	1
C. Background Information	3
D. Project Methodology	5
E. General Survey Results	5
2. PROCESS COST FACTORS	7
A. Ordering Process	7
B. Receiving Process	8
C. Preparation Process	10
D. Filling Process	12
E. Closing Process	14
F. Sterilization Process	15
G. Packaging Process	17
H. Shipping Process	18
3. GENERAL MANUFACTURING PROCESS COST FACTORS	19
A. General Manufacturing Problems	19
B. Cost Factors	21
C. General Recommendations for Future Development	22
4. FINAL CODA	24
APPENDIX: COST DRIVER QUESTIONNAIRE	25
DISTRIBUTION LIST	50

LIST OF FIGURES

Figure	Page
1. Process Decision Tree	5
2. Ordering Process Menu Item Problems	7
3. Receiving Process Menu Item Problems	8
4. Receiving Process Recommendations	9
5. Preparation Process Menu Item Problems	10
6. Preparation Process Recommendations	11
7. Filling Process Menu Item Problems	12
8. Filling Process Recommendations	13
9. Closing Process Menu Item Problems	14
10. Closing Process Recommendations	15
11. Sterilization Process Menu Item Problems	15
12. Sterilization Process Recommendations	16
13. Packaging Process Recommendations	17
14. Shipping Process Recommendations	18
15. Labor Intensity Chart	19
16. Process Decision Tree with Percentage Costs	22
17. Possibilities for General Manufacturing Process Improvements	22

LIST OF TABLES

Table	Page
1. One Step Menu Items (Group A)	2
2. Two Step Menu Items (Group B)	2
3. Hand Placement and Oven Bake Menu Items (Groups C & D)	2
4. FY88 Tray Pack Procurement	3
5. Ordering Costs Percentage Breakdown	8
6. Receiving Costs Percentage Breakdown	9
7. Preparation Costs Percentage Breakdown	11
8. Filling Costs Percentage Breakdown	13
9. Closing Costs Percentage Breakdown	14
10. Sterilization Costs Percentage Breakdown	16
11. Packaging Costs Percentage Breakdown	17
12. Shipping Costs Percentage Breakdown	18
13. Tray Pack Menu Item Problems	20
14. General Manufacturing Costs Percentage Breakdown	21

Chapter 1. INTRODUCTION

A. Purpose

The overall purpose of this report is to identify and quantify those key cost factors (*cost drivers*) within the manufacturing process of Tray Packs so that the current problem areas can be pinpointed and new innovations, along with new technologies, processes, and equipment can be developed to aid in reducing Tray Pack manufacturing costs. These cost factors are identified and their quantitative impact on manufacturing are assessed.

The Tray Pack manufacturing process is viewed as a series of interrelated component processes and sub-processes concerned with the manufacturing of the different Tray Pack menu items. The report is organized by the component and subcomponent manufacturing processes as well as by the type of the Tray Pack menu item. This report focuses on what *existing* factors affect the manufacturing operations, i.e., what are the key cost component areas that currently exist.

A questionnaire (see Appendix) was designed and was sent to all manufacturers of Tray Packs in the summer of 1986. Within the questionnaire schedule, there were certain questions which alluded to alternative ways of reducing manufacturing costs, but the bulk of the questionnaire focused on documenting and measuring *existing* cost factors in Tray Pack manufacturing.

B. Assumptions

Some of the key assumptions which guided the study were the following:

- i) Performance specifications for the Tray Pack menu items were assumed to be as manufacturers presently understood them.
- ii) Tray Pack volume will likely increase above current fiscal year levels, but the respondents were asked to reply based upon their current manufacturing technologies, i.e., plant, equipment, and operations, not what future changes they were contemplating.
- iii) In the questionnaire, the Tray Pack menu items were categorized in a way which would allow for ease in characterizing and identifying the key cost concerns. Therefore, the Tray Pack menu items are segmented into *four* food categories based on their manufacturability requirements. These four food groups are as follows:

Group A. One Step Filling (16 food items)

Group B. Two Step Filling (39 food items)

Group C. Hand Placement (3 food items)

Group D. Oven Bake (6 food items)

These basic food groups were derived from information available within NATICK with regards to the manufacturability of the Tray Pack menu items. Obviously, the division of the menu items into the food groups may not be the only breakdown, however it provides a useful stepping stone and serves as a guide in the questionnaire for determining the key cost factors in the manufacturing process.

Below are three tables of menu items subdivided into manufacturing types as defined by NATICK:

Table 1: One-Step Menu Items (Group A)

<i>Entrees</i>	<i>Entrees</i>	<i>Starches/Vegts</i>	<i>Desserts</i>
☐ BBQ Beef	☐ Chicken w/ Noodles	☐ Potato Salad	☐ Apple Dessert
☐ Beef Stew	☐ Chili Con Carne	☐ Sweet Creamed Corn	☐ Apple Sauce
☐ Breakfast Bake	☐ Creamed Gr. Beef	☐	☐ Blueberry Dessert
☐ Chicken a la King	☐ Eggs w/Ham	☐	☐ Chocolate Pudding
☐ Chicken Stew/Gravy			☐ Cherry Dessert

Table 2: Two Step Menu Items (Group B)

<i>Entrees</i>	<i>Entrees</i>	<i>Starches</i>	<i>Vegts/Desserts</i>
☐ BBQ Pork	☐ Meatloaf w/Gravy	☐ Beans w/Pork	☐ Glazed Carrots
☐ Beef and Macaroni	☐ Pork Sausage Links	☐ Buttered Noodles	☐ Green Beans
☐ Beef Pepper Steak	☐ Pork Slices w/Gravy	☐ Buttered Potatoes	☐ Mixed Vegetables
☐ Beef Tips w/Gravy	☐ Roast Beef w/Gravy	☐ Escalloped Potatoes	☐ Peas and Carrots
☐ Beef Pot Roast	☐ Roast Chicken	☐ Macaroni Cheese	☐ Peas/Mushrooms
☐ Canadian Bacon	☐ Spaghetti w/Meatballs	☐ Macaroni Salad	☐ Sliced Carrots
☐ Chicken Breasts	☐ Swedish Meatballs	☐ Spanish Rice	☐ Whole Kernel Corn
☐ Chicken Cacciatore	☐ Swiss Steak	☐ Sweet Potatoes	☐ Fruit Cocktail
☐ Franks in Brine	☐ Turkey Sl.w/Gravy	☐ White Rice	☐ Sliced Peaches
☐ Ham Slices	☐	☐	☐ Sliced Pears
☐	☐	☐	☐ Pineapple/Syrup

Table 3: Hand-Placement & Oven Bake Menu Items(Groups C & D)

Hand Placement Items

- ☐ Lasagne
- ☐ Stuffed Cabbage
- ☐ Stuffed Peppers

Oven Bake Items

- ☐ Apple Coffee Cake
- ☐ Blueberry Cake
- ☐ Chocolate Cake
- ☐ Marble Cake
- ☐ Pound Cake
- ☐ Spice Cake

For every manufacturer, all Tray Pack items they produced were to be identified so as to insure that the range of manufacturing problems associated with the different menu items could be identified. The results of the problems encountered with each of the menu items is discussed in the Chapters 2 and 3 of the report. In Table 4 below, the FY88 procurement for specific Tray Pack menu items is presented.

Table 4: FY88 Tray Pack Procurement

Item	Quantity (Cans)	Percentage (%) FY88 Procurement
BBQ Beef	42,200	1.05
Beef Stew	82,000	2.04
Chicken ala King	83,000	2.06
Creamed Ground Beef	59,500	1.48
Eggs w/Ham	67,000	1.67
Apple Dessert	143,000	3.56
¹ Beef Pepper Steak	18,300	0.45
Canadian Bacon	-	-
Chicken Breasts	107,000	2.66
Frankfurters in Brine	68,000	1.69
Swiss Steak	71,500	1.78
Turkey Slices w/Gravy	60,000	1.49
Escalloped Potatoes	-	-
Macaroni Cheese	39,000	0.97
Sweet Potatoes	8,500	0.21
Green Beans	92,000	2.29
Mixed Vegetables	130,500	3.24
Peas/Mushrooms	86,000	2.14
² Beans w/Gravy	32,500	0.81
Meatloaf w/Gravy	-	-
Pork Slices w/Gravy	-	-
³ Roast Beef w/Gravy	83,000	2.06
Roast Chicken	-	-
Macaroni Salad	-	-
Peas and Carrots	-	-

¹ Now *Bean w/Bacon*

² Now *Bean Pot Roast*

³ Now *Beef Strips & Green Peppers*

- None procured for FY88

C. Background Information

In order to understand the logic and organization of the study, some definitions of the manufacturing process and its component processes are helpful at this point. We view the manufacturing process as being composed of three separate but interrelated processes:

I. Purchasing: Concerned with the procurement of raw materials, tools, equipment and supplies necessary to the Tray Pack manufacturing process. Purchasing has two sub-component processes:

- 1. Ordering:** Process of acquisition of raw materials and necessary supplies for Tray Pack manufacturing.
- 2. Receiving:** Process of receiving raw materials from rail and truck deliveries, storing of these items, and retrieving these items from the warehouse.

II: Production & Assembly: Concerned with the preparation, fabrication and assembly of food products for the Tray Pack menu items. Production & Assembly have the following four subcomponent processes:

- 3. Preparation:** Process of preparing the raw materials for the specific menu item.
- 4. Filling:** Process of filling the cans with the menu item, inspecting the can contents, weighing the contents, and transferring the cans to the Closing operation.
- 5. Closing:** Process of joining the cans, lids and contents of each can, transferring the can to the seamer, closing the can, washing the can, and collecting the cans into a unit load so they can be transferred to the Sterilization process.
- 6. Sterilization:** Process of loading the unit load of cans into the sterilizer(s), cooking the cans, unloading the cans from the sterilizer(s) and transferring them to the Packaging area.

III: Distribution: Concerned with the carton fabrication, boxing, labelling, palletizing, sheathing and general shipping of completed Tray Pack assemblies. There are two subcomponent processes associated with Distribution:

- 7. Packaging:** Process of forming the cartons, providing pad inserts, boxing the trays, labelling the shipping cartons, palletizing the cartons, sheathing them and transferring them to the shipping warehouse.
- 8. Shipping:** Process of identifying and storing the pallets of Tray Packs, storing for USDA incubation purposes, retrieving them, shipping them on rail or truck, and storing damaged and returned cans.

D. Project Methodology

The questionnaire was organized around questions that sought to identify key cost factors by interrelating the three Manufacturing Processes (I., II., and III.), their eight subprocesses (1. through 8.) and comparing costs with the four food groups (A. through D. of Tables 1, 2 and 3). See Figure 1.

Below is a decision or morphological tree which indicates the general structure or framework around which the cost factors were identified for each food group.

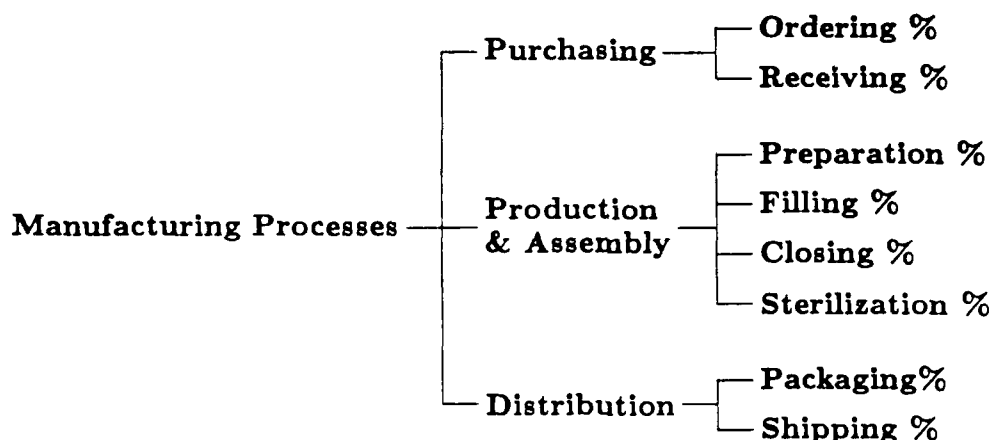


Figure 1: Process Decision Tree

In effect, the main goal of this study was to identify the key cost items of the decision tree so that future investment in plant, equipment and process modifications for the manufacturing of Tray Pack foods could be done in some optimal fashion. At the time of this study, there were seven Tray Pack manufacturers. The questionnaire was mailed out to each manufacturer. Four responded to the questionnaire and the report is written from their responses.

E. General Survey Results

There are some important findings that were revealed through the survey. While many of the cost factors were perhaps already known to most involved in Tray Pack manufacturing, this report has begun to quantify these cost factors in relation to the total manufacturing costs so that future investments in research and development may be better targeted to where improvements in cost savings can be best achieved.

As will be shown throughout the report, most cost improvements can be made within the Production/Assembly operations, namely Filling, Preparation, and Closing. Little improvements in automating these processes presently exist in Tray Pack manufacturing because much of the specialized equipment for Filling, Preparation, and Closing of Tray Pack operations does not either exist or is still in the developmental

stages. Also, demand for Tray Packs has been low, commercial markets are not strong, and little engineering expertise exists either within the manufacturer's operations or within the industry to implement the types of equipment and total line designs which would truly automate these processes. From the survey 73.5% of total manufacturing costs can be attributed to Production and Assembly operations, 21.0% for Distribution operations, while only 5.5% was allocated to Purchasing. Most manufacturers polled in the survey felt that the Packaging process within their plants could achieve the most immediate cost improvement because the activities (boxing the cans, labelling the cartons, palletizing the unit loads and sheathing the pallets) were repetitive and independent of the variety of menu items that tend to make automation difficult for the rest of the activities associated with Tray Packs.

Throughout Chapter 2 and the remainder of the report, we will examine the *detailed* concerns of each manufacturer for each of the eight subprocesses and identify not only what were the key problems and cost factors within each subprocess that occurred, but also what detailed improvements should be made. The results have been combined with regard to the food groups for ease in understanding.

Chapter 2. PROCESS COST FACTORS

This Chapter will focus on the detailed problems, cost factors, and recommendations made by the manufacturers with regards to each of the detailed subprocesses of Tray Pack manufacturing. Within each section of this Chapter, we will summarize the problems and concerns of the manufacturers along with their percentage allocation of the key cost factors within each subprocess. The reader may wish to scan the questions of the questionnaire, see the Appendix, as each section is reviewed to see the type of question asked and how the summary responses correlate with the questions.

A. Ordering Process

Most people have had some problems with the ordering of can/lids from Central States mainly due to the fact that Central States is a single-source supplier, delivery times are slow, and the quality of lids/bottoms are below what they should be.

Printing of the lids is also a problem because of available suppliers, printing costs, lead times, quality of printing and delivery times.

Depending on the producer and his/her location, some have had problems with the general acquisition and supply of meats, dairy, vegetable, starch and dessert raw materials for the Tray Pack menu items. Below is a listing of the menu items mentioned by producers for which problems with ordering occurred along with the reasons for the problem, indicated by the "blackened" squares (Figure 2).

ITEMS	REASONS for Problem		
☐ BBQ Beef	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Beef Stew	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Chicken a la King	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Creamed Gr.Beef	☐ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Eggs w/Ham	☒ Raw Material \$	☐ Material Quality \$	☐ Other \$ _____
☐ Apple Dessert	☐ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Beef Pepper Steak	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Canadian Bacon	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Chicken Breasts	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Franks in Brine	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Swiss Steak	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Turkey Sl.w/Gravy	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Escalloped Potatoes	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Macaroni Cheese	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Sweet Potatoes	☐ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Green Beans	☒ Raw Material \$	☒ Material Quality \$	☐ Other \$ _____
☐ Mixed Vegetables	☒ Raw Material \$	☐ Material Quality \$	☐ Other \$ _____
☐ Peas/Mushrooms	☒ Raw Material \$	☐ Material Quality \$	☐ Other \$ _____

Figure 2: Ordering Process Menu Item Problems

In general the most significant cost factors center on the raw material costs. Table 5 gives a general percentage breakdown of the cost factors affecting the Ordering process with the cost of raw materials absorbing 2/3 of total Ordering costs, labor requiring 1/10 of the total costs and the other factors are basically insignificant and can be attributed to overhead expenditures.

Table 5: Ordering Costs Percentage Breakdown %

Raw Material \$	<i>Direct (Food Items/Cans)</i>	66.00
	<i>Indirect (Wastage/Spoilage) . . .</i>	2.00
Labor \$	<i>Direct (Personnel)</i>	10.00
	<i>Indirect (Training/Overtime) . . .</i>	3.00
Equipment \$	<i>Direct (Capital Expenditures) . .</i>	2.00
	<i>Indirect (Operational/Repairs) . .</i>	5.00
Space \$	<i>Direct (Cubic footage)</i>	3.00
	<i>Indirect (Flexibility/Accessibility)</i>	--
Energy \$	<i>Direct (Power/Water/Cooling) . .</i>	6.00
	<i>Indirect (Breakdowns/Weather) . .</i>	2.00
Maintenance\$	<i>Direct (Personnel)</i>	--
	<i>Indirect (Accidents/Vermin)</i>	1.00
Administrative\$	<i>Direct (Personnel)</i>	3.00
	<i>Indirect (Copying/Computing) . .</i>	2.00
Summary\$	Grand Total	100.00

B. Receiving Process

For the Receiving process, which is concerned with the receipt of goods and their proper warehousing before being utilized in the preparation of the Tray Pack menu items, some of the menu items have created problems within the warehouse operations of the manufacturers. Figure 3 illustrates those menu items that have resulted in spoilage and significant warehousing costs.

ITEMS		REASONS for Problem		
☐ BBQ Beef	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Creamed Gr.Beef	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Eggs w/Ham	☒ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Apple Dessert	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Franks in Brine	☒ Spoilage \$	☐ Warehouse \$	☒ Other \$: Fresh Time Frame	
☐ Beans w/Pork	☒ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Escalloped Potatoes	☒ Spoilage \$	☐ Warehouse \$	☐ Other \$	_____
☐ Sweet Potatoes	☒ Spoilage \$	☐ Warehouse \$	☐ Other \$	_____
☐ Green Beans	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Mixed Vegetables	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____
☐ Peas/Mushrooms	☐ Spoilage \$	☒ Warehouse \$	☐ Other \$	_____

Figure 3: Receiving Process Menu Item Problems

Table 6 illustrates the cost breakdown for the receiving costs, and as expected, raw material costs account for 3/4 of the cost of the receiving operations and the rest of the costs can be attributed to overhead.

Table 6: Receiving Costs Percentage Breakdown		%
Raw Material \$	Direct (Food Items/Cans)	75.00
	Indirect (Wastage/Spoilage) . . .	2.00
Labor \$	Direct (Personnel)	2.00
	Indirect (Training/Overtime) . . .	1.00
Equipment \$	Direct (Capital Expenditures) . .	--
	Indirect (Operational/Repairs) . .	--
Space \$	Direct (Cubic footage)	4.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) . .	4.00
	Indirect (Breakdowns/Weather) .	2.00
Maintenance\$	Direct (Personnel)	--
	Indirect (Accidents/Vermin) . . .	2.00
Administrative\$	Direct (Personnel)	4.00
	Indirect (Copying/Computing) . .	1.00
Summary\$	Grand Total	100.00

Given the emphasis on raw material costs, it is understandable that the manufacturers felt that reducing delivery delays and improving the refrigeration and storage systems would be the wisest means of improving the Receiving process. Figure 4 indicates the recommendations felt to be most important for improving the Receiving process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

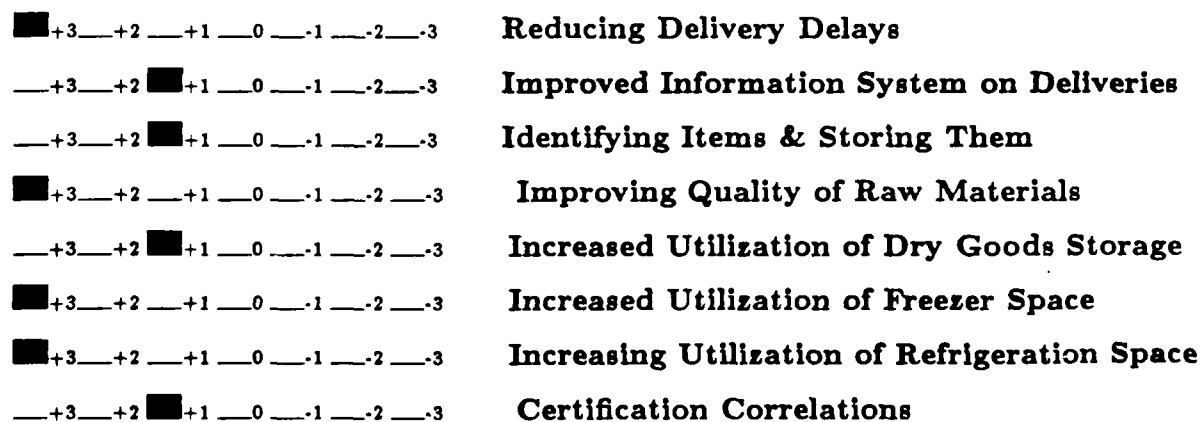


Figure 4: Receiving Process Recommendations

D. Filling Process

For the Filling process, which is concerned with filling the cans with the specified menu item, inspecting the can contents, weighing the contents and transferring the cans to the closing operation, again there are key labor and equipment problems created by the various menu items associated with the Filling process. Not surprisingly, the list of items identified as problematic during the Preparation process is again identified in Figure 7 as problematic during the Filling process.

ITEMS	REASONS for Problem		
☐ BBQ Beef	☒ Labor\$	☒ Equipment\$	☐ Other\$_____
☐ Beef Stew	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Creamed Gr.Beef	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Eggs w/Ham	☒ Labor\$	☒ Equipment\$	☐ Other\$_____
☐ Apple Dessert	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Franks in Brine	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Meatloaf w/Gravy	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Pork Slices w/Gravy	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Roast Beef w/Gravy	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Roast Chicken	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Swiss Steak	☐ Labor\$	☒ Equipment\$	☐ Other\$_____
☐ Turkey Sl.w/Gravy	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Macaroni Cheese	☒ Labor\$	☒ Equipment\$	☐ Other\$_____
☐ Green Beans	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Mixed Vegetables	☒ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Peas/Mushrooms	☒ Labor\$	☐ Equipment\$	☐ Other\$_____

Figure 7: Filling Process Menu Item Problems

Also, as may be expected, raw materials loom as the key underlying reason for driving the costs during the Filling process since they control the number and complexity of the filling steps and labor and equipment requirements necessary in filling the Tray Packs.

Ways of automating all aspects of the Filling process dominate the recommendations for improvement. Figure 8 illustrates the strength and importance and types of automation all along the Filling line operation. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*. Later on when we aggregate our cost factors, the Filling operation will turn out to be the most costly of all the operations so it is understandable that any automation of the activities in this process would be beneficial.

Table 8: Filling Costs Percentage Breakdown		%
Raw Material \$	Direct (Food Items/Cans)	73.50
	Indirect (Wastage/Spoilage) . . .	1.00
Labor \$	Direct (Personnel)	10.00
	Indirect (Training/Overtime) . . .	1.00
Equipment \$	Direct (Capital Expenditures) . .	2.00
	Indirect (Operational/Repairs) . .	1.00
Space \$	Direct (Cubic footage)	1.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) . .	3.00
	Indirect (Breakdowns/Weather) .	1.00
Maintenance\$	Direct (Personnel)	1.00
	Indirect (Accidents/Vermin) . . .	1.00
Administrative\$	Direct (Personnel)	1.00
	Indirect (Copying/Computing) . .	0.50
Summary\$	Grand Total	100.00

—+3—+2—+1—0—-1—-2—-3	Automated Can and Lid Stacking
—+3—+2—+1—0—-1—-2—-3	Automated Can Washing
■+3—+2—+1—0—-1—-2—-3	Automated Placement of Large Menu Items
■+3—+2—+1—0—-1—-2—-3	Automated Piston & Liquid Filling
■+3—+2—+1—0—-1—-2—-3	Automated Check-Weigh Reject Operations
■+3—+2—+1—0—-1—-2—-3	Automated Can Transfer between Stations
■+3—+2—+1—0—-1—-2—-3	Automated Material Handling

Figure 8: Filling Process Recommendations

E. Closing Process

As can be seen in Figure 9, certain menu items have closing problems. Besides the Lid/Can Merge and Closing Equipment itself, Integrity of the Seam for the listed menu items is a crucial problem.

ITEMS

REASONS for Problem

☐ BBQ Beef	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Eggs w/Ham	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Apple Dessert	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Franks in Brine	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Pork Slices w/Gravy	☒ Lid/Can Merge\$	☐ Closing Equipm\$	☐ Other\$: Seam Integrity
☐ Turkey Sl.w/Gravy	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Beans w/Pork	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Macaroni Cheese	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Green Beans	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Mixed Vegetables	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity
☐ Peas/Mushrooms	☒ Lid/Can Merge\$	☒ Closing Equipm\$	☒ Other\$: Seam Integrity

Figure 9: Closing Process Menu Item Problems

As is demonstrated in Table 9, 40% of the closing costs are due to equipment problems while 30% are due to labor problems. It is probably due to the frequent breakdowns and closing equipment reliability that the labor costs are so significant.

Table 9: Closing Costs Percentage Breakdown

		%
Labor \$	Direct (Personnel)	33.50
	Indirect (Training/Overtime) ...	5.00
Equipment \$	Direct (Capital Expenditures) ..	10.00
	Indirect (Operational/Repairs) ..	30.00
Space \$	Direct (Cubic footage)	2.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) ..	5.00
	Indirect (Breakdowns/Weather) ..	3.00
Maintenance\$	Direct (Personnel)	5.00
	Indirect (Accidents/Vermin)	1.00
Administrative\$	Direct (Personnel)	2.00
	Indirect (Copying/Computing) ..	0.50
Summary\$	Grand Total	100.00

As can be seen in the recommendations made by the manufacturers, material movement of the can between closing and seaming and a faster/more reliable seamer would be most cost effective during the Closing process. Other automatic procedures also are recommended in Figure 10. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3___+2___+1___0___-1___-2___-3	Automated Lid/Tray Merge
■+3___+2___+1___0___-1___-2___-3	Automated Can Transfer between Closure to Seamer
■+3___+2___+1___0___-1___-2___-3	Faster Seaming Process (Reliability/Repair)
___+3___+2___+1___0___-1___-2___-3	Automated Quality Check of Seam
___+3___+2___+1___0___-1___-2___-3	Automated Can Washing at Seamer Outfeed
___+3___+2___+1___0___-1___-2___-3	Automated Stacking of Can into a Unit Load
___+3___+2___+1___0___-1___-2___-3	Handling Full Tray Damage Reduction

Figure 10: Closing Process Recommendations

F. Sterilization Process

Besides controlling the Sterilization process and material handling problems between the seamer and sterilizers and eventual Packaging process, Galvanic Corrosion (chemical reactions between the can and the can contents), Process Times, and High Acid problems on the Apple Dessert item were identified as key problems during the Sterilization process. Figure 11 presents this data.

ITEMS	REASONS for Problem		
☐ BBQ Beef	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Creamed Gr.Beef	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$_____
☐ Eggs w/Ham	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$ Process Time
☐ Apple Dessert	☐ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: High Acid
☐ Franks in Brine	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Turkey Sl.w/Gravy	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Macaroni Cheese	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Process Time
☐ Green Beans	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Mixed Vegetables	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Peas & Carrots	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion
☐ Peas/Mushrooms	☒ Sterilizer Control\$	☒ Load/Unload\$	☒ Other\$: Galvanic Corrosion

Figure 11: Sterilization Process Menu Item Problems

The Direct Costs of the Sterilization equipment as well as their Operational and Energy costs largely control costs of the Sterilization process.

Table 10: Sterilization Costs Percentage Breakdown %

Labor \$	<i>Direct (Personnel)</i>	12.00
	<i>Indirect (Training/Overtime)...</i>	2.00
Equipment \$	<i>Direct (Capital Expenditures) ..</i>	30.00
	<i>Indirect (Operational/Repairs) ..</i>	10.00
Space \$	<i>Direct (Cubic footage)</i>	5.00
	<i>Indirect (Flexibility/Accessibility)</i>	5.00
Energy \$	<i>Direct (Power/Water/Cooling) ..</i>	20.00
	<i>Indirect (Breakdowns/Weather) ..</i>	5.00
Maintenance\$	<i>Direct (Personnel)</i>	4.00
	<i>Indirect (Accidents/Vermin)</i>	4.00
Administrative\$	<i>Direct (Personnel)</i>	2.00
	<i>Indirect (Copying/Computing) ..</i>	1.00
Summary\$	Grand Total.....	100.00

Material Handling dominates as the key process improvement of the Sterilization process. For the three recommendations for improvement in the Sterilization process which were recommended by the manufacturers (Figure 12), a +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

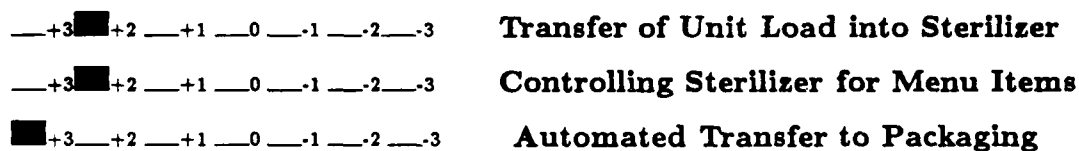


Figure 12: Sterilization Process Recommendations

G. Packaging Process

Since the Packaging process is not really affected by the menu item, no list of problems was requested of the manufacturers. What was found as a result of the cost drivers identified in Table 11, however, was the labor intensity of this process and its impact on costs of the Packaging process. As shown, 70% of the costs of the Packaging process are due to labor.

Table 11: Packaging Costs Percentage Breakdown %

Raw Material \$	<i>Direct (Packaging/Boxing Items)</i>	20.00
	<i>Indirect (Wastage/Spoilage) ...</i>	2.00
Labor \$	<i>Direct (Personnel)</i>	70.00
	<i>Indirect (Training/Overtime) ...</i>	3.00
Equipment \$	<i>Direct (Capital Expenditures) ..</i>	--
	<i>Indirect (Operational/Repairs) ..</i>	--
Space \$	<i>Direct (Cubic footage)</i>	--
	<i>Indirect (Flexibility/Accessibility)</i>	2.00
Energy \$	<i>Direct (Power/Water/Cooling) ..</i>	--
	<i>Indirect (Breakdowns/Weather) ..</i>	--
Maintenance\$	<i>Direct (Personnel)</i>	2.00
	<i>Indirect (Accidents/Vermin)</i>	--
Administrative\$	<i>Direct (Personnel)</i>	1.00
	<i>Indirect (Copying/Computing) ..</i>	--
Summary\$	Grand Total.....	100.00

Automation could play a key role to reducing costs of the Packaging process as Figure 13 demonstrates. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Carton Forming
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Pad Insertion
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Boxing of Cans
___ +3 ___ +2 ■ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Checking of Packaging Quality
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Labelling of Shipping Cartons
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Palletizing of Shipping Cartons
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Sheathing of Unit Load
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Can Cleaning

Figure 13: Packaging Process Recommendations

H. Shipping Process

Finally, as is seen in the cost driver breakdown for the Shipping process, Table 12, Administrative problems loom as the key driver of Shipping costs.

Table 12: Shipping Costs Percentage Breakdown		%
Labor \$	Direct (Personnel)	15.00
	Indirect (Training/Overtime) ...	2.00
Equipment \$	Direct (Capital Expenditures) ..	3.00
	Indirect (Operational/Repairs) ..	1.00
Space \$	Direct (Cubic footage)	20.00
	Indirect (Flexibility/Accessibility)	10.00
Energy \$	Direct (Power/Water/Cooling) ..	--
	Indirect (Breakdowns/Weather) ..	--
Maintenance\$	Direct (Personnel)	--
	Indirect (Accidents/Vermin)	--
Administrative\$	Direct (Personnel)	45.00
	Indirect (Copying/Computing) ..	4.00
Summary\$	Grand Total	100.00

Figure 14 represents the manufacturer's recommendations for controlling costs in the Shipping process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*. These recommendations center on an automated information system for improving cost control in Shipping.

■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Shipping Warehouse Storage
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Order Picking of Stored Cans
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Material Handling/Transfer
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Computerized Product Accountability

Figure 14: Shipping Process Recommendations

Chapter 3. GENERAL MANUFACTURING PROCESS COST FACTORS

A. General Manufacturing Problems

This last Chapter summarizes all the problems found with the subprocesses and examines which subprocesses are the key cost drivers and recommends in general where cost savings might be identified and focused.

In order to summarize some of the results found in the survey, Table 13 indicates with an X the subprocesses found by the manufacturers that are most problematic for each of the manufactured menu items. The table reflects a composite aggregation of all manufacturer's responses across all subprocesses as discussed in detail in Chapter 2. It is interesting to note that *BBQ Beef, Eggs w/Ham, Apple Dessert, Frankfurters in Brine, Green Beans, Mixed Vegetables, and Peas/Mushrooms* all experienced problems across all the subprocesses. Packaging and Shipping were not included as subprocesses here in Table 13 since all menu items could be improved by increased automation for these activities.

In another summary pass over the data, it is useful to examine how the manufacturers felt about which processes were the most *labor intensive*. Traditionally, labor intensive processes would be the most likely candidates for future automation and technological improvements. Figure 15 below represents their opinion as to the most *labor intensive* processes. A +3 indicates *most labor intensive* while a -3 indicates *least labor intensive*, and a 0 weight indicates *no opinion*.

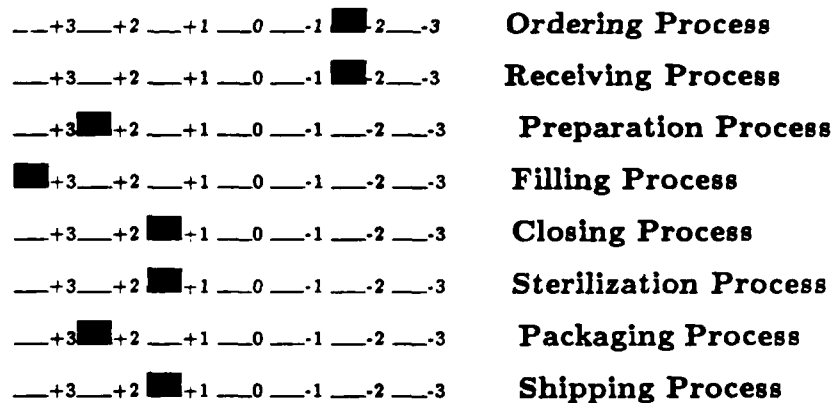


Figure 15: Labor Intensity Chart

Inspecting Figure 15 we see that the three most critical labor intensive processes are Filling, followed by Packaging and finally Preparation. Even though Packaging appears to be tied with Preparation, when the scores are aggregated, Packaging slightly edges out Preparation in being more labor intensive.

That Filling is the most labor intensive is perhaps not surprising, given its labor intensive activities as described in Chapter 2, and the state of the Filling equipment used by the various producers. The lack of adequate Filling equipment is due to the low volume requirements for Tray Packs and the specialized Filling equipment needed to handle the size and range of placement-filling problems for the menu items.

Table 13: Tray Pack Menu Item Problems

Item	Ordering	Receiving	Preparation	Filling	Closing	Sterilization
BBQ Beef	X	X	X	X	X	X
Beef Stew	X		X	X		
Chicken ala King	X					
Creamed Ground Beef	X	X	X	X		X
Eggs w/Ham	X	X	X	X	X	X
Apple Dessert	X	X	X	X	X	X
Beef Pepper Steak	X		X			
Canadian Bacon	X					
Chicken Breasts	X					
Frankfurters in Brine	X	X	X	X	X	X
Swiss Steak	X				X	
Turkey Slices w/Gravy	X		X	X	X	X
Escalloped Potatoes	X	X				
Macaroni Cheese	X			X	X	X
Sweet Potatoes	X	X				
Green Beans	X	X	X	X	X	X
Mixed Vegetables	X	X	X	X	X	X
Peas/Mushrooms	X	X	X	X	X	X
Beans w/Gravy		X	X		X	
Meatloaf w/Gravy			X	X		
Pork Slices w/Gravy			X	X	X	
Roast Beef w/Gravy			X	X		
Roast Chicken			X	X		
Macaroni Salad			X			
Peas and Carrots						X

Packaging's importance over Preparation was slightly more favored by the respondents, although marginally, but it is quite important to future cost savings because of its generality and automation characteristics. While Preparation is a third in this itemization of labor intensive operations, it is very dependent on the type of raw material ingredients and the menu item preparation process unique to those ingredients, whereas Packaging is independent of the menu item and would be one of the most easily implementable technological changes in Tray Pack manufacturing.

To quantify the importance of Figure 15, Table 14 gives the percentage breakdown of total costs over the eight subprocesses. Table 14 illustrates again the order of importance of Filling, Packaging and Preparation as the most critical factors in Tray Pack manufacturing costs. Filling accounts for 36% of total costs while Packaging accounts

for 17% and Preparation accounts for 16.50%.

Again, the independence of the Packaging operation from the others would suggest its importance in cost savings technology for Tray Pack manufacturing. All manufacturers could aid from some form of automated packaging systems: boxing, pad insertion, labelling, palletizing, and pallet sheathing. Various equipment items for automating these operations are described in a previous report.*

B. Cost Factors

Table 14: General Manufacturing Cost Percentages

PROCESS	Percentage of Cost %
Ordering	2.00
Receiving	3.50
Preparation	16.50
Filling	36.00
Closing	10.00
Sterilization	11.00
Packaging	17.00
Shipping	4.00
Grand Total	100.00

* J. MacGregor Smith, *Tray Pack Prototype Plant Design* Technical Report NATICK/TR-87/017, June 1986. (AD A180 296)

Figure 16 aggregates the costs of the manufacturing processes into our decision tree defined earlier in Chapter 1. As is indicated in Figure 16, the percentage cost breakdown acts as a guide to future research and development expenditures for improving the Tray Pack manufacturing process.

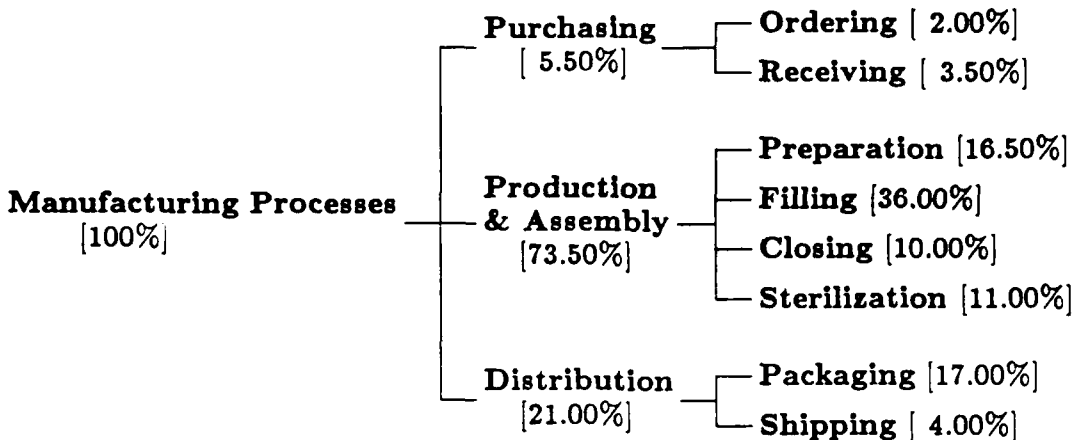


Figure 16: Process Decision Tree with Percentage Costs

C. General Recommendations for Future Developments

As another general guide to where improvements in the manufacturing process might come about to correct deficiencies in the entire Tray Pack manufacturing process, the manufacturers were asked to pinpoint those processes where improvements may come about as new advances in automation equipment or new processes of manufacturing.

Figure 17 summarizes the results from the manufacturer's opinions about where new improvements could be made for each of the various subprocesses. Within Figure 17, A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

—+3—+2—+1—0—-1— ■ —2—-3	Ordering Process
—+3—+2—+1—0—-1— ■ —2—-3	Receiving Process
—+3 ■ +2—+1—0—-1—-2—-3	Preparation Process
■ +3—+2—+1—0—-1—-2—-3	Filling Process
■ +3—+2—+1—0—-1—-2—-3	Closing Process
—+3—+2 ■ +1—0—-1—-2—-3	Sterilization Process
■ +3—+2—+1—0—-1—-2—-3	Packaging Process
—+3—+2 ■ +1—0—-1—-2—-3	Shipping Process

Figure 17: Possibilities for General Manufacturing Process Improvements

In interpreting Figure 17, Filling improvements are of primary importance, while Packaging and Closing share the second most important spot. New improvements in Preparation is third. The importance of new technological changes in the Filling process have been echoed throughout this report in Chapter 2 and the percentage cost breakdown embodied in Table 14 underscores its importance.

Packaging has also been shown to require some innovative ways of automating its processes since standardization already exists at this stage of the Tray Pack manufacturing process and various pieces of automated equipment are available to implement these improvements within the plants.

Improvements in the Closing process are needed because of the frequent dilemmas of the lid/can merge problem, material handling problems from closing to seaming, and maintaining seam integrity.

Improvements in the Preparation process are also needed to smooth production and reduce labor costs in these areas. Finally, improvements that would affect the Ordering, Receiving and Shipping operations are the development of a computerized information, inventory and scheduling system operable on a personal computer (PC) for tracking and identifying raw materials and finished goods. In this way, much of the paperwork and inefficiencies and eventual costs associated with the manufacture of Tray Packs could be streamlined.

While the report has offered one predominant viewpoint and approach to a cost driver analysis, at the end of the questionnaire, we asked the manufacturers to provide their opinion as to what additional comments and concerns may have been overlooked by our questionnaire process. Below is included one set of responses, which were felt to be quite relevant and informative:

Standardization of specifications as to raw materials preparation, and processes would reduce costs.

Also, allowing processors to use any acceptable (commercial) methods in the processing itself to yield an acceptable end item would lend flexibility.

Raw material criteria (especially spices, etc.) are overly restrictive when dealing in small amounts.

Slice size should be allowed to vary if serving size and end item are consistent.

Rapid evaluation and adoption of VECP's (i.e. Labelling or double stacking during shipment after appropriate testing) could save \$20,000,000 per year to the program.

Chapter 4. FINAL CODA

This report has pointed out , qualified, and quantified a number of the key cost components and factors that affect Tray Pack manufacturing costs.

Within Chapter 3, new equipment technologies have been pinpointed which might further realize these cost control measures. Most importantly, if the volume of Tray Packs is to increase beyond present levels and line throughput rates are to achieve the desired goal of 20 cans per minute (CPM), then many of these new technologies should be pushed forward.

This report does not attempt to be a panacea for identifying, quantifying and recommending all cost improvements possible in Tray Pack manufacturing but is simply a first step in this complex process and makes a concerted attempt to provide guidance for future efforts, research, and changes in optimizing Tray Pack manufacturing.

APPENDIX

III. General Manufacturing Questions

This question section requests background information on your present involvement with Tray Pack manufacturing. *This information will be held in strictest confidence.*

1. Background

Company _____ Date: _____

Name _____

How many Tray Packs total did you produce this last fiscal year? _____

2. Production Items

In the following tables, please check all the Tray Pack menu items within the four functional categories you have produced to date.

Entrees

- ☐ BBQ Beef
- ☐ Beef Stew
- ☐ Breakfast Bake
- ☐ Chicken ala king
- ☐ Chicken Stew/Gravy

Entrees

- ☐ Chicken w/ Noodles
- ☐ Chili Con Carne
- ☐ Creamed Gr. Beef
- ☐ Eggs w/Ham

Starches/Vegets

- ☐ Potato Salad
- ☐ Sweet Creamed Corn
- ☐
- ☐

Desserts

- ☐ Apple Dessert
- ☐ Apple Sauce
- ☐ Blueberry Dessert
- ☐ Chocolate Pudding
- ☐ Cherry Dessert

Table of One-Step Menu Items

Entrees

- ☐ BBQ Pork
- ☐ Beef and Macaroni
- ☐ Beef Pepper Steak
- ☐ Beef Tips w/Gravy
- ☐ Beef Pot Roast
- ☐ Canadian Bacon
- ☐ Chicken Breasts
- ☐ Chicken Cacciatore
- ☐ Franks in Brine
- ☐ Ham Slices
- ☐

Entrees

- ☐ Meatloaf w/Gravy
- ☐ Pork Sausage Links
- ☐ Pork Slices w/Gravy
- ☐ Roast Beef w/Gravy
- ☐ Roast Chicken
- ☐ Spaghetti w/Meatballs
- ☐ Swedish Meatballs
- ☐ Swiss Steak
- ☐ Turkey Sl.w/Gravy
- ☐
- ☐

Starches

- ☐ Beans w/Pork
- ☐ Buttered Noodles
- ☐ Buttered Potatoes
- ☐ Escalloped Potatoes
- ☐ Macaroni Cheese
- ☐ Macaroni Salad
- ☐ Spanish Rice
- ☐ Sweet Potatoes
- ☐ White Rice
- ☐
- ☐

Vegts/Desserts

- ☐ Glazed Carrots
- ☐ Green Beans
- ☐ Mixed Vegetables
- ☐ Peas and Carrots
- ☐ Peas/Mushrooms
- ☐ Sliced Carrots
- ☐ Whole Kernel Corn
- ☐ Fruit Cocktail
- ☐ Sliced Peaches
- ☐ Sliced Pears
- ☐ Pineapple/Syrup

Table of Two Step Menu Items

Hand Placement Items

- ☐ Lasagne
- ☐ Stuffed Cabbage
- ☐ Stuffed Peppers

Oven Bake Items

- ☐ Apple Coffee Cake
- ☐ Blueberry Cake
- ☐ Chocolate Cake
- ☐ Marble Cake
- ☐ Pound Cake
- ☐ Spice Cake

Table of Hand-Placement & Oven Bake Menu Items

3. Ordering: Process of acquiring raw materials and necessary supplies for Tray Pack manufacturing

(Please circle the appropriate response or fill the blank line as best as possible.)

☐ yes ☐ no Have you had any problems ordering can bottoms and lids from Central States?

If yes, please check as many of the items below as necessary:

- | | |
|--|---|
| ☐ Inadequate Lead Time | ☐ Slow Delivery time |
| ☐ Quality of lids/bottoms | ☐ Other: _____ |

☐ yes ☐ no Have you had problems with the securing of labels for the cans?

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of meat items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------------|------------------------------------|--------------------------------------|
| ☐ Beef | ☐ Hamburger | ☐ Pork |
| ☐ Bacon | ☐ Chicken | ☐ Turkey |
| ☐ Frankfurters | ☐ Sausage | ☐ Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of dairy items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------|---------------------------------------|--------------------------------------|
| ☐ Milk | ☐ Butter | ☐ Eggs |
| ☐ Cheese | ☐ Cream Cheese | ☐ Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of fresh vegetable items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | | |
|------------------------------------|----------------------------------|--------------------------------------|--------------------------------------|
| ☐ Peas | ☐ Beans | ☐ Lima Beans | ☐ Chili Beans |
| ☐ Mushrooms | ☐ Carrots | ☐ Cabbage | ☐ Corn |
| ☐ Tomatoes | ☐ Peppers | ☐ Other _____ | |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the general acquisition and supply of Starch items?
If yes, please check as many of the items below as necessary:

- | | | |
|--|-----------------------------------|--------------------------------------|
| ☐ Rice | ☐ Flour | ☐ Wheat |
| ☐ Potatoes | ☐ Macaroni | ☐ Spaghetti |
| ☐ Cereals/Grain | ☐ Noodles | ☐ Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ **yes** ☐ **no** Do you have any problem with the supply of sauces or related items?
If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------------|---------------------------------------|--------------------------------------|
| ☐ Tomato sauce | ☐ Tomato Paste | ☐ Other _____ |
|---------------------------------------|---------------------------------------|--------------------------------------|

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the acquisition of dessert items?
If yes, please check as many of the items below as necessary:

- | | | |
|--------------------------------------|--------------------------------------|-------------------------------------|
| ☐ Cherries | ☐ Oranges | ☐ Pineapples |
| ☐ Peaches | ☐ Blueberries | ☐ Pears |
| ☐ Other _____ | | |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the acquisition of spices and condiments?
If yes, please check as many of the items below as necessary:

- | | | |
|-------------------------------------|--|--------------------------------------|
| ☐ Salt | ☐ Pepper | ☐ Brown Sugar |
| ☐ Cornstarch | ☐ Garlic Powder | ☐ Yeast |
| ☐ Molasses | ☐ Nuts | ☐ Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| ☐ Cost of Items | ☐ Quality of Items | |
| ☐ Lead Times | ☐ Delivery Times | ☐ Other _____ |

3. Ordering Process

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beef Stew	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Breakfast Bake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chicken ala king	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chicken Stew/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chicken w/ Noodles	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chili Con Carne	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Creamed Gr.Beef	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Eggs w/Ham	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Potato Salad	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Sweet Creamed Corn	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Apple Dessert	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Apple Sauce	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Blueberry Dessert	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chocolate Pudding	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Cherry Dessert	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Pork	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beef and Macaroni	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beef Pepper Steak	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beef Tips w/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beef Pot Roast	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Canadian Bacon	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chicken Breasts	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chicken Cacciatore	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Franks in Brine	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Ham Slices	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Meatloaf w/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Pork Sausage Links	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Pork Slices w/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Roast Beef w/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Roast Chicken	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Spaghetti w/Meatballs	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Swedish Meatballs	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____

☐ Swiss Steak	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Turkey Sl.w/Gravy	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Beans w/Pork	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Buttered Noodles	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Buttered Potatoes	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Escalloped Potatoes	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Macaroni Cheese	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Macaroni Salad	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Spanish Rice	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Sweet Potatoes	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ White Rice	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Glazed Carrots	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Green Beans	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Mixed Vegetables	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Peas & Carrots	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Peas/Mushrooms	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Sliced Carrots	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Whole Kernel Corn	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Fruit Cocktail	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Sliced Peaches	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Sliced Pears	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Pineapples/Syrup	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Lasagne	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Stuffed Cabbage	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Stuffed Peppers	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Blueberry Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Chocolate Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Marble Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Pound Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____
☐ Spice Cake	☐ Raw Material\$	☐ Material Quality	☐ Other\$_____

e) In the following table, please *estimate as accurately as possible* the percentage costs of your Ordering sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	Direct\$ (Food Items/Cans)	_____ %
	Indirect\$ (Wastage/Spoilage)	_____ %
Labor \$	Direct\$ (Personnel)	_____ %
	Indirect\$ (Training/Overtime)	_____ %
Equipment \$	Direct\$ (Capital Expenditures) ..	_____ %
	Indirect\$ (Operational/Repairs) ..	_____ %
Space \$	Direct\$ (Cubic footage)	_____ %
	Indirect\$ (Flexibility/Accessibility)	_____ %
Energy \$	Direct\$ (Power/Water/Cooling) ..	_____ %
	Indirect\$ (Breakdowns/Weather) .	_____ %
Maintenance\$ & Safety\$	Direct\$ (Personnel)	_____ %
	Indirect\$(Accidents/Vermin)	_____ %
Administrative\$	Direct\$ (Personnel)	_____ %
	Indirect\$ (Copying/Computing) ..	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

4. Receiving: Process of receiving raw materials from rail and truck deliveries, storing of these items, and retrieving them from the Warehouse.

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any One-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beef Stew	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Breakfast Bake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chicken ala king	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chicken Stew/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chicken w/ Noodles	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chili Con Carne	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Creamed Gr.Beef	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Eggs w/Ham	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Potato Salad	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Sweet Creamed Corn	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Apple Dessert	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Apple Sauce	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Blueberry Dessert	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chocolate Pudding	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Cherry Dessert	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____

b) For the *Two-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Pork	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beef and Macaroni	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beef Pepper Steak	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beef Tips w/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beef Pot Roast	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Canadian Bacon	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chicken Breasts	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chicken Cacciatore	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Franks in Brine	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Ham Slices	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Meatloaf w/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Pork Sausage Links	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Pork Slices w/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Roast Beef w/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Roast Chicken	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Spaghetti w/Meatballs	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Swedish Meatballs	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____

☐ Swiss Steak	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Turkey Sl.w/Gravy	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Beans w/Pork	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Buttered Noodles	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Buttered Potatoes	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Escalloped Potatoes	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Macaroni Cheese	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Macaroni Salad	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Spanish Rice	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Sweet Potatoes	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ White Rice	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Glazed Carrots	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Green Beans	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Mixed Vegetables	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Peas & Carrots	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Peas/Mushrooms	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Sliced Carrots	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Whole Kernel Corn	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Fruit Cocktail	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Sliced Peaches	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Sliced Pears	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Pineapples/Syrup	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Lasagne	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Stuffed Cabbage	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Stuffed Peppers	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Blueberry Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Chocolate Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Marble Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Pound Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____
☐ Spice Cake	☐ Spoilage\$	☐ Warehouse\$	☐ Other\$_____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Receiving** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	<i>Direct\$ (Food Items/Cans)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage)</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed operations within the **Receiving** sub-process. Could you please weight the importance of investing in new technologies (equipment and processes) to assist the overall **Receiving** sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Reducing Delivery delays</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Improved Information System on Deliveries</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Unpacking/Identifying items and Storing them</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Improving Quality of Raw Materials</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Increasing utilization of Dry Goods storage space</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Increasing utilization of Freezer space</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Increasing utilization of Refrigeration space</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Other _____</i>

5. Preparation: Process of preparing the raw materials for the specific menu item

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beef Stew	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Breakfast Bake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chicken ala king	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chicken Stew/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chicken w/ Noodles	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chili Con Carne	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Creamed Gr.Beef	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Eggs w/Ham	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Potato Salad	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Sweet Creamed Corn	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Apple Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Apple Sauce	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Blueberry Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chocolate Pudding	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Cherry Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Pork	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beef and Macaroni	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beef Pepper Steak	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beef Tips w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beef Pot Roast	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Canadian Bacon	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chicken Breasts	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chicken Cacciatore	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Franks in Brine	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Ham Slices	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Meatloaf w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Pork Sausage Links	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Pork Slices w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Roast Beef w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Roast Chicken	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Spaghetti w/Meatballs	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Swedish Meatballs	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Swiss Steak	☐ Labor\$	☐ Equipment\$	☐ Other\$_____

☐ Turkey Sl.w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beans w/Pork	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Buttered Noodles	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Buttered Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Escalloped Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Macaroni Cheese	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Macaroni Salad	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Spanish Rice	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Sweet Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ White Rice	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Glazed Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Green Beans	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Mixed Vegetables	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Peas & Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Peas/Mushrooms	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Sliced Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Whole Kernel Corn	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Fruit Cocktail	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Sliced Peaches	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Sliced Pears	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Pineapples/Syrup	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Lasagne	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Stuffed Cabbage	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Stuffed Peppers	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Blueberry Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chocolate Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Marble Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Pound Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Spice Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Preparation** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	<i>Direct\$ (Food Items/Cans)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Preparation** sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) for the **Preparation** process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3___+2___+1___0___-1___-2___-3	<i>Improved Trimming and Dicing operations</i>
___+3___+2___+1___0___-1___-2___-3	<i>Improved Quality Inspection of Raw Materials</i>
___+3___+2___+1___0___-1___-2___-3	<i>Better utilization of Refrigeration storage</i>
___+3___+2___+1___0___-1___-2___-3	<i>Better utilization of Freezer areas</i>
___+3___+2___+1___0___-1___-2___-3	<i>Flexible Preparation Equipment</i>
___+3___+2___+1___0___-1___-2___-3	<i>Flexible Cooking Space</i>
___+3___+2___+1___0___-1___-2___-3	<i>Adequate washing and sink areas</i>
___+3___+2___+1___0___-1___-2___-3	<i>Other _____</i>

6. Filling: Process of filling the cans with the menu item, inspecting the can contents, weighing the contents, and transferring the can to the closing operation

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beef Stew	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Breakfast Bake	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chicken ala king	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chicken Stew/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chicken w/ Noodles	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chili Con Carne	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Creamed Gr.Beef	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Eggs w/Ham	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Potato Salad	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Sweet Creamed Corn	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Apple Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Apple Sauce	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Blueberry Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chocolate Pudding	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Cherry Dessert	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Pork	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beef and Macaroni	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beef Pepper Steak	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beef Tips w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Beef Pot Roast	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Canadian Bacon	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chicken Breasts	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Chicken Cacciatore	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Franks in Brine	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Ham Slices	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Meatloaf w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Pork Sausage Links	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Pork Slices w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Roast Beef w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Roast Chicken	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____
☐ Spaghetti w/Meatballs	☐ Labor\$	☐ Equipment\$	☐ Other\$ _____

☐ Swedish Meatballs	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Swiss Steak	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Turkey Sl.w/Gravy	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Beans w/Pork	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Buttered Noodles	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Buttered Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Escalloped Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Macaroni Cheese	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Macaroni Salad	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Spanish Rice	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Sweet Potatoes	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ White Rice	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Glazed Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Green Beans	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Mixed Vegetables	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Peas & Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Peas/Mushrooms	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Sliced Carrots	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Whole Kernel Corn	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Fruit Cocktail	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Sliced Peaches	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Sliced Pears	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Pineapples/Syrup	☐ Labor\$	☐ Equipment\$	☐ Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Lasagne	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Stuffed Cabbage	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Stuffed Peppers	☐ Labor\$	☐ Equipment\$	☐ Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Blueberry Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Chocolate Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Marble Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Pound Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____
☐ Spice Cake	☐ Labor\$	☐ Equipment\$	☐ Other\$_____

e) In the following table, please estimate as accurately as possible the percentage costs of your Filling sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	Direct\$ (Food Items/Cans)	_____%
	Indirect\$ (Wastage/Spoilage)	_____%
Labor \$	Direct\$ (Personnel).....	_____%
	Indirect\$ (Training/Overtime)....	_____%
Equipment \$	Direct\$ (Capital Expenditures) ..	_____%
	Indirect\$ (Operational/Repairs) ..	_____%
Space \$	Direct\$ (Cubic footage).....	_____%
	Indirect\$ (Flexibility/Accessibility)	_____%
Energy \$	Direct\$ (Power/Water/Cooling) ..	_____%
	Indirect\$ (Breakdowns/Weather) .	_____%
Maintenance\$ & Safety\$	Direct\$ (Personnel).....	_____%
	Indirect\$(Accidents/Vermin)	_____%
Administrative\$	Direct\$ (Personnel).....	_____%
	Indirect\$ (Copying/Computing) ..	_____%
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed operations within the Filling sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) for the Filling process. A +3 indicates most important while a -3 indicates least importance, and a 0 weight indicates no opinion.

___+3___+2___+1___0___-1___-2___-3	Automated Can and Lid Stacking
___+3___+2___+1___0___-1___-2___-3	Automated Can Washing
___+3___+2___+1___0___-1___-2___-3	Automated Placement of Large Menu items
___+3___+2___+1___0___-1___-2___-3	Automated Piston & Liquid Filling operations
___+3___+2___+1___0___-1___-2___-3	Automated Check-weigh reject operations
___+3___+2___+1___0___-1___-2___-3	Automated Can transfer between stations
___+3___+2___+1___0___-1___-2___-3	Other _____

7. Closing: Process of joining the bottoms, lids and contents of each can, transferring the can to the seamer, closing the can, washing the can and collecting the cans into a unit load

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Beef Stew	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Breakfast Bake	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chicken ala king	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chicken Stew/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chicken w/ Noodles	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chili Con Carne	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Creamed Gr.Beef	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Eggs w/Ham	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Potato Salad	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Sweet Creamed Corn	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Apple Dessert	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Apple Sauce	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Blueberry Dessert	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chocolate Pudding	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Cherry Dessert	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____

b) For the *Two-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ENTREES

REASONS for Problem

☐ BBQ Pork	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Beef and Macaroni	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Beef Pepper Steak	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Beef Tips w/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Beef Pot Roast	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Canadian Bacon	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chicken Breasts	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Chicken Cacciatore	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Franks in Brine	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Ham Slices	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Meatloaf w/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Pork Sausage Links	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Pork Slices w/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Roast Beef w/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Roast Chicken	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____
☐ Spaghetti w/Meatballs	☐ Lid/Can Merge \$	☐ Closing Equipt\$	☐ Other\$ _____

☐ Swedish Meatballs	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Swiss Steak	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Turkey Sl.w/Gravy	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Beans w/Pork	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Buttered Noodles	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Buttered Potatoes	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Escalloped Potatoes	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Macaroni Cheese	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Macaroni Salad	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Spanish Rice	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Sweet Potatoes	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ White Rice	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Glazed Carrots	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Green Beans	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Mixed Vegetables	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Peas & Carrots	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Peas/Mushrooms	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Sliced Carrots	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Whole Kernel Corn	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Fruit Cocktail	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Sliced Peaches	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Sliced Pears	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Pineapples/Syrup	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ENTREES

REASONS for Problem

☐ Lasagne	☐ Lid/Can Merge \$	☐ Closing Equipment\$	☐ Other\$ _____
☐ Stuffed Cabbage	☐ Lid/Can Merge \$	☐ Closing Equipment\$	☐ Other\$ _____
☐ Stuffed Peppers	☐ Lid/Can Merge \$	☐ Closing Equipment\$	☐ Other\$ _____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Lid/Can Merge \$	☐ Closing Equipment\$	☐ Other\$ _____
☐ Blueberry Cake	☐ Lid/Can Merge \$	☐ Closing Equipment\$	☐ Other\$ _____
☐ Chocolate Cake	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Marble Cake	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Pound Cake	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____
☐ Spice Cake	☐ Lid/Can Merge \$	☐ Closing Equipmt\$	☐ Other\$ _____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Closing** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Labor \$	<i>Direct\$ (Personnel).....</i>	_____%
	<i>Indirect\$ (Training/Overtime)....</i>	_____%
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____%
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____%
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____%
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____%
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____%
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____%
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____%
	<i>Indirect\$(Accidents/Vermin)</i>	_____%
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____%
	<i>Indirect\$ (Copying/Computing) ..</i>	_____%
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Closing** sub-process. Could you please weight the importance of the operation to the overall manufacturing costs for this sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Lid/Tray Merge</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Can transfer between closure to seamer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Faster Seaming process (reliability/repair)</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Quality/Check of Seam</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Can washing at outfeed of seamer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Stacking of cans into a unit load</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Other _____</i>

8. Sterilization: Process of loading the unit load into the Sterilizer(s), cooking the cans, controlling the process, unloading the cans and transferring them to the Packaging area.

a) For the *One-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any One-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Beef	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Beef Stew	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Breakfast Bake	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chicken ala king	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chicken Stew/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chicken w/ Noodles	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chili Con Carne	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Creamed Gr.Beef	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Eggs w/Ham	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Potato Salad	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Sweet Creamed Corn	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Apple Dessert	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Apple Sauce	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Blueberry Dessert	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chocolate Pudding	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Cherry Dessert	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ BBQ Pork	☐ Sterilizer Control\$	☐ Load/Unload \$	☐ Other\$_____
☐ Beef and Macaroni	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Beef Pepper Steak	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Beef Tips w/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Beef Pot Roast	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Canadian Bacon	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chicken Breasts	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Chicken Cacciatore	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Franks in Brine	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Ham Slices	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Meatloaf w/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Pork Sausage Links	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Pork Slices w/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Roast Beef w/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Roast Chicken	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Spaghetti w/Meatballs	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Swedish Meatballs	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____

☐ Swiss Steak	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Turkey Sl.w/Gravy	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Beans w/Pork	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Buttered Noodles	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Buttered Potatoes	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Escalloped Potatoes	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Macaroni Cheese	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Macaroni Salad	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Spanish Rice	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Sweet Potatoes	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ White Rice	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Glazed Carrots	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Green Beans	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Mixed Vegetables	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Peas & Carrots	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Peas/Mushrooms	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Sliced Carrots	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Whole Kernel Corn	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Fruit Cocktail	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Sliced Peaches	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Sliced Pears	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Pineapples/Syrup	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Lasagne	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Stuffed Cabbage	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Stuffed Peppers	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

☐ Apple Coffee Cake	☐ Sterilizer Control\$	☐ Loading/Unloading\$	☐ Other\$_____
☐ Blueberry Cake	☐ Sterilizer Control\$	☐ Loading/Unloading\$	☐ Other\$_____
☐ Chocolate Cake	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Marble Cake	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Pound Cake	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____
☐ Spice Cake	☐ Sterilizer Control\$	☐ Load/Unload\$	☐ Other\$_____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Sterilization** sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Labor \$	<i>Direct\$ (Personnel)</i>	_____%
	<i>Indirect\$ (Training/Overtime)</i>	_____%
Equipment \$	<i>Direct\$ (Capital Expenditures)</i> ..	_____%
	<i>Indirect\$ (Operational/Repairs)</i> ..	_____%
Space \$	<i>Direct\$ (Cubic footage)</i>	_____%
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____%
Energy \$	<i>Direct\$ (Power/Water/Cooling)</i> ..	_____%
	<i>Indirect\$ (Breakdowns/Weather)</i> .	_____%
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel)</i>	_____%
	<i>Indirect\$(Accidents/Vermin)</i>	_____%
Administrative\$	<i>Direct\$ (Personnel)</i>	_____%
	<i>Indirect\$ (Copying/Computing)</i> ..	_____%
SUMMARY	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Sterilization** sub-process. Could you please weight the importance of the operation to the overall manufacturing costs for this sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Transfer of unit load into sterilizer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Controlling Sterilizer for menu items</i> .
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Unloading & Transfer to Packaging</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Other</i> _____

9. Packaging

a) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Packaging** sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Raw Material \$	<i>Direct\$ (Packaging/Boxing Items)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS.....	[100%]

b) Below is a series of activities concerning the detailed *operations* within the **Packaging** sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) to the *Packaging* process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Carton forming
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Pad insertion
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Boxing of cans
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Checking Quality of Packaging
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Labelling of shipping cartons
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Palletizing of shipping cartons into a unit load
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Sheathing of unit load
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Other:_____

10. Shipping: Identifying and storing unit loads, selecting trays for incubation, shipping unit loads, collecting damaged and returned cans.

a) In the following table, please *estimate as accurately as possible* the **percentage costs** of your Shipping sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Labor \$	Direct\$ (Personnel).....	_____ %
	Indirect\$ (Training/Overtime)....	_____ %
Equipment \$	Direct\$ (Capital Expenditures) ..	_____ %
	Indirect\$ (Operational/Repairs) ..	_____ %
Space \$	Direct\$ (Cubic footage).....	_____ %
	Indirect\$ (Flexibility/Accessibility)	_____ %
Energy \$	Direct\$ (Power/Water/Cooling) ..	_____ %
	Indirect\$ (Breakdowns/Weather) .	_____ %
Maintenance\$ & Safety\$	Direct\$ (Personnel).....	_____ %
	Indirect\$(Accidents/Vermin)	_____ %
Administrative\$	Direct\$ (Personnel).....	_____ %
	Indirect\$ (Copying/Computing) ..	_____ %
SUMMARY\$	GRAND TOTALS.....	[100%]

b) Below is a series of activities concerning the detailed operations within the Shipping sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) to the Shipping process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automated Shipping warehouse storage
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automating order picking of stored cans
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automated material handling/transfer
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Other _____

11. Summary

Below is a series of questions concerning the overall *Sub-Processes*. Could you please weight each *Sub-Process* as to which is the *most labor intensive* in your Tray Pack manufacturing process. A +3 indicates *most labor intensive* while a -3 indicates *least labor intensive*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Ordering Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Receiving Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Preparation Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Filling Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Closing Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Sterilization Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Packaging Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Shipping Process

Given your previous answers to the questions among the eight sub-process categories for your general Tray Pack manufacturing operations, how would you allocate percentage (%) manufacturing costs among the eight sub-processes:

Ordering Process	_____ %
Receiving Process	_____ %
Preparation Process	_____ %
Filling Process	_____ %
Closing Process	_____ %
Sterilization Process	_____ %
Packaging Process	_____ %
Shipping Process	_____ %
Grand Totals	[100%]

[illegible]

Receiving Process

Filling Process

Sterilization Process

Shipping Process

In the following section, please give us your *GENERAL* opinion as to how manufacturing costs might be better controlled if you feel we have overlooked or omitted some issues and problems that have not been addressed by the previous sections and questions in the questionnaire. *You may use the back of this sheet if necessary.*

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

49

Distribution List

	Copies
Defense Technical Information Center Attn: DTIC-DDAB Cameron Stn BG5 Alexandria, VA 22314	2
Commander Defense Logistics Agency Attn: DPMSO (Mr. O'Brien) Cameron Station Alexandria, VA 22304-6100	1
Merton Singer, Colonel (Ret.) Executive Secretary RSDA for Military Food Packaging Systems, Inc. 103 Biltmore Drive, Suite 106 San Antonio, TX 78213	1
Central States Can Co. Attn: Mr. Dave Blizzard, Vice President, Engineering + R&D 700 16th Street, S.E. Massillon, OH 44648	1
Sterling Bakery, Inc. Attn: Mr. Dexter Bellis, Tray Pack Production Manager 5722 Kenwick San Antonio, TX 78238	1
Vantage Foods, Inc. Attn: Mr. Avery Konor, Project Manager 10311 Evendale Drive Cincinnati, OH 45241	1
Southern Packaging and Storage Company, Inc. Attn: Mr. Alan Dafler, Vice President, Research and Development Bennettsville, SC 29512	1
Venice Maid Co., Inc. Attn: Mr. Charles Lagrosso 270 North Mill Road P.O. Box 1505 Vineland, NJ 08360	1
Vance Foods Company Attn: Mr. Ron Van Ekeren, Vice President 5415 Mc Dermott Drive Berkeley, IL 60163	1
Bryan Bros. Attn: Mr. Richard Lanke, Plant Production Manager P.O. Box 1177 West Point, MS 39773	1

Right Away Foods Corp. 1
 Attn: Mr. James Bourg, President
 P.O. Box 184
 Edinburg, TX 78540

Rollason Engineering Co. 1
 Attn: Mr. Lans Herbert
 Fern Park, FL 32720

Eaton-Kenway 1
 attn: Mr. William B. York
 515 East 100 South
 P.O. Box 4250
 Salt Lake City, Utah 84102

Hartman Material Handling Systems, Inc. 1
 attn: Mr. Edward J. Budill
 86 School Street
 Victor, New York 14564

Jervis B. Webb Company 1
 attn: Mr. Carl M. Kaltwasser
 Executive Plaza
 540 Pennsylvania Avenue, Suite 321
 Fort Washington, Pennsylvania 19034

SPS Technologies 1
 attn: Mr. Charles D. Wenzel
 Township Line Road
 Hatfield, Pennsylvania 19440

Litton UHS 1
 3101 Old Hayneville Road
 P.O. Drawer 177
 Montgomery Alabama 36195

FMC Corporation 1
 attn: Mr. David Schlueter
 103 East Maple Street
 Hoopeston Illinois 60942

Groen Division/Dover Corporation 1
 1900 Pratt Boulevard
 Elk Grove Village, Illinois 60007

Solbern Corporation 1
 attn: Mr. Bill Kalmar
 8 Kulick Road
 Fairfield, New Jersey 07006

Packaging Research Corporation 1
 attn: Mr. Rodney D. Wicklund
 2852 S. Tejon
 Englewood, Colorado 80110

Barkley & Dexter Laboratories, Inc. 1
 attn: Mr. Sam Gudgel

50 Frankfort Street
 P.O. Box 307
 Fitchburg, Massachusetts 01420

Industrial Marketing International 1
 attn: Mr. Heinz Grossjohan
 P.O. Box 503 - 1-3 Broad Street
 Kinderhook, New York 12106

FMC Corporation 1
 attn: Mr. Richard Houtzer
 Food Processing Machinery Division
 2300 Industrial Avenue Box A
 Madera, California 93639

Alvey Washing Equipment 1
 attn: Harley Huddle
 11337 Willimason Road
 P.O. Box 41031
 Cincinnati, Ohio 45241-0031
 (513) 489-3060

FMC Corporation 1
 attn: Mr. Richard Houtzer
 Food Processing Machinery Division
 2300 Industrial Avenue Box A
 Madera, California 93639

FMC Corporation 1
 attn: J.C. Lascenzo
 Food Processing Machinery Division
 419-B Malcolm Drive Box 570
 Westminster, Maryland 21157

ABC Packaging Corporation 1
 attn: Mr. James Hooker
 811 Live Oak Street
 Tarpon Springs, Florida 33589

Western Packaging Systems, Ltd 1
 attn: Mr. John J. Fisher
 P.O. Box 2287
 Naperville, Illinois 60565

FMC Corporation 1
 attn: Mr. Jim Klaber
 103 East Maple Street
 Hoopston Illinois 60942

Litton UHS 1
 3101 Old Hayneville Road
 P.O. Drawer 177
 Montgomery Alabama 36195

Dalemark Industries Inc. 1
 attn: Maria Rau
 950 Airport Road

Lakewood, New Jersey 08701

Ankler Labelers Corp. 1
Briggs Road
Mt. Laurel, New Jersey 08054

American Technologies 1
1301 Dugdale Road
Waukegan, Illinois 60085

INTERNAL DISTRIBUTION

	Copies
<i>Technical Director</i>	<i>1</i>
<i>Director, Aero-Mechanical Engineering Directorate</i>	<i>1</i>
<i>Director, Food Engineering Directorate</i>	<i>1</i>
<i>Director, Individual Protection Directorate</i>	<i>1</i>
<i>Director, Science and Advanced Technology Directorate</i>	<i>1</i>
<i>Technical Library</i>	<i>3</i>
<i>Project Officer</i>	<i>25</i>