

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET		FOR AID USE ONLY <b>BATCH 60</b>
1. SUBJECT CLASSIFICATION	A. PRIMARY Food production and nutrition	AQ10-0000-G635
	B. SECONDARY Food processing--India	
2. TITLE AND SUBTITLE A survey of food processing industry in Tamil Nadu, India		
3. AUTHOR(S) (100) Kothari, K.B.; Thiagarajan, P.S. (101) Cantor, S.M., Associates Inc., Haverford, Pa.		
4. DOCUMENT DATE 1973	5. NUMBER OF PAGES 289p.	6. ARC NUMBER ARC
7. REFERENCE ORGANIZATION NAME AND ADDRESS Cantor		
8. SUPPLEMENTARY NOTES ( <i>Sponsoring Organization, Publisher, Availability</i> ) (In Tamil Nadu Nutrition Project, v.2, Sect.E)		
9. ABSTRACT <p>A detailed survey of the food processing industry in Tamil Nadu, India, was conducted as part of a systematic analysis of nutrition delivery systems. Objectives were to collect relevant data on food manufacturing plants, food processed, nutrient values of raw material inputs and product outputs, marketing methods, distribution practices, costs, and prices. A stratified sampling plan was used to select 1,000 of the more than 20,000 processing plants for inclusion in the survey, conducted from September to November, 1971. Much descriptive and statistical information is presented on the following industries: rice, flour, and dal mills; bakeries; dairies; sugar mills; edible oil mills; canning and preserving of fruits and vegetables; confectionaries; soft drinks and aerated water industry; sago industry; salt industry; tea curing industry; cashew industry; and industries concerned with other food products. An attempt to establish the amount of nutrients lost through processing was not successful, owing to lack of available data on the nutrient values of certain raw food materials.</p>		
10. CONTROL NUMBER PN-AAD-779	11. PRICE OF DOCUMENT	
12. DESCRIPTORS Distribution systems Food industry India Tamil Nadu, India?	13. PROJECT NUMBER	
	14. CONTRACT NUMBER AID/nesa-399 GTS	
	15. TYPE OF DOCUMENT	





**PREFACE**

This study on Food Processing and Distribution in Tamil Nadu has been carried out under a contract with CANTOR/ATAC and represents an in-depth analysis of the food processing and distribution sub-system for an integrated and operational project entitled "The Tamil Nadu Food and Nutrition Study" performed for the Government of India and the Government of Tamil Nadu.

The major objectives of this survey were to collect detailed information on:

- a) the number and size of food processing units in the state of Tamil Nadu according to established categories
- b) capital invested, employment and cost structure
- c) total food items produced and raw materials serviced
- d) distribution and marketing pattern and sales promotion methods
- e) raw materials needs, prices and procurement practices
- f) storage facilities and techniques
- g) transportation of raw materials and finished products and related losses, and
- h) approximate total nutrient values of inputs and outputs

A stratified sampling frame was adopted with six strata according to size and approximately 1,130 units in all categories were contacted for the survey. 916 of the units contacted responded with the required information. The field work was conducted by well qualified investigators after a rigorous training of two weeks. In the fourteen districts

of Tamil Nadu, a field force of 25 staff performed the task from September to November, 1971.

The report is presented in this single volume. However, computer print-outs of detailed tables have been provided separately. The tables which are considered most important are presented in this report in summary form.

## ACKNOWLEDGMENTS

During the course of the survey a number of industry associations besides 1,130 food processing units was contacted by our investigators. They were helpful and provided the necessary data. We are indebted to all of them.

Many agencies of the Government of Tamil Nadu have been uniformly courteous and helpful in providing needed data and answering questions.

Mr. P.S. Thiagarajan, Manager, Operations Research served as Project Director for this study. Other professional staff participating in this study from ORG were Messrs. K. S. Narayanan, V. Raghu, R. Narasimhan, S. Krishna Kumar, S. S. Easwaran, V. Krishnamurthy, D. N. Basu, P. H. Reddy and S. J. Dilip. The coding and data preparation were done by a number of coders who were supervised by Messrs. S. G. Mehta and S. N. Pathan. The charts were prepared by Mr. Mahadkar.

To all those referred to, I am happy to express our grateful appreciation. Finally, I wish to express our thanks to Mr. Bruce Strassburger, Mr. Kalmann Schaefer and Mr. K. B. Kothari of CANTOR/ATAC for their active participation and discussions at all stages of the study.

D.V.N. Sarman  
Director

A SURVEY OF THE FOOD PROCESSING INDUSTRY IN TAMIL NADU  
COMMENTARY

The Tamil Nadu Nutrition Project was separated into three major study sections which, when combined, describe the manner in which food-stuffs proceed from the ground (Agriculture subsystem) through Processing and Distribution (Processing subsystem) to the consumer (Consumer subsystem). The three subsystems are related through the common thread of Food and Nutrition.

The survey of the food processing industry in Tamil Nadu was carried out by the Operations Research Group of Baroda. Its objective was to describe the nature and size of the Tamil Nadu food processing industry, what commodities were handled, what processing techniques were used, how its products are distributed and what economic groups participate. The data compiled by ORG are voluminous. Some key points should be borne in mind when considering these data, whether superficially or in depth. These include:

- 1) Most of the food processing units within the State belong to what is called the unregistered sector. These are units not registered under the Factories Act of 1948 and are those which either employ less than 10 persons and use electric power or less than 20 persons without electric power.
- 2) The largest number of units, irrespective of sector, represent the rice, oil and baking industries category.
- 3) The total rupee value of products is greatest in the oil, rice and sugar industries; oil and rice account for 50% of the total value of goods produced by the food industry in Tamil Nadu.

#### Full Processing versus Servicing

4) When considering inputs and outputs of processing plants, a strong distinction is made between (a) those units for which raw materials are procured, processed and from which finished products are sold (processed goods), and (b) those units to which persons other than the mill owners bring raw materials for processing and take away finished products (serviced goods).

5) Major sources of raw materials are local although raw material for dhal mills is brought in from other States and cashews are, in part, imported. Major markets are mostly local. Major problems cited by processors are price fluctuations (a normal occurrence, it would seem), poor quality, inadequate credit and seasonal supply.

6) Processing technology is mostly traditional. Exceptions are modern sugar mills, dairy plants and tea curing units. A very noteworthy rice processing modernization program has been in force. (See particularly the Report of the ECAFE Expert Team on Rice-Processing Machinery, 9 March, 1970.)

#### Nutrition Sources

According to the ORG survey, approximately 80% of the calorie and protein sources in Tamil Nadu are raw materials fed to the rice mills and oil mills. In view of this observation it is to be noted that the oil milling industry is not cited for being modern in technology. Rice mills in the State are being modernized actively (see above). There are twelve modern rice mills in the State, three of which were covered by the survey.

### Nutrition Through the Food System

It is important to trace raw material calories and proteins from origin through processing to the consumer. Actual production of rice, the principal source of both calories and proteins, for the year 1970-71 was 5.3 million tonnes. This is equivalent to about 18.3 million million Kcals. The ORG survey, which covered 1971-1972, estimated 2.1 million tonnes of rice or about 6. million million calories. This shortfall was traced, in part, to the examination of only a small sample of the large mills and, even more important, the low estimate of smaller units (operated by fewer than 5 persons) existing throughout the State. Reestimation by ORG resulted in a value of 4.3 million tonnes of rice or about 15 million million Kcals for the State as a whole (still short of the production figure).

From the Consumer Food Habits Survey the amount of rice consumed during 1971-1972 was estimated as being equivalent to 18.7 million million Kcals. This value corresponds with production approximations and still leaves the food processing survey somewhat short. This may reflect again the emphasis placed on the relative size of operation dealt with by the survey.

### Protein Accountability

Rice also accounts for almost half of the protein in processed foods. Data from the Consumer Food Habits Survey showed that about half the protein consumed is from rice. Secondary sources for available protein in the food processing industry are flour and dal mills. However, even raising the estimate of rice processed as was done in accounting for calorie availability, the amount of food processed from a protein available viewpoint matches only about two-thirds of the 670 million kgs. of protein reaching the consumer.

A brief description of the amounts of calories and proteins emanating from the food processing industries both as processed and serviced products is given in Table 1. The Table also registers the results taken from the Consumer Food Habits Survey for comparison. The percentage of foods, as measured by calorie and protein intake, reaches the public through channels of complete processing (20-25%), servicing (40-50%) and other means (35%). The other means are those accounting for the differences noted between the ORG survey results and those obtained through the Consumer Food Habits Survey.

TABLE 1

SOURCES OF CONSUMER FOOD PRODUCTS  
FOOD PROCESSING SURVEY VS. CONSUMER FOOD HABITS SURVEY<sup>a</sup>

	Kcals x 10 <sup>6</sup>			Protein, Kg. x 10 <sup>6</sup>		
	O.R.G. Survey <sup>b</sup>		C.F.H.S. <sup>b</sup>	O.R.G. Survey <sup>b</sup>		C.F.H.S. <sup>b</sup>
	Processed	Serviced	Consumed	Processed	Serviced	Consumed
Rice Mills	4,000	12,600	18,700	76.0	302.0	313.0
Oil Mills	1,200	800	1,400 <sup>c</sup>	--	--	--
Flour Mills	800	350	2,700 <sup>c</sup>	26.0	9.0	46.0
Dal Mills	110	170	1,960 <sup>c</sup>	8.0	11.0	10.9
Sugar Mills	890	-	840	--	--	--
Total for TN <sup>d</sup>	7,600	13,200	31,800	116.0	321.0	670.0

a. Measured as calories and protein

b. ORG = Food Processing Survey; CFHS = Consumer Food Habits Survey

c. These figures do not correspond to the processed quantities because the food consumption categories used contain many more items than the limited number which are processed in the oil, flour, and dal mills. There is direct correspondence only with the sugar and rice mills.

d. Totals include other processing categories in addition to the five tabulated here.

Data from the ORG and Food Habits Survey were also combined to assist in locating major food purchase points. These data are shown in Table 2. Sources of most provisions, whether one is considering calorie or protein intake in urban or rural settings, are the petty shops and provision stores. Sources of the remainder include vendors (sellers who do not operate from a shop or fixed place of business), vegetable markets and the customers' own land (homegrown foods). Urban people buy almost exclusively from petty shops and provision stores, while rural people patronize other sources, except for rice, for 10-30% of their purchases.

The identification of sites of purchase can be of value for future marketing of any particular type of food for any specified purpose.

TABLE 2

FOODSTUFFS PURCHASED FROM DIFFERENT SUPPLIERS IN RURAL, URBAN  
AND STATEWIDE TAMIL NADU, AS PERCENTAGE OF CALORIES AND PROTEIN

Point of Purchase / Food Source	Calories, % of Total					Protein, % of Total		
	Rice Mills	Oil Mills	Flour Mills	Dal Mills	Sugar Mills	Rice Mills	Flour Mills	Dal Mills
RURAL								
Petty shops	99.5%	2.8%	71.5%	30.0%	--	100.0%	75.0%	30.0%
Provision stores,								
Coops, ration shops	--	79.5	2.6	41.0	89.0%	--	--	42.0
Vendors, veg. markets								
Shandy	0.5	7.7	21.0	14.5	11.0	--	25.0	14.0
Not paid for (homegrown)	--	10.0	4.9	14.5	--	--	--	14.0
URBAN								
Petty shops	99.8%	2.0%	87.0%	31.0%	--	100.0%	100.0%	37.5%
Provision stores,								
Coops, ration shops	--	95.0	6.0	55.7	98.5	--	--	62.5
Vendors, veg. markets,								
Shandy	0.2	3.0	1.0	11.4	1.5	--	--	--
Not paid for (homegrown)	--	--	5.0	1.9	--	--	--	--
STATEWIDE								
Petty shops	99.8%	3.0%	74.5%	30.5%	--	100.0%	67.0%	25.0%
Provision stores,								
Coops, ration shops	--	87.0	3.8	48.0	94.5	--	--	50.0
Vendors, veg. markets,								
Shandy	0.2	5.0	16.7	13.0	5.5	--	33.0	12.5
Not paid for (homegrown)	--	5.0	5.0	8.5	--	--	--	12.5



A SURVEY OF  
FOOD PROCESSING INDUSTRY  
IN TAMIL NADU

CONTENTS

	Page
CHAPTER I	
<u>INTRODUCTION</u>	
1.1 Background	1
1.2 Objectives	1
CHAPTER II	
<u>METHODOLOGY</u>	
2.1 Coverage of the Survey	3
2.2 Sampling Scheme	5
2.3 Data Collection	8
2.4 Estimation Procedure	12
2.5 Organization of the Report	16
CHAPTER III	
<u>FOOD PROCESSING SECTOR :</u> <u>GENERAL FEATURES</u>	
3.1 Size and Structure	18
3.2 Value of Output	21
3.3 Procurement of Raw Materials	26
3.4 Products Produced in the Food Processing Industry	28
3.5 Marketing and Sales Promotion	29
3.6 Technology and Techniques of Processing	33
3.7 Nutritional Standards	35

CONTENTS (Cont'd.)

	Page
CHAPTER IV <u>ANALYSIS BY INDUSTRY</u>	
4.1    Rice Mills	52
4.2    Flour Mills	70
4.3    Dal Mills	82
4.4    Bakeries	95
4.5    Dairies	108
4.6    Sugar Mills	121
4.7    Edible Oil Mills	132
4.8    Canning and Preserving of Fruits and Vegetables	148
4.9    Confectioneries	157
4.10    Soft Drinks/Aerated Water Industry	170
4.11    Sago Industry	184
4.12    Salt Industry	193
4.13    Gur Industry	202
4.14    Tea Curing Industry	203
4.15    Cashew Industry	212
4.16    Other Food Products Industry	223
CHAPTER V <u>ECONOMIC CHARACTERISTICS</u>	
5.1    Investment Costs	235
5.2    Cost Structure	243
5.3    Gross Value Added	249
APPENDIX I    Profiles of Selected Categories	254
APPENDIX II    Standard Errors of Some Selected Estimates	266

LIST OF TABLES

	Page	
2.3.1	Sample Size by Industry Category	9
2.4.1	Total number of Units in the Different Categories of Food Processing Industry	14
2.4.2	Projection Factors Used in Estimation for the Different Categories	15
3.1.1	Food Processing Industry in Tamil Nadu - Size and Structure	19
3.2.1	Value of Production and Service Charges Earned by the Food Processing Industry in Tamil Nadu	21
3.2.2	Shares of Different Categories in the Value of Production and Service Charges Earned	23
3.2.3	Value of Production of the Food Processing Industry	24
3.2.4	Service Charges Earned by the Food Processing Industry	25
3.7.1	Calorie and Protein Equivalents of the Processed Foods	36
3.7.2	Calorie and Protein Equivalents of Major Inputs	41
3.7.3	Calorie and Protein Equivalents of Materials Serviced	45
3.7.4	Nutrients Equivalents for Rice Mills and Oil Mills	50
4.1.1	Employment Structure of Rice Mills	53
4.1.2	Products Manufactured and Marketed by Rice Mills	56
4.1.3	Materials Serviced by Rice Mills	57
4.1.4	Value of Production in Rice Mills	59
4.1.5	Consumption of Major Inputs in Rice Mills	61
4.1.6	Percentage Recovery of Rice Products	61
4.1.7	Quantity of Paddy Produced by Rice Mills from Different Locations	62
4.1.8	Quantity of Rice Marketed in Different Locations	63

	Page	
4. 1. 9	Capital Investment in Rice Mills in Registered and Unregistered Sectors	65
4. 1. 10	Working Capital and Value of Production in Rice Mills	66
4. 1. 11	Cost Structure of Rice Mills	67
4. 1. 12	Selected Coefficients for Rice Mills	68
4. 2. 1	Employment Structure of the Flour Mills Industry	71
4. 2. 2	Production and Servicing Done in Flour Mills	73
4. 2. 3	Quantity Produced in Flour Mills	73
4. 2. 4	Procurement of Wheat by Flour Mills - Source and Transport Mode	74
4. 2. 5	Consumption of Raw Material by Flour Mills	75
4. 2. 6	Products Marketed by Flour Mills at Different Locations	76
4. 2. 7	Marketing Details of Flour Mills Industry	77
4. 2. 8	Fixed Capital Invested by the Flour Mills Industry	78
4. 2. 9	Working Capital of Flour Mills as Percent of Value of Production	79
4. 2. 10	Cost Structure of Flour Mills in the Registered Sector	80
4. 2. 11	Selected Coefficients for the Flour Mills Industry	81
4. 3. 1	Employment Structure of the Dal Mills Industry	83
4. 3. 2	Products Produced in Dal Mills	84
4. 3. 3	Products Manufactured and Marketed by Dal Mills	85
4. 3. 4	Materials Serviced by Dal Mills	86
4. 3. 5	Value of Production in Dal Mills	87
4. 3. 6	Quantity of Raw Materials Procured by Dal Mills From Different Locations	88

**SIDNEY M. CANTOR ASSOCIATES INCORPORATED**

	Page	
4.3.7	Raw Material Procurement Details of Dal Mills Industry	89
4.3.8	Quantity of Raw Materials Consumed by Dal Mills	90
4.3.9	Quantum of Products Sold in Different Locations by Dal Mills	91
4.3.10	Fixed Capital Investments by Dal Mills Industry	92
4.3.11	Working Capital of Dal Mills as Percent of Value of Production	93
4.3.12	Cost Structure of Dal Mills Industry	94
4.3.13	Selected Co-efficients of Dal Mills Industry	95
4.4.1	Employment Structure of the Bakery Industry	96
4.4.2	Value of Production in the Bakery Industry	97
4.4.3	Products Manufactured by the Bakery Industry	98
4.4.4	Raw Materials Procured by the Bakery Industry from Different Locations	99
4.4.5	Quantity of Different Raw Materials Procured by the Bakery Industry	100
4.4.6	Annual Consumption of Major Raw Materials by the Bakery Industry	101
4.4.7	Sales of Bakery Products at Different Locations	102
4.4.8	Quantity Marketed by the Bakery Industry at Different Locations	103
4.4.9	Amount Spent by the Bakery Industry on Advertising and Other Promotional Schemes	104
4.4.10	Fixed Capital Invested by the Bakery Industry	105
4.4.11	Working Capital of the Bakery Industry as Percent of Value of Production	106
4.4.12	Cost Structure of the Bakery Industry	107
4.4.13	Selected Co-efficients for the Bakery Industry	108
4.5.1	Employment Structure of the Dairy Industry	109

	Page	
4.5.2	Products Manufactured by the Dairy Industry	111
4.5.3	Details of Value of Production in Dairy Industry	112
4.5.4	Rated Capacity of the Dairy Industry	113
4.5.5	Consumption of Major Inputs by the Dairy Industry	113
4.5.6	Procurement Pattern of Milk by the Dairy Industry	114
4.5.7	Milk Distributed by Dairies to Different Locations	116
4.5.8	Investment on Fixed Capital by the Dairy Industry	117
4.5.9	Details of Working Capital in the Dairy Industry	118
4.5.10	Cost Structure of the Dairy Industry	119
4.5.11	Selected Co-efficients of the Dairy Industry	120
4.6.1	Employment Structure of the Sugar Mills Industry	122
4.6.2	Quantity Processed by Sugar Mills Industry	123
4.6.3	Sugarcane Procured by Sugar Mills from Different Sources	124
4.6.4	Details of Procurement of Sugarcane by Sugar Mills	125
4.6.5	Quantity of Sugar Marketed by Sugar Mills at Different Locations	126
4.6.6	Marketing Details of Sugar Mills Industry	127
4.6.7	Fixed Capital Investment by the Sugar Mills Industry	128
4.6.8	Working Capital of the Sugar Mills Industry	129
4.6.9	Cost Structure of the Sugar Mills Industry	130
4.6.10	Selected Co-efficients of the Sugar Mills Industry	131
4.7.1	Employment Structure of Edible Oil Mills Industry	134
4.7.2	Products Manufactured and Marketed by Edible Oil Mills	136
4.7.3	Materials Serviced by Edible Oil Mills	137
4.7.4	Value of Production in Edible Oil Mills	138
4.7.5	Consumption of Major Inputs by Edible Oil Mills	139
4.7.6	Percentage Recovery of Oils from Oilseeds	140
4.7.7	Procurement Pattern of Groundnut and Oilseeds by Edible Oil Mills	141
4.7.8	Distribution Pattern of Edible Oils	142
4.7.9	Fixed Capital Investments by the Edible Oil Mills Industry	143
4.7.10	Details of Working Capital of the Edible Oil Mills Industry	144

	Page	
4. 7. 11	Cost Structure of the Edible Oil Mills Industry	145
4. 7. 12	Selected Co-efficients of Edible Oil Mills Industry	147
4. 8. 1	Employment Structure of the Canning Industry	149
4. 8. 2	Production in the Different Strata of the Canning Industry	150
4. 8. 3	Value of Production in the Canning Industry	151
4. 8. 4	Procurement Pattern of Raw Materials by the Canning Industry	152
4. 8. 5	Consumption of Major Inputs by the Canning Industry	153
4. 8. 6	Quantity Marketed by the Canning Industry in Different Locations	153
4. 8. 7	Working Capital as Percent of Value of Pro- duction in Canning Industry	154
4. 8. 8	Cost Structure in the Canning Industry	155
4. 8. 9	Selected Co-efficients of the Canning Industry	156
4. 9. 1	Employment Structure of the Confectionery Industry	158
4. 9. 2	Quantity of Products Procured by the Confectionery Industry	159
4. 9. 3	Value of Production in the Confectionery Industry	160
4. 9. 4	Quantity of Raw Materials Consumed by the Confectionery Industry	161
4. 9. 5	Raw Material Procurement by the Confectionery Industry from Different Sources	162
4. 9. 6	Details of Purchase of Raw Materials by the Confectionery Industry	163
4. 9. 7	Quantity Marketed by the Confectionery Industry at Different Locations	164
4. 9. 8	Details of Marketing by the Confectionery Industry	165
4. 9. 9	Fixed Capital Investment of the Confectionery Industry	166
4. 9. 10	Cost Structure of the Confectionery Industry	168

	Page	
4.9.11	Selected Co-efficients of the Confectionery Industry	169
4.10.1	Employment Structure of the Soft Drinks/Aerated Water Industry	171
4.10.2	Value of Production in the Soft Drinks/Aerated Water Industry	172
4.10.3	Quantity of Products Produced by the Soft Drinks/Aerated Water Industry	173
4.10.4	Details of Procurement of Raw Materials by the Soft Drinks/Aerated Water Industry	174
4.10.5	Quantity of Raw Materials Procured by Soft Drinks/Aerated Water Industry from Different Sources	175
4.10.6	Quantity of Raw Materials Consumed by the Soft Drinks/Aerated Water Industry	176
4.10.7	Quantity of Squashes and Fruit Juices Marketed by the Soft Drinks/Aerated Water Industry at Different Locations	177
4.10.8	Quantity of Soda, etc. Marketed by the Soft Drinks/Aerated Water Industry at Different Locations	178
4.10.9	Transit and Handling Losses of Soft Drinks/Aerated Water Industry	178
4.10.10	Details of Marketing for the Soft Drinks/Aerated Water Industry	179
4.10.11	Fixed Capital Investment of the Soft Drinks/Aerated Water Industry	180
4.10.12	Working Capital as Per cent of Value of Production in the Soft Drinks/Aerated Water Industry	181
4.10.13	Cost Structure of the Soft Drinks/Aerated Water Industry	182
4.10.14	Selected Co-efficients of the Soft Drinks/Aerated Water Industry	183
4.11.1	Average Number of Days Worked by Units in the Sago Industry	184
4.11.2	Employment Structure of the Sago Industry	185
4.11.3	Quantity Produced by the Sago Industry	186

	Page	
4.11.4	Value of Production of the Sago Industry	187
4.11.5	Quantity of Raw Materials Procured by the Sago Industry from Different Sources	188
4.11.6	Quantity Marketed by the Sago Industry at Different Location and Modes of Transport Used	189
4.11.7	Fixed Capital Investment of the Sago Industry	190
4.11.8	Cost Structure of the Sago Industry	191
4.11.9	Selected Co-efficients of the Sago Industry	192
4.12.1	Employment Structure of the Salt Industry	194
4.12.2	Value of Production of the Salt Industry	195
4.12.3	Shares of the Different Strata in the Production in the Salt Industry	196
4.12.4	Quantity of Salt Marketed at Different Locations	197
4.12.5	Shares of Different modes of Transport in the Quantity of Salt Marketed	198
4.12.6	Fixed Capital of the Salt Industry	200
4.12.7	Selected Co-efficients of the Salt Industry	201
4.14.1	Employment Structure of the Tea Curing Industry	204
4.14.2	Value of Production of Tea	205
4.14.3	Quantity of Tea Marketed at Different Locations	207
4.14.4	Fixed Capital Investment of the Tea Curing Industry	208
4.14.5	Working Capital of the Tea Industry as Per cent of Value of Production	209
4.14.6	Cost Structure of the Tea Curing Industry	210
4.14.7	Selected Co-efficients of the Tea Curing Industry	211
4.15.1	Employment Structure of the Cashew Industry	213
4.15.2	Value of Production of the Cashew Industry	215
4.15.3	Quantity of Cashew Shell and Nut Procured from Different Locations	216
4.15.4	Quantity of Cashewnut and Shell Consumed by the Cashew Industry	218
4.15.5	Quantity of Cashewnut Marketed at Different Locations	219
4.15.6	Fixed Capital Investment of the Cashew Industry	221
4.15.7	Selected Co-efficients of the Cashew Industry	222

	Page
4.16.1	Employment Structure of the Other Food Products Industry 224
4.16.2	Value of Production of the Other Food Products Industry 225
4.16.3	Quantity of Products Produced by the Other Food Products Industry 226
4.16.4	Procurement of Raw Materials by the Other Food Products Industry 227
4.16.5	Raw Materials Purchased by the Other Food Products Industry from Different Locations 228
4.16.6	Quantity of Major Raw Materials Consumed by the Other Food Products Industry 229
4.16.7	Major Products Sold by the Other Food Products Industry 230
4.16.8	Transit and Handling Losses of Other Food Products Industry 231
4.16.9	Marketing Details of Other Food Products Industry 231
4.16.10	Amount Spent on Promotional Schemes by the Other Food Products Industry 232
4.16.11	Fixed Capital Investment by the Other Food Products Industry 233
4.16.12	Cost Structure of the Other Food Products Industry 234
4.16.13	Selected Co-efficients of the Other Food Products Industry 234
5.1.1	Estimates of Total Investments in Fixed Capital 237
5.1.2	Estimates of Investments in Land and Buildings 238
5.1.3	Estimates of Investments in Plant and Machinery 239
5.2.1	Cost Components of Food Processing Industry 243
5.2.2	Estimates of Total Cost of Production 245
5.2.3	Estimates of Material Cost 246
5.2.4	Estimates of Processing Cost 247
5.2.5	Estimates of 'Other Costs' 248
5.3.1	Estimates of Gross Value Added by Manufacture 251

**LIST OF CHARTS**

	Page
1. Percentage Shares of Registered and Unregistered Sectors — Number of Units and Value of Production	20
2. Value of Production and Protein Equivalents of Major Inputs	47
3. Value of Production and Calorie Equivalents of Major Inputs	48
4. Percentage Shares of Registered and Unregistered Sectors --- Fixed Capital Investment and Gross Value Added	240
5. Fixed Capital Investments and Protein Equivalents of Major Inputs	241
6. Fixed Capital Investments and Calorie Equivalents of Major Inputs	242
7. Gross Value Added and Protein Equivalents of Major Inputs	252
8. Gross Value Added and Calorie Equivalents of Major Inputs	253



## CHAPTER I

### INTRODUCTION

#### 1.1 Background

"The Tamil Nadu Study of Nutrition as an integrated system" is a project undertaken by the CANTOR/ATAC with the main objective of systematically analyzing the nutritional intake of pre-school children, pregnant and lactating mothers. The in-depth study of nutrition is to attempt establishment of relationships of relevant parameters in the chain from the inputs of food production, through processing and distribution, to consumption by the target population. Since food processing and distribution by the commercial sector forms an important and essential link in the chain, it was proposed to conduct a detailed survey of this sector. Commissioned by CANTOR/ATAC, the Operations Research Group, Baroda conducted this survey and this report presents the important findings.

#### 1.2 Objectives

The major objectives of the survey were to collect relevant data on the basis of an in-depth interview with processing units on:

- a) The number and size of the food manufacturing plants in the state according to established categories.
- b) Total food processed and total nutrient values of raw material inputs and output products.
- c) Marketing, advertising and sales procedures.
- d) Distribution and transport practices including wastage and handling losses.

- e) Raw material quantity, price and procurement sources.
- f) Cost structure of units including investments.

The survey was designed to elicit information on production, marketing and distribution, procurement of major inputs, storage facilities and technique, capital invested, cost structure and the total nutrient of inputs and outputs.

## CHAPTER II

### METHODOLOGY

#### 2.1 Coverage of the Survey

The Food Processing Industry is highly heterogeneous consisting of manufacturing units of different sizes engaged in producing a variety of food items. The manufacturing units are therefore classified on the basis of:

- a) Type of processing involved and the product manufactured.
- b) Size and structure of the manufacturing units.

The National Industrial Classification (N. I. C. ) of manufacturing units which provides the required classification by type of processing and products manufactured has been adopted. The following industrial categories are considered for the purpose of the study.

<u>N. I. C. Code</u>	<u>Description</u>
201	Slaughtering and preservation of meat
202	Manufacture of dairy products
203	Canning and preservation of fruits and vegetables
204	Canning of fish, etc.

**SIDNEY M. CANTOR ASSOCIATES INCORPORATED**

<u>N. I. C. Code</u>	<u>Description</u>
205-1	Flour mills
205-2	Rice mills
205-3	Dal mills
206	Bakeries
207-1	Sugar
207-2	Gur
208	Confectionery
209-2	Edible oils (other than hydrogenated oils)
209-3	Hydrogenated oils
209-4	Tea curing
209-5	Coffee curing
209-6	Cashew curing
209-9	Salt
209-10 (1)	Sago
209-10 (2)	Other miscellaneous food products
214	Soft drinks, aerated water

Classification by size of manufacturing units within each of the above industrial categories was done according to the Factories Act 1948, as follows:

1. Registered Sector: The units are registered under Sections 2m (i), 2m (ii), and Section 85 of the Factories Act, 1948; these units employ 10 persons or more with power, or 20 persons or more without power.
2. Unregistered Sector: The units are not registered under Factories Act, 1948; they employ less than 10 persons with power, or less than 20 persons without power.

## 2.2 Sampling Scheme

A total of 351 units in the registered and 649 units in the unregistered sectors were selected as described below:

- a) Registered Sector: The 18 categories of food processing industry in this sector are classified in accordance with the Annual Survey of Industries, viz., Census sector, employing 50 persons or more with power, or 100 persons or more without power and sample sector consisting of the remaining units. Selections from the Census sector was done as follows:
  - i) Select all units of a category if the number of units in this sector is less than 5.
  - ii) In categories where the number of units in this sector is more than 5, select all the units employing 400 persons or more.
  - iii) Draw a sample from among the units employing less than 400 persons.

In the sample sector, complete enumeration was done in the case of categories with less than 13 units and sampling was resorted to in the case of other categories.

The units in the Census and Sample sectors were selected, using the list of factories maintained by the Chief Inspector of Factories as the sampling frame.

- b) Unregistered Sector: This sector covers the manufacturing units in the Food Processing Industry employing 5 persons or more but not registered under the Factories Act, 1948. Based on the Census of such small-scale industries conducted by the Central Statistical Organization in 1970, a total sample of 449 units was allocated over the 17 categories. In accordance with the representation given in the Registered Sector for each category and, again based on the relative importance of these categories, different sampling proportions were chosen for the various categories; within each category the allocated samples were selected by the simple random sampling method using the C. S. O. Census list as sampling frame.

An additional sample of 200 units was allocated over the categories 203, 205-1, 205-2, 205-3, 206, 208, 209, 209-10, and 214 to account for the manufacturing units employing less than 5 persons. The samples were distributed over these 9 categories proportionate to the total number of units in each category as per the C. S. O. Census distribution of small-scale units.

The actual selection of these 200 sample units was done at the time of the field work in some selected places spread over the districts in which a particular category is concentrated, as per the C. S. O. Census.

The above sampling scheme has resulted, in short, in the following six strata. The short names by which they are referred in this report as well as the corresponding codes used for the purpose of tabulation are also shown against each stratum.

**SIDNEY M. CANTOR ASSOCIATES INCORPORATED**

<u>Number</u>	<u>Description</u>	<u>Short Name</u>	<u>Stratum Code</u>
1.1.1	<u>Registered Units - Census Sector</u>  Total number of units is less than 5 and hence all units are selected.	Census Sector - St. 11	11
1.1.2	<u>Registered Units - Census Sector</u>  Units employ 400 or more persons hence all units are selected.	Census Sector - St. 12	12
1.1.3	<u>Registered Units - Census Sector</u>	Census Sector - St. 12	13
1.2.1	<u>Registered Units - Sample Sector</u>  Units employ less than 50 persons with power (or less than 100 persons without power); sampling carried out.	Sample Sector	21
2.1.1	<u>Unregistered Units</u>  Units employ 5 to 9 persons with power (or 5 to 19 persons without power); sampling carried out.	C.S.O. Sector	31
2.2.1	<u>Unregistered Units</u>  Units employ less than 5 persons; samples are selected.	1 - 4 Sector	41

### **2.3 Data Collection**

Advance information, along with the survey instrument, was sent to each of the selected manufacturing units, explaining the purpose of the survey, to facilitate data collection and to minimize the non-response rate. Also, suitable additional samples were provided to substitute for the units from which information could not be obtained due to various reasons.

The field work was carried out during August-November, 1971 in all the 14 districts of Tamil Nadu. The following table shows the final position of the successfully completed calls in each stratum within individual categories.

Table - 2.3.1: Sample Size by Industry Category

Category	Census Sector							Grand Total
	Less than 5 Units	Employment over 400	Employment between 50 & 400	Sample Sector	Sub-total	CSO	Quota Samples	
	(11)	(12)	(13)	(21)		(31)	(41)	
Slaughtering and preservation of meat	-	-	-	-	-	1	-	1
Manufacture of dairy products	1	-	-	8	9	1	-	10
Canning and preservation of fruits and vegetables	1	-	-	-	1	23	12	36
Canning of fish, etc.	-	-	-	1	1	2	-	3
Flour mills	-	-	4	8	12	42	29	83
Rice mills	-	-	3	82	85	91	35	211
Dal mills	-	-	-	12	12	20	9	41
Bakeries	-	-	-	9	9	56	35	100
Sugar	-	6	2	-	8	2	-	10

Table - 2.3.1 - Sample Size by Industry Category (Continued)

Census Sector								
Category	Less than 5 Units	Employment over 400	Employment between 50 & 400	Sample Sector	Sub-Total	CSO	Quota Samples	Grand Total
	(11)	(12)	(13)	(21)		(31)	(41)	
Gur	-	-	-	-	-	17	-	17
Confectionery	1	-	-	6	7	24	9	40
Edible oils (other than hydrogenated oils)	3	-	-	52	55	46	31	132
Hydrogenated oils	-	-	-	-	-	-	-	-
Tea curing	-	-	5	9	14	1	-	15
Coffee curing	-	-	-	3	3	-	-	3
Cashew curing	-	2	-	3	5	5	-	10
Salt	-	-	4	2	6	11	-	17
Sago	-	-	8	45	53	-	-	53

Table - 2.3.1 - Sample Size by Industry Category (Continued)

Category	Census Sector							Grand total
	Less than 5 Units	Employment over 400	Employment between 50 & 400	Sample Sector	Sub-Total	CSO	Quota Samples	
	(11)	(12)	(13)	(21)		(31)	(41)	
Soft drinks, aerated water	3	-	-	7	10	36	30	76
Other miscellaneous food products	1	-	-	4	5	40	13	58
Total	10	8	26	251	295	418	203	916
Number of units contacted	13	11	41	317	382	510	238	1130

2.4 Estimation Procedure

To obtain the estimates of the various characteristics for a given industry-category, the individual stratum estimates are first built up in accordance with the sampling scheme adopted for the stratum; these are then pooled over the strata to yield the final estimates for the industry.

For the  $i^{\text{th}}$  industry,

let  $n_{ij}$  = number of completed sample units in the  $j^{\text{th}}$  stratum,

$x_{ijk}$  =  $k^{\text{th}}$  sample value of variable X in the  $j^{\text{th}}$  stratum,

$N_{ij}$  = Total number of units (establishments) in the  $j^{\text{th}}$  stratum,

and let  $m_{ij} = N_{ij}/n_{ij}$ , if  $n_{ij} \neq 0$

Then, the estimate of X for the  $i^{\text{th}}$  industry from strata 13, 21, 31 and 41 is given by

$$\hat{X}_{ij} = m_{ij} \sum_k x_{ijk} \quad k = 1, 2, \dots, n_{ij}$$

$$\hat{X}_i = \sum_j \hat{X}_{ij} \quad (j \text{ over the strata 13 to 41})$$

For the strata 11 and 12, the sample total itself is taken as the estimate for the stratum (i. e.,  $m_{ij} = 1$  for strata 11 and 12) since all existing units have been included in the sample.

However, some of the units did not cooperate in furnishing the relevant data in time and as such, necessary care should be taken in using the estimates from these strata.

$$\text{let } \hat{X}_i = \sum_k x_{ijk} \quad k = 1, 2, \dots, n_{ij}$$

for stratum 11 or 12

$$\text{then, } \hat{X}_i = \hat{X}_i + \hat{X}_i$$

In the absence of information on the total number of establishments in stratum 41 for each category, the total number of units in stratum 41 (i. e., employing less than 5 persons) in the food processing industry as a whole was distributed over the individual categories on the basis of the pattern observed in stratum 31 (C. S. O. Sector). It is necessary, therefore, to compare these estimates of total number of establishments with industry-wise Census figures as and when they are available.

The strata-wise total number of establishments and  $m_{ij}$ 's for each industry are given in the following tables - 2.4.1 and 2.4.2, respectively.

Table - 2.4.1 - Total Number of Units in the Different Categories of the Food Processing Industry

Category	Census Sector							Grand Total
	Less than 5 Units	Employment over 400	Employment between 50 & 400	Sample Sector	Sub-Total	CSO	Quota Samples	
	Stratum 11	Stratum 12	Stratum 13	Stratum 21	Stratum 31	Stratum 41		
Slaughtering and preservation of meat	-	-	-	-	-	4	-	4
Dairies	1	-	-	10	11	2	-	13
Canning of fruits & vege.	1	-	-	2	3	104	337	444
Canning of fish, etc.	-	-	-	2	2	2	-	4
Flour mills	-	-	6	26	32	416	1404	1852
Rice mills	-	-	6	754	760	999	3372	5131
Dal mills	-	-	-	31	31	86	290	407
Bakeries	1	-	-	12	13	745	2514	3272
Sugar mills	-	7	14	5	26	8	-	34
Gur industry	-	-	-	-	-	113	-	113
Confectionery	1	-	-	6	7	72	243	322
Edible oil mills	3	-	-	218	221	698	2356	3275
Hydrogenated oil mills	2	-	-	2	4	-	-	4
Tea curing industry	-	1	45	79	125	9	-	134
Coffee curing industry	-	-	7	11	18	-	-	18
Cashew industry	-	3	13	6	22	9	-	31
Salt industry	-	-	17	18	35	169	-	204
Sago industry	-	-	14	282	296	-	-	296
Soft drinks/aerated water	4	-	-	26	30	438	1 478	1946
Other food products industry	2	-	-	22	24	597	2015	2636
<b>Total</b>	<b>13</b>	<b>11</b>	<b>124</b>	<b>1512</b>	<b>1660</b>	<b>4471</b>	<b>14009</b>	<b>20140</b>

Note: The total of 14,009 units in stratum 41 has been distributed over categories in the same proportion as in stratum 31.

Table 2.4.2 - Projection Factors Used in Estimation  
for the Different Categories

	<u>Census Sector</u>					
	Less than 5 Units	Employment over 400	Employment between 50 & 400	Sample Sector	CSO	Quota Samples
	Stratum 11	Stratum 12	Stratum 13	Stratum 21	Stratum 31	Stratum 41
Slaughtering and preservation of meat	-	-	-	-	4.000	-
Dairies	1.000	-	-	1.250	2.000	-
Canning of fruits & vege.	1.000	-	-	-	4.522	28.083
Canning of fish, etc.	-	-	-	2.000	1.000	-
Flour mills	-	-	1.500	3.250	9.905	48.414
Rice mills	-	-	2.000	9.195	10.978	96.343
Dal mills	-	-	-	2.583	4.300	32.222
Bakeries	1.000	-	-	1.333	13.304	71.829
Sugar mills	-	1.000	7.000	-	4.000	-
Gur industry	-	-	-	-	6.647	-
Confectionery	1.000	-	-	1.000	3.000	27.000
Edible oil mills	1.000	-	-	4.192	15.174	76.000
Tea curing industry	-	-	9.000	8.778	9.000	-
Coffee curing industry	-	-	-	3.667	-	-
Cashew industry	-	1.000	-	2.000	1.800	-
Salt industry	-	-	4.250	9.000	15.364	-
Sago industry	-	-	1.750	6.267	-	-
Soft drinks/aerated water	1.000	-	-	3.714	12.167	49,267
Other food products in-	1.000	-	-	5.500	14.925	155.000

## 2.5 Organization of the Report

Chapter III presents the general features of the food processing sector in terms of various categories of industries.

Chapter IV presents, by category, the different characteristics of the industry. The various functional components are discussed. Four of the categories viz., Canning of fish etc., Slaughtering and preservation of meat, Coffee curing and Hydrogenated oils have not been analyzed in this report because of inadequate effective samples.

Chapter V presents a brief discussion on some of the important economic characteristics of the food processing industry.

Profiles of six major industry categories viz., Rice mills, Flour mills, Dal mills, Bakeries, Dairies and Edible oil mills are presented as an Appendix - I to the report. In Appendix - II, standard errors of the estimates of quantity produced for principal products of major industry categories are presented.

It would be appropriate here to define some of the terms used in the report.

Value of Production is the value realized by the industry after deducting from the actual price, the cost of transportation to the point of delivery, royalty and taxes on sale. In other words, it excludes distribution costs.

Processing Units are the units which procure the raw materials, process it and sell the finished products.

Servicing Units are the units which hire out the processing facility and charge for the services rendered and do not have any procurement or selling activities.

## CHAPTER III

### FOOD PROCESSING SECTOR: GENERAL FEATURES

In this Chapter, some of the general characteristics of the food industry, such as size and structure, value of output, procurement pattern of raw materials, processed foods, by-products and waste, marketing details, processing technology and nutrient equivalents of raw materials and finished products are discussed to facilitate a quick understanding of the functioning of the entire food processing industry.

#### 3.1 Size and Structure

The total number of industrial units in the food processing sector in Tamil Nadu is estimated as 20,084, of which 18,474 units or 92% of the total are the small-scale ones classified under the unregistered sector.

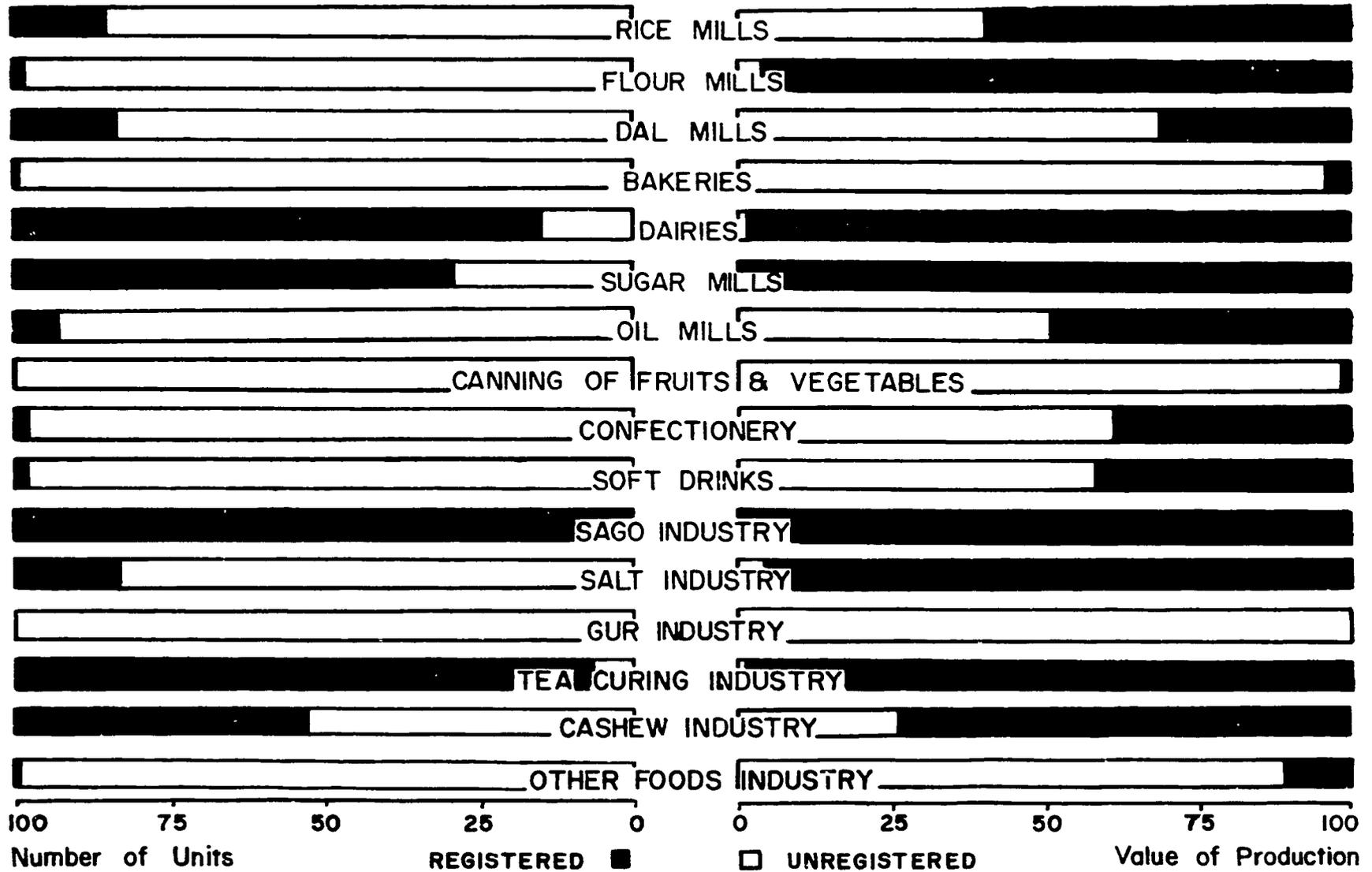
The largest number of food processing units are rice mills, followed by oil mills and bakeries. Table - 3.1, gives the distribution of industrial units in the registered and unregistered sectors among various categories of food processing industry in Tamil Nadu. The corresponding value of production (exclusive of service charges earned) and the rank of each category on the basis of total value of production are also shown against individual categories. A detailed discussion on value of production is presented in Section 3.2.

Table 3.1.1 - Food Processing Industry in Tamil Nadu - Size and Structure

Category	Estimated No. of Units			Value of Production (in Rs. '000s)			Rank Based on Value of Production
	Registered Sector	Unregistered Sector	Total	Registered Sector	Unregistered Sector	Total	
Rice mills	760	4,371	5,131	354,991	246,723	601,714	2
Flour mills	32	1,820	1,852	248,970	10,539	259,509	5
Dal mills	31	376	407	21,752	48,348	70,100	9
Bakery	12	3,259	3,271	3,177	72,405	75,582	8
Dairy	11	2	13	41,032	856	41,888	10
Sugar	20	8	28	359,412	580	359,992	3
Oil	221	3,054	3,275	371,361	400,695	772,056	1
Canning of fruits and vegetables	1	441	442	9	2,692	2,701	15
Confectionery	7	315	322	4,291	7,127	11,418	14
Soft drinks	29	1,916	1,945	10,939	15,687	26,626	11
Sago	296	-	296	93,205	-	93,205	7
Salt	35	169	204	19,284	844	20,128	12
Gur	-	113	113	-	40	40	16
Tea curing	124	9	133	325,248	2,754	328,002	4
Cashew curing	8	9	17	14,409	5,182	19,591	13
Other foods	23	2,612	2,635	12,083	99,590	111,673	6
Total	1,610	18,474	20,084	1880,163	914,062	2794,225	

Source: ORG Survey, 1971.

**CHART I**  
**PERCENTAGE SHARES OF**  
**REGISTERED AND UNREGISTERED SECTORS**



3.2 Value of Output

The total gross earnings of the food processing industry in Tamil Nadu in 1970-1971 is estimated at Rs. 2,874 million, of which Rs. 80 million is earned by way of service charges for hiring out the processing facility. The registered sector accounts for 66.3 % of the total gross earnings. The following table shows the percentage shares of value of goods produced and service charges earned in the two sectors.

Table 3.2.1 - Value of Production and Service Charges Earned by the Food Processing Industry in Tamil Nadu

Description	Registered Sector		Unregistered Sector		Total	
	Amount	%	Amount	%	Amount	%
Value produced	1,880	93.5	914	94.2	2,794	97.2
Service charges earned	24	6.5	56	5.8	80	2.8
Total	1,904	100.0%	970	100.0%	2,874	100.0%

Source: ORG Survey, 1971.

The estimated value of production relates to an estimated number of 13,476 units (1,244 in the registered and 12,232 in the unregistered sectors), which accounts for all the processing units and composite units which carry out servicing operation partly. Edible oil mills and rice mills together, conforming to the pattern of agricultural production and consumption in the state, constitute around 50%

of the total value produced in the food processing industry. It can be seen from table 3.2.2 that in both the sectors edible oil mills accounts for the largest share in the total value of production, followed by rice mills and sugar mills. Tea curing industry and flour mills are the other two categories with significant shares in the total value of production.

Analyzing the role of the two sectors for the different categories, it is seen that the registered sector accounts for more than 90% of the total value of production in the case of dairy, flour mills, sugar mills, tea curing, salt and sago industries. The unregistered sector has high shares in the total value of production of dal mills, bakery, canning of fruits, and gur industries. Table 3.2.3 shows the constitution of the two sectors in the total value of production of the different categories and the value produced per unit. In terms of output per unit, sugar mills rank first, followed by flour mills in the food processing industry as a whole and in the registered sector. In the unregistered sector, however, rice milling industry has the highest output per unit, followed by cashew curing industry.

Service charges earned by the food processing industry in 1970-1971 is estimated as Rs. 80 million, about three-fourth of it coming from rice mills and little over one-tenth from both flour mills and edible oil mills. The pattern in the unregistered sector is similar to that of the industry as a whole. Only notable change in the registered sector is that the contribution of flour mills industry in the total service charges earned by this sector is very insignificant (table 3.2.2). It may be noted that servicing is done in only 9 of the categories and, in some cases, only in one of the two sectors. From table 3.2.4, which give details of service charges earned by the different categories, it can be seen that in the case of four important categories, viz., rice mills, flour mills, oil mills, and edible oil mills, the largest share comes from the unregistered sector, indicating the dependence of this sector on servicing activity.

Table - 3.2.2: Share of Different Categories in the Value of Production and Service Charges Earned

Category	Percent share in the value of production			Percent share in the service charges earned		
	Regis-tered Sector	Unregis-tered Sector	Total	Regis-tered Sector	Unregis-tered Sector	Total
Rice Mills	18.88	26.99	21.53	89.56	67.54	74.12
Flour mills	13.24	1.15	9.29	0.04	15.98	11.22
Dal mills	1.15	5.29	2.51	0.93	3.31	2.60
Bakeries	0.17	7.92	2.70	-	-	-
Dairies	2.18	0.09	1.50	-	-	-
Sugar mills	19.12	0.06	12.88	-	-	-
Edible oil mills	19.75	43.85	27.63	7.99	11.20	10.24
Canning of fruits & vegetables	Neg.	0.29	0.10	-	-	-
Confectionery	0.23	0.78	0.41	-	-	-
Soft drinks /aerated water industry	0.58	1.72	0.95	-	-	-
Sago industry	4.96	-	3.34	0.10	-	0.03
Salt industry	1.03	0.09	0.72	-	0.44	0.30
Gur industry	-	Neg.	Neg.	-	0.16	0.12
Tea curing industry	17.30	0.30	11.74	-	-	-
Cashew industry	0.77	0.57	0.70	1.38	-	0.41
Other food products industry	0.64	10.90	4.00	-	1.37	0.96
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: ORG Survey, 1971

**Table - 3.2.3: Value of Production of the Food Processing Industry**

(Value in '000 Rs.)

Category	Registered Sector			Unregistered Sector			Total	
	Value	Percent Share	Value per Unit	Value	Percent Share	Value per Unit	Value	Value per Unit
Rice mills	354,991	59.0	757	246,723	41.0	631	601,714	701
Flour mills	248,970	96.0	8,585	10,539	4.0	527	259,509	5,296
Dal mills	21,752	31.0	906	48,348	69.0	170	70,100	227
Bakeries	3,177	4.2	265	72,405	95.8	22	75,582	23
Dairies	41,032	98.0	3,730	856	2.0	428	41,888	3,222
Sugar mills	359,412	99.8	17,971	580	0.2	73	359,992	12,857
Edible oil mills	371,361	48.1	2,350	400,695	51.9	148	772,056	270
Canning of fruits & Vegetables	9	0.3	9	2,692	99.7	6	2,701	6
Confectionery	4,291	37.6	613	7,127	62.4	22	11,418	35
Soft drinks/aerated water industry	10,939	41.1	377	15,687	58.9	8	26,626	14
Sago industry	93,205	100.0	296	-	-	-	93,205	296
Salt industry	19,284	95.8	551	844	4.2	5.5	20,128	106
Gur industry	-	-	-	40	100.0	-	40	-
Tea curing industry	325,248	99.2	2,623	2,754	0.8	306	328,002	2,466
Cashew industry	14,409	73.5	2,058	5,182	26.5	576	19,591	1,224
Other food products industry	12,083	10.8	525	99,590	89.2	38	111,673	42
<b>Total</b>	<b>1,880,163</b>	<b>67.0</b>	<b>1,519</b>	<b>914,062</b>	<b>33.0</b>	<b>75</b>	<b>2,794,225</b>	<b>208</b>

Source: ORG Survey, 1971

Table - 3.2.4: Service Charges Earned by the  
Food Processing Industry

(Amount in '000 Rs.)

Category	<u>Registered Sector</u>			<u>Unregistered Sector</u>			Total	
	Amount	Percent Share	Amount per Unit	Amount	Percent Share	Amount per Unit	Amount	Amount per Unit
Rice mills	21,379	36.1	36.7	37,825	63.9	8.8	59,204	12.1
Flour mills	10	0.1	3.3	8,949	99.9	5.0	8,959	5.0
Dal mills	222	10.7	22.2	1,852	89.3	13.2	2,074	13.8
Edible oil mills	1,907	23.3	21.4	6,272	76.7	5.4	8,179	6.6
Sago industry	25	100.0	1.9	-	-	-	25	1.9
Salt industry	-	-	-	246	100.0	16.4	246	16.4
Gur industry	-	-	-	93	100.0	13.3	93	13.3
Cashew industry	328	100.0	328.0	-	-	-	328	328.0
Other food products industry	-	-	-	767	100.0	3.6	767	3.6
Total	23,871	30.0	34.2	56,004	70.0	7.3	79,875	9.6

Source: ORG Survey, 1971

### 3.3 Procurement of Raw Materials

Procurement of raw materials in the food processing industry in Tamil Nadu is predominantly localized, the purchases being made from sources in the same locality or in the same district where the unit is functioning. However, in the case of dal mills, different types of grams are procured from neighboring states and in the case of the cashew industry, raw materials are being imported. Price fluctuations, seasonality in supplies and credit requirements are reported as the major problems faced by the industries in the procurement of raw materials. Details of major raw materials, sources of supply and problems faced for the individual industries are summarized below:

<u>Category</u>	<u>Major raw material</u>	<u>Major sources of supply</u>	<u>Problems faced</u>
Rice mills	Paddy	Local within state	Price fluctuation, gov't. regulations
Flour mills	Wheat	FCI	Poor quality limited supply, transport difficulties
Dal mills	Tur gram, black gram, green gram	Other states	Price fluctuations, inadequate credit
Bakeries	Maida, sugar, vanaspaty, oils, eggs	Local, within district	Price fluctuations, poor quality inadequate credit
Dairies	Milk, milk powder	Local, within district	Seasonality in supply, limited supply, poor quality

<u>Category</u>	<u>Major raw material</u>	<u>Major sources of supply</u>	<u>Problems faced</u>
Sugar mills	Sugar-cane	Local, within district	Price fluctuations, inadequate credit, seasonality in supply
Edible oil mills	Groundnut (pods & kernel), gingelly seeds	Local, within state, other states	Price fluctuations, inadequate credit, seasonality in supply
Canning of fruits & vegetables	Fruits (mango, lime, lemon, banana), sugar, spices, khandasari	Local, within district	Price fluctuations inadequate credit, seasonality in supply
Confectionery	Sugar, groundnut kernel	Local, within district	Price fluctuations, inadequate credit, poor quality
Soft drinks / aerated water industry	Sugar, carbon dioxide, essence	Local, within district	Price fluctuations inadequate credit, poor quality
Sago industry	Tapioca	Local, within district, other states	Price fluctuations, seasonality in supply, poor quality
Salt industry	Sea water	Local	Price fluctuations, non-availability of credit
Gur industry	Palm juice	Local	Seasonality in supply, limited supply

<u>Category</u>	<u>Major raw material</u>	<u>Major sources of supply</u>	<u>Problems faced</u>
Tea curing industry	Green tea leaves	Local, within	Poor quality limited supply, price fluctuations
Cashew industry	Cashew nut (whole)	Imports, other states	Poor quality, limited supply, price fluctuations
Other food products industry	Maida, coffee seeds	Local, within state	Inadequate credit, poor quality, price fluctuations

### 3.4 Products Produced in the Food Processing Industry

The major finished products, by-products and waste produced in each category of the food processing industry are given below:

<u>Category</u>	<u>Major Products</u>	<u>By-products and Waste</u>
Rice mills	Rice	Rice brokens, rice bran,
Flour mills	Maida, atta, suji (rava)	Wheat bran
Dal mills	Tur dal, black gram dal, (urid dal), green gram dal, (mung dal)	Dal flours and dust
Bakeries	Bread, bun, biscuits, rusk, cake	
Dairies	Whole milk, toned milk	Butter, ghee
Edible oil mills	Groundnut oil, gingelly oil	Oil cakes, husks

<u>Category</u>	<u>Major Products</u>	<u>By-products and Waste</u>
Sugar mills	Sugar (cane)	Molasses, bagasse
Canning of fruits & vegetables	Syrups, squashes	-
Confectionery	Toffees, sugar confectionery, manila cake	-
Soft drinks / aerated water industry	Soda water, sweet water	-
Sago industry	Sago, starch	Thippi (Tapioca bagasse)
Salt industry	Salt	-
Gur industry	Palm gur	-
Tea curing industry	Cured tea leaves	Tea dust
Cashew industry	Cashew kernel	Cashew shell oil, cashew shell
Other food products industry	Vermicelli, coffee powder	-

### 3.5 Marketing and Sales Promotion

Distribution of processed foods is also very much localized in the food processing sector though this operation extends to a wider area than procurement. Cashew curing industry stands out as an exception with most of its sales exported to other countries and other states. The other industries having considerable amount of

sales outside the state are sago, tea curing and flour mills. Private traders (wholesale and retail) are the major channels of distribution, though sales directly to ultimate consumers are not uncommon. Limited demand, seasonal fluctuations in the demand pattern and inadequate credit facilities are reported to be the major marketing problems of the food processing industry.

Sales promotional efforts in the food processing sector are, generally, not very significant except in the case of large-scale units in the sugar, flour mills, tea curing and cashew industries which report some organized measures of sales promotion. There is no common pattern in advertising by the different industry categories. Packing materials, boardings and miscellaneous low-cost methods are the popular media of advertising employed by the food processing industry.

The marketing details and sales promotional efforts in the various categories of industries in the food processing sector are as follows:

<u>Category</u>	<u>Major Markets</u>		<u>Sales Promotion</u>	
	<u>Market Centers</u>	<u>Channels</u>	<u>Methods Employed</u>	<u>Problem Faced</u>
Rice mills	Local, state	Private traders	Packing Materials	Government regulations, inadequate credit, low profit margin
Flour mills	State, country	Private traders	Press advertising	Limited demand, low profit margin
Dal mills	Local, state	Private traders	Press advertising	Limited demand, taxation, competition
Bakeries	Local, district	Directly to customers, private traders	Dealer incentive schemes, advertising	Limited demand, inadequate credit
Dairies	Local, district	Directly to customers, gov't agency	Press advertising	Milk availability, distribution cost seasonal demand
Sugar mills	State, district	Private traders	Press advertising	Government regulations
Edible oil mills	Local, state	Private traders, directly to customers	Packing materials, press, adv.	Inadequate credit, taxation, high cost of production
Canning of fruits & vegetables	Local, district	Private traders	Packing materials, hoardings	Limited demand, seasonal fluctuation

<u>Category</u>	<u>Major Markets</u>		<u>Sales Promotion</u>	
	<u>Market Center</u>	<u>Channels</u>	<u>Methods Employed</u>	<u>Problem Faced</u>
Confectionery	Local, state	Private traders, directly to customers	Packing materials, Press advertising	High cost of production, Limited demand
Soft drinks/aerated water industry	Local, State	Private traders, directly to customers	Hoardings, Packing paper	Seasonal demand, inadequate credit
Sago industry	Local, district, country	Private traders, brokers	All modes	Seasonal demand, high cost of production, inadequate credit
Salt industry	Local, district	Private traders	Press advertising	Inadequate credit, distribution cost
Gur industry	Local	Private traders	--	Inadequate credit
Cashew industry	Exports, country	Private traders, directly to customers	Press advertising	Taxation, distribution cost
Tea curing industry	Country, local	Private traders, specific companies	Press advertising	Taxation, government regulations
Other food products industry	Local, district	Private traders, directly to customers	Packing paper, Press advertising	Inadequate credit limited demand, distribution cost

### 3.6 Technology & Techniques of Processing

Since most of the units in the food processing sector are small-scale ones, conventional techniques in processing is the common phenomenon. Modern technology and equipment have not made significant impact in the food processing industry in general, but for the dairy, sugar and tea curing industries. The technology and techniques employed by the different categories are given below:

<u>Category</u>	<u>Technology &amp; Technique Employed</u>	<u>Remarks</u>
Rice mills	Modern/traditional	Hullers; huller/sheller; modern rice mills
Flour mills	Modern/traditional	Roller mills, conventional grinders
Dal mills	Traditional	Conventional grinders used
Bakeries	Modern/traditional	Small-scale units adopt conventional methods
Dairies	Modern and pasteurization	Since most of the dairy plants are now run by the government or co-operatives they are built with modern technology and are using pasteurization technique
Sugar mills	Modern	Modern machinery used
Edible oil mills	Modern/traditional	Solvent extraction plants, expellers, rotaries, traditional 'ghanis', are the different forms of machinery used for oil extraction

<u>Category</u>	<u>Technology &amp; Technique Employed</u>	<u>Remarks</u>
Canning of fruits and vegetables	Traditional/modern	Run at small-scale levels. Practically no use of machinery
Confectionery	Traditional/modern	Most of the units are small-scale ones. Conventional machines are used sparingly.
Soft drinks / aerated water industry	Modern/traditional	Except for a few large size units with sophisticated machinery, small-scale units are only conventional machines for bottling and corking
Sago industry	Traditional	Types of machinery used same; only capacity varies depending on the size of the unit
Salt industry	Traditional	--
Gur industry	Traditional	Machinery not used
Tea curing industry	Modern/traditional	Most of the units are large size ones and use modern machinery for tea curing
Cashew industry	Modern/traditional	Modern equipments are used for packing; pneumatic foreign matter segregators; fumigation chambers
Other food products industry	Traditional	Low capacity machinery used in most of the units

### 3.7 Nutritional Standards

One of the very important objectives of this survey is to assess the total nutrients available to the target group from the food processing sector and nutrients lost during processing. This "processing loss" can be exactly ascertained once the nutrient equivalents of both finished products and raw materials that go in to make these finished products are available. However, information on nutrient equivalents for some of the products, especially those which do not have any standard ingredient composition such as pickles, syrups, fruit juices, aerated sweet drinks, etc., are not readily available. As such, nutrient equivalents (in terms of protein and calories) of the available items are computed and presented in the tables 3.7.1 to 3.7.3. Protein and calorie equivalents for the processed foods, for major inputs (corresponding to the finished products) and for raw materials serviced are obtained by multiplying the estimates of quantities produced, consumed and serviced by the standard nutrient values. The nutrient values of individual items, used for the purpose of this analysis, are also shown against each item in the tables for easy reference. In using the nutrient tables, it is important to note the following assumptions that were made while calculating the nutrient equivalents:

- (1) Bun is same as bread
- (2) Starch is same as sago
- (3) All sweets and toffees are the same
- (4) Cashew shell is 25% of cashew kernels
- (5) Nutrient values of flours and brokens are same as whole grain

Table - 3.7.1: Calorie and Protein Equivalents of the Processed Foods

<u>Category/Processed Item</u>	<u>Total Food Value Processed (tonnes)</u>	<u>Standard Calorific Value (kcal/100g.)</u>	<u>Total Calories (million kcals)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Rice Mills</b>					
1. Rice	543,201	346	1,879,475	6.4	34,765
2. Rice broken	46,881	346	162,206	6.4	3,000
3. Rice bran	99,564	*a	--	*a	--
Sub-total	689,646		2,041,681		37,765
<b>Flour Mills</b>					
1. Maida	152,512	348	530,742	11.0	16,776
2. Suji/rava	49,037	348	170,650	10.4	5,100
3. Atta	31,778	341	108,364	12.1	3,845
4. Bran-wheat	56,262	*b	--	*b	--
Sub-total	289,589		809,756		25,721
<b>Dal Mills</b>					
1. Tur dal	16,555	335	55,457	22.3	3,692
2. Tur broken and flour	261	335	872	22.3	57
3. Urid dal	13,016	347	45,168	24.0	3,124
4. Urid broken and flour	2,082	347	7,223	24.0	499

Table - 3.7.1 (cont'd)

<u>Category/Processed Item</u>	<u>Total Food Value Processed (tonnes)</u>	<u>Standard Calorific Value (kcal/ 100 g.)</u>	<u>Total Calories (million kcals)</u>	<u>Standard Protein Value (gms /100 g.)</u>	<u>Total Protein (tonnes)</u>
5. Mung dal	1,691	348	5,887	24.5	415
6. Mung broken and flour	36	348	128	24.8	9
Sub-total	33,641		114,735		7,796
<b>Bakeries</b>					
1. Bread	19,571	245	47,940	8.3	1,624
2. Biscuits	7,669	492	37,732	6.5	498
3. Bun	5,389	245	17,316	8.3	587
4. Cakes	1,565	450	8,398	5.0	93
Sub-total	34,494		111,386		2,802
<b>Dairies</b>					
1. Whole milk	33,503	92	30,822	3.8	1,273
2. Toned milk	1,211	29	351	2.5	30
Sub-total	34,714		31,173		1,303
<b>Sugar mills</b>					
1. Cane sugar	225,401	398	897,096	0.1	225

Table - 3.7.1 (cont'd)

<u>Category/Processed Item</u>	<u>Total food Item Processed (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Edible Oil Mills</b>					
1. Groundnut oil	74,769	900	672,924	0	nil
2. Gingelly oil	52,766	900	474,894	0	nil
3. Coconut oil	7,423	900	66,808	0	nil
Sub-total	134,958		1,214,626		nil
<b>Canning of Fruits and Vegetables</b>					
1. Syrup, squashes, fruit juice	503	130 *c	9	0.1	--
2. Pickles	358	*b	--	*b	--
3. Fruit jam	253	*b	--	*b	--
Sub-total	1,114		9		--
<b>Confectionery</b>					
1. Sugar confectionery	2,812	435	12,232	2.1	59
2. Manila cake (chikki)	493	*b	--	*b	--
3. Other sweets	956	435	4,161	2.1	20
4. Biscuits	293	492	1,442	6.5	19
Sub-total	4,554		17,835		98

Table - 3.7.1 (cont'd)

<u>Category/Processed Item</u>	<u>Total Food Item Processed (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcals)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Soft Drinks/Aerated Water Industry</b>					
1. Squashes	5,143	130	7,355	0.1	*d
2. Soda water	17,344	*b	--	*b	--
3. Fruit drink	18,705	*b	--	*b	--
4. Ginger water	4,055	*b	--	*b	--
Sub-total	45,247		7,355		--
<b>Sago Industry</b>					
1. Sago	60,435	351	212,127	0.2	121
2. Starch	20,363	351	71,475	0.2	41
Sub-total	80,798		283,602		162
<b>Salt Industry</b>					
1. Salt	667,023	0	nil	0	nil
<b>Gur Industry</b>					
1. Palm gur	65	359	234	1.0	*d

Table - 3.7.1 (cont'd)

<u>Category/Processed Item</u>	<u>Total Food Item Processed (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcals)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Tea Curing Industry</b>					
1. Black tea (cured)	64,227	*b	--	*b	--
<b>Cashew Industry</b>					
1. Cashew kernel	2,056	596	12,251	21.2	436
<b>Other Food Products Industry</b>					
1. Vermicelli	14,246	352	50,149	8.7	1,239
2. Coffee powder	5,573	300	16,721	12.5	697
3. Appalam	1,767	288	5,089	18.8	332
Sub-total	21,586		71,959		2,268
<b>Total</b>			<b>5,613,698</b>		<b>78,576</b>

\*a Nutrient values for sheller-mill bran only available

\*b Nutrient values not available

\*c Nutrient values available only for squashes

\*d Nutrient values negligible

Source: ORG Survey, 1971

Table - 3.7.2: Calorie and Protein Equivalents of Major Inputs

<u>Category/Raw Materials</u>	<u>Total Raw Material (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Rice Mills</b>					
1. Paddy	803,085	277*a	2,222,939	5.1*a	41,118
<b>Flour Mills</b>					
1. Wheat	296,000	346	1,024,682	11.8	34,946
<b>Dal Mills</b>					
1. Tur gram	20,511	320	65,638	21.0	4,307
2. Urid gram	15,284	334	51,049	23.5	3,592
3. Mung gram	2,418	334	8,076	24.0	580
Sub-total	38,213		124,763		8,479
<b>Bakeries</b>					
1. Maida	26,101	348	90,834	11.0	2,271
2. Sugar	6,824	398	27,161	0.1	7
3. Vanaspati & oils	1,127	900	8,612	0	Nil
4. Eggs	366	177	645	13.4	51
Sub-total	34,418		127,252		2,929

Table - 3.7.2 (cont'd)

<u>Category/Raw Materials</u>	<u>Total Raw Material (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Dairies</b>					
1. Milk	36,428	92	33,514	3.8	1,384
2. Milk powder	15	427	65	32.0	5
Sub-Total	36,443		33,579		1,389
<b>Sugar Mills</b>					
1. Sugar cane	2,580,265	40	1,032,106	0.05	1,290
<b>Edible Oil Mills</b>					
1. Groundnut kernel	148,347	567	841,129	25.3	37,532
2. Groundnut (in pods)	42,945	425	171,752	18.9	7,931
3. Gingelly seeds	124,549	563	701,213	18.3	22,793
4. Coconut kernel	12,943	662	85,686	6.8	880
Sub-total	280,437		1,805,780		69,136
<b>Canning of Fruits and Vegetables</b>					
1. Sugar	384	398	1,528	0.1	--
2. Glucose	25	400	101	0	1
3. Jaggery	23	383	86	3.9	1

Table - 3.7.2 (cont'd)

Category/Raw Material	Total Raw Material (tonnes)	Standard Calorific Value (kcal/100 g.)	Total Calories (million kcal)	Standard Protein Value (gms/100 g.)	Total Protein (tonnes)
4. Khandasari	93	394	368	0.2	0
5. Sugar candy	10	--	--	--	--
6. Lime/lemon	171	42	72	1.0	2
7. Mangoes	91	32	30	1.2	1
8. Bananas	152	82	125	0.9	1
9. Spices	44	--	--	--	--
Sub-total	993		2,310		5
<b>Confectionery</b>					
1. Sugar	3,353	398	13,346	0.1	3
2. Maida	336	348	1,170	11.0	37
3. Groundnut kernel	386	567	2,187	25.3	98
4. Vanaspati, oil, etc.	47	900	421	0	nil
5. Jaggery	174	383	666	3.9	7
6. Glucose	430	400	1,718	0	nil
Sub-total	4,726		19,508		145
<b>Soft Drinks/Aerated Water Industry</b>					
1. Sugar	1,678	398	6,678	0.1	*c
2. Carbon-di-oxide	1,094	*b	--	*b	--
3. Essence & colour	56	*b	--	*b	--
Sub-total	2,828		6,678		--

Table - 3.7.2 (cont'd)

<u>Category/Raw Material</u>	<u>Total Raw Material (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Sago Industry</b>					
1. Tapioca	330,786	157	532,793	0.7	2,375
<b>Gur Industry</b>					
1. Palm juice	302	60	181	0.3	*c
<b>Tea Curing Industry</b>					
1. Green tea leaves	284,922	*b	--	*b	--
<b>Cashew Industry</b>					
1. Cashew (in shell)	3,966	150	5,910	5.3	210
2. Cashew kernel	2,024	596	12,065	21.2	429
Sub-total	5,990		17,975		639
<b>Other Food Products Industry</b>					
1. Maida	13,411	348	46,670	11.0	1,475
2. Coffee seeds (raw)	6,899	*b	--	*b	--
3. Chicory powder	512	*b	--	*b	--
4. Urid dal	1,528	347	5,303	24.0	367
Sub-total	22,350		53,358		1,842
<b>Total</b>			<b>7,003,904</b>		<b>164,293</b>

Table - 3.7.3: Calorie and Protein Equivalents of Materials Serviced

<u>Category/Material Serviced</u>	<u>Total Raw Materials (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
<b>Rice Mills</b>					
1. Rice	93,537	346	323,640	6.4	5,986
2. Paddy	2,064,359	277	5,714,146	5.1	105,695
3. Groundnut kernel	92,172	567	522,615	25.3	23,319
4. Groundnut (in pods)	88,110	425	364,696	18.9	16,273
Sub-total	2,347,178		6,925,097		150,973
<b>Flour Mills</b>					
1. Paddy	65,924	277	182,477	5.1	3,375
2. Rice	19,839	346	68,641	6.4	1,270
3. Grams (All)	6,388	340*	21,718	23.0*	1,469
4. Food grains (All)	49,919	346*	172,718	6.4*	3,195
Sub-total	142,070		445,554		9,309
<b>Dal Mills</b>					
1. Groundnut (in pods)	9,534	425	39,464	18.9	1,760
2. Tur gram	11,079	320	35,453	21.0	2,326
3. Urid gram	24,280	334	81,094	23.5	5,706
4. Grams (All)	3,364	340*	11,438	23.0*	773
Sub-total	48,257		167,449		10,565

Table - 3.7.3 (cont'd)

<u>Category/Material Serviced</u>	<u>Total Raw Materials (tonnes)</u>	<u>Standard Calorific Value (kcal/100 g.)</u>	<u>Total Calories (million kcal)</u>	<u>Standard Protein Value (gms/100 g.)</u>	<u>Total Protein (tonnes)</u>
Edible Oil Mills					
1. Groundnut (in pods)	29,795	425	123,325	18.9	5,502
2. Groundnut kernel	37,933	567	215,098	25.3	9,597
3. Oil seeds (All)	9,215	565*	52,066	25.0*	2,303
4. Coconut kernel	942	662	62,387	6.8	64
5. Rice	7,718	346	267,050	6.4	494
6. Paddy	150,639	346	416,967	6.4	7,713
7. Food grains (All)	24,042	346*	83,184	6.4	1,538
Sub-total	260,284		1,220,057		27,211
Total	2,797,789		8,758,157		198,058

\* average nutrient values assumed

Source : ORG Survey, 1971

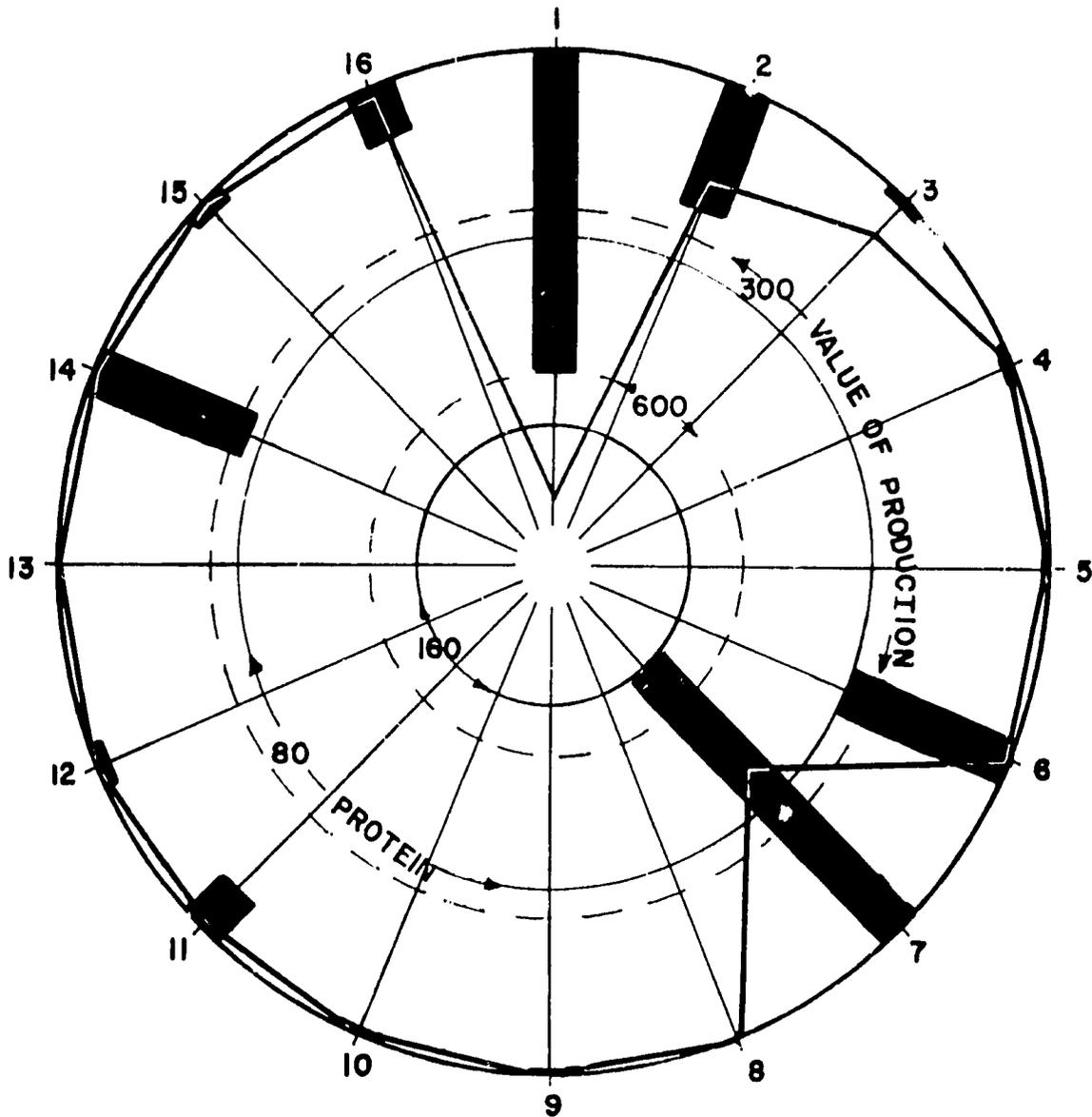
The Standard Calorific values and Protein values used in the calculation of nutrient equivalents in Tables 3.7.1 to 3.7.3 are based on the theoretical values given in "Nutritive value of Indian Foods" - published by National Institute of Nutrition & Indian Council of Medical Research, 1971.

CHART 2

VALUE OF PRODUCTION

&

PROTEIN EQUIVALENTS OF MAJOR INPUTS



Proteins in '000 Tonnes  
Value of Production in Million Rs.

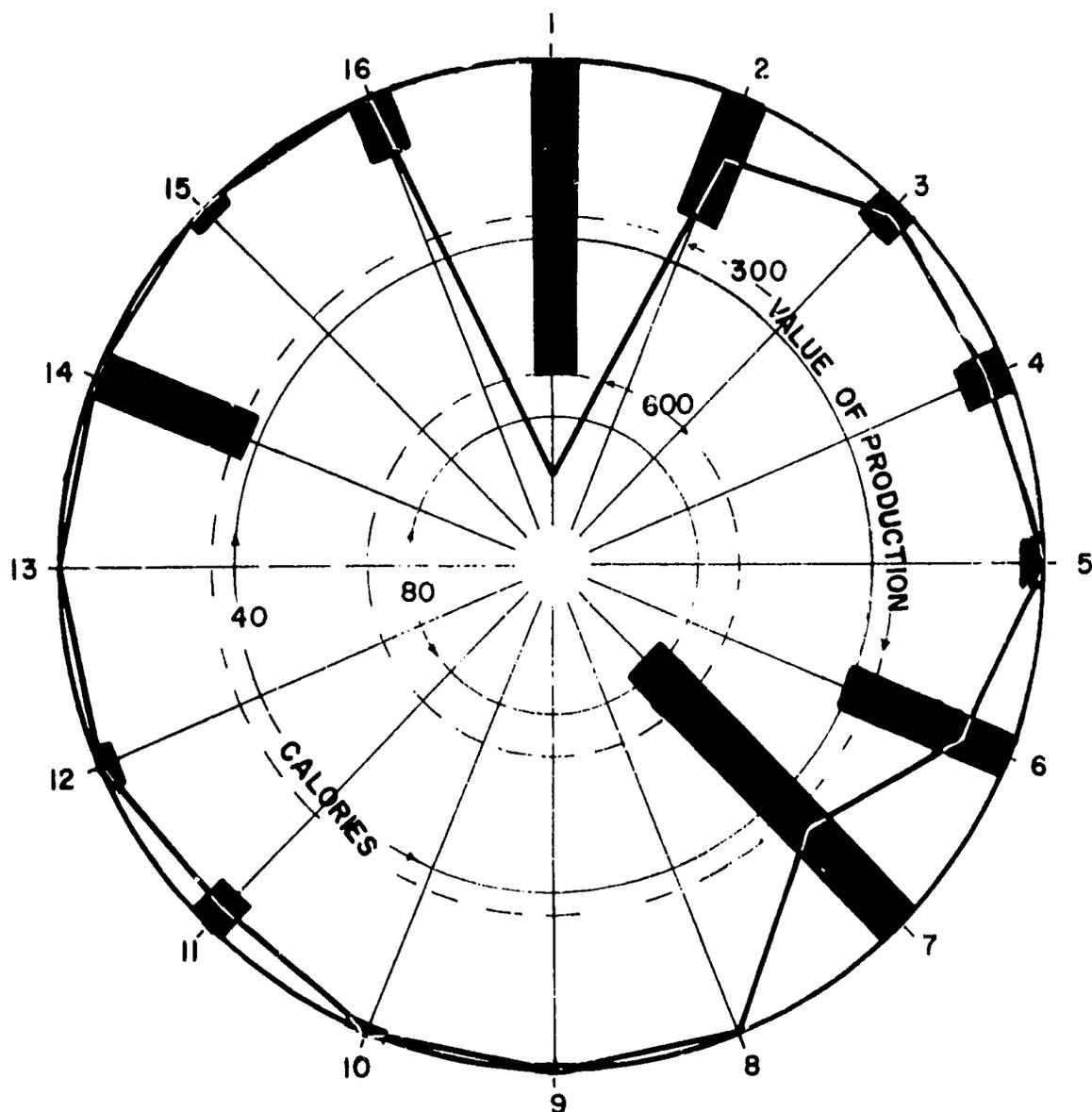
- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables |                         |
| 9. Confectionery    | 10. Soft Drinks                   | 11. Sago Industry       |
| 12. Salt Industry   | 13. Gur Industry                  | 14. Tea Curing Industry |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

CHART 3

VALUE OF PRODUCTION

&

CALORIE EQUIVALENTS OF MAJOR INPUTS



Calories in 10<sup>11</sup> KCals  
Value of Production in Million Rs.

- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables |                         |
| 9. Confectionery    | 10. Soft Drinks                   | 11. Sago Industry       |
| 12. Salt Industry   | 13. Gur Industry                  | 14. Tea Curing Industry |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

The total available nutrients from the finished products of the food processing industry in Tamil Nadu works out to 78,576 tonnes of protein and 5,613,698 million calories. (A calorie in this case stands for a physiological calorie which is equal to 1000 physical calories and, hence, denoted by 'Kcal'). Of this, the major share of protein contribution comes from the Rice mills (46%), followed by Flour mills (33%) and Dal mills (14%).

The corresponding in-take of protein through raw materials is estimated as 164,293 tonnes. The huge loss to the tune of 85,717 tonnes of protein in the processing sector is mainly due to the oil industry. In this case, the raw materials rich in protein, such as groundnut, are consumed, but the principal finished products, viz. oils, are completely void of protein. The entire amount of protein goes into oil cakes which are not directly meant for human consumption.

Interestingly, the Oil mills take away a large proportion (42%) of the total protein in-take but turns out next to nothing in finished products. The share of Rice mills in the total protein in-take is 25 percent, Flour mills 20 percent, and Dal mills 6 percent.

The total protein equivalent of raw materials serviced is 198,058 tonnes. Rice mills alone account for 75 per cent of the total protein contents of the raw materials serviced; and the share of Oil mills is 14 percent.

Combining the two estimates, the total protein equivalent of raw materials that go through the processing sector (either in terms of raw materials consumed or raw materials serviced) works out to 362,351 tonnes per annum.

The total energy yield of finished products is estimated as 5,613,698 million calories in the entire food processing industry. Among the various categories in food processing industry, Rice mills lead in the energy contribution with a share of 36 percent followed by Oil mills (20%), Sugar mills (16%) and Flour mills (14%).

Correspondingly, the total in-take of energy equivalents of raw materials

consumed is on the order of 7,003,904 million calories. Here again, Rice mills are the major contributors with a share of about 31 percent, followed closely by Oil mills (26%) and Sugar mills (15%).

The energy equivalents of raw materials serviced is estimated as 8,758,157 million calories. The Rice mills take the first place with a very high share of 79 percent, followed by Oil mills with a share of 14 percent.

In the Food Processing Industry in Tamil Nadu, two categories, viz. Rice mills and Oil mills, together wield a great influence insofar as nutrients are concerned. The following table gives the total nutrient in-takes (through raw materials consumed and serviced) in these two categories.

Table - 3.7.4: Nutrient Equivalents for Rice Mills and Oil Mills

	Protein		Energy	
	Qty. (tonnes)	%	Qty. (million Kcals)	%
Rice mill	192,091	53.0	9,148,036	58.0
Oil mill	96,347	26.6	3,025,837	19.2
Sub-Total	288,438	79.6	12,173,873	77.2
Total in the entire food processing in- dustry	362,351	100.0	15,762,061	100.0

Source: ORG Survey, 1971

Since rice mills play such a prominent role, (as shown in the above table) any improvement in the processing techniques and machinery used would yield handsome results. Efforts to popularize new and improved methods

of processing (such as the new parboiling and drying technique developed in TCMF, Tiruvarur) and the use of better machinery (such as sheller-huller mills in the place of conventional hullers) are worthwhile to be undertaken in case of rice mills. The oil mills account for 26 percent of the total protein in-take; but this amount is totally lost in processing in the sense that the principal products, viz. oils, do not contain even a trace of this nutrient. The protein from raw materials, finds its place in the by-product, viz. oilcakes, not directly meant for human consumption. This suggests an excellent area to explore the possibilities of making this protein rich by-product palatable and acceptable to human consumption.

## CHAPTER IV

### ANALYSIS BY INDUSTRY

#### 4.1 Rice Mills (205 - 2)

##### (a) Structure of the Industry:

This category is the most important among the food processing industries in Tamil Nadu considering the number of units and the total quantum of inputs that go through these units. There is a handful of highly capital intensive modern rice mills, a few sheller-huller mills and a very large number of conventional huller mills with a little capital investment.

In all, there are 12 modern Rice mills in the State, of which 7 are situated in the district of Thanjavur, the traditional rice-bowl of Tamil Nadu. There are only 6 sheller-huller type rice mills in Thanjavur district, while in Trichy district a sizeable number of mills are of this type -- especially in Manachanallur, the nerve center of rice trade in the State. Among the conventional huller mills, many are functioning as servicing units.

The registered sector consists of all modern rice mills and the sheller-huller type mills, whereas the huller mills are functioning under both registered and unregistered sectors. The predominance of servicing units in both the sectors is an interesting point to note. A very high proportion of mills (90%) is working as servicing units in the unregistered sector and even in the registered sector, units engaged in servicing, either completely or partially, account for more than 75 percent of the total number of units. This is mainly due to strict government restrictions on this industry, and the tendency of the entrepreneurs to declare their establishments a servicing unit as far as possible and thereby avoid legal complications. Almost all the units work throughout the year. Participation of casual labor is substantial (40%) in terms of total man-shifts in the industry as a whole comprising the registered and unregistered sectors; the contribution of casual labor in the former is 63 percent and in the latter 24 percent. For the regular

employees, the average monthly salary in the registered sector is Rs. 100/-, twice that an employee in the other sector earns. In short, there is an appreciable difference in the structure of the units in the registered and unregistered sector in the industry. In the following table, the particulars of employment, wages, etc., in the various strata within this industry are presented.

Table - 4.1.1: Employment Structure in Rice Mills

<u>Stratum</u>	<u>Permanent Workers</u>		<u>Casual Workers</u>		Average No of Days Worked (Shift/Day)	Total No. of Units
	Average No./ Day (no/Shift)	Average Monthly Salary (Rs.)	Average No. / Shift	Average Daily Rate (Rs.)		
Total	4 (4)	71	2	2.40	294 (1.0)	5131
<u>Registered Sector</u>						
11						
12						
13	47 (26)	185	8	4.70	266 (1.9)	6
21	7 (6)	106	11	2.30	253 (1.1)	754
<u>Unregistered Sector</u>						
31	4 (4)	59	2	2.60	297 (1.0)	999
41	3	55	0.7	2.60	303 (1.0)	3372

Source: ORG Survey, 1971.

**(b) Processing and Production:**

The processing involved in the conversion of paddy into par-boiled rice conforms broadly to two different patterns, -- (a) scientific and modern rice milling and (b) conventional rice milling. Essentially, the processing steps are the same in both the methods. They are soaking, parboiling, drying and milling in that order. The difference, however, lies in the technique employed in each step. The modern rice milling employs better equipment and machinery at each stage and a well-defined procedure is adopted on the basis of continuous research studies carried out to achieve better quality of rice as well as higher yield rates. For example, soaking of paddy is done for a fixed number of hours, first in cold water and later in hot water. Parboiling is then carried out for a fixed amount of time with the use of brine solution. This effectively reduces the drying time which could otherwise prove a bottleneck in the entire processing and as a result affect the utilization level. The milling of dried paddy is carried out with the use of shellers which yield a higher out turn of rice and also a better quality of rice and rice-bran, a by-product. Manual intervention at each stage is kept to a minimum so that the chance of contamination of the end product is negligible.

In sharp contrast to this, the conventional method engages machinery only for the purpose of milling the dried paddy. Invariably, experience and traditional practice are the only guiding factors in this process. Scientific and systematic controls are practically negligible. Inadequacy of hygienic soaking pits, uncontrolled parboiling (this results in poor quality and poor quantity of the product), open plinth drying and the use of hullers are some of the serious defects in this method. The entrepreneurs in most cases are totally ignorant or indifferent to the technological advances in the rice milling industry. It is true that a large capital is a prerequisite to attain the level of modern

rice mills. But, under present market conditions, the entrepreneurs are not inclined to make such huge investments, for the returns from existing modern rice mills have not been lucrative. Nevertheless, they could be educated to accept and implement those technological improvements that do not require huge capital outlay and yet pay handsome dividends in terms of productivity. Parboiling with brine, a process developed under the research laboratory in Tiruvarur, the doyen of modern rice milling, is perhaps one such technique which needs to be popularized among the traditional mill owners.

The preponderance of hullers is a striking feature of this industry. It is an accepted fact that the performance of sheller-hullers is better than that of conventional hullers, in terms of the quality of rice and rice-bran and also in terms of output of rice. Yet there are very few sheller-hullers (6) in Thanjavur district.

The capacities of different types of hullers as prescribed by the government are as follows:

Huller Type	Capacity (Tons/day)
I & II	2.9
III & IV	0.9
VII & VIII	1.7

The capacity of shellers vary from 1 to 4 tons per hour as compared to this.

Thus, the need of the hour is to revitalize this most important food processing industry in the state with a concerted effort to accelerate the penetration of the technological advancements into the traditional rice milling and achieve an improved modern milling system.

The total quantity of rice produced and marketed through processing units is on the order of 690 thousand tonnes, of which the registered sector turns out 56 percent. (See Tables 4.1.2 and 4.1.3).

Table - 4.1.2: Products Manufactured and Marketed  
by Rice Mills in Tonnes

	Registered Sector		Unregistered Sector		Total
	Stratum 13	Stratum 21	Stratum 31	Stratum 41	
<u>Major Products</u>					
Rice	16,644	290,634	92,468	143,455	543,201
Rice broken	1,129	3,787	1,703	40,262	46,881
Rice bran	1,163	71,045	27,356	-	99,564
Sub Total	18,936	365,466	121,527	183,717	689,646
<u>Other Products</u>					
Oils	-	7,829	-	-	7,829
Groundnut kernel	-	6,176	1,491	-	7,667
Others (flours, etc.)	-	275	-	-	275
Sub Total	-	14,280	1,491	-	15,771
Total	18,936	379,746	123,018	183,717	705,417

Source: ORG Survey, 1971

Table - 4.1.3: Materials Serviced by Rice Mills  
in Tonnes

<u>Type of Servicing</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>		<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>	<u>Stratum 31</u>	<u>Stratum 41</u>	
Hulling of paddy	5,230	369,887	504,317	1,184,925	2,064,359
Flouring of rice	-	29,377	38,167	25,993	93,537
Flouring other foodgrains	-	4,048	8,933	61,357	74,338
Crushing oilseeds & oilcakes	-	15,328	23,986	78,953	118,267
Decorticating ground- nut	-	56,593	31,517	-	88,110
Total	5,230	475,233	606,920	1,351,228	2,438,611

Source: ORG Survey 1971

Other products such as oils, groundnut kernel and flours share a meagre 3.5 percent by weight of the total produce in rice mills in the registered sector and less than 1 percent in the other sector.

The registered sector accounts for 56 percent of the total quantity of all products manufactured in rice mills. Considering rice and rice products alone, the contribution of the registered sector is again 56 percent. As for the other products, this sector almost entirely covers the total production.

The quantum of paddy serviced (the product not marketed by the industrial units) is more than double the amount processed for the purpose of marketing the end product, viz., rice. Such difference is much more pronounced in the case of other products. Overall, the quantity of raw materials serviced in rice mills is about double that processed and marketed. In the unregistered sector, the quantity of raw material serviced is as much as four times the quantity processed for marketing.

The unregistered sector accounts for about 82 percent of the total quantum of all materials serviced in the industry, whereas the registered sector contributes only 18 percent. It is evident from the above tables that "servicing" is a more dominant and widely carried out activity than "processing" for marketing.

Sixty percent of the total value produced is accounted for by the registered units.

The percentage share of value produced and per unit value of production are as follows:

Table - 4.1.4 : Value of Production in Rice Mills

<u>Description</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>	<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>		
Value produced ('000 Rs.)	16,272	338,719	246,723	601,714
Percent share	2.7	56.3	41.0	100
Value produced per unit ('000 Rs.)	4,068	709	631	701
Estimated number of units*	4	478	391	873

\*Equal to 'processing units' plus 'processing and servicing units'.

Source: ORG Survey, 1971

Rice bran is a very important by-product and if proper attention is given to the processing technique, this can yield very good returns to the industrial units. Industrial bran oil is a valuable commodity, which is extracted at Tiruvarur bran oil plant, the only one of its kind in Tamil Nadu. The oil contents of different kinds of bran are as follows:

Modern mill bran	20 - 25%
Sheller - huller mills	11 - 12%
Huller mills	5 - 6%

Yield of bran in the huller mills is 160 - 180 kgs. per tonne of paddy and it is about 45 - 50 kgs. in modern mills.

Price of modern mill bran ranges from Rs. 400 to 420 per tonne and that of oil is Rs. 3000/-per tonne. De-oiled bran-cake is a very good cattle feed.

A hullite plant has been set up in Tanjore by the Food Corp. of India to produce hullite, - a new kind of fuel for household consumption - from paddy husk. The price is about Rs. 125/- a tonne (compared to Rs. 220/- a ton of traditional fuel).

(c) Inputs

Consumption of major inputs relating to the estimates of production presented in Table - 4.1.5 is as follows:

The out-turn of rice (whole) is highest in Stratum 13\* (units in registered sector employing 50 persons or more) followed by smaller units in the registered sector. Table 4.1.6 shows the yield-rates in different strata of the industry.

\*Includes modern rice mills

Table - 4.1.5 Consumption of Major Inputs in Rice Mills in Tonnes

<u>Inputs</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>		<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>	<u>Stratum 31</u>	<u>Stratum 41</u>	
Paddy	23,800	427,152	141,334	210,799	803,085
Oil seeds	-	20,786	-	-	20,786
Groundnut seed ( whole )	-	7,958	2,252	-	10,210
Other foodgrains	-	342	-	-	342
Total	23,800	456,238	143,586	210,799	834,423

Note: All estimates relating to production and consumption in stratum 41 are based on the sample observations collected from two units engaged in both processing and servicing.

Source: ORG Survey, 1971

Table - 4.1.6: Percentage Recovery of Rice Products

<u>Product</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>	<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>		
Rice (whole)	69.9	68.0	67.0	67.6
Rice (brokens) and rice bran	9.7	17.6	19.7	18.3

Source: ORG Survey, 1971

It is interesting to note that the out-turn rates of rice (brokens) and rice bran is very high in the strata with smaller size units. This is mainly due to the level of technology employed in these strata in processing of paddy which results in a higher proportion of brokens and a higher percentage of husks present in the bran.

Raw materials, of which paddy constitutes 97 percent, (629 million rupees) are procured annually. The purchases of paddy from traders account for Rs. 246 million (39%), from farmers directly for Rs. 133 million (21%) and through brokers for Rs. 189 million (30%). Procurement through brokers is more prevalent among the small size units. Raw materials are taken delivery mostly from the sellers' place or the transport cost is borne by the processing units. The payments are made invariably in cash right at the time of purchase. Also, commissions are reported to be paid in more than 50 percent of the cases. This, in effect, shows the intensity of competition among the processing units in this category. The procurement pattern of paddy from different locations is shown in Table - 4.1.7.

Table - 4.1.7 : Quantity of Paddy Procured by Rice Mills from Different Locations

<u>Location</u>	<u>Quantity (tonnes)</u>	<u>Percent to Total</u>	<u>Transport Charges Incurred ( '000 Rs. )</u>
Local	508,432	56.9	8,802
Within District	88,231	9.9	953
Within State	279,685	31.3	18,289
Within Country	17,085	1.9	644
Total	893,433	100.00	28,688

Source: ORG Survey, 1971

Transport cost to move the raw materials from places outside the district (but within the state) is about 65 rupees per tonne of paddy; in other words, the average cost of transport per bag (57 kgs.) of paddy is Rs. 3.50 which is about 10 percent of its price at the source of supply. This may be attributed to the fact that this industry utilizes only road transport for the movement of paddy and as such the cost is likely to be quite high. However, losses due to handling and transit are found to be less than 0.1 percent.

Government and co-operative agencies find it very difficult to compete with the private sector because the price offered by the latter is usually higher than the control rates. The prevailing market rates were much higher than the government stipulated price even during the past bumper harvest season. As a result, good quality paddy is practically cornered by the private millers due to their better organization and ability to pay a higher price.

Procurement by the private mill owners is done through brokers and also through small mill owners.

Government regulations seem to be the major problem faced by the private industry.

(d) Marketing:

The distribution pattern of rice marketed at different locations is shown in the table below:

Table - 4.1.8: Quantity of Rice Marketed in Different Locations

<u>Location</u>	<u>Quantity (tonnes)</u>	<u>Percent to Total</u>
Local	323,270	57
Within District	40,266	7
Within State	200,593	35
Within Country	4,082	1
Total	568,211	100

Source: ORG Survey, 1971

Rice constitutes 97 percent by weight of all products marketed by rice mills and groundnut oil and kernel share 2.6 percent between them equally. In terms of value, about 50 percent is distributed through private traders, a little over 10 percent through government agency and around 25 percent directly to consumers. Delivery of the products is invariably at the factor site, the mode of transactions largely in cash, though private traders transact both in cash and credit. The private businessmen, unlike other channels, also get the advantage of commissions. More than 80 percent of the commissions go to the private traders. However, the practice of paying brokerage/commission is itself negligible (slightly above 10 percent).

(e) Capital:

Fixed capital worth 349 million rupees is being used toward a gross earning of 670 million rupees (including service charges). The registered units use 40 percent of the capital while the rest is employed in the unregistered sector. On the whole, fixed capital per unit works out to 68 thousand rupees with a huge variation such as 2340 thousand rupees in stratum 13, to 47 thousand rupees in the unregistered sector. It is interesting to note that the share of land and building in the fixed capital is above 75 percent in all the strata.

Table - 4.1.9: Capital Investment in Rice Mills in the Registered and Unregistered Sector

<u>Description</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>	<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>		
Fixed capital ('000 Rs.)	14,040	127,445	207,250	348,735
Percent share	4	36	60	100
Fixed capital per unit ('000 Rs.)	2,340	169	47	68
Percent share of land & buildings in total capital in each stratum	81	78	76	77

Source: ORG Survey, 1971

Total working capital employed in this industry is about 52 million rupees against the total value of production of 612 million rupees. The following table shows the total working capital employed in each stratum as a percentage of the value of production.

Table - 4.1.10 : Working Capital and Value of  
Production in Rice Mills

Item	Registered Sector		Unregistered Sector	Total
	Stratum 13	Stratum 21		
Working capital ( '000 Rs. )	15,762	26,483	9,588	51,833
Value of production ( '000 Rs. )	16,272	338,719	246,723	611,616
Working capital as percent of value of pro- duction	99.5	7.8	3.9	8.5

Source: ORG Survey, 1971

The high proportion of working capital in stratum 13 is due to heavy interest on loans paid by two modern rice mills, and due to the suspension of processing activity for the best part of the year in one of the biggest modern rice mills.

(f) Cost structure:

The proportion of material cost (comprising raw and packing materials) works out to about 90 percent of the total cost in strata 21 and 31. The low proportion of material cost in the registered sector consisting of large size rice mills employing more than 50 persons (stratum 13) is again due to impact of the heavy interest on loans. The following table shows actual costs incurred with corresponding proportions in various strata.

Table - 4.1.11: Cost Structure of Rice Mills

(Value in '000 Rupees)

<u>Stratum</u>	<u>Material Cost</u>		<u>Processing Cost</u>		<u>Other Costs</u>		<u>Total</u>
	<u>Value</u>	<u>% to Total</u>	<u>Value</u>	<u>% to Total</u>	<u>Value</u>	<u>% to Total</u>	
<u>Registered Sector</u>							
Stratum 13	11,316	52.2	1,204	5.6	9,084	42.2	21,604
Stratum 21	304,685	91.2	12,985	3.9	15,818	4.9	333,488
<u>Unregistered Sector</u>							
Stratum 31	90,207	91.1	4,659	4.7	4,297	4.2	99,163
Stratum 41	106,170	82.7	12,136	9.5	9,920	7.8	128,226
Total	512,378	88.0	30,984	5.3	39,119	6.7	582,481

Source: ORG Survey, 1971

(g) Selected Co-efficients :

Some of the selected co-efficients for the industry are presented in the following table:

Table - 4.1.12 : Selected Co-efficients for Rice Mills

(Value in '000 Rupees)

Item	Registered Sector		Unregistered Sector	Total
	Stratum 13	Stratum 21		
Number of units	6	754	4,371	5,131
Value of production	16,272	338,719	246,723	601,714
Service charges earned	76	21,303	37,825	59,204
Fixed capital	14,040	127,445	207,250	348,735
Total input cost	12,590	323,905	217,365	553,860
Gross value added	3,758	36,117	67,183	107,058
Gross value added per unit	626	48	15	21
Gross value added per unit investment	0.27	0.28	0.32	0.31

Source : ORG Survey, 1971

The rate of return for stratum 13 in terms of gross value added per unit investment is the lowest among the various strata, even though this stratum consists of large size registered units, including modern rice mills. This is due to the fact that one of the large sampled units has stopped production for a major part of the year and another was functioning as a servicing unit during the year. These two under-utilized units have decreased the

estimates of total value and quantity produced in this stratum.

The estimates of total quantum of paddy going through the food processing sector via Rice mills, Flour mills, Dal mills and Edible oil mills works out to 3,097 thousand metric tonnes. The equivalent out-turn of rice, at the rate of 68% is 2,106 thousand tonnes as against the official forecast of 5,303 thousand tonnes of rice production in the state for the year 1970-1971. This under-estimate is mainly due to two reasons: First, the coverage of large size rice mills in the sampling frame was inadequate. It was found that only three out of twelve modern rice mills are listed in the sampling frame provided by the Department of Industries. It is necessary, therefore, to make corresponding adjustments in the estimates for stratum 13.

Secondly, in the absence of individual category estimates of total number of units in stratum 41, the following procedure was adopted, as mentioned earlier in Sec. 2.4. The distribution of units among the various categories in stratum 41 is assumed to be the same as that in stratum 31. The Census of Establishments, 1970, puts the total number of units of all categories in stratum 41 (employing less than 5 persons) at 15,090.

The number of rice mills in stratum 41 is thus estimated as 3,372 and the total number of rice mills in the state (over all strata) works out to 5,131. However, the Department of Civil Supplies puts the latter figure at 12,455. It is therefore, necessary to build up fresh estimates for stratum 41 once the number of rice mills in this stratum as per the Census of Establishments, 1970 is made available.

Based on the above estimate of 12,455 units, the total number of rice mills in stratum 41 would now be 10,696 in the state. The revised estimates of through-put of paddy in stratum 13 and 41 of rice mills industry would therefore be as follows:

	<u>Stratum 13</u>	<u>Stratum 41</u>
Consumption of paddy in tonnes (See Table - 4.1.5)	59,500	668,655
Quantity of paddy serviced in tonnes (See Table - 4.1.3)	13,075	3,758,588

The new estimate of total quantum of paddy going through the food processing sector in the state is therefore 6,415 thousand tonnes equivalent to 4,362 thousand tonnes of rice, at the rate of 68 per cent out-turn.

#### 4.2 Flour Mills (205 - 1)

##### (a) Structure of the Industry

An unique feature of the flour mills industry is that all the units in the registered sector, except 3, are processing units and those in the unregistered sector, except 20, are servicing units. The units in the registered sector are comprised of units which are capital intensive.

This industry includes highly capital intensive roller flour mills as well as conventional grinders with a relatively small capital invested in machinery. The roller flour mills produce maida, suji and atta.

Employment in the two sectors is distinctly different because of the nature of work of the units. Servicing units require very few workers. This is substantiated by the very low average number of workers reported by the unregistered sector. Units in the registered sector, being mostly processing units, have a large number of permanent workers (Table - 4.2.1). Participation of casual workers is very low in this industry. Units in the registered sector on an average work for two shifts a day. Units in the unregistered sector work only for a single shift. All the units of this industry work for over 300 days in a year.

Table - 4.2.1: Employment Structure of the Flour Mills Industry

<u>Stratum</u>	<u>Permanent Workers</u>		<u>Casual Workers</u>		<u>Average No. of Days Worked (Shift/Day)</u>	<u>Number of Units</u>
	<u>Average No. /Day (no. /Shift)</u>	<u>Average Monthly Salary (Rs.)</u>	<u>Average No. / Shift</u>	<u>Average Daily Rate (Rs.)</u>		
Total	3 (3)	84	0.2	2.4	304 (1.0)	1852
<u>Registered Sector</u>						
11						
12						
13	75 (43)	306	0.2	4.0	283 (1.8)	6
21	28 (14)	145	1.4	4.6	288 (1.9)	26
<u>Unregistered Sector</u>						
31	3 (3)	57	0.2	2.9	301 (1.0)	416
41	2 (2)	50	0.2	1.9	306 (1.0)	1404

Source: ORG Survey, 1971.

**(b) Processing and Production :**

Activities of the two sectors are quite distinct because of the nature of their operations. Most of the units in the unregistered sector being servicing units undertake, in addition to flouring of the wheat, the flouring of other foodgrains, hulling of paddy and crushing oil-seeds, etc. In the registered sector, activity of the different units is restricted to the manufacture of different grades of wheat flour (maida, atta, suji, etc.) Table - 4.2.2 gives details of production in the registered sector and servicing done in the unregistered sector.

The total value of production is estimated at Rs. 259 million. About 96 per cent of the total value of production is contributed by the registered sector. The average value of production per unit in this sector is about Rs. 8.5 million. Total amount earned for the services rendered is estimated at Rs. 8.96 million, almost entirely from the units in the unregistered sector. The average service charge earned per unit is about Rs. 5,000.

Table - 4.2.3 gives data on the production of major products in this industry in the registered and unregistered sectors.

Table - 4.2.2 : Production and Servicing in Flour Mills  
in Tonnes

	Registered Sector		Unregistered Sector		Total	
	Quantity	%	Quantity	%	Quantity	%
<u>Production of wheat flour</u>	284,298	99.8	5,794	3.1	290,092	61.8
<u>Servicing</u>						
Flouring of foodgrains	-	--	100,058	54.2	100,058	21.4
Hulling of paddy	520	0.2	65,404	35.5	65,924	14.0
Crushing oilseeds and oilcakes	-	--	13,219	7.2	13,219	2.8
Total	284,818	100.00	184,475	100.0	469,293	100.0

Source : ORG Survey, 1971

Table - 4.2.3 : Tonnes Produced in Flour Mills

Product	Registered Sector		Unregistered Sector	Total
	Stratum 13	Stratum 21		
Maida	57,300	95,212	-	152,512
Atta	13,551	18,228	-	31,776
Rava	16,111	27,132	5,794	49,037
Bran-wheat	20,884	35,378	-	56,262

Source: ORG Survey, 1971

(c) Inputs and Consumption:

Wheat is the only raw material consumed by this industry. The registered units obtain their supplies from the Food Corporation of India. The unregistered units depend on traders for the purchase of raw materials. The procurement is almost entirely controlled by the FCI. Since the raw material is collected from various centers stipulated by the FCI, over Rs. 6 million (approximately at the rate of Rs. 2 per quintal) is spent by the units towards transport charges. It would be noticed from Table - 4.2.4 below that over 80 per cent of the procurement is from within the state and road is the popular mode of transport.

Table - 4.2.4 : Procurement of Wheat by Flour Mills - Source and Transport Mode

(Qty. in Tonnes)

Source/Mode	Road		Rail		Total	
	Quantity	%	Quantity	%	Quantity	%
Local	126,857	42.91	-	-	126,857	42.91
Within District	23,146	7.83	16,821	5.69	39,967	13.52
Within State	53,262	18.02	17,232	5.83	60,494	23.85
Within Country	1,486	0.50	1,486	0.50	2,972	1.00
Imports	55,354	18.72	-	-	55,354	18.72
Total	260,105	87.98	35,539	12.02	295,644	100.00

Source: ORG Survey, 1971

It is estimated that 296 thousand tonnes of wheat was consumed by the industry, of which 295 thousand tonnes were consumed by the registered sector.

Table - 4.2.5: Consumption of Raw Material by Flour Mills

Raw Material	( Qty. in '000 tonnes)						Total Qty.
	Registered Sector				Unregis. Sector		
	Stratum 13		Stratum 21		Stratum 31		
	Qty.	%	Qty.	%	Qty.	%	
Wheat	112	38	178	60	6	2	296

Source: ORG Survey, 1971

Consumption of the units in the unregistered sector is bound to be low because all the units as mentioned earlier concentrate on servicing. Table - 4.2.2 gives details of the quantity serviced in the unregistered sector.

(d) Marketing:

Wheat products manufactured by the units in the registered sector mostly find outlets in the state itself. A little over 20 percent of the net sales is outside the state. However, local and within district sales are very low. Table - 4.2.6 gives details of sales in different locations. The products are entirely moved by road, but for a small fraction (2.7%) moved by rail to markets outside the state.

Table - 4.2.6 : Products Marketed by Flour Mills at  
Different Locations

Product	Quantity (tonnes) Marketed				Total
	Local	Within District	Within State	Within Country	
Maida	-	28,109	92,491	30,460	151,060
Atta	-	4,655	13,377	12,057	30,090
Rava	5,749	12,912	21,224	6,883	48,796
Total	7,776	45,676	127,092	49,402	229,946
Percentage to total	3.4	19.9	55.3	21.4*	100.0

\*18.7% by road and 2.7% by rail

Source: ORG Survey, 1971.

Refined flours, vis., maida and suji are marketed in Tamil Nadu and neighboring states. These can be sent outside the state only under government permits, whereas for atta and bran, no such permit is required. It is reported that atta and bran are sent to north India while maida and suji are consumed mostly in the state itself.

The government has fixed up prices for wheat products and also stipulated certain norms in the packing of these products. Yet, the prevailing market price has always been less than this ceiling price. This is attributed to keen competition from other brands of products, consumer resistance and movement restrictions imposed by the government. There is also a perennial problem of wagon shortage for movement of finished products.

Marketing is done mostly through wholesalers and retailers.

Payment in cash, through bank and credit transaction are equally frequent. Over 50 percent of the units offer commission/brokerage up to 2 percent. Table - 4.2.7 gives details of the marketing channels used, mode of transaction, distribution pattern, etc.

Table - 4.2.7 : Marketing Details of Flour Mills Industry

<u>Description</u>	<u>Sales To</u>			<u>Total</u>
	<u>Whole-salers/ Retailers</u>	<u>Brokers</u>	<u>Customers</u>	
Sales value ('000 Rs.)	233,428	10,098	14,356	257,882
No. of units dealing with the channel	37	11	15	49
No. of units delivering at customers' place	10	-	10	20
No. of units incurring transport cost	21	11	5	32
No. of units with sales effected without brokerage	11	-	15	26
No. of units with sales effected with brokerage up to 2%	31	11	-	23

Source : ORG Survey, 1971

About Rs. 3 million was spent on promotional schemes, almost entirely by the registered sector. Advertisements through press is the only medium used by over 90 percent of the units.

(e) Capital Investment

(e) Capital Investment

The flour mills industry is highly capital intensive. The total fixed capital invested by this industry is estimated at Rs. 130 million. The shares of the registered and unregistered sectors are 40 and 60 percent, respectively (Table - 4.2.8). However, the average investment per unit in the registered sector is Rs. 1.7 million while in the unregistered sector it is a meagre Rs. 42,000.

Table - 4.2.8: Fixed Capital Invested by the  
Flour Mills Industry

<u>Description</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Fixed capital ('000 Rs.)	53,218	77,298	130,514
Percent share	40.8	59.2	100.0
Fixed capital/Unit ( '000 Rs.)	1,663	42	70
Share of investment in machinery in the total fixed capital (%)	55	36	44

Source: ORG Survey, 1971

It would be noticed from the above table that the average investment in machinery in the registered sector is over 1.5 times of that in the unregistered sector.

The total working capital of the industry is estimated at Rs. 12.6 million. Requirement of working capital by the units in the un-registered sector is very low. The average capital requirement per unit in the unregistered sector is very low (Rs. 1,100). Almost the entire amount is in the form of cash and very little raw material and finished product inventory is reported by these units. Shares of raw materials and finished products to the total working capital in the registered sector are 40 and 39 percent, respectively. The average working capital per unit in the registered sector is Rs. 395 thousand.

Table - 4.2.9 shows working capital as a percentage of value of production. It is seen that the ratio of working capital to value of production in the registered sector is one of the lowest among the different food processing industries in the state.

Table - 4.2.9 : Working Capital of Flour Mills as Percent of Value of Production

<u>Description</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>	<u>Total</u>
	<u>Stratum 13</u>	<u>Stratum 21</u>		
Total working capital (Rs. '000)	3,796	6,785	2,031	12,611
Value of production	94,478	154,492	13,246	259,509
Working capital as percent of value of production	4.0	4.4	19.2	4.8

Source: ORG Survey, 1971

## (f) Cost Structure:

Analysis of cost structure has been restricted to the registered sector as cost details obtained for the unregistered sector is for both processing and servicing units. Raw material costs account for over 90 percent of the total cost in the registered sector, fuel, electricity and repair charges is about 1.1 percent and packing costs are about 3.5 percent.

Table - 4.2.10 Cost Structure of Flour Mills in the Registered Sector

Stratum	Total Cost (Rs. '000)	Total Cost/Unit (Rs. '000)	Percent Share of Components				
			Raw Material	Packing Material	Fuel & Electricity	Taxes	Depreciation
13	95,410	15,900	92.8	2.9	1.1	0.3	0.6
21	147,563	5,675	90.8	3.8	1.3	0.6	0.7

Source: ORG Survey, 1971

## (g) Comments:

The agricultural production of wheat in the state was of the order of 500 tonnes in 1966-67, which is a negligible proportion of the total wheat processed in the state. The total capacity of the roller flour mills is 50,000 tonnes of wheat and the utilization level is about 58 percent.

Table - 4.2.11 : Selected Co-efficients for the Flour Mills Industry

Item	Value in '000 Rupees		
	Registered Sector	Unregistered Sector	Total
Number of units	32	1,820	1,852
Value of production	248,970	10,539	259,509
Service charges earned	10	8,949	8,959
Fixed capital invested	43,218	77,296	130,514
Total input cost	236,858	13,962	250,820
Gross value added	12,122	5,526	17,638
Gross value added/unit	378.5	3.0	9.5
Gross value added/unit investment	0.28	0.07	0.14

Source: ORG Survey, 1971

About 20 percent of output is obtained as a by-product bran which is mainly used as cattle feed. This is a very nutritious portion of wheat. Oil extraction from wheat gems is possible, but no large scale production of bran oil is carried out in the state.

Table 4.2.11 gives details of some of the selected co-efficients for the Flour mills industry. It would be noticed that the gross value added per unit of investment in the registered sector is about four times that in the unregistered sector. This is due to the fact that most of the units in the registered sector are having roller mills which are highly capital intensive and yield a high rate of return.

#### 4.3 Dal Mills (205 - 3)

##### (a) Structure of Industry :

The dal mill industry of Tamil Nadu has the lowest number of operating units among the different groups of units manufacturing grain mill products. There are in all 407 units in this category compared to 1,852 flour mills and 5,131 rice mills. However, the proportion of units engaged exclusively in servicing is the lowest in this category (only 25 percent compared to 97 percent in flour mills). Only 31 of the 407 dal mills are in the registered sector.

A unique feature of the unregistered sector of this industry is that there are equal number of permanent and temporary workers. In the registered sector the ratio of permanent to temporary workers is 2 : 1. Almost all the units work for over nine months in a year. The units are uniformly non-seasonal in operation. Table - 4.3.1 gives details of the employment structure in the dal mill industry.

Table - 4.3.1 : Employment Structure of the Dal Mills Industry

Stratum	Permanent Workers		Casual Workers		Average no. of days worked (Shift/day)	Total Number of Units
	Average number/day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	3 (3)	59	3	2.9	265 (1.0)	407
<u>Registered Sector</u>						
11						
12						
13	9 (9)	74	4	3.0	301 (1.0)	31
<u>Unregistered Sector</u>						
31	4 (4)	84	4	3.5	262 (1.0)	86
41	2 (2)	34	2	2.6	263 (1.0)	290

Source : ORG Survey, 1971

(b) Production :

Dals and flours from pulses constitute over 90 percent of the total production in this category. Cereal flours (from wheat and rice) account for another 4 percent and the rest are non-edible by-products. The share of the registered sector is about 30 percent. Among the materials serviced, grams account for 8.5 percent and groundnut seeds for 18.7 percent. The servicing is done almost entirely (93%) in the unregistered sector.

Tables - 4.3.2, 4.3.3 and 4.3.4 give details of the different products produced and materials serviced.

Table - 4.3.2 : Products Produced in Dal Mills  
(Tonnes)

Products	Registered Sector	Unregistered Sector		Total
	Stratum 21	Stratum 31	Stratum 41	
Tur dal	9,956	4,849	1,750	16,555
Tur broken	128	11	-	139
Tur flour	-	122	-	122
Urid dal	1,542	6,741	4,733	13,016
Urid broken	35	531	694	1,260
Urid flour	-	822	-	822
Mung dal	98	820	773	1,691
Mung broken	1	5	-	6
Mung flour	-	30	-	30
Total	11,760	13,931	7,950	33,641

Source : ORG Survey, 1971

Table - 4.3.3 : Products Manufactured and Marketed by Dal Mills

(Qty. in quintals)

<u>Products</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>		<u>Total</u>	
	<u>Quantity</u>	<u>%</u>	<u>Quantity</u>	<u>%</u>	<u>Quantity</u>	<u>%</u>
Dals (including brokens)	127,530	29.7	301,628	70.3	429,158	100.0
Flours (pulses)			15,204	100.0	15,204	100.0
Flours (cereals)	17,355	34.0	3,315	16.0	20,670	100.0
Dust (pulses)	11,199	65.8	5,830	34.2	17,029	100.0
Total	156,084	32.4	325,977	67.6	482,061	100.0

Source : ORG Survey, 1971

Table - 4.3.4 : Materials Serviced by Dal Mills

(Quantity in Quintals)

<u>Material &amp; type of Service</u>	<u>Registered Sector</u>		<u>Unregistered Sector</u>		<u>Total</u>	
	<u>Quantity</u>	<u>%</u>	<u>Quantity</u>	<u>%</u>	<u>Quantity</u>	<u>%</u>
Grams (to dal)	33,342	8.1	377,480	91.9	410,822	100.0
Paddy (hulling)	3,460	100.0	-	-	3,460	100.0
Oilseeds (crushing)	-	-	701	100.0	701	100.0
Groundnut seeds (decorticating)	-	-	95,344	100.0	95,344	100.0
Total	36,802	7.2	473,525	92.8	510,327	100.0

Source : ORG Survey, 1971

The total value of production is estimated at Rs. 70 million. The unregistered sector plays a predominant role with a share of over 70 percent. However, average value of production per unit in the registered sector is 5.3 times that in the unregistered sector. Table - 4.3.5 gives details of value of production in the two sectors.

Table - 4.3.5 : Value of Production in  
Dal Mills

<u>Description</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Value produced (Rs. '000)	21,752	48,348	70,100
Percent share	31.0	69.0	100.0
Value produced/unit (Rs. '000)	906	170	227
Estimated number of units	24	285	309

\*Equal to processing units -- those units having processing or servicing facilities

Source: ORG Survey, 1971

(c) Inputs and Consumption:

Tur, Urid, Bengal and Mung grams are the raw materials used by this industry. This industry is dependent on other states for the supply of raw materials unlike the two other grain product industries, vis., flour and rice mills.

Over 90 percent of the total requirement is met by different agencies from outside the state. Of the 44,171 tonnes of pulses procured from the different states, 32,380 tonnes (73%) was transported by rail.

Table - 4.3.6 gives details of the quantity procured from different locations.

Table - 4.3.6 : Quantity of Raw Materials Procured by Dal Mills from Different Locations

( Tonnes )

<u>Raw Material</u>	<u>Local</u>	<u>Within District</u>	<u>Within State</u>	<u>Within Country</u>	<u>Total</u>
Tur gram	-	370	72	18,601	19,043
Urid gram	1,222	522	1,410	12,300	15,454
Mung gram	-	-	51	2,042	2,093
Bengal gram	312	-	-	11,128	11,440
Peas, raw	111	-	-	99	210
Total	1,645	892	1,532	44,172	48,241
Percent to total	3.4	1.8	3.2	91.6	100.0

Source: ORG Survey, 1971

Though handling losses are negligible, about 1.4 per cent of raw materials were lost in transit. The loss was reported by the units procuring raw materials from outside the state. Rail was the mode of transport used by these units.

Table - 4.3.7: Raw Material Procurement Details  
of Dal Mills Industry

<u>Description</u>	Procurement Source			<u>Total</u>
	<u>Wholesalers and Dealers</u>	<u>Brokers</u>	<u>Directly from Farmers</u>	
Procurement value ('000 Rs.)	41,484	16,247	3,867	61,598
No. of units procuring from the source				
i) Total	254	55	64	309
ii) On Cash Payment	214	37	64	251
iii) No brokerage	244	7	64	251
iv) On brokerage up to 1 %	9	46	-	55

Source : ORG Survey, 1971

From the above table it would be noticed that only 6 per cent by value, of raw materials is procured directly from the farmers. Dealings from outside the state are mostly with wholesalers and brokers.

The total consumption of grams in this category is estimated at 50 thousand tonnes of which 14 thousand tonnes was consumed by the registered sector. The yield rates of dals from whole grams in the registered and unregistered sectors work out to 86.5 per cent and 85.4 percent, respectively.

Table - 4.3.8 : Quantity of Raw Materials Consumed  
by Dal Mills

Raw Material	Registered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
		(Tonnes)		
Tur gram	12,275	6,303	1,933	20,511
Urid gram	1,846	8,060	5,378	15,284
Mung gram	143	1,244	1,031	2,418
Total	14,264	15,607	8,342	38,213

Source: ORG Survey, 1971

(d) Marketing :

About 95 percent of the total products sold by dal mills is within the state. In terms of quantity sold, tur dal and urid dal have a major share. Table 4.3.9 gives details of quantity sold by location for different products produced by dal mills. It would be noticed that almost the entire sales of fried peas is done locally. Tur dal is the only product having over 50 percent sales outside the district.

The total value of the different products sold is estimated at Rs. 71 million. Over 90 percent of the sales is to wholesalers and dealers. Road is the only mode of transport used for movement of the products (but for a small fraction of 0.3 percent going outside the state) to different locations. In addition to cash transactions, credit facilities are offered by most of the units. Less than 4 percent of the total sales is made through middlemen. About 10 percent of the units have reported brokerage and commissions, ranging from 0.1 to 3.0 percent.

Table - 4.3.9 : Quantum of Products Sold in  
Different Locations by Dal Mills

<u>Product</u>	(Tonnes)				
	<u>Local</u>	<u>Within District</u>	<u>Within State</u>	<u>Within Country</u>	<u>Total</u>
Tur dal	5,769	4,010	5,407	1,078	16,264
Urid dal	7,538	1,727	3,280	132	12,677
Mung dal	788	124	739	33	1,684
Fried gram	5,938	2,671	2,643	56	9,308
Fried peas	131	4	5	7	147
Total	18,164	8,536	12,072	1,308	40,080
Percent to total	45	21	30	4	100

Source : ORG Survey, 1971.

(e) Investment :

The total fixed capital of all units in this category is estimated at Rs. 16 million. The contribution of the registered sector is only 14 per cent of the total fixed capital. The average investment per unit in the registered sector is Rs. 76,000 while in the unregistered sector it is only Rs. 36,000. Share of land and buildings in the fixed capital is high in both sectors, indicating the need for very little machinery by this industry.

Table - 4.3.10 : Fixed Capital Investment by  
Dal Mills Industry

<u>Description</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Fixed capital (Rs. '000)	2,370	14,222	16,592
Percent share	14.3	85.7	100.0
Fixed capital/unit (Rs. '000)	76	38	40.8
Percent share of land & buildings to fixed capital	75	85	84

Source : ORG Survey, 1971.

The total working capital of dal mills industry is estimated at Rs. 13 million. The shares of the registered and unregistered sector are 35.7 and 64.3 percent, respectively. Over 50 percent of the total working capital in the registered sector is in the form of raw material and finished products inventory. In the unregistered sector almost the entire working capital is in the form of cash in hand.

Table - 4.3.11 shows working capital as a percentage of the value of production in the two sectors.

Table - 4.3.11 : Working Capital of Dal Mills as  
Percent of Value of Production

Description	Regis- tered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
Total working capital (Rs. '000)	4,632	5,223	3,129	12,984
Value of Production (Rs. '000)	21,752	34,268	14,080	70,100
Working capital as percent of value of production	21.3	15.2	22.2	18.5

Source : ORG Survey, 1971.

(f) Cost Structure :

Raw material cost accounts for over 90 percent of the total cost in both the sectors. Processing cost in the form of fuel, electricity and repairs is a meager 1.0 percent. Contribution of inward transport costs and taxes paid is 2.2 percent and 3.9 percent, respectively in the registered sector.

Table - 4.3.12 : Cost Structure of Dal Mills Industry

Stratum	Total Cost (Rs.'000)	Total Cost/Unit (Rs.'000)	Percent share of important components			
			Raw - mater- ials	Fuel & Elec- tricity	Taxes	Inward trans- port
21	20,627	859	90.0	0.40	2.26	3.90
31	33,672	118	91.1	1.34	2.77	2.31
41	13,146	43	91.4	1.20	1.72	1.46

Source : ORG Survey, 1971.

(g) Comments :

Table - 4.3.13 gives some of selected co-efficients for the dal mills industry in Tamil Nadu. It would be noticed from this table that the unregistered sector is dominant in terms of the number of units, value of production and the nature of activity (processing or servicing). The rate of return however, is higher from the registered sector.

Table - 4.3.13 : Selected Co-efficients of  
Dal Mills Industry

(Value in '000 Rs.)

<u>Co-efficients</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Number of units	31	376	407
Value of production	21,752	48,348	70,100
Service charges earned	222	1,852	2,074
Fixed capital invested	2,370	14,222	16,592
Total input cost	19,617	44,663	64,280
Gross value added	2,357	5,537	7,894
Gross value added/unit	76	14.7	19.3
Gross value added/ unit investment	1.00	0.39	0.48

Source : ORG Survey, 1971.

#### 4.4 Bakeries (206)

##### (a) Structure of the Industry :

The Bakery industry consists of a small number of units in the registered sector, situated mostly in Madras and other big cities in the state and a large number of small units in the unregistered sector with a very limited area of operation. The registered units have an average employment of seventeen permanent and 1.5 casual workers. These units as well as the units in the unregistered sector work only one shift. Table - 4.4.1 gives details of employment in the different strata of the industry.

Table - 4.4.1 : Employment Structure of  
the Bakery Industry

<u>Stratum</u>	<u>Average No./day (No./shift)</u>	<u>Average monthly salary (Rs.)</u>	<u>Average number/ shift</u>	<u>Average daily rate (Rs.)</u>	<u>Average no. of days worked (shift/day)</u>	<u>No. of Units</u>
Total	4 (4)	60	0.4	3.4	290 (1.0)	3271
<u>Registered Sector</u>						
11						
12						
13						
21	17 (14)	119	1.5	3.3	307 (1.2)	12
<u>Unregistered Sector</u>						
31	5 (5)	75	1.5	3.4	287 (1.0)	745
41	4 (4)	60	1.0	3.5	291 (1.0)	2514

Source : ORG Survey, 1971.

(b) Processing & Production :

The total value of production of the bakery industry is estimated at Rs. 76 million. The registered sector contributes only 4 per cent to the total value of production. The average value of production per unit, however, varies widely between the two sectors. The average value of production/unit in the registered sector is Rs. 265 thousand while in the unregistered sector it is only Rs. 22 thousand. Table - 4.4.2 gives details of the value of production, shares of the two sectors and the value of production per unit in the two sectors.

Table - 4.4.2 : Value of Production in  
the Bakery Industry

Description	Regis- tered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
Value of production ( '000 Rs. )	3,177	25,358	47,047	75,582
Percent share	4.2	33.6	62.2	100.0
Value produced/unit ( '000 Rs. )	264.7	34.0	18.7	23.1
Estimated number of units	12	745	2,514	3,271

Source : ORG Survey, 1971.

All the units in the registered sector are either big or medium sized units. These units have modern machinery for the manufacture of various bakery products. Units in the unregistered sector however, are quite primitive and most of the work is being done manually.

Bread, biscuits and buns are the major products of this industry. These three together contribute 93 percent by weight to the total production. The small unregistered units practically control the entire economy of this industry. Over 90 percent of the total production is from these small units. It is to be noted that two products, viz. buns and rusks are produced almost entirely by the unregistered sector and most of their sales is to the low income group. Table - 4.4.3 gives details of the various products produced in the two sectors.

Table - 4.4.3 : Products Manufactured by the Bakery Industry

Products	Regis- tered Sector	Unregistered Sector		Total	Percent to Total
		Stratum 31	Stratum 41		
Bread (all types)	686	7,666	11,219	19,571	53.1
Biscuits	223	3,436	4,010	7,669	20.8
Buns	66	1,612	1,612	5,389	19.2
Cake	174	487	1,204	1,865	5.1
Rusk	2	39	229	270	0.7
All Bakery products	64	250	-	314	0.9
Confectionary	47	62	-	109	0.2
Total	1,262	13,551	22,051	36,865	100.0

Source : ORG Survey, 1971.

(c) Inputs and Consumption :

Raw materials are purchased mainly from private traders (to the extent of 86 percent) and average purchase per unit from all sources is only 15 thousand rupees per annum. There are no special procurement practices observed by this industry. Materials are purchased from the local merchants at their shops on cash payment.

Table - 4.4.4 : Raw Materials Procured by the Bakery Industry from Different Locations

<u>Location</u>	<u>Quantity (tonnes)</u>	<u>Percent to Total</u>	<u>Transport Cost(Rs.)</u>	
			<u>Total</u>	<u>per tonne</u>
Local	27,177	80	496,948	18.3
Within district	6,127	18	121,423	19.8
Within state	663	2	14,130	21.3
Total	33,967	100	632,501	18.6

Source : ORG Survey, 1971.

In the table below only major raw materials (mentioned in the consumption table) are considered for the analysis. It is interesting to observe that this industry does not depend on any source outside the state, except for the imports of 120 kgs. of yeast.

Table - 4.4.5 : Quantity of Different Raw Materials  
Procured by the Bakery Industry

(Tonnes)

<u>Raw Material</u>	<u>Local</u>	<u>Within District</u>	<u>Within State</u>	<u>Total</u>
Maida	21,076	4,915	234	26,225
Sugar	4,900	1,030	421	6,356
Butter	89	-	-	89
Vanaspati	720	124	9	853
Eggs ('000 nos.)	6,207	416	-	6,623

Source : ORG Survey, 1971

As against a total production of 37 thousand tonnes of bakery products, the consumption of major raw material is estimated at 34 thousand tonnes. By weight, maida has the major share with a contribution of 76 percent to the total consumption followed by sugar (20%). The following table shows the consumption pattern in different strata.

Table - 4.4.6 : Annual Consumption of Major Raw Materials by the Bakery Industry

Raw Material	Regis- tered Sector	Unregistered Sector		Total	Percent to Total
		Stratum 31	Stratum 41		
Maida	831	8,448	16,822	26,101	75.8
Sugar	177	1,928	4,719	6,824	19.8
Butter, Vanaspati & Other Oils	73	461	593	1,127	3.3
Eggs* (edible portion)	30	124	212	366	1.1
Total	1,111	10,961	22,346	34,418	100.0
Percent to total	3.2	31.9	64.9	100.0	

\*Assuming 20 eggs to yield 1 kg. of edible portion.

Source : ORG Survey, 1971.

Besides those mentioned above, 60 tonnes of milk, 10 tonnes of milk powder and 3 tonnes of condensed milk were consumed by the various units. Substitutes to sugar, such as jaggery, khandasari and sugar candy are used by both registered and unregistered units to the extent of 100 tonnes whereas sweet powder ( about 1 tonne ) is reported to have been consumed only in the 1-4 sector (unregistered). Consumption of glucose is the highest (80 tonnes) in the 1-4 sector as against a total of 86 tonnes by all the sectors.

(d) Marketing :

About 92 percent of bakery products are marketed locally (in places where the manufacturing unit is situated) and a small proportion (7.6%) is reported to be marketed within the district; this again relates to places just outside the town of origin. Of the products marketed within the district, biscuits have a major share though the transport cost per kg. varies from 12 to 20 paise depending upon the destination. Handling losses, though very negligible, are reported for products distributed locally. About 0.2 percent of buns and 0.1 percent of biscuits were lost in distribution.

Table - 4.4.7 : Sales of Bakery Products at  
Different Locations

<u>Product</u>	(Quintals)				
	<u>Local</u>	<u>Within District</u>	<u>Within State</u>	<u>Within Country</u>	<u>Total</u>
Bread	166	448	-	-	614
Biscuits	63	1,629	8	63	1,763
Cake	48	-	-	-	48
Buns	429	1,331	-	-	1,760

Source : ORG Survey, 1971.

The distribution pattern of bakery products marketed at different locations is shown in the table below:

Table - 4.4.8 : Quantity Marketed by the Bakery Industry at Different Locations

Location	Quantity (tonnes)	Percent to Total	Transport Cost (Rs.)	Transport Cost /tonne
Local	34,549	92.2	70,701	2.0
Within district	2,857	7.6	340,809	119.2
Within state	52	0.1	785	14.7
Within country	31	0.1	6,266	202.1
Total	37,489	100.0	418,561	

Source : ORG Survey, 1971.

About 65 percent of sales is made directly to the customers and about 20 percent is through private dealers. Private dealers are provided with transport facility by the manufacturing units in 50 per cent of the cases. The mode of transaction is cash. It is of interest to note that commissions paid to private dealers often exceed 10 percent.

(e) Promotional Schemes :

A very meager amount is being spent by the units on advertising and various other promotional schemes. Table - 4.4.9 gives a breakdown of the amount spent on different advertising/promotional schemes.

Table - 4.4.9 : Amount Spent by the Bakery Industry  
on Advertising and Other Promotional  
Schemes

<u>Stratum</u>	<u>Press</u>	<u>Cinema</u>	<u>Hand bills</u>	<u>Mixed</u>	<u>Total</u>
<u>Registered Sector</u>	161	-	-	67	319
<u>Unregistered Sector</u>					
31	53	120	120	146	1,038
41	72	144	144	1,006	1,365

Source : ORG Survey, 1971.

(f) Investment :

The total fixed capital of all units in this category is estimated at Rs. 50 million. The shares of the registered and unregistered sector in the total fixed capital are 3.3 and 96.7 percent, respectively. However, the ratio of the fixed capital per unit in the two sectors is 9.4 : 1.1. The fact that very little machinery is used by the industry for processing the materials is evident from the high share of land and buildings in the total fixed capital (refer table - 4.4.10).

Table - 4.4.10 : Fixed Capital Invested by the Bakery Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ('000 Rs.)	1,674	48,715	50,389
Percent share	3.3	96.7	100.0
Fixed capital/unit ('000 Rs.)	139.5	14.9	15.4
Percent share of land and buildings to total fixed capital	75.3	80.8	80.5

Source : ORG Survey, 1971.

The working capital of this industry is quite low. A large percentage of the capital is in the form of cash in hand. Being mostly small units manufacturing the day to day requirements, most of the unregistered units have very little inventory of finished products and raw materials. Table - 4.4.11 gives details of the working capital as per cent of value of production.

Table - 4.4.11 : Working Capital of the Bakery Industry  
as Percent of Value of Production

Item	Regis- tered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
Total working capital (Rs. '000)	211	2,117	2,830	5,158
Value produced (Rs. '000)	3,177	25,358	47,047	75,582
Working capital as per cent of value produced	6.6	8.3	6.0	6.8

Source : ORG Survey, 1971.

(g) Cost Structure :

In both the sectors raw material cost accounts for over 80 percent of the total cost. Processing cost in the form of fuel, electricity and repairs is 7.0 percent. Packing contributes about 4.2 percent to the total cost in the registered sector. However, its contribution to the total cost in the unregistered sector is only 1.8 percent.

Table - 4.4.12 : Cost Structure of the Bakery Industry

Stratum	Total cost (Rs. '000)	Total cost/unit (Rs. '000)	% share of important components			
			Raw materials	Fuel & Electricity	Taxes	Depreciation
21	2,328	194	80.8	2.4	4.7	1.6
31	20,152	27	83.4	4.9	2.7	0.4
41	39,222	16	80.9	6.8	1.1	0.2

Source : ORG Survey, 1971.

(h) Selected Co-efficients :

As mentioned earlier, this industry has a large number of units in the unregistered sector and a small number of units in the registered sector. Mention must be made here that estimates made on the basis of data obtained from the survey is likely to be slightly underestimated and the exact status of the industry in the registered sector is not fully known as some of the big units like Modern Bakeries, Britannia Biscuits, etc. were not willing to provide any information. Within this limitation, it has been observed that the bakery industry has a good rate of return (Table - 4.4.13).

Table - 4.4.13 : Selected Co-efficients for the Bakery Industry

Item	(Value in '000 Rs.)		
	Regis- tered Sector	Unregi- stered Sector	Total
Number of units	12	3,259	3,271
Value of production	3,177	72,405	75,582
Service charges earned	-	-	-
Fixed capital invested	1,674	48,715	50,389
Input cost	2,060	54,845	56,915
Gross value added	1,117	17,560	18,677
Gross value added/unit	93	54	57
Gross value added/unit investment	0.67	0.36	0.37

Source : ORG Survey, 1971.

#### 4.5 Dairies (202)

##### (a) Structure :

All the units, except two, in this category are owned by co-operatives and the government. Eleven out of a total of 13 units are in the registered sector and all these are equipped with modern plant and machinery for pasturization and preparation of milk-products. All the units work for over 300 days a year. Casual laborers form a negligible proportion compared to the regular employees. In terms of man-shifts, the former account for less than 5 percent of the total man-shifts in this industry. The details of employment are given below:

Table - 4.5.1 : Employment Structure of the Dairy Industry

Stratum	Permanent Workers		Casual workers		Average no. of days worked (shift/day)	No. of Units
	Average no./day (No./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	48	194	1.5	2.4	354 (1.5)	13
<u>Registered Sector</u>						
11	91 (37)	111	6.2	2.4	300 (2.4)	1
12						
13						
21	51 (31)	209	1.1	2.5	357 (1.6)	10
<u>Unregistered Sector</u>						
31	13 (13)	182	-	-	365 (1.0)	2
41						

Source : ORG Survey, 1971.

(b) Processing and Production :

The units in the registered sector are all equipped with modern machinery and equipment and the technical personnel have undergone training in some of the Dairy Research Institutes.

The estimated quantity of milk processed by the Dairy Industry is 34,714 tonnes per annum, of which toned milk accounts for 1,211 tonnes (3%).

Among the milk products, butter and ghee have large shares. It may be noted that cheese is not at all produced in the registered sector.

The following table gives the estimates of production in the registered and unregistered sectors of the dairy industry.

Table - 4.5.2 : Products Manufactured by the Dairy Industry

(Quantity in tonnes)

Product	Registered Sector		Unregistered Sector		Total	
	Quantity	%	Quantity	%	Quantity	%
Whole milk	32,633	97.0	870	3.0	33,503	100.0
Toned milk	1,211	100.0	-	-	1,211	100.0
Sub-total	33,844	97.0	870	3.0	34,714	100.0
Butter	200	100.0	-	-	200	100.0
Ghee	156	100.0	-	-	156	100.0
Other milk products	99	98.0	2	2.0	101	100.0
Sub-total	455	100.0	2	2.0	457	100.0
Total	34,299	98.0	872	2.0	35,171	100.0

Source : ORG Survey, 1971.

In terms of value of production, 98 percent is accounted for by the registered sector out of a total of 41.9 million rupees. Details of value of production in the two sectors are presented in the following table.

Table - 4.5.3 : Details of Value of Production  
in Dairy Industry

<u>Description</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Value of production ('000 Rs.)	41,032	856	41,888
Percent share	98	2	100
Value produced per unit ('000 Rs.)	3,730	428	3,222
Estimated number of units	11	2	13

Source : ORG Survey, 1971.

The total rated capacity of dairies in the state is 66,270 tonnes per annum. As against this, the average throughput of these units in October, 1971, a peak month for supply of milk, has been 116 tonnes per day, or 42,340 tonnes per annum at this rate.

The rated capacities of dairies in different centers of Tamil Nadu are as follows:

Table - 4.5.4 : Rated Capacity of the Dairy Industry

<u>Sr. No.</u>	<u>Center</u>	<u>Annual rated capacity (tonnes)</u>	<u>Throughput in October 1971 (Tonnes per day)</u>
1.	Coimbatore	5,957	17
2.	Kodaikanal	745	1
3.	Madras	27,922	68
4.	Kanyakumari	1,117	3
5.	Madurai	18,615	16
6.	Trichy	5,957	7
7.	Thanjavur	5,957	4
	Total	66,270	116

Source : National Dairy Development Board, Anand.

(c) Inputs :

The major inputs consumed by dairies in the registered and unregistered are shown below:

Table - 4.5.5 : Consumption of Major Inputs by the Dairy Industry

<u>Inputs</u>	(Tonnes)		<u>Total</u>
	<u>Registered Sector</u>	<u>Unregistered Sector</u>	
Milk	35,518	910	36,428
Milk powder	15	-	15
Skimmed milk	265	-	265
Butter	248	-	248
Chemicals	29	-	29

Source : ORG Survey, 1971.

The registered sector consumes 98 percent of the total inputs in the industry. The procurement pattern of milk from different sources is shown in the table below:

Table - 4.5.6 : Procurement Pattern of Milk  
by the Dairy Industry

<u>Source</u>	<u>Milk Procured (tonnes)</u>	<u>Percent to total</u>
Local	9,716	26
Within district	18,089	50
Within state	8,619	24
Total	36,424	100

Source : ORG Survey, 1971.

Seven percent of the total annual procurement of milk (36,424 tonnes) is done locally or from within the district and the rest from neighboring districts in the state. Road transport is the only mode used for collecting milk from various centers. Procurement through co-operative agencies account for 80 of the purchases and mostly the dairies collect milk at the various centers and use their own transport to bring to the processing units. From surrounding villages and rural areas within a reasonable distance milk is procured and brought to the dairy. From far off villages, milk is collected and cooled at intermediate chilling centers and then brought to the dairy.

A good amount of effort is needed to explore surplus areas and organize collection of surplus milk in a systematic manner. It is also a difficult task to retain these procurement centers, for, competition from private milk vendors springs up very fast once it is known that there is surplus milk. The dairies are thus left with such exploration as a permanent problem.

Some of the dairies do not directly get into this type of procurement - at least not in all areas - but they get their requirements from the affiliated (or member) co-operative societies. It is however, reported that these affiliated societies also face stiff competition from individual vendors. The quality of milk, especially the fat content, varies from area to area and this is attributed to the quality and type of fodder used.

The co-operatives are paid through banks in 50 percent of the cases and in cash in 25 percent of the cases. There is absolutely no brokerage or commission involved in procurement of milk. Seasonal fluctuations in the supply of milk and also inadequate supply are the major problems faced by the dairy industry.

(d) Marketing :

Sixty-nine percent of the processed milk is consumed locally, (in the town in which the dairy is situated) and in the same district and the remaining 31 percent is moved out of the district. The quantum of milk exported to other states is negligible whereas in the case of major milk products, viz., butter and ghee, the export component is between 25 and 33 percent.

The following table shows the quantity of milk distributed to different locations.

Table - 4.5.7 : Milk Distributed by Dairies to  
Different Locations

<u>Location</u>	<u>Milk Distributed (tonnes)</u>	<u>Percent to Total</u>
Local	19,614	58
Within district	3,603	11
Within state	10,319	30
Within country	441	1
Total	33,977	100

Source : ORG Survey, 1971.

Road is the only mode of transport used for movement of finished products from dairies within the state while rail is used mainly for the movement of butter outside Tamil Nadu. Consequently, almost the entire transport cost (amounting to Rs. 1.5 million) incurred by the dairies is accounted for by the former mode. Transit and handling losses of the products are practically nil. Since milk is mostly distributed directly to consumers, it is sold invariably against cash payment. There are no intermediaries in marketing of the products and thus no brokerage or commission is paid. High distribution cost and a fluctuating demand pattern over the seasons are the main problems reported in this industry. Thirty-three per cent of the units have reported these problems whereas 25 percent of them have spoken of high cost of production and inadequate credit facilities also as difficulties faced by them.

(e) Capital :

The details regarding investments on fixed capital in the dairy industry are as follows:

Table - 4.5.8 : Investment on Fixed Capital by  
the Dairy Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ( '000 Rs. )	15,077	152	15,229
Percent share	99	1	100
Fixed capital per unit ( '000 Rs. )	1,371	76	1,172
Percent share of land and buildings in total fixed capital	45	29	45

Source : ORG Survey, 1971.

The capital intensive nature of this industry is clear from the fact that the average fixed capital for a dairy unit works out to 1.2 million rupees and in the registered sector it is even higher - that is, of the order of 1.4 million rupees. Further, it is interesting to note that as much as 55 percent of the fixed capital is invested in plant and machinery. This is in sharp contrast to the pattern observed in the other major food processing industry categories. The average working capital employed in an unit is about 0.2 million rupees which is 16 percent of the average fixed capital. The following table shows the amount of working capital in the registered and unregistered sectors as well as its percentage to the value of production.

Table - 4.5.9 : Details of the Working Capital in the Dairy Industry

Description	Regis- tered Sector	Unregi- stered Sector	Total
Total working capital ( '000 Rs.)	2,806	195	3,001
Value of production ( '000 Rs.)	41,032	856	41,888
Working capital as percent of value of production	6.8	22.7	7.1

Source : ORG Survey, 1971.

(f) Cost Structure :

Of the total 35 million rupees included in the total cost, direct inputs account for 33 million rupees (92%) raw material costs alone adding to 31 million rupees (86%) and inward transport cost to approximately 1 million rupees (2.6%). Details of various cost components are as follows:

Table - 4.5.10 : Cost Structure of the Dairy Industry

(Value in '000 Rs.)

Stratum	Material cost		Processing cost		Other costs		Total cost
	Value	%	Value	%	Value	%	
Registered sector	30,172	87	987	3	3,591	10	34,750
Unregistered sector	680	93	16	2	38	5	734
Total	30,852	87	1,003	3	3,629	10	34,484

Source : ORG Survey, 1971.

The high proportion of other costs (10%) is due to the large amount of interest on loans paid by the dairies.

(g) Comments :

Although all the 11 dairies in the registered sector were contacted for the purpose of data collection, two units had refused to furnish the required information. One of them, the Madras Dairy Milk Project, has the highest capacity in the state. The estimates are, therefore obtained by projecting the information from the 9 units which responded to the survey are as such likely to be slight under-estimates.

In the unregistered sector, information from only one unit (out of a total 2) could be collected and hence the corresponding estimate should be viewed with appropriate care. In the following table some of the selected co-efficients for the dairy industry are presented.

Table - 4.5.11: Selected Co-efficients of  
the Dairy Industry

Description	(Value in '000 Rs.)		
	Regis- tered Sector	Unregis- tered Sector	Total
Number of units	11	2	13
Value of production	41,032	856	41,888
Fixed capital invested	15,077	152	15,229
Total input cost	32,049	722	32,771
Gross value added	8,983	134	9,117
Gross value added per unit	817	67	701
Gross value added per unit investment	0.60	0.88	0.60

Source : ORG Survey, 1971.

Apparently, the unregistered sector yields higher returns than the registered units. Yet as mentioned earlier, the estimate for the unregistered sector is based on a single observation and as such they should not be drawn for any such comparisons.

4.6 Sugar Mills (209 - 1)

(a) Structure of the Industry

All the sugar mills in Tamil Nadu extracting sugar from sugarcane are in the organized sector. There are eight units in the unregistered sector manufacturing sugar candy and bursugar. Of the 20 units in the registered sector, 6 units have a permanent employment of over 150 persons and the rest have less than 150. Units in the unregistered sector have on an average only 4 permanent workers. It would be noticed from Table - 4.6.1 that in the registered sector casual labor per shift accounts for a meager 15.5 per cent of the total employed per shift. The unregistered sector have not reported any employment of casual workers.

Working in the sugar mills is highly seasonal. Mills worked on an average for 212 days last year. This is much higher than the all India average duration of the working season for sugar mills (142 days). Mills worked for all the three shifts during the season. Units in the unregistered sector worked intermittently throughout the year on a single shift basis.

Table - 4.6.1 : Employment Structure of the  
Sugar Mills Industry

Stratum	Permanent workers		Casual workers		Average no. of days worked (shift/day)	No. of Units
	Average no./day (No./ shift)	Average monthly salary (Rs.)	Average number/ shift	Average daily rate (Rs.)		
Total	216 (141)	318	40	3.4	219 (2.3)	28
<u>Registered Sector</u>						
11						
12	918 (309)	278	57	2.1	259 (3)	6
13	126 (71)	447	39	4.5	197 (1.0)	14
21						
<u>Unregistered Sector</u>						
31	4 (4)	67	-	-	228 (1.0)	8
41						

Source : ORG Survey, 1971.

(b) Processing and Production :

Almost the entire production of sugar in the state comes from the organized sector. The value of production is estimated at Rs. 360 million, of which the contribution of the unregistered sector is only Rs. 580 thousand. It is estimated that 225 thousand tonnes of sugar is processed annually. **Molasses**, which has important industrial uses, amounting to 1.5 tonnes was obtained as a by-product in this industry. Sugar candy and bursugar are the products manufactured in the unregistered sector. It has been estimated that 240 tonnes of sugar candy and 26 tonnes of bursugar were produced during the previous year.

Table - 4.6.2 : Quantity Processed by Sugar Mills Industry

Product	(Quantity in tonnes)				Total
	Registered Sector		Unregistered Sector		
	Quantity	%	Quantity	%	
Sugar	225,401	100	-	-	225,401
Khandsari	408	100	-	-	408
Sugar candy	-	-	241	100	241
Bursugar	-	-	26	100	26

Source : ORG Survey, 1971 .

(c) Inputs and Consumption :

Sugarcane is the major input for the manufacture of sugar. Sugarcane procurement during the last year was about 2.6 million tonnes valued at Rs. 196 million, all of it being procured during the season. Most of the requirement of the sugar mills are met by the farmers (84%) and the rest by dealers and wholesalers. Sixty-five percent of the mills have direct cash dealings with the farmers and wholesalers, while the remaining have credit facilities with their buyers. It would be noticed from Table - 4.6.3 that 2.41 million tonnes of sugarcane is procured within the district and only 6.7 percent comes from outside the district. The average transport cost per tonne incurred by the mills procuring from the different sources is also shown in this table.

Table - 4.6.3 : Sugarcane Procured by Sugar Mills  
from Different Sources

Source	Quantity procured (tonnes)	Percent to total	Total transport cost (Rs.)	Average transport cost per tonne (Rs.)
Local	625,160	24.3	925,227	1.48
Within District	1,782,492	69.0	5,670,553	3.18
Within State	172,613	6.7	1,674,211	9.70
Total	2,580,265	100.0		

Source : ORG Survey, 1971.

Table - 4.6.4 : Details of Procurement of Sugarcane  
by Sugar Mills

Description	Whole- salers and dealers	Directly from farmers	Total
Purchase value ('000 Rs.)	31,318	165,605	196,923
<u>No. of units purchasing directly</u>			
i) Total	10	18	28
ii) With no transport cost	6	10	16
iii) On cash payment	10	7	17
iv) Without brokerage	10	18	28

Source : ORG Survey, 1971.

It is estimated that 2.56 million tonnes of sugarcane was consumed last year by the sugar mills. Lime stone and sulphur are the major chemicals used for refining sugar. It is estimated that 455 tonnes of sulphur and 1,494 thousand tonnes of lime stone were consumed by the mills.

Bursugar and sugar candy produced by the unregistered sector has sugar as the basic ingredient. It is estimated that 268 metric tonnes of sugar was consumed by the 8 units to produce the various products.

(d) Marketing :

The entire sugar production in the state is being marketed through wholesalers, retailers and dealers. The payments are in cash for all the units excepting 7 which utilize the services of the bank in addition to cash transactions. There is hardly any promotional schemes employed by the units. The amount spent is only Rs. 453,000 of which Rs. 385,000 is on advertising in newspapers, periodicals, etc.

Table - 4.6.5 gives details of sugar marketed at different locations. The entire sales is transported by road to different locations. About 50 percent of the units (13 out of 28), mainly the bigger units, have ex-factory delivery. Seven units utilize their own transport and do not charge the customers for transportation. Four of the units deliver goods directly at the customers place and charge the customers for the services rendered.

Table - 4.6.5 : Quantity of Sugar Marketed by Sugar Mills at Different Locations

<u>Location</u>	<u>Quantity sold (tonnes)</u>	<u>Percent to total</u>
Local	7,023	4.1
Within District	61,082	35.7
Within State	78,609	45.8
Within Country	24,629	14.4
Total	171,344	100.0

Source : ORG Survey, 1971.

Table - 4.6.6 : Marketing Details of  
Sugar Mills Industry

Description	Whole- salers and dealers	Directly to customers	Total
Sales value ('000 Rs.)	257,959	72	258,031
<u>No. of units selling directly</u>			
i) total	24	4	28
ii) incurring no transport cost	13	-	13
iii) on cash payment*	17	4	21
iv) without brokerage**	23	4	27

\* 7 units provide bank facilities to their buyers.

\*\* 1 unit has to pay a commission of 0.5%

Source : ORG Survey, 1971.

(e) Investment:

Sugar mills are highly capital intensive. The average fixed capital investment per unit is estimated at Rs. 9.4 million. Contribution of machinery is about 75 percent to the total fixed capital and that of land and building is only 25 percent.

Table - 4.6.7 : Fixed Capital Investment by the Sugar Mills Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ('000 Rs.)	187,649	588	188,237
Percent share	98.8	0.2	100.0
Fixed capital per unit ( '000 Rs.)	9,382	73	6,722
Percent share of machinery in total fixed capital	75	5	75

Source : ORG Survey, 1971.

Units manufacturing sugar candy and bursugar have a low capital requirement compared to the sugar mills. The average fixed capital requirement for such an unit is Rs. 73,500. The machinery requirement is also very low (Rs. 3,000). The working capital necessary for these units is also very small.

The total working capital of all sugar mills is estimated at Rs. 188 million. This is about 48 percent of the value of production. It is to be born in mind that net balance payable has not been considered while computing the working capital as all the units were not able to provide details. The net working capital computed would be much less if the net amount payable is also taken into consideration.

The table below gives details of working capital of the sugar industry for the year 1965-66 as prepared by the Annual Survey of Industries (ASI) and compares these with those computed from the present survey.

Table - 4.6.8 : Working Capital of the Sugar Mills Industry

Description	A.S.I. (1965-66)	ORG Survey (1971)
Value of production	121	390
Total working capital	22	188
Stock of raw materials	10	5
Stock of finished products and other inventories	35	183
Net payable	26	n.a.
Percent of working capital not including the net payable	40	48

n.a. = not available

The slightly higher percentage noticed during the present survey is due to the higher stocks accumulated with the producers during the last year. Stock accumulation was a problem reported by all the units contacted in the survey.

(f) Cost Structure :

Raw material costs account for over 70 percent of the total cost of production for sugar mills and over 90 percent for units producing sugar candy and bursugar. Processing costs in the form of fuel, electricity and repairs is a meager 5 per cent of the total cost. Taxes in the form of government levy and cess for procurement at the rate of Rs. 5 per tonne, depreciation (at the rate of 6%) and payment of interest (at the rate of 8%) are the other major contributors to the total cost.

Table - 4.6.9 : Cost Structure of the  
Sugar Mills Industry

Stratum	Total cost ( '000 Rs.)	Total cost/unit ( '000 Rs.)	% share of important components			
			Raw mate- rial	Fuel & Elec- tricity	Taxes	Depre- ciation
12	165,612	27,602	72.5	1.2	11.2	3.0
13	121,093	8,649	56.7	1.4	8.5	9.1

(g) Selected Co-efficients :

Sugar industry of Tamil Nadu ranks third in the country. Uttar Pradesh and Maharashtra, the first two, are the only states producing over 10 percent of the total all-India production. Contribution of Tamil Nadu is 8 percent. The average recovery of sugar from sugarcane is 8.99 percent and this is slightly lower than the all-India average of 9.33 percent. However, the average duration of the crushing season is much higher (192 days compared to all-India average of 142). An increase of 3.3 percent in sugar production in Tamil Nadu in 1970-71 is reported over 1969-70.

Table - 4.6.10 : Selected Co-efficients of the  
Sugar Mills Industry

Item	(Value in '000 Rs.)		
	<u>Regis- tered Sector</u>	<u>Unregis- tered Sector</u>	<u>Total</u>
Number of units	20	8	28
Value of production	359,412	580	359,992
Fixed capital invested	187,649	588	188,237
Input costs	218,443	500	218,943
Gross value added	140,969	80	141,049
Gross value added/unit	7,048	10	5,037
Gross value added/unit investment	0.75	0.13	0.75

Source : ORG Survey, 1971.

Comparison between the two sectors is not meaningful as the products of the two sectors are entirely different. The finished product, namely sugar, of the registered sector is used as a raw material by the unregistered sector.

4.7 Edible Oil Mills (209 - 2)

(a) Structure :

This industry is comprised of manufacturing units engaged mainly in crushing oil seeds and to some extent oilcakes to produce non-hydrogenated edible oils. As such, this oil contains certain impurities and some undesirable fatty acids which may be removed by the process of hydrogenation to yield refined oil and later vanaspati. There are 3 kinds of industrial units in this category, viz., a few expeller units with a high capital investment, a large number of rotaries with a primemover mostly electrical and sometimes mechanical and a number of ghanis using bullocks.

Though oil is the main product of these units, in this category, there are some compound units, both in the registered and unregistered sectors, having facilities to carry out other processing activities such as hulling (de-husking) of paddy, flouring of cereals and pulses and decorticating of groundnut seed. In this respect, this category closely resembles grainmill industries. A good number of units function as servicing units, either wholly or partially, in the sense that the processing facility is hired to the customer who brings in his raw materials and, after processing, takes away the end products.

Sixty percent of units in both the registered and unregistered sectors do not carry out servicing operations; 28 percent in the former and 11 percent in the latter sector are exclusively servicing units and the rest combine both natures of the operation.

The registered units in this industry depend more on casual labor whose contribution is 61 percent to the total manshifts worked; the corresponding proportion in the other sector works out to only 17 percent.

The following table shows details of employment, wages and the intensity of operation in the different strata of the industry.

Table - 4.7.1 : Employment Structure of Edible Oil Mills Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (Shift/day)	No. of Units
	Average no./day (No./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	3 (3)	77	1.0	3.1	250 (1.0)	3,275
<u>Registered Sector</u>						
11	24 (13)	221	9.0	3.3	256 (1.8)	3
12						
13						
21	8 (7)	128	11.0	2.8	237 (1.3)	218
<u>Unregistered Sector</u>						
31	5 (4)	106	1.0	2.9	272 (1.1)	698
41	3 (3)	47	0.4	4.1	245 (1.0)	2,356

Source : ORG Survey, 1971.

(b) Production :

Groundnut oil, gingelly oil (sesame) rice and coconut oil, in that order, are the major products of this category of the food processing industry, their individual shares to the total production by weight being 23.0 per cent, 16.0 per cent, 2.9 per cent and 2.3 per cent respectively. Refined oil is also reported to be manufactured, though on a small scale (0.6%), since one big registered unit (in stratum 11) in this category is found to have facilities for oil refining. An unique phenomenon in this industry is that oilcakes, a byproduct not meant for direct human consumption, has a higher share of 54.8 per cent by weight to the total production than the principal products. The registered and the unregistered sectors contribute equally to the total production, though the composition of products in the two sectors are different. Gingelly oil occupies the top position in the unregistered sector and on the other hand groundnut oil has the highest percent share to total production in the registered sector.

The following table - 4.7.2 shows the pattern of production in the two sectors.

Taking only oils and oilcakes, the registered sector yields 48 per cent of the total production of these products. Also, it is interesting to note that in the unregistered sector there is no activity other than crushing oilseeds. In other words, there are no compound processing units. However, this is not true in the case of servicing units, which can be clearly seen from the following table. (Table - 4.7.3).

Table - 4.7.2 : Products Manufactured and Marketed  
by Edible Oil Mills

(Quantity in tonnes)

Finished Product	Registered Sector		Unregistered Sector		Total	
	Qty.	%	Qty.	%	Qty.	%
Groundnut oil	45,917	28.5	28,852	17.6	74,769	23.1
Gingelly oil	14,537	9.0	38,229	23.4	52,766	16.2
Coconut oil	4,916	3.0	2,507	1.6	7,423	2.3
Oilcakes	84,127	52.1	93,913	57.4	178,040	54.8
Refined oil	1,858	1.2	-	-	1,858	0.6
Groundnut kernel	474	0.3	-	-	474	0.1
Rice	9,515	5.9	-	-	9,515	2.9
Total	161,344	100.0	163,501	100.0	324,845	100.0
Percent to total	49.7		50.3		100.0	

Source : ORG Survey, 1971.

Table - 4.7.3 : Materials Serviced by Edible  
Oil Mills

(Quantity in tonnes)

Description	Registered Sector		Unregistered Sector		Total	
	Qty.	%	Qty.	%	Qty.	%
Oilseeds	22,336 (43.2)	69.0	29,414 (56.8)	14.5	51,750 (100)	21.9
Paddy	8,257 (5.6)	25.6	142,382 (94.4)	70.0	150,639 (100)	63.9
Flouring of foodgrains	1,769 (5.3)	5.4	31,604 (94.7)	15.5	33,373 (100)	14.2
Total	32,362	100.0	203,400	100.0	235,762	100.0
Percent to total	13.9		86.1		100.0	

Source : ORG Survey, 1971.

The servicing operation assumes entirely a different pattern. The unregistered sector, as expected, has the larger share (86%) in the total quantity of raw materials serviced with paddy as the most important item to be serviced. However, the registered units service more oilseeds than other raw materials in conformity with the industrial classification.

The value of production in the edible oil mills industry is of the order of Rs. 772 million, of which 48 per cent is accounted for by the registered sector. The value of production per unit (engaged in processing either wholly or partially) in the registered sector is appreciably higher (about 15 times) than the corresponding value in the other sector.

The percentage share in the total value produced and per unit value of production for the two sectors are as follows:

Table - 4.7.4 : Value of Production in Edible Oil Mills

Description	Regis- tered Sector	Unregis- tered Sector	Total
Value produced ( '000 Rs.)	371,361	400,695	772,056
Percent share	48.1	51.9	100.0
Value produced per unit ( '000 Rs.)	2,350	148	270
Estimated no. of units*	158	2,704	2,862

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

(c) Inputs :

The major inputs consumed in this industry are obviously oilseeds with groundnut taking the lead. The following table shows the consumption of these inputs in the two sectors.

Table - 4.7.5 : Consumption of Major Inputs  
by Edible Oil Mills

Raw material	(Tonnes)		Total
	Registered Sector	Unregistered Sector	
Groundnut (in pods)	17,069	25,876	42,945
Groundnut kernel	96,760	51,587	148,347
Gingelly seeds	32,750	91,799	124,549
Coconut kernel*	7,744	5,199	12,943
Paddy	12,967	-	12,967
Oils	538	-	538
Other raw materials	6,432	9,324	15,756
<b>Total</b>	<b>174,260</b>	<b>183,785</b>	<b>358,045</b>
Percent to total	48.6	51.4	100.0

\*The weight of kernel portion in account is assumed as 200 gms.

Source : ORG Survey, 1971.

Assuming that the edible portion of groundnut (in pods) is 73 per cent (i.e., kernel forms 73%) the yield rates of groundnut oil show a small difference of 1.1 per cent between the two sectors. There is an appreciable difference, however, in the case of gingelly oil. The following table shows the yield rates of these two products in the registered and unregistered sectors.

Table - 4.7.6 : Percentage Recovery of Oils from Oilseeds

<u>Product</u>	<u>Registered Sector</u>	<u>Unregistered Sector</u>	<u>Total</u>
Groundnut oil	42.0	40.9	41.6
Gingelly oil	44.4	41.6	42.4

Source : ORG Survey, 1971.

It is evident from Tables - 4.7.2 and 4.7.5 that groundnut (in pods and kernel) and gingelly (sesame) are the major raw materials of this industry. The following is the pattern of procurement of these materials from different sources of supply.

Table - 4.7.7 : Procurement Pattern of Groundnut and Oilseeds by Edible Oil Mills

<u>Source</u>	<u>Qty. procured (tonnes)</u>	<u>Per cent to total</u>	<u>Transport Cost (Rs.)</u>	
			<u>Total</u>	<u>Per tonne</u>
Local	109,212	34.2	1,133,439	10.4
Within district	34,494	10.8	453,128	13.1
Within state	105,844	33.1	2,639,030	24.9
Within country	69,914	21.9	3,789,666	54.2
Total	319,464	100.0	8,015,263	25.1

Source : ORG Survey, 1971.

Purchases of these oilseeds from private traders amount to 58 per cent by value of the total procurement; purchases through marketing association and directly from farmers have an equal share of 15 per cent each. The interesting point to note is that all the sources of supply are tapped by this industry which shows the intensity of competition among the manufacturing units. It is very much a sellers' market so far as procurement of raw materials goes, for, delivery of raw materials is invariably taken at the sellers' place on cash payments. Brokerage and commissions up to 3 per cent are reported by about 20 per cent of the units.

Oilseeds, especially groundnut, are available only in certain seasons of the year in a region. Big units are able to purchase from different places (during the season) and also to stock raw materials and finished products. The bulk of the procurement by big units is done through regulated marketing societies in important centers.

(d) Marketing :

Marketing of finished products follows an interesting pattern, in that considerable quantities are moved outside the district of production to other districts in the state as well as to other states. Consumption in the local markets is about 40 per cent. Road transport is the major mode used for movement of products; rail is used mainly for movements outside the state.

The distribution pattern of edible oils marketed at different locations is given below:

Table - 4.7.8 : Distribution Pattern of Edible Oils

Location	Quantity sold (tonnes)	Per cent to total	Total trans-port cost (Rs.)	Trans-port cost/unit (Rs.)
Local	51,572	39.3	530,429	10.2
Within district	8,890	6.8	499,832	56.2
Within state	41,921	31.9	1,960,723	40.2
Within country	28,837	21.9	2,408,753	83.5
Exports	97	0.1	-	-
Total	131,317	100.0	5,399,737	

Source : ORG Survey, 1971.

In terms of value, 63 per cent of the products are distributed through private traders and 19 per cent are sold directly to customers. The registered sector records about 20 per cent of its sales to specific companies, such as Hindustan Lever and Tata Oil Mills, engaged in manufacture of refined oil and vanaspati. Also, about 16 per cent of the units operate through co-operative agencies, although by value sales through this channel is negligible. In this case, the manufacturing units either arrange for transport (without incurring cost) or deliver at the selling places of co-operative agencies; further, credit and delivery against deposits are the payment terms which are equally in operation as cash payments. This trend in terms of delivery and mode of transaction is observed in the case of trade with private traders also, though not to the same extent.

(e) Capital :

Ninety five million rupees worth of fixed capital is employed in this industry towards a gross earning of 780 million rupees (inclusive of service charges earned). The share of the registered sector is only 28 per cent, even though its share in production is around 50 per cent. The details of fixed capital are shown in Table - 4.7.9.

The share of land and buildings in this category also is considerably high as in most of the food processing industries.

Table - 4.7.9 : Fixed Capitals Investments by the  
Edible Oil Mills Industry

Description	Registered Sector	Unregistered Sector	Total
Fixed capital ( '000 Rs. )	26,878	67,909	94,787
Per cent share	28.3	71.7	100.0
Fixed capital per unit ( '000 Rs. )	121.6	22.2	28.9
Per cent share of land & buildings in total fixed capital	71.7	67.2	68.6

Source : ORG Survey, 1971.

Seventy seven million rupees of working capital is employed in the industry as a whole. This works out to 10 per cent of the total value produced. This proportion, however, is higher in the registered sector. This is perhaps due to its capacity to hold more stocks in terms of raw materials as well as finished products. The following table shows the amount of working capital and its proportion in the value of production in the two sectors.

Table - 4.7.10 : Details of Working Capital of the  
Edible Oil Mills Industry

Description	Registered Sector	Unregistered Sector	Total
Total working capital ('000 Rs.)	43,084	33,947	77,031
Value of production ('000 Rs.)	371,361	400,695	772,056
Working capital as percent of value of production	11.6	8.5	10.0

Source : ORG Survey, 1971.

(f) Cost Structure :

Raw and packing materials have a share of 93 per cent of the total cost in the industry as a whole. It is of interest to note that the material and processing cost components do not show any significant difference between the registered and unregistered sectors. The Table - 4.7.11 shows the shares of various cost components in the different strata of the edible oil mills industry.

The registered sector accounts for 48 per cent of the total cost (amounting to 746 million rupees) incurred in this industry. This proportion, incidentally, is the same as this sector's share in the total value of production.

Table - 4.7.11 : Cost Structure of the Edible Oil Mills Industry

(Value in '000 Rs.)

Stratum	Material Cost		Processing Cost		Other Costs		Total Cost
	Value	%	Value	%	Value	%	
Registered Sector	317,826	94	6,470	2	13,624	4	337,920
Unregistered Sector	375,256	92	8,747	2	24,141	6	408,144
Total	693,082	93	15,217	2	37,765	5	746,064

Source : ORG Survey, 1971.

(g) Selected Co-efficients :

Oilcake from conventional mills (i.e., from ghanis rotaries and expellers) is said to be having 7 to 12 per cent of oil. This can be recovered by solvent extraction method which extracts all but 1 per cent of oil. There are 5 solvent extraction plants in the state with a total capacity of 350 tonnes a day (i.e., 105,000 tonnes per annum). However, none of them was listed in the sampling frame and as such they could not be included in the sample. Although solvent extraction plants require a very heavy capital investment, it would be worthwhile, from the point of view of increasing the productivity, to explore the possibility of setting up more plants of this type. Even small increments in the recovery rates of oil would yield handsome results, because Tamil Nadu is one of the major groundnut producing states and also because oil, irrespective of the type, is one of the highest energy yielding food items.

In the following table, some of the selected co-efficients relating to the edible oil industry are presented.

Table - 4.7.12 : Selected Co-efficients of Edible Oil Mills Industry

(Value in '000 Rs.)

Description	Regis- tered Sector	Unregis- tered Sector	Total
Number of units	221	3,054	3,275
Value of production	371,361	400,695	772,056
Service charges earned	1,907	6,272	8,179
Fixed capital invested	26,878	67,909	94,787
Total input cost	326,859	389,437	716,296
Gross value added	46,409	17,530	63,939
Gross value added per unit	210	6	20
Gross value added per unit investment	1.7	0.3	0.7

Source : ORG Survey, 1971.

The registered sector shows a very high rate of return per unit investment compared to the unregistered sector. Although economy of large scale production plays a vital role in this sector yielding much higher returns on investment, it is also true that big units are likely to underestimate their assets to avoid taxation. However, the above table clearly brings out the inherent structural differences between the two sectors of the industry.

#### 4.8 Canning and Preserving of Fruits & Vegetables (203)

##### (a) Structure of the Industry

This is an industry with a preponderance of small scale units. Out of 443 units, only 2 are in the registered sector. (Information regarding the third registered unit could not be obtained fully, hence this is not considered in our analysis.) Only 6 per cent of the units report seasonal variation in their production, whereas 80 per cent of them work throughout the year. In terms of the number of days worked, the average is 240 in 1970-71. All units work only one shift a day. The labor consists predominantly of permanent workers which is evident from the fact that, in terms man shifts, the contribution of casual labor is only 6 per cent of that of regular employees. The average monthly earning of a regular employee is the lowest (Rs. 26) in the entire food processing industry. This is due to very high participation of family members. The details of employment are presented in the following table.

Table - 4.8.1 : Employment Structure of the Canning Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (shift/day)	No. of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	3 (3)	26	0.2	2.8	241 (1.0)	442
<u>Registered Sector</u>						
11	5 (5)	128	3.0	3.0	180 (1.0)	1
12						
13						
21						
<u>Unregistered Sector</u>						
31	3 (3)	29	0.2	1.8	268 (1.0)	104
41	3 (3)	25	0.2	3.2	233 (1.0)	337

Source : ORG Survey, 1971.

Table - 4.8.2 : Production in the Different Strata  
of the Canning Industry

Products	Unit	Registered Sector	Unregistered Sector		Total	Per cent to total
			Stratum 31	Stratum 41		
Syrup, squashes fruit juice	HL	28 (0.5)	759 (15.1)	4,242 (84.4)	5,029 (100)	45
Pickles	QL	-	700 (19.6)	2,879 (80.4)	3,579 (100)	32
Fruit jam	QL	7 (0.3)	2,190 (86.4)	337 (13.3)	2,534 (100)	23
Total		35 (0.3)	3,649 (32.8)	7,458 (66.9)	11,142 (100)	100

Figures in brackets give percentage share of the different strata.

Source : ORG Survey, 1971.

(b) Production :

In terms of quantity produced, syrups, squashes and fruit juice account for 45 per cent, followed by pickles (32%) and fruit jam (23%). Except in the cases of fruit jam, the contribution by the stratum 41 (units in the unorganized sector employing 1 to 4 persons) exceeds 80 per cent of the total production. Overall contribution of this stratum is 67 per cent.

Out of the total value of production (2.7 million rupees) stratum 11 (registered sector) accounts for only 0.3 per cent whereas the unregistered sector, stratum 31 (31.1%) and stratum 41 (68.6%) contributes the rest. The average value of production per unit in this category is Rs. 6,000/per annum.

Table - 4.8.3 : Value of Production in the Canning Industry

Description	Registered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
Value produced ('000 Rs.)	9	839	1,853	2,701
Per cent share	0.3	31.1	68.6	100
Value produced per unit ('000 Rs.)	9.0	8.0	5.4	9.1
Estimated no. of units	1	104	337	442

Source : ORG Survey, 1971.

(c) Procurement :

Procurement of raw materials is mostly restricted to local markets with very little dependence on the markets outside the district and absolutely no purchases from outside the state. All movements are made by road transport only. The purchases, being of a small magnitude, (around Rs. 5,000/-per unit annually) are made directly from the traders and payments are made in cash. Price fluctuations, lack of credit facilities and seasonal variations in supply of raw materials are the main problems the manufacturers in this industry seem to be facing.

Table - 4.8.4 : Procurement Pattern of Raw  
Materials by the Canning Industry

Source	Qty. procured (tonnes)	Per cent to total
Local	835	76
Within district	266	24
Total	1,101	100

Source : ORG Survey, 1971.

Sugar and sugar products are the major ingredients for making panjamtam (a product made of fruits, sugar, etc.). Pickles, another product has lime/lemon, mangoes and spices as principal ingredients. Table 4.8.5 gives the consumption figures in the two sectors from some of the important raw materials.

Table - 4.8.5 : Consumption of Major Inputs  
by the Canning Industry

Raw materials	(Tonnes)		Total
	Registered Sector	Unregistered Sector	
Sugar	2	382	384
Glucose	-	25	25
Jaggery	-	23	23
Khandesari	-	93	93
Sugar candy	-	10	10
Lime/Lemon	-	171	171
Spices	-	44	44
Banana, mangoes	-	91,152	91,152

Source : ORG Survey, 1971.

(d) Marketing :

Fifty eight per cent, by weight, of the finished products, are sold in local markets, 27 per cent within the district and the rest outside the district. No finished product moves out of the state.

Table - 4.8.6 : Quantity Marketed by the Canning  
Industry in Different Locations

Location	Quantity sold (tonnes)	Per cent to total
Local	612	58
Within district	285	27
Within state	167	15
Total	1,064	100

(For the purpose of calculation of weight, it is assumed that 1 liter = 1 kg. for syrup, squash and fruit juice).

Source : ORG Survey, 1971.

The only mode of transport used is road and no handling loss or transit loss is reported.

The products are marketed mainly through dealers (wholesale or retail) and practically all transactions are in cash. Less than 10 per cent of the units have reported commissions being offered in the range of 3 to 10 per cent.

(e) Capital :

Fixed capital employed on an average per unit in this industry is a meager Rs. 13,600 - which is almost entirely accounted for by land and building. The share of plant and machinery is only 4 per cent. Working capital, however, is comparatively high and it amounts to 22 per cent of the value of production.

Table - 4.8.7 : Working Capital as Per Cent of Value of Production in the Canning Industry

	Registered Sector	Unregistered Sector		Total
		Stratum 31	Stratum 41	
1. Total working capital ('000 Rs.)	2	115	486	603
2. Value of production ('000 Rs.)	9	839	1,853	2,701
3. Working capital as per cent of value of production	22	14	26	22

Source : ORG Survey, 1971.

(f) Cost Structure :

Raw material costs account for almost 80 per cent of the total cost. Processing cost is only 5 per cent of the total cost.

Table - 4.8.8 : Cost Structure in the Canning Industry

(Value in '000 Rs.)

Stratum	Material cost		Processing cost		Other costs		Total Cost
	Value	%	Value	%	Value	%	
<u>Registered Sector</u>							
11	8	100	-	-	-	-	8
<u>Unregistered Sector</u>							
31	644	88	34	5	35	7	731
41	1,824	82	112	5	280	13	2,216
Total	2,476	84	146	5	333	11	2,955

Source : ORG Survey, 1971.

(g) Selected Co-efficients :

The only one unit in the registered sector works mostly as a demonstration unit. It is to be noted that since this unit does not work at full capacity, comparisons between the two sectors are not very meaningful.

Table - 4.8.9 : Selected Co-efficients of the  
Canning Industry

Item	(Value in '000 Rs.)		
	Registered Sector	Unregistered Sector	Total
No. of units	1	441	442
Value of production	9	2,692	2,701
Fixed capital invested	143	5,868	6,011
Input costs	8	2,614	2,622
Gross value added	1	78	79
Gross value added/unit	1	0.18	0.18
Gross value added/unit investment	0.01	0.01	0.01

Source : ORG Survey, 1971.

The low return as indicated by the above table is a gross under-estimation as the fixed capital estimates are overestimated. Most of the units in the unregistered sector have almost the entire processing done at the owners' residences. The share of land and buildings to the total fixed capital is over 96 per cent. Almost all the units have reported personal property of land and buildings (place of work) in their fixed capital investment.

#### 4.9 Confectionery (208)

##### (a) Structure of the Industry

The confectionery industry is also one of the many food processing industries in Tamil Nadu having a large number of small units in the unregistered sector. In terms of the value of production the ratio of registered to unregistered sector is slightly less than 1 : 2. However, in terms of the number of units the ratio is as high as 1 : 45, thereby indicating a high unit value of production in the registered sector (Rs. 613,000 to Rs. 22,600).

All the units of this industry work on an average 10 to 12 months on a single shift basis. The average monthly salary, as would be noticed from the following table, is quite low in the unregistered sector (stratum 31 and 41).

Table - 4.9.1 : Employment Structure of the Confectionery Industry

Stratum	Permanent workers		Casual workers		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	39 (39)	69	1.0	3.2	282 (1.0)	322
<u>Registered Sector</u>						
11	52 (52)	158	-	-	300 (1.0)	1
12						
13						
21	24 (26)	72	2.0	3.0	255 (1.0)	6
<u>Unregistered Sector</u>						
31	6 (6)	76	0.7	1.5	262 (1.0)	72
41	2.5 (2.5)	57	1.0	3.7	289 (1.0)	243

Source : ORG Survey, 1971.

(b) Production :

Confectionery, coconut burfi and manila cake are the important products produced by this industry. The following table gives details of the quantity of different products manufactured in the two sectors. Biscuits and confectionery are the only two products manufactured in the registered sector.

Table - 4.9.2 : Quantity of Products Produced by the Confectionery Industry

Product	Registered Sector		Unregistered Sector		Total Quantity (tonnes)
	Qty. (tonnes)	% to total	Qty. (tonnes)	% to total	
Confectionery	934	33.2	1,878	66.8	2,812
Manila cake	-	-	493	100.0	493
Coconut burfi	-	-	41	100.0	41
Other sweets	-	-	915	100.0	915
Biscuits	293	100.0	-	-	293

Source : ORG Survey, 1971.

It is estimated that products worth Rs. 11.4 million were produced by this industry. The shares of the registered and unregistered sectors were 37.6 and 62.4 per cent respectively.

The percentage share of value produced and value of production per unit in the two sectors are as follows.

Table - 4.9.3 : Value of Production in the  
Confectionery Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Value produced ( '000 Rs. )	4,291	7,127	11,418
Percent share	37.6	62.4	100.0
Value produced per unit ( '000 Rs. )	613	22.6	35.4
Estimated no. of units*	7	315	322

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

(c) Procurement :

Essence, maida, sugar, milkfat and glucose are the important raw materials consumed by this industry. It would be noticed from Table - 4.9.4 that consumption of maida and milkfat (the basic ingredients for making biscuits) is high in the registered sector.

Table - 4.9.4 : Quantity of Raw Materials Consumed  
by the Confectionery Industry

(Quantity in quintals)

Raw material	Registered Sector		Unregistered Sector		Total
	Qty.	%	Qty.	%	
Essence	15	51.7	14	48.3	29
Maida	2,587	77.0	776	23.0	3,363
Sugar	8,241	24.6	25,293	75.4	33,534
Milkfat	102	98.1	2	1.9	104
Glucose	1,517	35.4	2,778	64.6	4,295
Vanaspati	232	87.2	34	12.8	266

Source : ORG Survey, 1971.

Total purchase value of all raw materials for the last year is estimated at Rs. 9 million. Almost the entire purchase is through wholesalers and dealers. A very small percentage of the total purchase is directly from farmers.

The entire purchase of raw materials is transported by road. The following table gives the distribution pattern of the different sources of procurement for some of the important raw materials.

Table - 4.9.5 : Raw Material Procurement by the Confectionery Industry from Different Sources

Raw Material	Unit of Qty.	Local		Within district		Within state		Within country		Total
		Qty.	%	Qty.	%	Qty.	%	Qty.	%	
Sugar	(T)	2,809	84.0	537	16.0	-	-	-	-	3,346
Milkfat	Kg.	196	1.8	-	-	-	-	10,624	98.2	10,820
Glucose	Ql.	1,688	38.2	1,243	28.1	471	10.8	1,016	23.0	4,418
Maida	Ql.	1,235	36.4	1,419	41.8	738	21.8	-	-	3,392

(T) = Tonne  
(Ql) = Quintal

Source : ORG Survey, 1971.

The following table gives details of purchase value, terms of delivery, mode of transaction, etc., for important procurement channels.

Table - 4.9.6 : Details of Purchase of Raw Materials  
by the Confectionery Industry

Description	Whole- salers & Retailers	Farmers	Total
Purchase value ('000 Rs.)	8,867	131	8,998
<u>Number of units procuring</u>			
i) through the channel	315	7	322
ii) directly from the channel	259	7	266
iii) on cash payment*	303	7	310
iv) without brokerage	312	7	319

\*In addition 13 units have cash and credit facilities with their sellers.

Source : ORG Survey, 1971.

Only 3 units having purchases through brokers pay a commission ranging from 0.1 to 1.0 per cent.

(d) Marketing :

The total sales value of the confectionery industry is estimated at Rs. 11.7 million, the shares of the registered and unregistered sector being 37.2 and 62.8 per cent respectively. Biscuits and confectionery were the only products marketed by the registered sector.

The products marketed by the unregistered sector include biscuits, confectionery, manila cake, coconut burfi and sweets. The distribution pattern of confectionery and other products marketed at different locations is given below:

Table - 4.9.7 : Quantity Marketed by the Confectionery Industry at Different Locations

Product	(Quintals)				Total
	Local	Within district	Within state	Within country	
Confectionery	11,271	2,842	8,422	6,101	28,636
Manila cake	4,452	376	205	-	5,033
Coconut burfi	-	-	-	-	489
Sweets	2,557	147	4,527	1,280	8,511
Biscuits	-	-	1,467	1,479	2,946
Total	18,768	3,366	14,620	8,861	45,615
Percent of total	41.2	7.4	32.0	19.4	100.0

Source : ORG Survey, 1971.

Road is the only mode of transport used for marketing the goods.

Details of value of sales, mode of transaction, terms of delivery and brokerage for the main marketing channels are given in the table below:

Table - 4.9.8: Details of Marketing by the  
Confectionery Industry

Description	Whole- salers and Retailers	Directly to Customers	Specific Companies	Total
Sale value ('000 Rs.)	9,911	1,429	188	11,708
<u>No. of units dealing with the channel</u>				
i) total	218	114	1	322
ii) delivering at customer's place	107	41	1	148
iii) on cash payment*	157	110	1	258
iv) without brokerage	202	73	-	269

\*In addition, 71 units have cash and credit facilities.

Source : ORG Survey, 1971.

Of the units paying commission, 54 units pay 3.1 to 10.0 per cent while 15 others pay 0.1 to 3.0 per cent.

(e) Promotional Scheme :

The confectionery industry spends about 1.1 per cent of the total sales value on advertisement and promotional schemes. Major share of this amount is spent on printed labels on bottles, wrapper printing and packing paper. Half a per cent of the total amount spent is on a combination of various media schemes, e.g., advertisements during festive occasions.

(f) Capital Investment :

The fixed capital investment of the confectionery industry is estimated at Rs. 10.5 million. The capital requirements of this industry is quite moderate compared to the other food processing industries.

Table - 4.9.9 : Fixed Capital Investment of  
the Confectionery Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ( '000 Rs.)	2,224	8,287	10,511
Percent share	21.2	78.8	100.0
Fixed capital per unit ( '000 Rs.)	317.7	26.3	32.6
Percent share of land & buildings in the total fixed capital	26.9	90.5	77.0

Source : ORG Survey, 1971.

Even though the share of the registered sector in the fixed capital is a low 21.2 per cent, the average fixed capital requirement per unit in this sector is 12 times that of a unit in the unregistered sector. The capital requirement for machinery is also very high in the registered sector compared to the unregistered sector (13 : 2). This is because of the machinery requirement for the manufacture of biscuits.

It is estimated that the total working capital of the industry is Rs. 1.7 million. The average working capital per unit is estimated at Rs. 5,400. However, the average working capital per unit in the registered sector is Rs. 158,000. Shares of raw materials, finished products and other inventories in the working capital in the registered sector are 29.6, 17.4 and 43.7 per cent respectively.

(g) Cost Structure :

The contribution of raw material and processing costs to the total cost is over 90 per cent in both the sectors. Units in the registered sector have reported a higher payment of taxes compared to those in the unregistered sector.

It would be noticed from the table below that more use of machinery is made in stratum 21 of the registered sector.

Table - 4.9.10 : Cost Structure of the Confectionery Industry

Stratum	Total cost ( '000 Rs.)	Total Cost/unit ( '000 Rs.)	Per cent share of important components				
			Raw material	Packing	Fuel & elec- tricity	Taxes	Depre- ciation
<u>Registered Sector</u>							
11	544	544	63.1	19.3	1.6	4.6	0.2
21	3,238	539	66.3	10.0	2.5	9.2	2.0
<u>Unregistered Sector</u>							
31	4,197	58	88.9	3.5	1.7	1.7	0.2
41	2,919	12	91.7	-	-	1.4	-

Source : ORG Survey, 1971.

(h) Selected Co-efficients :

The confectionery industry with a large number of small units and a small number of capital intensive bigger units have very distinct features. Table - 4.9.11 compares some of the co-efficients for the two sectors of the industry.

Table - 4.9.11 : Selected Co-efficients of the  
Confectionery Industry

(Value in '000 Rs.)

Item	Regis- tered Sector	Unregis- tered Sector	Total
Number of units	7	315	322
Value of production	4,291	7,127	11,418
Service charges earned	-	-	-
Fixed capital invested	2,224	6,287	10,511
Total input cost	3,182	6,767	9,949
Gross value added	1,109	360	1,469
Gross value added/unit	158	1.1	4.3
Gross value added/unit investment	0.5	0.06	0.13

Source : ORG Survey, 1971.

4.10 Soft Drinks/Aerated Water Industry (214)

(a) Structure of the Industry

Soft drinks/aerated water industry is one of the largest food processing industries in Tamil Nadu. The number of units in the unregistered sector is very significant (1,916 units out of a total of 1,945 units in the state). The units are nonseasonal in operation. Eighty four per cent of the units work for 11 to 12 months a year and the rest for 7 to 10 months. The units in the registered sector work for 11 to 12 months. All the units, except three units in stratum 11 which work for 1½ shifts, work only one shift. All the units prefer permanent employment as can be seen from Table - 4.10.1.

Table - 4.10.1 : Employment Structure of the Soft Drinks/Aerated Water Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	3 (3)	56	0.2	3.0	269 (1.0)	1,945
<u>Registered Sector</u>						
11	66 (45)	132	6.8	2.8	304 (1.4)	3
12						
13						
21	19 (18)	102	1.3	2.3	328 (1.0)	26
<u>Unregistered Sector</u>						
31	5 (5)	57	0.4	3.1	288 (1.0)	438
41	3 (2.4)	46	0.3	3.0	262 (1.0)	1,478

Source : ORG Survey, 1971.

(b) Production :

The total value of production of the entire industry is Rs. 26.6 million. The shares of registered and unregistered sector are 41 and 59 per cent respectively. The smaller scale of operation of the units in the unregistered sector is indicated by the low value of production per unit. (Rs. 8,000 compared to Rs. 377,000 per unit in the registered sector).

Soda water and fruit drinks are the most important products of this industry. The shares of the unregistered sector for these two products are 74 and 60 per cent respectively. Squashes and ginger water are the two important products produced.

The percentage share of value produced and value of production per unit in the two sectors are as follows:

Table - 4.10.2 : Value of Production in the Soft Drinks/Aerated Water Industry

Description	Registered Sector	Unregistered Sector	Total
Value produced ('000 Rs.)	10,939	15,687	26,626
Per cent share	41.0	59.0	100.0
Value produced per unit ('000 Rs.)	377.2	8.2	13.6
Estimated no. of units*	29	1,916	1,945

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

Table - 4.10.3 : Quantity of Products Produced by the Soft Drinks/Aerated Water Industry

Products	Unit	Registered Sector		Unregistered Sector		Total
		Quantity	%	Quantity	%	
Squashes	HL	-	-	51,431	100.0	51,431
Soda water	HB	226,498	26.0	640,700	74.0	867,198
Soft drink	HB	376,784	40.0	558,454	60.0	935,238
Ginger water	HL	14,636	36.0	25,914	64.0	40,550

Source : ORG Survey, 1971.

(c) Procurement Inputs :

Sugar, carbon dioxide and essence, the important raw materials consumed by this industry, are mostly procured locally. Almost the entire procurement is through wholesalers, retailers and dealers. The table given below shows the distribution pattern of the raw materials procured from different locations and details of agencies of purchase, mode of transaction, terms of delivery, etc.

Table - 4.10.4 : Details of Procurement of Raw Materials by the Soft Drinks / Aerated Water Industry

Description	Whole-salers	Farmers	Total
Purchase value ('000 Rs.)	8,578	49	8,627
<u>No. of units processing</u>			
i) total	1,884	61	1,945
ii) without transport cost	690	12	702
iii) on cash payment	1,886	61	1,927
iv) without brokerage	1,859	61	1,920

Source : ORG Survey, 1971.

Table - 4.10.5 : Quantity of Raw Materials Procured  
by Soft Drinks / Aerated Water Industry  
from Different Sources

Source	Quantity procured (tonnes)	Per cent to total
Local	1,919	69.8
Within district	503	18.3
Within state	319	11.6
Within country	11	0.3
Imports (kgs.)	1,285	-
Total	2,753	100.0

Source : ORG Survey, 1971.

Road is the only mode of transport used for procuring sugar and carbon dioxide. Of the 40 tonnes of essence procured, 15.76 per cent was from outside Tamil Nadu and 0.38 per cent was imported. Procurement from outside the state and through imports accounted for 57.73 and 15.41 per cent respectively of the quantity of citric acid procured by the industry.

Sugar and carbon dioxide are the important raw materials consumed by this industry. The unregistered sector consumes 65 per cent of sugar and 78 per cent of carbon dioxide. Essence and color are the other important raw materials consumed.

Table - 4.10.6 : Quantity of Raw Materials Consumed by the  
Soft Drinks/Aerated Water Industry

Raw material	Unit	Registered Sector		Unregistered Sector		Total
		Quantity	%	Quantity	%	
Carbon dioxide	(T)	239	22.0	855	78.0	1,094
Sugar	(T)	586	35.0	1,091	65.0	1,678
Essence	(Kg.)	20,306	51.0	19,884	49.0	40,190
Color	(Kg.)	5,084	32.0	10,815	65.0	15,899

Source : ORG Survey, 1971.

(d) Marketing :

Squashes, fruit juices and soda are the products of this industry having maximum sales. Table - 4.10.7 gives the distribution pattern of squashes and fruit juices marketed at different locations. It will be noticed that 85.8 per cent of the total sales is marketed locally and the rest within the district.

Table - 4.10.7 : Quantity of Squashes and Fruit Juices Marketed by the Soft Drinks / Aerated Water Industry at Different Locations

Location	Quantity sold (100 liters)	Per cent to total
Local	47,827	85.8
Within district	7,860	14.2
Total	55,687	100.0

Source : ORG Survey, 1971.

The distribution pattern of soda, etc., marketed at different locations is given below:

Table - 4.10.8 : Quantity of Soda, etc., Marketed  
by the Soft Drinks/Aerated Water  
Industry at Different Locations

Location	Quantity sold (100 liters)	Per cent to total
Local	264,951	83.5
Within district	7,480	2.4
Within state	34,500	10.9
Within country	10,366	3.2
Total	317,297	100.0

Source : ORG Survey, 1971.

The entire movement of finished products is by road. Transit and handling losses are significant in this industry compared to the other industries. The table below gives details of handling and transit losses for squashes and soda.

Table - 4.10.9 : Transit and Handling Losses of  
Soft Drinks/Aerated Water Industry

Product	Transit loss (HL)	Per cent of qty. sold	Handling loss (HL)	Per cent of qty. sold
Squashes	146	0.26	146	0.26
Soda, etc.	805	0.25	605	0.19

Source : ORG Survey, 1971.

The following table gives in detail the breakup of sales, mode of transaction, terms of delivery and brokerage for the main marketing channels.

Table - 4.10.10 : Details of Marketing for the  
Soft Drinks/Aerated Water  
Industry

Description	Whole- salers/ Retailers	Brokers	Directly to customers	Total
Sales value ('000 Rs.)	17,006	4,743	7,527	29,540
<u>No. of units dealing with the channel</u>				
i) total	1,442	12	676	1,945
ii) delivering at customer's place	997	11	130	1,119
iii) on cash payment	1,140	12	577	1,531
iv) on cash and credit	234	-	99	333
v) without brokerage	1,041	4	658	1,552
vi) with brokerage of 0.1 to 1.0 per cent	185	5	7	197
vii) with brokerage of 2.1 to 3.0 per cent	147	-	-	147

Source : ORG Survey, 1971.

It would be noticed from the above table that hardly 20 per cent of the units pay commission even though about 75 per cent of the units sell their products to wholesalers and retailers.

(e) Capital Investment :

The total fixed capital invested by the industry is estimated at Rs. 22.8 million. The shares of the registered and unregistered sector are 15.6 and 84.4 per cent respectively. The fixed capital per unit in the unregistered sector is quite low (Rs. 10,000) compared to the fixed capital per unit in the registered sector, (Rs. 123,000). The fact that very little machinery is required by the industry is seen by the high percentage of capital utilized in land and buildings (77.6 per cent of fixed capital in the registered and 69.8 in the unregistered sectors).

Table - 4.10.11 : Fixed Capital Investment of the  
Soft Drinks/Aerated Water Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ( '000 Rs. )	3,569	19,235	22,804
Per cent share	15.6	84.4	100.0
Fixed capital per unit ( '000 Rs. )	123.0	10.0	11.7
Per cent share of land and buildings in the total fixed capital	77.6	69.8	71.0

Source : ORG Survey, 1971.

The total working capital of the entire industry is estimated at Rs. 7.2 million. The shares of the registered and unregistered sectors are 49 and 51 per cent respectively. Cash on hand forms the major part of the working capital in both the sectors. The average working capital required per unit in the registered and unregistered sectors are Rs. 120,000 and Rs. 2,000 respectively. The high working capital per unit in the registered sector is due to six large soft drink units, three of them in stratum 11.

Table - 4.10.12 : Working Capital as Per Cent of Value of Production in the Soft Drinks/Aerated Water Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Total working capital ( '000 Rs.)	3,504	3,703	7,206
Value produced ( '000 Rs.)	10,939	15,687	26,626
Working capital as per cent of value produced	32.0	23.6	27.0

Source : ORG Survey, 1971.

(f) Cost Structure :

Contribution of raw material and processing costs in the registered sector is much lower compared to the unregistered sector. Packing material costs are very high in the registered sector. It is also reported that big units in the registered sector have to pay taxes on their production. The taxes paid by units in stratum 11 is 17.8 per cent of the total cost. Inward transport costs are also very high for these units.

Table - 4.10.13 : Cost Structure of the Soft Drinks /  
Aerated Water Industry

Stratum	Total cost (Rs.)	Total cost/unit (Rs.)	Per cent share of important components					
			Raw material	Packing material	Fuel & electricity	Taxes	Inward transport	Depreciation
<u>Registered Sector</u>								
11	2,193	731	31.1	22.6	3.3	17.8	4.1	2.9
21	4,668	179	48.2	22.5	1.0	3.5	-	6.4
<u>Unregistered Sector</u>								
31	4,173	9.5	62.1	12.2	2.3	4.1	1.7	1.7
41	6,747	4.6	62.1	13.1	2.3	-	1.7	1.5

Source : ORG Survey, 1971.

(g) Selected Co-efficients :

As mentioned earlier, this industry has a large number of units in the unregistered sector. Mention must be made here that Southern Bottlers did not respond to the survey and to that extent the estimates of some of the products in registered sector might be underestimated. Working under this limitation, it has been observed that the rate of return on investment in the registered sector is about five times that in the unregistered sector. Table - 4.10.14 compares some of the important co-efficients for the two sectors of the industry.

Table - 4.10.14 : Selected Co-efficients of the Soft Drinks/Aerated Water Industry

(Value in '000 Rs.)

Item	Regis- tered Sector	Unregis- tered Sector	Total
Number of units	29	1,916	1,945
Value of production	10,939	15,687	26,626
Fixed capital invested	3,569	19,235	22,804
Total input cost	5,098	9,129	14,227
Gross value added	5,841	6,558	12,399
Gross value added/unit	201.4	3.4	6.3
Gross value added/unit investment	1.6	0.34	0.54

Source : ORG Survey, 1971.

4.11 Sago Industry (209-10A)

(a) Structure of the Industry

Sago industry is one of the most organized food processing industries in Tamil Nadu with all units in the registered sector. Out of a total of 296 units, there are 13 units which have a combined operation of processing and servicing. There are 14 units in stratum 13 and the rest are in the census sector. All the units except 38 are nonseasonal in operation and work on an average 7 to 12 months in a year. The seasonal units work for 5 to 6 months in a year. Table - 4.11.1 gives the distribution of the number of units by number of days worked

Table - 4.11.1: Average Number of Days Worked  
by Units in the Sago Industry

Number of days worked in a year	No. of Units		Total
	Stratum 13	Stratum 21	
Less than 150	2	63	65
151 - 200	4	94	98
201 - 250	5	69	74
251 - 300	2	50	52
301 - 365	-	6	6

Source : ORG Survey, 1971.

Table - 4.11.2 : Employment Structure of the Sago Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	4 (4)	64	24	2.6	198 (1.0)	296
<u>Registered Sector</u>						
11						
12						
13	7 (8)	112	57	2.4	254 (1.0)	14
21	4 (4)	60	22	2.6	16	282

Source : ORG Survey, 1971.

All the units work for a single shift only. It would be noticed from the above table that the amount of casual labor employed is substantial in both strata.

(b) Production :

It is estimated that the annual production of sago and starch during the last year is Rs. 93 million. The average value of production per unit is about Rs. 315 thousand. The shares of stratum 13 and 21 in the total production are 12.9 and 87.1 per cent respectively.

In terms of quantity, the total production of sago and starch were 60 thousand tonnes and 20 thousand tonnes respectively (Table - 4.11.3). The raw material consumed was 0.34 million tonnes of tapioca, indicating a 23.5% yield rate.

Table - 4.11.3 : Quantity Produced by the Sago Industry

(Quantity in tonnes)

Product	Stratum 13		Stratum 21		Total (Qty.)
	Qty.	% share	Qty.	% share	
Sago	7,496	12.40	52,939	87.60	60,435
Starch	2,575	12.65	17,788	87.35	20,363

Source : ORG Survey, 1971.

The following table gives details of the share in the total value produced and value of production per unit for the two sectors.

Table - 4.11.4 : Value of Production of the Sago Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Value of products ( '000 Rs.)	93,205	-	93,205
Per cent share	100	-	100
Value produced per unit ( '000 Rs.)	314.9	-	314.9
Estimated no. of units*	296	-	296

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

(c) Procurement and Inputs :

Tapioca, the raw material for the industry, is mostly procured locally or from the same district, as shown in Table - 4.11.5. The entire procurement is transported to the factory site by road. Sixty per cent of the purchases is made directly from the farmers. Shares of brokers and retailers are 21 and 19 per cent respectively. More than three fourth of the units do not incur any expense on transport.

Table - 4.11.5 : Quantity of Raw Materials  
Procured by the Sago Industry  
from Different Sources

Source	Quantity procured (Quintals)	Per cent to total
Local	1,535,406	46.42
Within district	976,501	29.52
Within state	212,440	6.42
Within country	583,515	17.64
Total	3,307,862	100.00

Source : ORG Survey, 1971.

Seventy three per cent of the units have direct cash dealings and the remaining have both cash and credit facilities with their buyers.

A total of 3.4 million tonnes of tapioca was consumed by the industry. The shares of stratum 13 and 21 were 9.9 and 90.1 per cent respectively.

(d) Marketing :

Most of the sales is made locally and within the district. Road is the only mode of transportation used for movement of finished products. The distribution pattern of sago marketed at different locations is shown in Table - 4.11.6.

Nearly 72 per cent of the total sales is made to the wholesalers, dealers and retailers and 25 per cent through brokers. Fifty five per cent of the units deliver their goods directly to the customers. Thirty two per cent of the units charge their customers for the transport of goods and 10 per cent of the units do not charge for the service rendered.

Table - 4.11.6 : Quantity Marketed by the Sago Industry at Different Locations and Modes of Transport Used

Location	Quantity sold (tonnes)	Per cent to total	Mode of transport used	
			Road (% of units)	Rail (% of units)
Local	27,882	46.75	46.75	-
Within district	25,401	42.59	42.59	-
Within state	407	0.68	0.68	-
Within country	5,949	9.98	2.12	7.86
Total	59,640	100.00	92.14	7.86

Source : ORG Survey, 1971.

Thirty per cent of the units have direct cash dealings with the buyers; 29 per cent of the units have in addition credit facilities and 28 per cent of the units deal with cash and bank payments. Commission to dealers and brokers ranging from 0.1 to 1.0 per cent are paid by 209 units and 25 units pay between 1.1 and 2.0 per cent.

(e) Capital Investment :

The total fixed capital of this industry is estimated at Rs. 28 million. The shares of the two strata are 5 and 95 per cent respectively. The fact that very little machinery is required for processing is indicated by the high share of land and buildings (79.1%) in the total fixed capital. The average fixed capital required by a single unit is estimated at Rs. 95,000.

The total working capital of all the units is estimated at Rs. 16 million. The average working capital per unit is about Rs. 55,000. Finished and semi-finished products contribute 78 per cent to the total working capital. Ten per cent of the working capital is in the form of other inventories. Cash on hand contributes a very small percentage (7.5%) to the working capital.

Table - 4.11.7 : Fixed Capital Investment of the Sago Industry

Description	Registered Sector
Fixed capital ('000 Rs.)	28,108
Per cent share	100.0
Fixed capital per unit ('000 Rs.)	95.0
Per cent share of land & buildings in total fixed capital	79.1

Source : ORG Survey, 1971.

(f) Cost Structure

Share of raw materials' cost in the total cost in both the strata of the registered sector is very high. Table - 4.11.8 gives details of the different components of cost of the Sago industry. The average cost for processing a tonne of tapioca is slightly higher in stratum 13.

Table - 4.11.8 : Cost Structure of the Sago Industry

Stratum	Total cost ('000 Rs.)	Total cost/unit ('000 Rs.)	Cost/tonne of tapioca (Rs.)	% share of important components			
				Raw materials	Fuel and electricity	Taxes	Depreciation
13	9,240	66.00	247.3	89.81	1.95	3.07	0.32
21	65,406	23.19	213.9	95.16	2.13	1.98	0.37

Source : ORG Survey, 1971.

(g) Selected Co-efficients :

The average value of production per unit in the Sago industry is quite high (Rs. 315,000). The gross value added per unit investment for the bigger size unit (stratum 13) is three times that of a smaller size unit (stratum 21).

Table - 4.11.9 presents some of the important co-efficients for this industry.

Table - 4.11.9 : Selected Co-efficients of the Sago Industry

(Value in '000 Rs.)

Item	Registered Sector		Total
	Stratum 13	Stratum 21	
Number of units	14	282	296
Value of production	11,007	82,198	93,205
Service charges earned	-	25	25
Fixed capital invested	1,456	26,652	28,108
Total input cost	8,767	63,070	71,837
Gross value added	3,240	19,153	22,393
Gross value added/unit	231	67.9	75.6
Gross value added/unit investment	2.22	0.72	0.80

Source : ORG Survey, 1971.

4.12 Salt Industry (209-9)

(a) Structure of the Industry :

The salt industry is another food processing industry in the state with most of the units in the unregistered sector. There are only 35 units in the registered sector and all are processing units. There are 15 servicing units in the unregistered sector.

It would be noticed from Table - 4.12.1 that the average number of casual workers employed per shift is far higher compared to the number of permanent workers. This is a peculiar characteristic of the industry. All the units work on an average 8 to 10 months in a year on a single shift basis. Average salary of a permanent worker in the unregistered sector is quite low compared to his counterpart in the registered sector.

Table - 4.12.1 : Employment Structure of the Salt Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	7 (7)	97	19	3.4	232 (1.0)	204
<u>Registered Sector</u>						
11						
12						
13	41 (41)	131	140	3.5	287 (1.0)	17
21	6 (6)	198	38	3.3	296 (1.0)	18
<u>Unregistered Sector</u>						
31	4 (3)	47	2	2.8	228 (1.1)	169
41						

Source : ORG Survey, 1971.

(b) Production :

Value of salt produced during the last year was Rs. 20.1 million with the share of the unregistered sector a meager 4.2 per cent. Average value produced by a unit in the registered sector was Rs. 550,900 and by a unit in the unregistered sector was only Rs. 5,500. The 15 servicing units earned Rs. 246,000 by way of charges for services rendered. The percentage shares of value produced and value of production per unit for the two sectors are as follows:

Table - 4.12.2 : Value of Production of the Salt Industry

Description	Registered Sector	Unregistered Sector	Total
Value produced ('000 Rs.)	19,284	844	20,128
Per cent share	95.8	4.2	100
Value produced per unit ('000 Rs.)	550.9	5.5	106.4
Estimated no. of units*	35	154	189

\*Equal to "processing units " plus "processing and servicing units".

Source : ORG Survey, 1971.

In terms of quantity, 44,600 tonnes of crushed and 622,000 tonnes of uncrushed salt were produced. In addition 62,000 tonnes of gypsum was produced in the registered sector.

The following table shows the share of the different strata in the production of crushed and uncrushed salt.

Table - 4.12.3 : Shares of the Different Strata in the Production in the Salt Industry

Product	Percentage share of stratum			Total Production (tonnes)
	13	21	31	
Salt crushed	47.99	24.52	27.49	44,593
Salt uncrushed	66.16	27.85	5.99	622,430

Source : ORG Survey, 1971.

Fourteen thousand tonnes of common salt was serviced by the 15 servicing units.

(c) Procurement :

Water, which is the major constituent, is plentiful and there are no problems of procurement. Information on purchase value, modes of transaction, terms of delivery, etc., has no relevance for this industry.

(d) Marketing :

Salt worth Rs. 32 million was sold during the last year. The distribution pattern of salt marketed at different locations is given in Table - 4.12.4. It would be noticed that 83.4 per cent of the total sales is within the district and a meager 0.6 per cent is exported. The total quantity sold is estimated at 1 million tonnes, whereas the production during the same period was only 647 thousand tonnes. It has been reported that units in the registered sector holding huge stocks disposed of their produce due to prevailing favorable marketing conditions.

Table - 4.12.4 : Quantity of Salt Marketed at  
Different Locations

Location	Quantity sold	Per cent to total	Total transport cost (Rs.)	Transport cost/tonne (Rs.)
Local	479,569	45.8	1,120,447	2.3
Within district	395,263	37.6	3,557,565	9.0
Within state	91,332	8.7	1,286,816	14.1
Within country	77,024	7.3	1,636,315	21.2
Exports	6,230	0.6	148,460	23.8
Total	1,049,418	100.0	7,749,603	

Source : ORG Survey, 1971.

Table - 4.12.5 below shows the per cent shares of the different modes of transportation in the total quantity marketed of crushed and uncrushed salt. Local sales, which constitute 21.64 per cent of the total, does not use any transport facility. Road transport has a share of 69.22 per cent in total sales. Waterways are exclusively used for exports of uncrushed salt. A small amount of crushed salt to the eastern part of the country is transported by rail.

Table - 4.12.5 : Shares of Different Modes of Transport in the Quantity of Salt Marketed

Product	Per cent of total quantity of salt marketed			
	Without any transport	Road transport	Railways	Waterways
Salt crushed	0.04	3.18	-	1.00
Salt uncrushed	21.60	66.04	5.24	2.88
Total	21.64	69.22	5.24	3.88

Source : ORG Survey, 1971.

Ninety six per cent of the total sales was through wholesalers, retailers and dealers. Three per cent of the sales was to specific companies and 1 per cent was to marketing associations and brokers.

One hundred and forty units out of a total of 204 did not bear any transport cost and 46 units delivered goods at the customer's place. Eighty four units had direct cash dealings with their buyers while 35 units had credit system and the remaining 70 units had both cash and credit system.

Of the 138 units having dealings through wholesalers, etc., only 46 did pay any commission. Rates of commission varied between 0.1 and 3.0 per cent of the total sale value. Sixty one units having dealings through brokers were charged commission-brokerage ranging from 1.0 to 3.0 per cent.

(e) Capital :

It is estimated that the fixed capital of the two sectors total Rs. 5.4 million. The shares of the registered and the unregistered sectors are 95 per cent and 5 per cent respectively. The fixed capital per unit in the registered sector is quite high (Rs. 147,000) while for a unit in the unregistered sector it is insignificant. This low fixed capital in the unregistered sector establishes the fact that very little machinery is necessary for smaller units. The table below gives details of the fixed capital in the different sectors.

Table - 4.12.6 : Fixed Capital of the Salt Industry

Description	Registered Sector	Unregistered Sector	Total
Fixed capital ('000 Rs.)	5,139	259	5,398
Per cent share	95.2	4.8	100
Fixed capital per unit ('000 Rs.)	146.8	1.5	26.4
Per cent share of land & buildings in the total fixed capital	64.0	52.9	63.5

Source : ORG Survey, 1971.

Finished and semi-finished products contribute about 40 per cent of the working capital in stratum 13 in the registered sector. The share of the unregistered sector is about the same (44%). However, the share per unit in the unregistered sector is very low because of the smallness of the units.

(f) Cost of Production :

Water being the raw material for salt manufacture, no raw material cost goes into the total cost of production. The major share (53%) in the cost of production in the registered sector is contributed by repair and maintenance of machinery. Taxes, inward transport, electricity and interest on loans, etc., account for 15.0, 3.8, 7.0 and 13.6 per cent respectively. In the unregistered sector the average cost of production per unit is only Rs. 900/-.

(g) Selected Co-efficients :

It would be noticed from Table - 4.12.7 that the gross value added per unit in the registered sector is about 30 times that of the unregistered sector. However, in terms of gross value added per unit investment, the ratio is about one third. High capital investment in land and buildings is reported by the bigger units in the registered sector.

Table - 4.12.7 : Selected Co-efficients of the Salt Industry

Item	(Value in '000 Rs.)		
	Registered Sector	Unregistered Sector	Total
No. of units	35	169	204
Value of production	19,284	844	20,128
Service charges earned	-	246	246
Fixed capital invested	5,139	259	5,398
Total input cost	12,991	152	13,143
Gross value added	6,293	938	7,231
Gross value added/unit	180	5.6	35
Gross value added/unit investment	1.21	3.62	1.42

Source : ORG Survey, 1971.

4.13 Gur Industry (207-2)

This is the smallest processing industry studied in terms of value and quantity of production. All the units of this industry are in the unregistered sector with 86 of a total of 113 units reporting non-seasonal working (8 to 12 months in a year). The other units work for 4 to 6 months in a year. All the units work one shift only. This industry has the lowest number of permanent workers - 546 for 113 units. The average number of days worked is 113 and the average number of casual laborers employed per shift is only 3.

Production of palm gur was 653 quintals from 3,018 quintals of palm juice. The procurement pattern for palm juice is unique. Most of the juice is obtained from the trees owned by the processor and a small quantity from other sources on a barter basis. Hence the questions of purchase value, terms of delivery, etc., are not applicable for this industry.

The entire palm gur produced is sold in the local market. Only 44.77 per cent of the quantity sold is delivered at the bazaar by road and the cost is born by the seller himself. The rest of the quantity is purchased directly at the factory.

4.14 Tea Curing Industry (209-4)

(a) Structure of the Industry :

The tea curing industry is also one of the industries in the state with over 90 per cent of the units coming under the registered category. The industry is nonseasonal working on an average 10 to 12 months in a year. All the units in the unregistered sector work for a single shift. About three-fourth of the units in strata 13 and 21 work for 2 shifts. Thirty per cent of the employment in the registered sector is accounted for by casual workers. There are no casual workers in the unregistered sector. The table below gives details of employment for the different strata.

Table - 4.14.1 : Employment Structure of the Tea Curing Industry

Stratum	<u>Permanent workers</u>		<u>Casual workers</u>		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	41 (26)	214	9	2.3	299 (1.5)	133
<u>Registered Sector</u>						
11						
12						
13	53 (35)	181	19	3.0	290 (1.4)	45
21	37 (23)	242	6	2.9	307 (1.6)	79
<u>Unregistered Sector</u>						
31	10 (10)	212	-	-	270 (1)	9
41						

(b) Production :

Almost the entire tea production of the state comes from the registered sector (99.1% by value). Of the 63 thousand tonnes of unblended tea produced during the last year, the contribution of strata 13 and 21 were 41 and 59 per cent respectively. However, in terms of value of production the contributions were 46.7 and 52.3 per cent respectively. Only 439 tonnes of blended tea were produced by the unregistered sector. Ninety six per cent of the total tea produced was unblended tea and 2.7 per cent was obtained as tea waste.

The percentage shares in the total value produced and value of production per unit for the two sectors are as follows:

Table - 4.14.2 : Value of Production of Tea

Description	Registered Sector	Unregistered Sector	Total
Value produced ('000 Rs.)	325,248	2,754	328,002
Per cent share	99.1	0.9	100.0
Value produced per unit ('000 Rs.)	2,622.9	306.0	2,466.2
Estimated no. of units*	124	9	133

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

(c) Procurement :

Tea leaf valued at Rs. 207 million was procured during the last year, of which direct purchases from farmers and others amounted to Rs. 175 million and the balance was through dealers, wholesalers and retailers. Half of the purchases in stratum 13 was direct purchases and the other half through wholesalers. The entire purchase in stratum 21 was made directly from farmers and others. In the unregistered sector the purchases are equally shared by wholesalers and farmers. Procurement from the farmers incurred no transport cost to the buyer. One hundred and twenty four units of the total of 133 had direct cash dealings with the sellers while the rest had dealings through banks.

All the tea was procured from within the district - 95.76 per cent locally and 4.24 per cent from other sources within the district. Road was the only mode of transport used. A total of 284 thousand tonnes of tea leaf was consumed by the industry. Hardly half a per cent of the total consumption was by the unregistered sector. Contribution of strata 11 and 21 in the total consumption was 42.7 and 56.7 per cent respectively.

(d) Marketing :

The distribution pattern of tea marketed at different locations as given in the table below indicates a high percentage of sales outside the state.

Table - 4.14.3 : Quantity of Tea Marketed at  
Different Locations

Location	Quantity sold (tonnes)	Per cent to total
Local	14,518	23.5
Within district	6,171	10.0
Within state	2,722	4.4
Within country	38,397	62.1
Total	61,808	100.0

Source : ORG Survey, 1971.

Road was the only mode of transport used by the industry for movement of finished products.

Sixty five per cent by value of the total sales was arranged through wholesalers, retailers and dealers and 5 per cent was sold directly to specific companies and 29 per cent was combined sales of different marketing channels.

Sixty two per cent of the 133 units delivered the goods directly at the customer's place with 26 delivering at the office of the transport agency and 27 charging the buyers for the transport arranged by them.

Sixty six per cent of the units have transaction through the bank; 20 per cent prefer direct cash dealings and the remaining 14 per cent utilize both credit and bank facilities.

Fourty four of the 97 dealers charge commission ranging from 0.1 to 1.0 per cent and 18 others charge 1.0 to 2.0 per cent. Units selling directly to specific companies are charged a commission ranging from 0.1 to 1.0 per cent.

(e) Investment :

The total fixed capital investment is estimated at Rs. 59 million. The share of units in the unregistered sector is a meager Rs. 2 million. This industry has adequate machinery for curing tea leaves. The investment in plant and machinery has been reported to be about 75 per cent of the total fixed capital.

Table - 4.14.4 : Fixed Capital Investment of the Tea Curing Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ( '000 Rs. )	57,126	1,980	59,106
Per cent share	96.6	3.4	100.0
Fixed capital/unit ( '000 Rs. )	460.7	220	444
Per cent share of land and buildings in the total fixed capital	23	50	24

Source : ORG Survey, 1971.

Working capital utilized by this industry is quite low. The major contribution to the working capital is in the form of finished products and other inventories. Table - 4.14.5 gives details of working capital as per cent of the value of production.

Table - 4.14.5 : Working Capital of the Tea Industry  
as Per Cent of Value of Production

Description	Registered Sector		Unregis- tered Sector	Total
	Stratum 13	Stratum 21		
Total working capital ( '000 Rs. )	8,226	8,331	450	17,007
Value of production ( '000 Rs. )	153,576	171,672	2,754	328,002
Working capital as per cent of value of production	5.3	4.8	16.3	5.2

Source : ORG Survey, 1971.

(f) Cost Structure :

The total cost of curing tea leaf, inclusive of raw material cost, is estimated at Rs. 300 million. The share of raw material cost to the total cost is 68 per cent; taxes and levies come next with a share of 18 per cent. The processing cost, however, is quite small (5%).

Table - 4.14.6 : Cost Structure of the Tea Curing Industry

Stratum	Total cost ( '000 Rs.)	Total cost/unit ( '000 Rs.)	Per cent share of important components				
			Raw material	Packing material	Fuel & electricity	Taxes	Depreciation
<u>Registered Sector</u>							
13	101,646	226	61.4	7.5	7.0	14.5	2.8
21	196,269	248	71.6	5.0	4.0	13.2	2.3
<u>Unregistered Sector</u>	2,259	251	62.6	5.2	5.6	-	4.8

Source : ORG Survey, 1971.

(g) Selected Co-efficients :

Some of the selected co-efficients of the industry are presented in Table - 4.14.7.

Table - 4.14.7 : Selected Co-efficients of the Tea Curing Industry

Item	Registered Sector	Unregistered Sector	Total
Number of units	124	9	133
Value of production	325,248	2,754	328,002
Fixed capital invested	57,126	1,980	59,106
Total input cost	243,896	1,764	245,660
Gross value added	81,352	990	82,342
Gross value added/unit	656	110	619
Gross value added/unit investment	1.42	0.5	1.39

Source : ORG Survey, 1971.

4.15 Cashew Industry (209-6)

(a) Structure of the Industry :

This is the only food processing industry in the state which has exports (51.1%) greater than the domestic sales. Only one unit is a servicing unit and it is in the registered sector (stratum 12). Of the 16 processing units, 7 are in the registered sector. Half of the units work over 250 days in a year. All the units work on a single shift basis. Casual workers equal the number of permanent workers in the unregistered sector and in stratum 21 of the registered sector. The average monthly salary of permanent workers is one of the lowest (Rs. 56) among the various food processing industries in the state. The average daily wage rate of casual workers is also very low (Rs. 2.50 per day). The table below gives detail of employment for the different strata.

Table - 4.15.1 : Employment Structure of the Cashew Industry

Stratum	Permanent workers		Casual workers		Average no. of days worked (shift/day)	Number of Units
	Average no./day (no./shift)	Average monthly salary (Rs.)	Average number/shift	Average daily rate (Rs.)		
Total	86 (104)	56	8	2.5	237 (1.0)	17
<u>Registered Sector</u>						
11						
12	660 (659)	53	-	-	295 (1.0)	2
13						
21	14 (15)	99	14	2.5	232 (1.0)	6
<u>Unregistered Sector</u>						
31	6 (6)	63	6	2.4	228 (1.0)	9
41						

Source : ORG Survey, 1971.

(b) Production :

About three-fourths of the total production is from the registered sector. Average values of production per unit from the registered and unregistered sectors are Rs. 2.0 million and Rs. 575 thousand, respectively. In terms of quantity produced the single unit in stratum 12 contributes 25.4 per cent of the total production and the 6 units in stratum 21 account for 46.2 per cent. Three hundred and twenty four tonnes of shell oil is produced in the registered sector and 112 tonnes is obtained as cashew waste.

Cashew shell amounting to 1,559 tonnes is serviced by the single servicing unit. Cashew shell obtained as a waste amounts to 586 tonnes with major part (89.62%) coming from the registered sector.

The percentage shares of value produced in the total production and per unit value of production for the two sectors are as follows:

Table - 4.15.2 : Value of Production of the Cashew Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Value produced ( '000 Rs.)	14,409	5,182	19,591
Per cent share	73.5	26.5	100.0
Value produced per unit ( '000 Rs.)	2,058.4	575.8	1,224.4
Estimated no. of units*	7	9	16

\*Equal to "processing units" plus "processing and servicing units".

Source : ORG Survey, 1971.

(c) Procurement :

Cashew shell and nut procured during the last year for processing amounted to 15,600 tonnes. This include the purchase of 11,400 tonnes by a single unit to meet its requirements as well as that of 6 other co-units located outside the state. The Table - 4.15.3 shows the different sources of procurement and the modes of transport used.

Cashew valued at Rs. 9.3 million were purchased from wholesalers while purchases worth Rs. 2.4 million were made from different marketing associations and another Rs. 4.1 million from producers.

Table - 4.15.3 : Quantity of Cashew Shell and Nut Procured  
from Different Locations

Location	Quantity procured (tonnes)	Per cent to total	Percentage share of transport mode		
			Road	Railways	Waterways
Local	1,740.3	11.1	11.1	-	-
Within district	106.6	0.7	0.7	-	-
Within state	3,465.1	22.2	22.2	-	-
Within country	1,166.6	7.5	7.5	-	-
Imports	9,120.0	58.5	-	-	58.5
Total	15,598.6	100.0	41.5	-	58.5

Source : ORG Survey, 1971.

About 93 per cent of the total purchases in the unregistered sector and the entire purchase of stratum 12 in the registered sector were through wholesalers and retailers. Of the purchases made by units in stratum 21 about 49 per cent was from farmers, 30 per cent was from marketing associations and the rest was through retailers.

Seven of the units are not charged for the transport of their purchases. The units purchasing from marketing associations and farmers are charged for the transportation expenses incurred. All the units have direct cash dealings with their suppliers.

(d) Consumption :

The cashew industry consumed about 6 thousand tonnes of cashew shell and nut. Sixty per cent of the consumption was in the form of shell. Table - 4.15.4 gives details of the nut and shell consumed by the different strata in the two sectors of the cashew industry.

Table - 4.15.4 : Quantity of Cashew Nut and Shell  
Consumed by the Cashew Industry

(Tonnes)

Raw material	Registered Sector		Unregis- tered Sector	Total
	Stratum 12	Stratum 21		
Cashew shell	1,824	1,408	734	3,966
Cashew nut	-	1,489	535	2,024
Total	1,824	2,897	1,269	5,990

Source : ORG Survey, 1971.

(c) Marketing :

As mentioned earlier, 51.1 per cent of the total sales is exported. Sales within the state and within the country form 11.6 and 37.3 per cent respectively. The table given below shows the distribution pattern of cashew nut marketed at different locations and modes of transport used. Mostly road transport was used for transporting cashew within the state and within the country. A meager 2.36 per cent of the quantity sold was transported through railways.

Table - 4.15.5 : Quantity of Cashewnut Marketed  
at Different Locations

Location	Quantity sold (tonnes)	Per cent to total	Percentage share of transport mode		
			Road	Rail- ways	Water- ways
Local	-	-	-	-	-
Within district	-	-	-	-	-
Within state	233	11.6	11.50	0.09	-
Within country	750	37.3	35.03	2.27	-
Exports	1,028	51.1	-	-	51.11
Total	2,011	100.0	40.53	2.36	51.11

Source : ORG Survey, 1971.

Cashew valued at Rs. 7.5 million was sold directly to customers, while sales worth Rs. 6.4 million and Rs. 5.0 million were through wholesalers and brokers, respectively. About 87 per cent of the total sales of the unregistered sector was through wholesalers. Of the total sales of stratum 21, about 79 per cent was directly to customers and the balance was through wholesalers. About 95 per cent of sales of stratum 12 was through brokers and the remaining was through wholesalers.

Fourteen of the 16 units have their own transport arrangement and charge the customers for the services rendered. Twelve units sell only on direct cash payment and the other 4 units have both cash and credit terms with the buyers. Ten units are being charged commission - seven of them paying 0.1 - 1.0 per cent and the others paying 2.1 - 3.0 per cent.

(e) Investment :

It is estimated that the total fixed capital of all the units in the two sectors amounts to Rs. 1.7 million. The shares of the registered and unregistered sectors are 68 and 32 per cent respectively. The fact that very little machinery is necessary for processing is indicated by the high share of land and buildings in the total fixed capital. The fixed capital per unit in the registered sector is 2.4 times that in the unregistered sector. This is because the average value of production of a unit in the registered sector is 3.6 times that of a unit in the unregistered sector.

The average working capital per unit for the entire industry is about Rs. 172,000. However, the average working capital per unit for the unregistered sector is only Rs. 44,000. Raw material, finished and semifinished products in the inventory form a very small percentage of the total working capital (23.2%); the major share is in the form of cash in hand and in bank.

Table - 4.15.6 : Fixed Capital Investment of  
the Cashew Industry

Description	Regis- tered Sector	Unregis- tered Sector	Total
Fixed capital ( '000 Rs. )	1,154	544	1,698
Per cent share	68.0	32.0	100.0
Fixed capital per unit ( '000 Rs. )	144.2	60.4	99.8
Per cent share of land and buildings in the total fixed capital	75.7	92.6	81.1

Source : ORG Survey, 1971.

(f) Cost Structure :

About 96 per cent of the cost of production in the registered sector is contributed by cost of raw materials. The share of fuel and taxes in the total cost are 2.1 and 1.2 per cent respectively. In the unregistered sector the share of raw materials is 95.7 per cent while that of taxes is 2.9 per cent of the total cost of production.

(g) Selected Co-efficients :

Some of the selected co-efficients for the industry are presented in Table - 4.15.7.

Table - 4.15.7 : Selected Co-efficients of the  
Cashew Industry

(Value in '000 Rs.)

Item	Regis- tered Sector	Unregis- tered Sector	Total
Number of units	8	9	17
Value of production	14,409	5,182	19,591
Fixed capital invested	1,154	544	1,698
Total input cost	10,240	3,807	14,047
Gross value added	4,169	1,375	5,544
Gross value added/unit	521	153	326
Gross value added/unit investment	3.6	2.5	3.3

Source : ORG Survey, 1971.

4.16 Other Food Products Industry (209-10 B)

(a) Structure :

All the processing units not classified among the different food processing industries of the state have been grouped together in this category. This group has one of the largest number of units, most of them small and in the unregistered sector. Ninety nine per cent of the units are in the unregistered sector. However, in terms of value of production, the ratio of registered to unregistered sector is about 1 : 8 and the ratio of value of production in the two sectors is 14 : 1, indicating thereby the smallness of the units in the unregistered sector.

Eight per cent of the units in this category offer servicing facilities in addition to the processing that is being done and all these units are in the unregistered sector.

As mentioned earlier, there are a large number of small units which employ less than 5 persons. It would be seen from the following table that 76 per cent of the units employ only 2 permanent workers and 22.6 per cent of the units employ 5 permanent workers. There is only one unit in the registered sector employing on an average 94 permanent workers and 8 casual workers per day. All the units are nonseasonal and work on an average 10 to 12 months in a year on a single shift basis.

Table - 4.16.1 : EMPLOYMENT STRUCTURE OF THE OTHER FOOD PRODUCTS INDUSTRY

Stratum	<u>Permanent Workers</u>		<u>Casual Workers</u>		Average no. of days worked (shift/day)	No. of units
	Average no. /day (no. / shift)	Average monthly salary (Rs.)	Average number/ shift	Average daily rate (Rs.)		
Total	3 (3)	94	0.5	2.2	274 (1.1)	2,635
<u>Registered Sector</u>						
11	94 (94)	172	8.3	3.0	299 (1.0)	1
12						
13						
21	15 (14)	153	9.1	2.1	287 (1.0)	22
<u>Unregistered Sector</u>						
31	5 (5)	163	0.9	2.1	301 (1.0)	597
41	2 (2)	46	0.3	2.2	266 (1.2)	2,015

Source : ORG Survey, 1971.

Production :

It is estimated that the total value of production in this category is about Rs. 112 million. The share of the two sectors are 10.8 and 89.2 percent respectively. The percentage share in the total value produced and per unit value of production for the two sectors are as follows:

Table - 4.16.2 : Value of Production of the Other  
Food Products Industry

Description	Registered Sector	Unregistered Sector	Total
Value produced ('000 Rs.)	12,083	99,590	111,673
Percent share	10.8	89.2	100.0
Value produced per unit ('000 Rs.)	525.3	38.1	42.3
Estimated no. of units*	23	2,612	2,635

\* Equal to "processing units" plus "processing and servicing units"

Source : ORG Survey, 1971.

Vermicelli, coffee powder, asafoetida and chicory are the important products produced in this category. Curry powder and pickles are produced by the single unit in stratum 11 of the registered sector and the estimated total production of the two products during the last year was 475 tonnes and 25 tonnes respectively. The table below gives production figures of major products produced in this category.

Table - 4.16.3 : Quantity of Products Produced by the  
Other Food Products Industry

(Qty. in tonnes)

Product	Registered Sector		Unregistered Sector		Total
	Qty.	%	Qty.	%	
Vermicelli	407	2.86	13,839	97.14	14,246
Curry powder	475	100.00	-	-	475
Appalam	-	-	1,767	100.00	1,767
Coffee powder	-	-	3,560	100.00	3,560
Asafoetida	357	34.94	666	65.06	1,023

Source : ORG Survey, 1971.

Confectionery is another product, produced exclusively in the registered sector and the total production in the last year was 81 tonnes.

Foodgrains and coffee seeds are the two materials serviced by the 215 servicing units belonging to this category. The quantity serviced during the last year were 310 tonnes of foodgrains and 4,132 tonnes of coffee seeds.

Procurement:

Purchase of raw materials worth Rs. 95.4 million was made during the last year. It would be noticed from the following table that most of the procurement is made from dealers, wholesalers, marketing associations and directly through farmers. About 13 percent of procurement is from government and cooperative agencies.

Table - 4.16.4 : Procurement of Raw Materials by  
the Other Food Products Industry

Description	Wholesalers and Dealers	Market- ing Associates	Directly from Farmers	Total
Purchase value ( '000 Rs. )	59,884	19,566	12,184	95,409
<u>No. of Units Purchasing from the Source</u>				
i) Total	2,389	60	186	2,635
ii) With no transport cost	2,139	60	186	2,400
iii) On cash payment	2,059	60	185	2,274
iv) Without brokerage	2,384	60	186	2,630

Source : ORG Survey, 1971.

Most of the raw material is procured either locally or within the district. However, 53 percent of coffee seeds, 80 percent of milk powder and 62 percent of urid dal are procured from other sources within the state. 76 percent of chicory and 99.9 percent of asafoetida are procured from outside the state. There are no significant transit and handling losses.

Table - 4.16.5 : Raw Materials Purchased by the Other Food Products Industry from Different Locations

(Qty. in Tonnes)

Material	Local		Within District		Within State		Within Country		Total (Qty.)
	Qty.	%	Qty.	%	Qty.	%	Qty.	%	
Maida	12,896	93.91	679	4.91	122	0.89	122	0.89	13,820
Coffee Seeds	1,836	24.36	984	13.05	4,015	53.28	701	9.31	7,536
Chicory	176	5.62	12	0.41	539	17.22	2,401	76.75	3,128
Asafoetida	-	-	-	-	-	-	79	100.00	79
Urid dal	6	38.05	-	-	9	61.95	-	-	15

Source : ORG Survey, 1971.

Consumption:

The following table gives details of the quantity of important raw materials consumed. Chillies (360 tonnes), dhaniya (243 tonnes), turmeric powder (53 tonnes) and mustard (94 tonnes) are the raw materials consumed by the single unit in stratum 11.

Table - 4.16.6 : Quantity of Major Raw Materials Consumed by the Other Food Products Industry

Raw Material	Registered Sector		Unregistered Sector		Total Qty.
	Qty.	%	Qty.	%	
Maida	550	4.10	12,861	95.90	13,411
Coffee Seeds	-	-	6,675	100.00	6,675
Sugar	220	63.24	128	36.76	348
Chicory	3,349	86.72	513	13.28	3,862
Asafoetida	55	71.53	22	28.47	77
Raw Coffee	-	-	224	100.00	224
Urid Dal	-	-	1,528	100.00	1,528

(Qty. in tonnes)

Source : ORG Survey, 1971.

Marketing:

Curry powder, appalam and asafoetida are the three products having a substantial export market. Toffee, asafoetida and other sweets are the products with a very good market within the country. The Table - 4.16.7 gives details of the important products marketed and the distribution pattern by location. Road is the only mode of transport used for all the goods sold, excepting for the quantity exported which is transported by sea from the port of export and for vermicelli sold outside the state which is transported by rail. Small quantities of vermicelli and coffee powder were lost in handling and during transit. The Table - 4.16.8 gives the details of the quantity lost.

Table - 4.16.7 MAJOR PRODUCTS SOLD BY THE OTHER FOOD PRODUCTS INDUSTRY

(Qty. in Tonnes)

Product	Local		Within District		Within State		Within Country		Exports		Total Quantity
	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%	
Vermicelli	9,160	64.3	4,236	29.7	792	5.6	62	0.4	-	-	14,250
Curry Powder	-	-	-	-	-	-	5	1.0	468	99.0	473
Appalam	158	10.3	64	4.2	742	48.7	-	-	576	37.4	1,540
Coffee Powder	3,158	94.3	193	5.8	-	-	-	-	-	-	3,351
Toffee	-	-	96	30.0	-	-	223	70.0	-	-	319
Asafoetida	32	3.4	-	-	626	67.6	251	27.1	18	1.9	927
Other Sweets	-	-	37	30.0	-	-	86	70.0	-	-	122

Source : ORG Survey, 1971.

Table - 4.16.8 : Transit and Handling Losses of Other Food Products Industry

Product	Transit Loss		Handling	
	Quantity (Kg.)	% of Qty. Sold	Quantity (Kg.)	% of Qty. Sold
Vermicelli	11,227	0.08	6,510	0.05
Coffee Powder	299	0.01	20,925	0.62

Source : ORG Survey, 1971.

Forty-four percent of the total sales is made directly to customers and the rest is to wholesalers, retailers and dealers. The following table gives details of the sales value, terms of delivery, mode of transaction and brokerage for the important marketing channels.

Table - 4.16.9 : Marketing Details of the Other Food Products Industry

Description	Wholesalers/ Retailers/ Dealers	Directly to Customers	Total
Sales value ('000 Rs.)	61,629	49,020	111,065
<u>No. of units dealing with the channel</u>			
i) Total	1,776	1,163	2,635
ii) Selling directly to customers	560	170	745
iii) Selling without trans- port cost	620	653	1,183
iv) Selling on cash payment	1,345	1,118	2,174
v) Selling without brokerage	1,421	1,163	2,310

Source : ORG Survey, 1971.

Rs. 1.45 million was spent during the last year by the industry on promotional schemes and on advertising. The following table gives details of amount spent on some of the important media.

Table - 4.16.10 : Amount Spent on Promotional Schemes by the Other Food Products Industry

Media	Amount Spent ('000 Rs.)	Percent to Total
Press	222.9	15.3
Cinema	34.9	2.3
Packing Paper	944.9	64.9
Combination of Various Media Schemes	216.7	14.9
Total	1454.8	100.0

Source : ORG Survey, 1971.

Investment :

The total fixed capital of all the units in this category is estimated at Rs. 102 million. The shares of registered and unregistered sector are 2.1 and 97.9 percent respectively. The ratio of the fixed capital per unit in the registered sector to that of a unit in the unregistered sector is 2.4 : 1.

The fact that very little machinery is necessary for processing the material is evident from the high share of land and buildings in the total fixed capital investment (Table - 4.16.11).

Table - 4.16.11 : Fixed Capital Investment by the  
Other Food Products Industry

Description	Registered Sector	Unregistered Sector	Total
Fixed capital ('000 Rs.)	2,175	100,031	102,206
Percent share	2.1	97.9	100.0
Fixed capital per unit ('000 Rs.)	94.5	38.2	38.8
Percent share of land and buildings in the total fixed capital	75.4	85.3	85.1

Source : ORG Survey, 1971.

The total working capital of all the units is estimated at Rs. 21.2 million. The average working capital per unit is very low (Rs. 8,000). The respective shares of raw materials, finished and semi-finished products and other inventories are 18.2, 14.7 and 11.8 percent respectively. The remaining is accounted by cash in hand and in banks.

#### Cost Structure :

The major contribution to the total cost comes from raw material. The average percentage share of raw material cost in the total cost for all the units is 85. Processing charges form only 2.5 percent of the total. Packing cost amounts to 5.8 percent of the total cost.

Table - 4.16.12 : Cost Structure of the Other Food Products Industry

Stratum	Total Cost ( '000 Rs.)	Percent Share of Selected Components					
		Raw Material	Packing Material	Fuel and Electricity	Taxes	Inward Transport	Depreciation
11	1,318	85.0	3.0	2.0	0.2	0.3	3.9
21	8,939	86.1	4.2	1.6	2.3	1.2	1.2
31	53,644	83.2	7.7	1.3	0.8	0.5	0.3
41	38,595	87.1	3.6	3.2	-	-	0.4

Source : ORG Survey, 1971.

#### Selected Coefficients :

This industry is formed of food processing units manufacturing and servicing a variety of products. The range of products as noted earlier includes vermicelli, curry powder, appalam, etc. Curry powder is the only product manufactured by the single unit in stratum 11.

Table 4.16.13 compares some of the selected coefficients for the two sectors of this industry.

Table - 4.16.13 : Selected Coefficients of the Other Food Products Industry

Item	(Value in '000 Rs.)		
	Registered Sector	Unregistered Sector	Total
Number of units	23	2,612	2,635
Value of production	12,083	99,590	111,673
Service charges earned	-	767	767
Fixed capital invested	2,175	100,031	102,206
Input cost	9,590	87,779	97,369
Gross value added	2,493	11,811	14,304
Gross value added/unit	108	4.5	5.4
Gross value added/unit investment	1.1	1.2	1.4

Source : ORG Survey, 1971.

## CHAPTER V

### ECONOMIC CHARACTERISTICS

#### Investment Costs :

Total investment on fixed capital include the cost of land and buildings and plant and machinery used for manufacturing purposes, all valued at the written down book value. However, since proper records were not maintained in many of the small industrial units the present market values of these components were substituted for the book values in estimating the investment on fixed capital. The total investment on fixed capital in the entire food processing industry is estimated as 1,081 million rupees of which 49 percent (Rs. 528 million) is accounted for by the registered sector. Rice mills have the largest share (32%) in the total investment, followed by Sugar mills (17%), Flour mills (12%) and Oil mills (9%) (Table - 5.1.1). It is interesting to note that almost the entire contribution of sugar mills to the investment on fixed capital comes from the registered sector.

Out of the total fixed capital of 1,081 million rupees, 62 percent (674 million rupees) is by way of investments in land and buildings and the rest in plant and machinery.

The small scale units (unregistered sector) accounts for a very high proportion (62%) of the investments in land and buildings. This could be due to the fact that in most cases, the manufacturing activity in this sector is carried on in the same premises where the owner lives and as such the value of land and buildings put to industrial use may be over estimated. Here again, rice mills have the largest share of 40 percent followed by flour mills (11%) and oil mills (10%), as shown in Table 5.1.2.

The value of plant and machinery, which forms 38 percent of the fixed capital in the food processing industry, is estimated as 407 million rupees. Of this, the registered sector accounts for 273 million rupees (67%) and the unregistered sector for 134 million rupees (33%). Sugar mills rank first with 35 percent share in the total investment in plant and machinery. (Table 5.1.3). The shares of rice mills, flour mills and oil mills are

20, 14 and 7 percent respectively. Tea curing industry accounts for 11 percent of the capital investment in plant and machinery, almost entirely in the registered sector. In the registered sector, sugar mills alone contribute 52 percent of the investments in the entire industry. The other categories with significant share in the total capital investment in plant and machinery in this sector are tea curing (16%), rice mills (11.4%) and flour mills (10.6%). In the unregistered sector, however, the pattern is slightly different. Rice mills have the maximum share (37%) of the total investments in this sector. Flour mills (21%) and oil mills (17%) account for another 38 percent between themselves.

In short, in the registered sector the share of plant and machinery is slightly above 50 percent of the total investment in fixed capital which is estimated as 528 million rupees, while in the unregistered sector, the value of plant and machinery is only 24 percent of the total investments.

The following tables give a detailed break-up of fixed capital, for each category of food processing industry in the registered and unregistered sectors.

Table - 5.1.1 : Estimates of Total Investments  
in Fixed Capital

Category	(Value in '000 rupees)					
	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	141,485	26.8	207,250	37.5	348,735	32.3
Flour mills	53,218	10.1	77,296	14.0	130,514	12.1
Dal mills	2,370	0.4	14,222	2.6	16,592	1.4
Bakeries	1,674	0.3	48,715	8.8	50,389	4.7
Dairies	15,077	2.9	152	Neg.	15,229	1.4
Sugar mills	187,649	35.5	588	0.1	188,237	17.4
Edible oil mills	26,878	5.1	67,909	2.3	94,787	8.8
Canning of fruits, etc.	143	Neg.	5,868	1.1	6,011	0.6
Confectionery	2,224	0.4	8,287	1.5	10,511	1.0
Soft drinks	3,569	0.7	19,235	3.5	22,804	2.1
Sago	28,108	5.4	-	-	28,108	2.6
Salt	5,139	1.0	259	Neg.	5,398	0.5
Gur	-	-	828	0.1	828	Neg.
Tea curing	57,126	10.8	1,980	0.4	59,106	5.5
Cashew curing	1,154	0.2	544	Neg.	1,698	0.2
Other foods	2,175	0.4	100,031	18.1	102,206	9.4
Total	527,989	100.0	553,164	100.0	1,081,153	100.0
Percent share		49		51		100

Source : ORG Survey, 1971

Table - 5.1.2 : Estimates of Investments in  
Land and Buildings

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	110,491	43.3	157,354	37.6	267,845	39.7
Flour mills	24,195	9.5	49,183	11.7	73,378	10. .
Dal mills	1,781	0.7	12,139	3.0	13,920	2.
Bakeries	1,261	0.5	39,330	9.4	40,591	6.0
Dairies	6,764	2.7	44	Neg.	6,808	1.
Sugar mills	46,543	18.2	560	0.1	47,103	7.0
Edible oil mills	19,283	7.6	45,702	10.9	64,985	9.6
Canning of fruits, etc.	139	Neg.	5,629	1.3	5,768	0.
Confectionery	599	0.2	7,500	1.8	8,099	1.2
Soft drinks	2,771	1.1	13,431	3.3	16,202	2. .
Sago	22,254	8.7	-	-	22,254	3.
Salt	3,290	1.3	137	Neg.	3,427	0.5
Gur	-	-	787	0.2	787	0.
Tea curing	13,213	5.2	990	0.2	14,203	2.1
Cashew curing	874	0.4	504	0.1	1,378	0. .
Other foods	1,642	0.6	85,373	20.4	87,015	12. .
Total	255,100	100.0	418,663	100.0	673,763	100.0
Percent share		38		62		100

Source : ORG Survey, 1971

Table - 5.1.3 : Estimates of Investments in  
Plant and Machinery

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	30,994	11.4	49,896	37.1	80,890	19.8
Flour mills	29,023	10.6	28,113	20.9	57,136	14.0
Dal mills	589	0.2	2,083	1.6	2,672	0.7
Bakeries	413	0.2	9,385	7.0	9,798	2.4
Dairies	8,313	3.0	108	0.1	8,421	2.1
Sugar mills	141,106	51.7	28	Neg.	141,134	34.9
Edible oil mills	7,595	2.8	22,207	16.5	29,802	7.3
Canning of fruits, etc.	4	Neg.	239	0.2	243	Neg.
Confectionery	1,625	0.6	787	0.6	2,412	0.6
Soft drinks	798	0.3	5,804	4.3	6,602	1.6
Sago	5,854	2.1	-	-	5,854	1.4
Salt	1,849	0.7	122	0.1	1,971	0.5
Gur	-	-	41	-	41	Neg.
Tea curing	49,913	16.1	990	0.7	44,903	11.0
Cashew curing	280	0.1	40	Neg.	320	Neg.
Other foods	533	0.2	14,658	10.9	15,191	3.7
Total	272,889	100.0	134,501	100.0	407,390	100.0
Percent share		67		33		100

Source : ORG Survey, 1971

**CHART 4  
PERCENTAGE SHARES OF  
REGISTERED AND UNREGISTERED SECTORS**

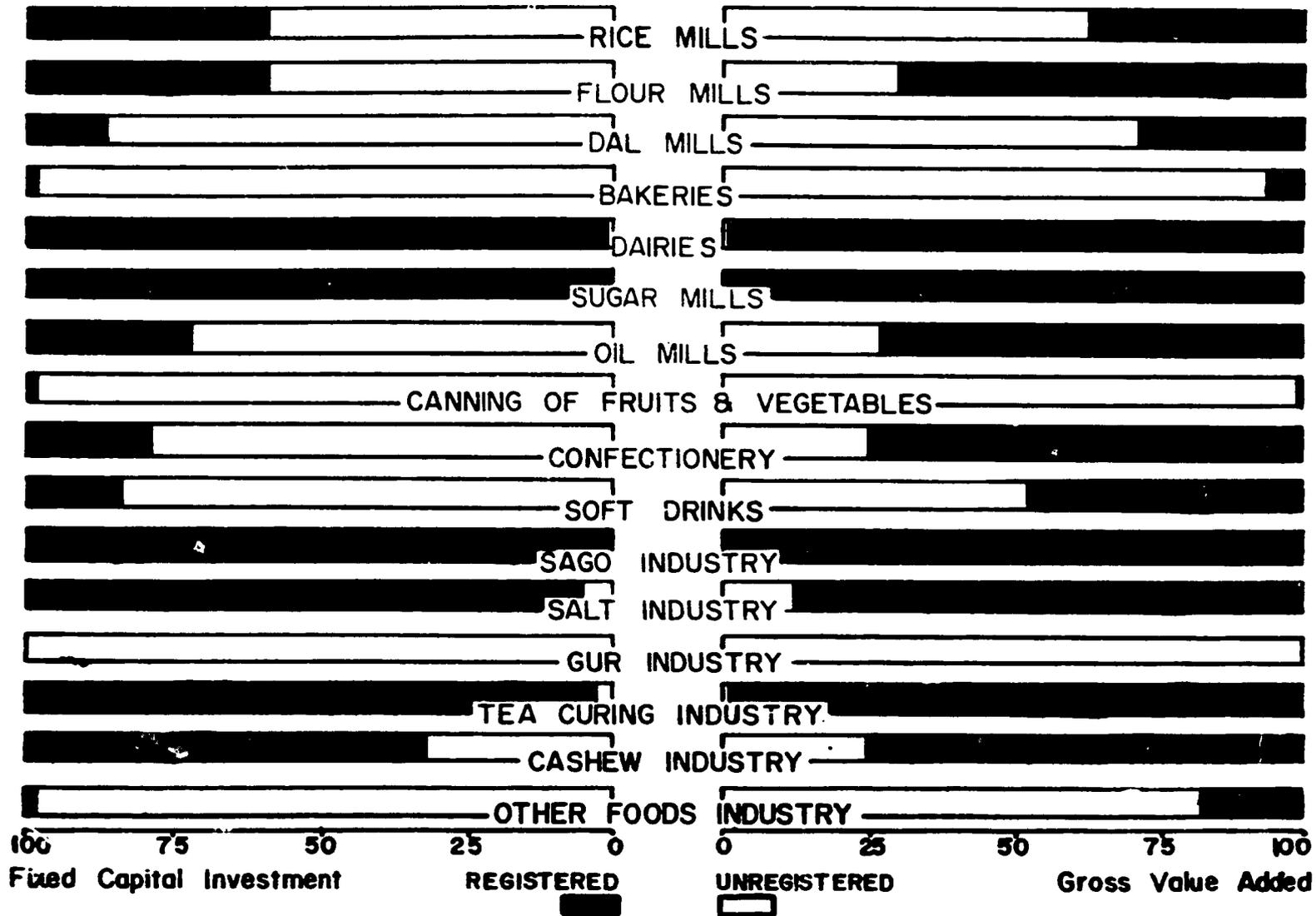
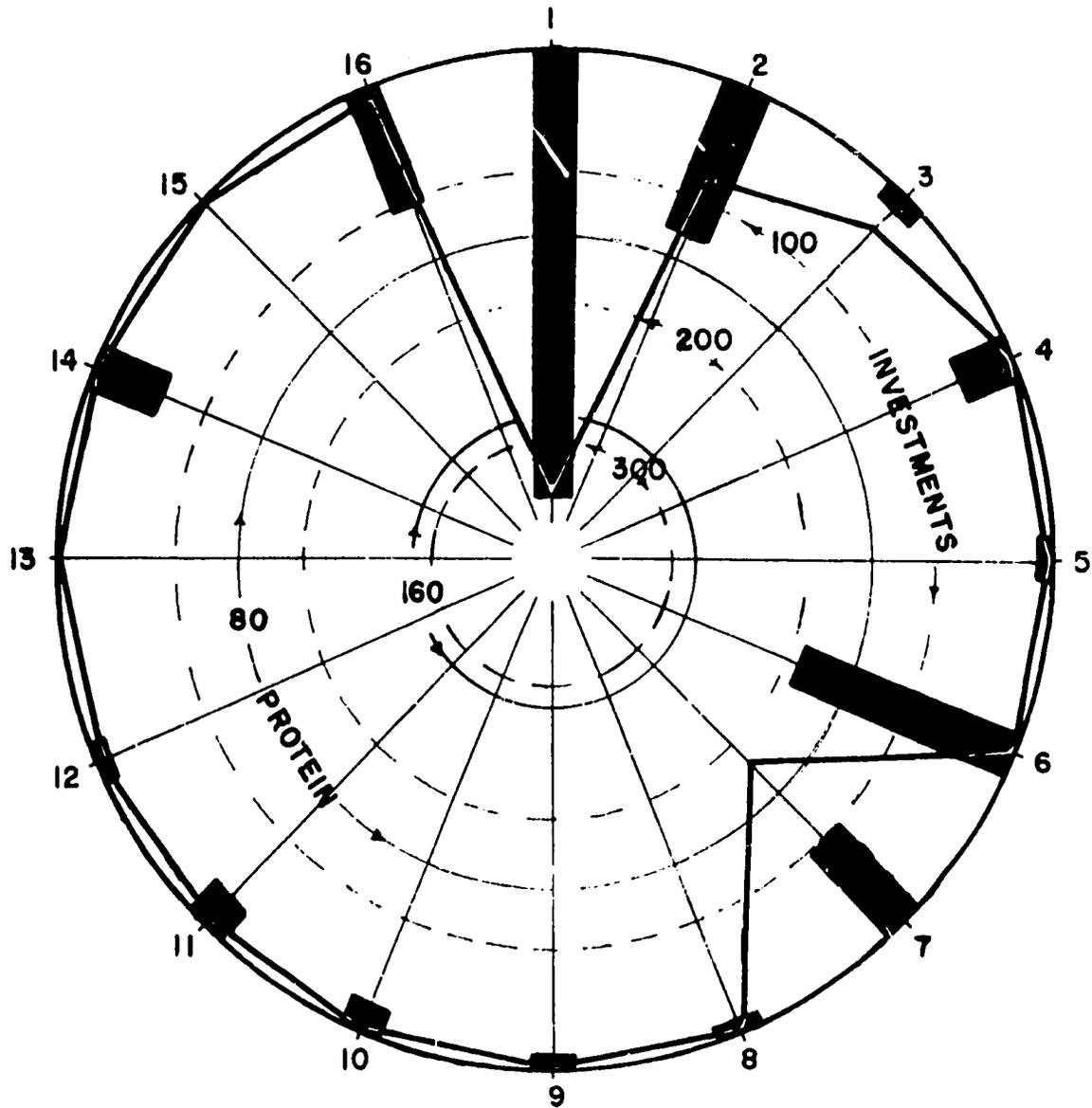


CHART 5

FIXED CAPITAL INVESTMENTS

&

PROTEIN EQUIVALENTS OF MAJOR INPUTS



Protein in '000 Tonnes  
Investments in Million Rs.

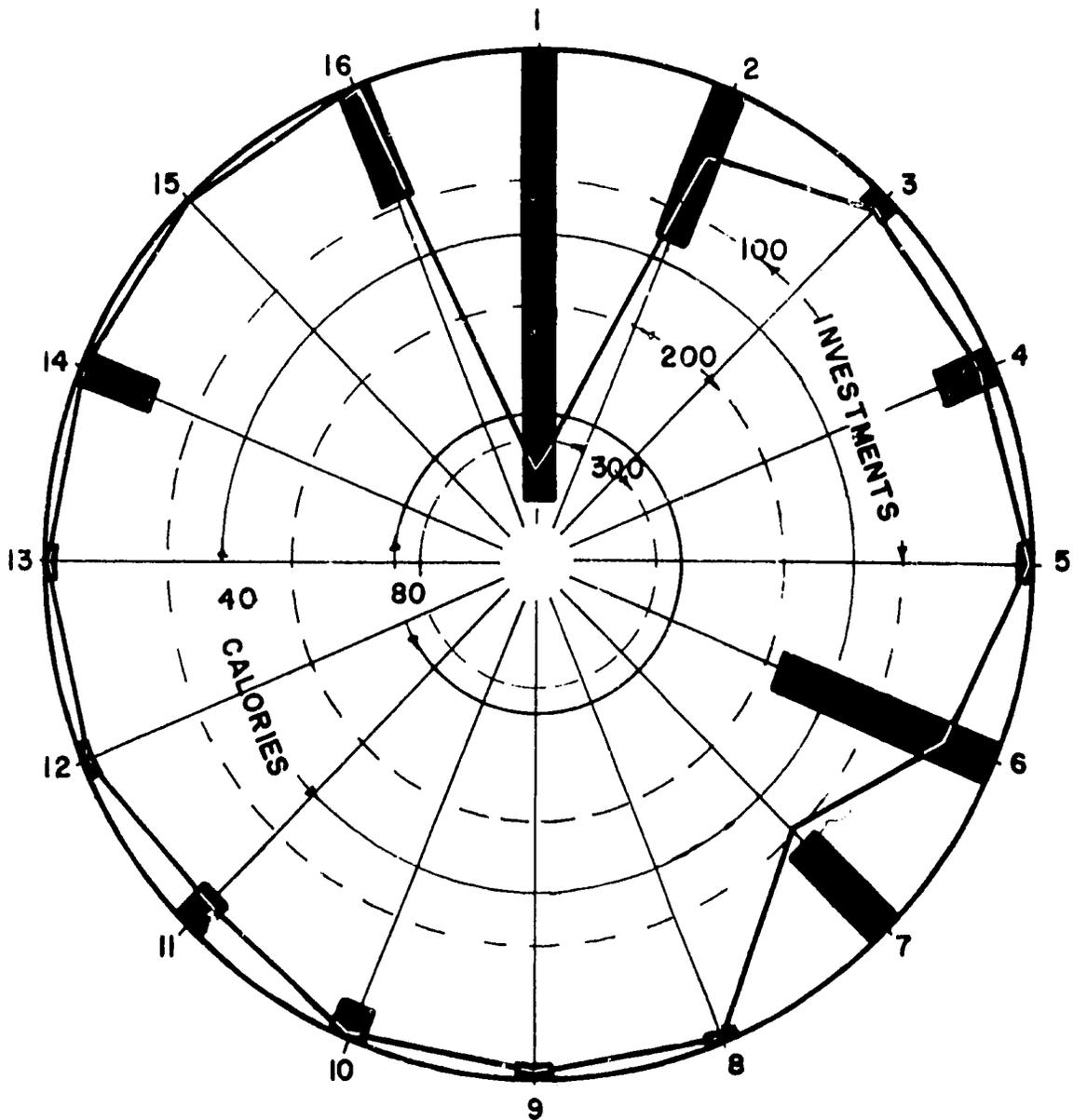
- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables |                         |
| 9. Confectionery    | 11. Sago Industry                 |                         |
| 12. Salt Industry   | 13. Gur Industry                  | 14. Tea Curing Industry |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

CHART 6

FIXED CAPITAL INVESTMENTS

&

CALORIE EQUIVALENTS OF MAJOR INPUTS



Calories in 10<sup>11</sup> KCals  
Investments in Million Rs.

- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables | 11. Sago Industry       |
| 9. Confectionery    | 10. Soft Drinks                   | 14. Tea Curing Industry |
| 12. Salt Industry   | 13. Gur Industry                  |                         |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

Cost Structure

For a study of the cost structure of the different categories the total cost of production has been worked out as sum of three major components, viz., material cost, processing cost and other costs. Material cost includes the gross value of raw and packing materials consumed, while the gross value of fuels and lubricants consumed, materials consumed for repair and maintenance, electricity charges, and services purchased add up to make the processing cost. Other costs include the gross value of rent paid for plant and machinery, taxes and duties paid, stationery and printing costs, inward transport charges, depreciation, interest paid on loans and other incidental expenses.

The total cost of production in the entire food processing industry is estimated at 2585 million rupees against an estimated gross earnings of 2884 million rupees. Table - 5.2.1 shows the cost structure of the entire food processing industry, in terms of the various components.

Table - 5.2.1 : Cost Components of Food Processing Industry

Item	(Value in '000 rupees)					
	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Material cost	1,433,884	84	782,453	89	2,216,337	86
	(65)		(35)		(100)	
Processing cost	72,580	4	39,907	4	112,487	4
	(65)		(35)		(100)	
Other costs	195,322	12	60,554	7	255,876	10
	(75)		(25)		(100)	
Total cost	1,701,786	100	882,914	100	2,584,700	100
	(66)		(34)		(100)	

Figures in brackets show the sectoral share of the individual cost component.

Source : ORG Survey, 1971

The registered sector accounts for 66 percent of the total cost incurred, the corresponding value being 1702 million rupees, while the share of the unregistered sector is 34 percent equivalent to 883 million rupees. The same pattern is observed in the two components of material cost and processing cost; however, the sectoral shares in the case of "other costs" show a slightly different trend, the corresponding ratio being 75 : 25.

This is mainly due to two categories of large-scale industries, viz., sugar and tea curing, which pay huge amounts in terms of interest on loans, taxes and duties. These two industries share between themselves 52 percent of the "other costs" incurred in the entire food processing industry. This again has resulted in a comparatively higher proportion (12%) of "other costs" in the total cost incurred in the registered sector.

An important feature in the cost structure is that the proportion of "processing cost" in both the sectors is four percent of the total cost incurred in each sector. This suggests that, on the whole, the registered and un-registered sectors do not differ significantly in their structure but for the scale of operation. The processing techniques employed in the two sectors can, therefore, be assumed to be same and that modern and improved technology has not made deep inroads in the food processing industry or at best its influence could only be marginal. Table - 5.2.2 to 5.2.5 gives the industry-wise particulars of each of the cost component in the registered and un-registered sectors of the food processing industry.

Table - 5.2.2 : Estimates of Total Cost of Production

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	355,092	20.9	227,389	25.8	582,481	22.5
Flour mills	242,973	14.3	20,084	2.3	263,057	10.2
Dal mills	20,627	1.2	46,818	5.3	67,445	2.6
Bakeries	2,328	0.1	59,373	6.7	61,701	2.4
Dairies	34,750	2.0	734	0.1	35,484	1.4
Sugar mills	286,705	16.9	528	0.1	287,233	11.1
Edible oil mills	337,920	19.9	408,144	46.2	746,064	28.9
Janning of fruits, etc.	8	Neg.	2,947	0.3	2,955	0.1
Confectionery	3,782	0.2	7,116	0.8	10,898	0.4
Soft drinks	6,861	0.4	10,920	1.2	17,781	0.7
Sago	74,646	4.4	-	-	74,646	2.9
Salt	17,464	1.0	367	Neg.	17,831	0.7
Gur	-	-	34	Neg.	34	Neg.
Tea curing	297,915	17.5	2,259	0.3	300,174	11.6
Cashew curing	10,458	0.6	3,962	0.4	14,420	0.6
Other foods	10,257	0.6	92,239	10.5	102,496	3.9
Total	1,701,786	100.0	882,914	100.0	2,584,700	100.0

Source: ORG Survey, 1971

Table - 5.2.3 : Estimates of Material Cost

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	316,001	22.0	196,377	25.1	512,378	23.
Flour mills	231,316	16.1	10,666	1.4	241,982	11.
Dal mills	18,676	1.3	42,808	5.5	61,484	3.
Bakeries	1,976	0.1	49,758	6.4	51,734	2.
Dairies	30,172	2.1	680	0.1	30,852	1.
Sugar mills	196,684	13.7	488	0.1	197,172	8.
Edible oil mills	317,826	22.2	375,256	47.9	693,082	31.
Canning of fruits, etc.	8	Neg.	2,468	0.3	2,476	0.
Confectionery	2,922	0.2	6,554	0.8	9,476	0.
Soft drinks	4,041	0.3	8,180	1.0	12,221	0.
Sago	70,579	4.9	-	-	70,579	3.
Salt	3,192	0.2	31	Neg.	3,223	0.
Gur	-	-	-	-	-	-
Tea curing	221,299	15.4	1,539	0.2	222,838	10.
Cashew curing	9,957	0.7	3,780	0.5	13,737	0.
Other foods	9,235	0.6	83,868	10.7	93,103	4.
Total	1,433,884	100.0	782,453	100.0	2,216,337	100.

Source: ORG Survey, 1971

Table - 5.2.4 : Estimates of Processing Cost

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	14,189	19.5	16,795	43.2	30,984	27.8
Flour mills	4,088	5.6	3,266	5.8	7,354	5.7
Dal mills	132	0.2	879	2.3	1,011	0.9
Bakeries	69	Neg.	4,914	12.6	4,983	4.5
Dairies	987	1.4	16	Neg.	1,003	0.9
Sugar mills	13,650	18.8	12	Neg.	13,662	12.3
Edible oil mills	6,470	8.9	8,747	22.5	15,217	13.6
Canning of fruits, etc.	-	-	146	0.4	146	0.1
Confectionery	232	0.3	186	0.5	418	0.3
Soft drinks	967	1.3	1,028	2.6	1,995	1.8
Sago	1,123	1.5	-	-	1,123	1.0
Salt	9,227	12.7	106	0.3	9,333	8.4
Gur	-	-	27	Neg.	27	Neg.
Tea curing	20,995	28.9	144	0.4	21,139	19.0
Cashew curing	205	0.3	14	Neg.	219	0.2
Other foods	246	0.3	3,627	9.3	3,873	3.5
Total	72,580	100.0	39,907	100.0	112,487	100.0

Source : ORG Survey, 1971

Table - 5.2.5 : Estimates of "Other Costs"

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total	
	Value	%	Value	%	Value	%
Rice mills	24,902	12.7	14,217	23.5	39,119	15.3
Flour mills	7,569	3.9	6,152	10.2	13,721	5.4
Dal mills	1,819	1.0	3,131	5.2	4,950	1.9
Bakeries	283	0.1	4,701	7.8	4,984	1.9
Dairies	3,591	1.8	38	Neg.	3,629	1.4
Sugar mills	76,371	39.1	28	Neg.	76,399	29.9
Edible oil mills	13,624	7.0	24,141	40.0	37,765	14.8
Canning of fruits, etc.	-	-	333	0.5	333	0.1
Confectionery	628	0.3	376	0.6	1,004	0.4
Soft drinks	1,853	1.0	1,712	2.8	3,565	1.4
Sago	2,944	1.5	-	-	2,944	1.2
Salt	5,045	2.6	230	0.4	5,275	2.1
Gur	-	-	7	Neg.	7	Neg.
Tea curing	55,621	28.5	576	0.9	56,197	21.9
Cashew curing	296	0.1	168	0.3	464	0.1
Other foods	776	0.4	4,744	7.8	5,520	2.2
Total	195,322	100.0	60,554	100.0	255,876	100.0

Source : ORG Survey, 1971

About 84 percent of the total cost of production of the entire food processing industry is accounted for by five categories - Oil mills (28.9%), Rice mills (22.5%), Tea curing (11.6%), Sugar mills (11.1%) and Flour mills (10.2%). In terms of individual components, these five categories account for 85 percent of the total material cost, 78 percent of the total processing cost and 87 percent of other costs. In the case of Rice mills and Oil mills both the registered and unregistered sectors contribute substantially to the total cost, while for the other three categories the contribution comes mostly from the registered sector.

It may be noted that by definition material cost is applicable only for units engaged in "processing" of food at least partially. Thus for purely "servicing units" the total cost includes only processing cost and other costs.

#### Gross Value Added

Gross value added by manufacture is the difference between the total value of output and the total value of inputs in an industry, where the total value of output is the sum of the value of products and by-products (excluding distribution costs) and the value of service charges earned by way of services sold and work done for other concerns. The total value of inputs, on the other hand, is taken as the direct input cost (i. e., sum of material cost and processing cost as described in Section 5.2, plus inward transport charges.

With this definition, the gross value added by manufacture in the entire food processing industry is estimated as 511 million rupees. The registered sector contributes 375 million rupees or 73 percent of the total. Sugar mills have the highest share of 27.6 percent equivalent to 141 million rupees, followed by Rice mills with 20.9 percent (107 million rupees), Tea curing industry with 16.1 percent (82 million rupees) and Edible oil mills with 12.5 percent (64 million rupees) shares. Thus these four industries together account for 77.1 percent of the total gross value added in the food

processing industry.

Within the registered sector, these industries again rank as the top four, with a total share of 82.2 percent in the following order - Sugar mills (37.5%), Tea curing (21.7%), Rice mills (10.6%) and Edible oil mills (12.4%). In the unregistered sector, however, the first two industries (Sugar mills and Tea curing) have practically nothing to contribute at all, whereas Rice mills alone have a share of 49.5 percent. Bakeries and Edible oil mills come next each with individual shares of 12.9 percent.

The gross value added for one rupee of investment in total fixed capital works out to 47 paise in the food processing industry as a whole. Comparing the two sectors, this coefficient is much higher in the registered sector 71 paise than in the unregistered sector 25 paise. Similar ratio, based on investments in plant and machinery alone, turns out to be Rs. 1.38 in the registered sector, Rs. 1.01 in the unregistered sector and Rs. 1.25 for the two sectors together.

Table - 5.3.1 gives the gross value added by manufacture in the two sectors for the different industries.

Table - 5.3.1 : Estimates of Gross Value Added  
by Manufacture

(Value in '000 rupees)

Category	Registered Sector		Un-registered Sector		Total		Rank
	Value	%	Value	%	Value	%	
Rice mills	39,875	10.6	67,183	49.5	107,058	20.9	2
Flour mills	12,122	3.2	5,526	4.1	17,648	3.5	7
Dal mills	2,357	0.6	5,537	4.1	7,894	1.5	11
Bakeries	1,117	0.3	17,560	12.9	18,677	3.7	6
Dairies	8,983	2.3	134	0.1	9,117	1.8	10
Sugar mills	140,969	37.5	80	0.1	141,049	27.6	1
Edible oil mills	46,409	12.4	17,530	12.9	63,939	12.5	4
Canning of fruit, etc.	1	Neg.	78	Neg.	79	Neg.	-
Confectionery	1,109	0.3	360	0.3	1,469	0.3	14
Soft drinks, etc.	5,841	1.6	6,558	4.8	12,399	2.4	9
Sago	22,393	6.0	-	-	22,393	4.4	5
Salt	6,293	1.7	938	0.7	7,231	1.4	12
Gur	-	-	106*	0.1	106 *	Neg.	-
Tea curing	81,352	21.7	990	0.7	82,342	16.1	3
Cashew curing	4,169	1.1	1,375	1.0	5,544	1.1	13
Other foods	2,493	0.7	11,811	8.7	14,304	2.8	8
Total	375,483	100.0	135,766	100.0	511,249	100.0	
Percent share		73		27		100	

\* Raw material cost is not included since palm juice is given to laborers in exchange of wages.

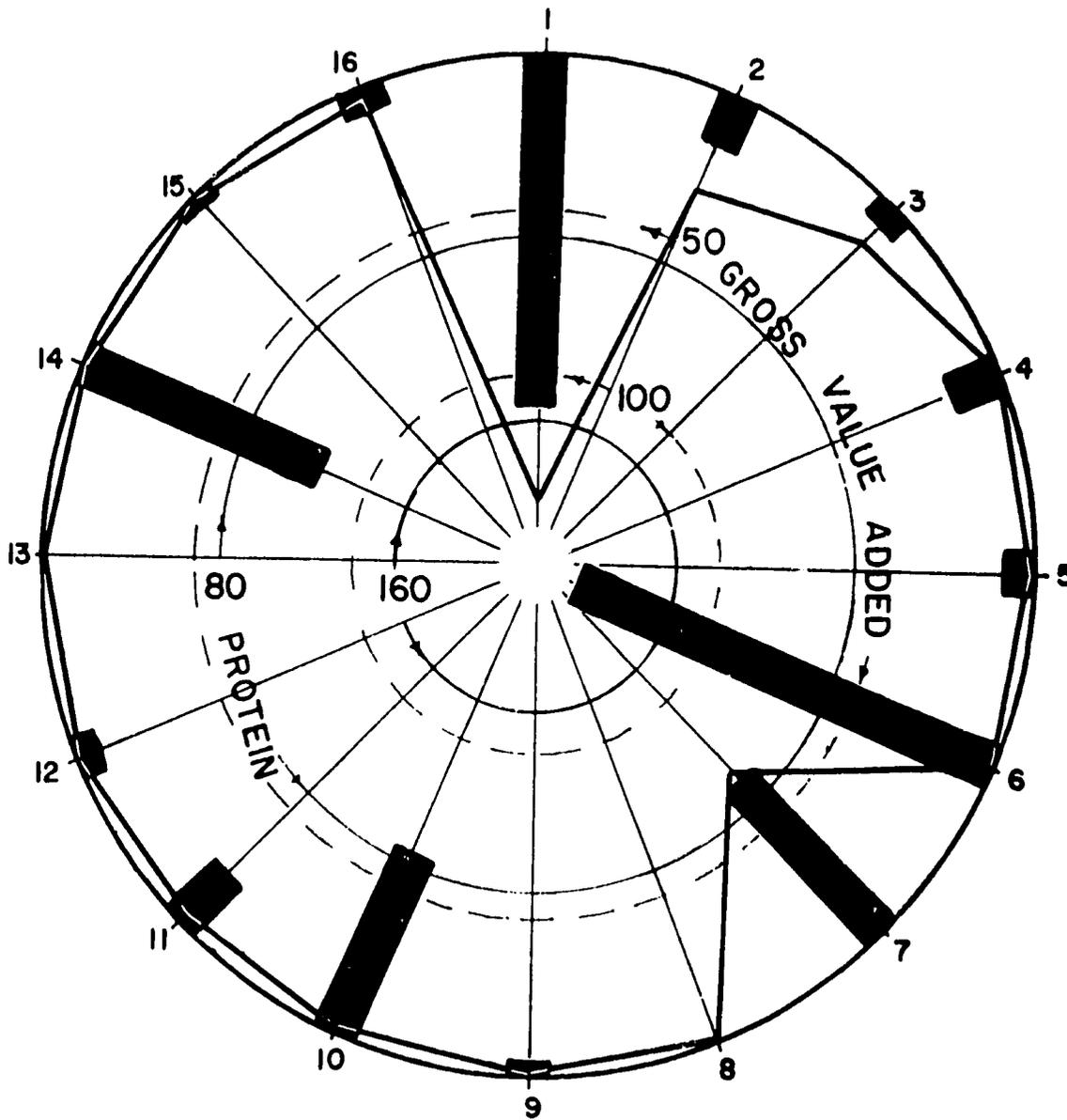
Source : ORG Survey, 1971

CHART 7

GROSS VALUE ADDED

&

PROTEIN EQUIVALENTS OF MAJOR INPUTS



Protein in '000 Tonnes  
Gross Value Added in Million Rs.

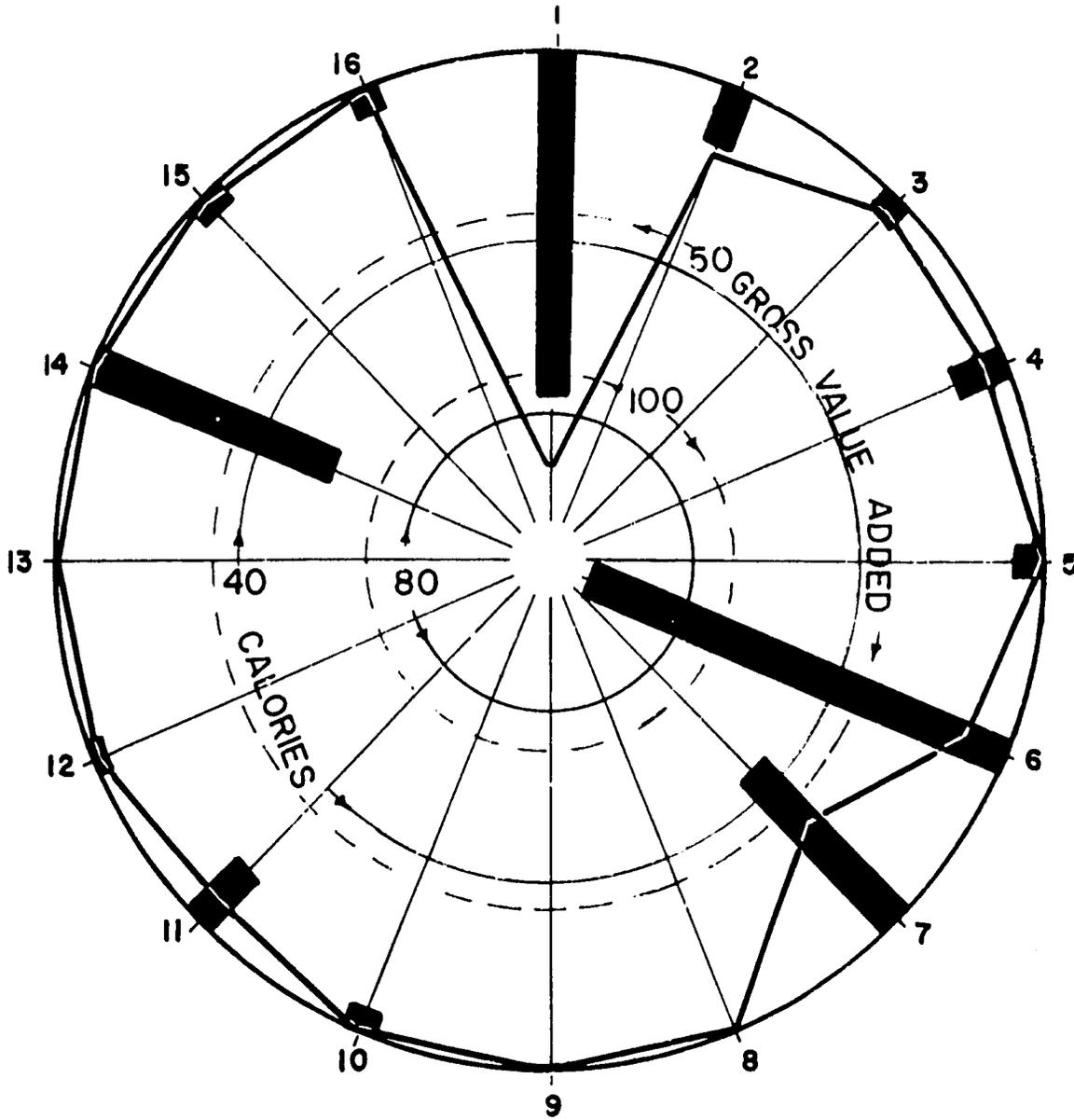
- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables |                         |
| 9. Confectionery    | 10. Soft Drinks                   | 11. Sago Industry       |
| 12. Salt Industry   | 13. Gur Industry                  | 14. Tea Curing Industry |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

CHART 8

GROSS VALUE ADDED

&

CALORIE EQUIVALENTS OF MAJOR INPUTS



Calories in  $10^{11}$  KCals  
Gross Value Added in Million Rs.

- |                     |                                   |                         |
|---------------------|-----------------------------------|-------------------------|
| 1. Rice Mills       | 2. Flour Mills                    | 3. Dal Mills            |
| 4. Bakeries         | 5. Dairies                        | 6. Sugar Mills          |
| 7. Oil Mills        | 8. Canning of Fruits & Vegetables | 11. Sago Industry       |
| 9. Confectionery    | 10. Soft Drinks                   | 14. Tea Curing Industry |
| 12. Salt Industry   | 13. Gur Industry                  |                         |
| 15. Cashew Industry | 16. Other Foods Industry          |                         |

PROFILES OF SELECTED CATEGORIESA. RICE MILLS

Item	Estimated State Total
1. Number of Units	5,131
2. Average number of days worked	294
3. Number of regular employees, total	20,033
4. Man-shifts worked, total	9,470,538
a) Man-shifts, regular employees	5,715,353
b) Man-shifts, casual workers	3,755,185
5. Wages, salaries and benefits or privileges, total annual	26,357
a) Regular employees	16,980
b) Casual workers	9,377
6. Productive capital employed, total	400,568
a) Fixed capital, total	348,735
i) Land & buildings	267,845
ii) Plant, machinery and tools	80,890
b) Working capital, total	51,833
i) Stocks of raw materials, stores, fuels, etc.	29,940
ii) Stocks of finished products and by-products	10,506
iii) Other inventories	11,387

(Cont'd.)

A. RICE MILLS (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	553,860
a) Fuels, electricity, lubricants, etc. consumed, total	17,989
b) Materials consumed, total	512,378
c) Material consumed for repair and maintenance	6,650
d) Services purchased	2,029
e) Inward transport charges	10,498
f) Other expenses	4,316
8. Gross value of output, total	660,918
a) Products and by-products, total	601,714
b) Work done for other concerns (service charge)	59,204
9. Depreciation	3,638
10. Gross value added by manufacture (8 - 7)	107,058

Total Sample Size : 211

Note: Figures for items 5 to 10 are in thousands of rupees

Source : ORG Survey, 1971

B. FLOUR MILLS

Item	Estimated State Total
1. Number of units	1,852
2. Average number of days worked	304
3. Number of regular employees, total	5,673
4. Man-shifts worked, total	1,874,743
a) Man-shifts, regular employees	1,721,582
b) Man-shifts, casual workers	153,161
5. Wages, salaries and benefits or privileges, total annual	6,134
a) Regular employees	5,753
b) Casual workers	381
6. Productive capital employed, total	143,125
a) Fixed capital, total	130,514
i) Land & buildings	73,378
ii) Plant, machinery and tools	57,136
b) Working capital, total	12,611
i) Stocks of raw materials, stores, fuels, etc.	4,810
ii) Stocks of finished products and by-products	4,597
iii) Other inventories	3,204

(Cont'd.)

B. FLOUR MILLS (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	250,820
a) Fuels, electricity, lubricants, etc. consumed, total	5,390
b) Material consumed, total	241,982
c) Material consumed for repair & maintenance	1,573
d) Services purchased	-
e) Inward transport charges	1,484
f) Other expenses	391
8. Gross value of output, total	268,468
a) Products and by-products, total	259,509
b) Work done for other concerns (service charges)	8,959
9. Depreciation	2,055
10. Gross value added by manufacture (8 - 7)	17,648

Total Sample Size : 83.

Note: Figures for items 5 to 10 are in thousand rupees.

Source : ORG Survey, 1971

C. DAL MILLS

Item	Estimated State Total
1. Number of units	407
2. Average number of days worked	265
3. Number of regular employees, total	1,144
4. Man-shifts worked, total	588,919
a) Man-shifts, regular employees	308,379
b) Man-shifts, casual workers	280,540
5. Wages, salaries and benefits or privileges, total annual	1,642
a) Regular employees	810
b) Casual workers	832
6. Productive capital employed, total	29,576
a) Fixed capital, total	16,592
i) Land and buildings	13,920
ii) Plant, machinery and tools	2,672
b) Working capital, total	12,984
i) Stocks of raw materials, stores, fuels, etc.	3,448
ii) Stocks of finished products and by-products	2,145
iii) Other inventories	7,391

(Cont'd.)

C. DAL MILLS (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	64,280
a) Fuels, electricity, lubricants, etc. consumed, total	690
b) Materials consumed, total	61,484
c) Materials consumed for repair and maintenance	211
d) Services purchased	43
e) Inward transport charges	1,785
f) Other expenses	67
8. Gross value of output, total	72,174
a) Products and by-products, total	70,100
d) Work done for other concerns (service charges)	2,074
9. Depreciation	228
10. Gross value added by manufacture (8 - 7)	7,894

Total Sample Size : 41

Note : Figures for items 5 to 10 are in thousands of rupees

Source : ORG Survey, 1971

D. BAKERIES

Item	Estimated State Total
1. Number of units	3,271
2. Average number of days worked	290
3. Number of regular employees, total	13,058
4. Man-shifts worked, total	4,260,464
a) Man-shifts, regular employees	3,851,713
b) Man-shifts, casual workers	408,751
5. Wages, salaries and benefits or privileges	11,672
a) Regular employees	10,276
b) Casual workers	1,396
6. Productive capital employed, total	55,547
a) Fixed capital, total	50,389
i) Land and buildings	40,591
ii) Plant, machinery and tools	9,798
b) Working capital, total	5,158
i) Stores of raw materials, stores, fuels, etc.	945
ii) Stocks of finished products and by-products	1,071
iii) Other inventories	3,142

(Cont'd.)

D. BAKERIES (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	56,915
a) Fuels, electricity, lubricants, etc. consumed, total	3,714
b) Materials consumed, total	51,734
c) Materials consumed for repair and maintenance	696
d) Services purchased	-
e) Inward transport charges	198
f) Other expenses	573
8. Gross value of output, total	75,582
a) Products and by-products, total	75,582
b) Work done for other concerns (service charges)	-
9. Depreciation	190
10. Gross value added by manufacture (8 - 7)	18,667

Total Sample Size : 100

Note : Figures for items 5 to 10 are in thousands of rupees

Source : ORG Survey, 1971

E. DAIRIES

Item	Estimated State Total
1. Number of units	13
2. Average number of days worked	354
3. Number of regular employees, total	624
4. Man-shifts worked, total	227,820
a) Man-shifts, regular employees	217,022
b) Man-shifts, casual workers	10,798
5. Wages, salaries and benefits or privileges, total annual	1,480
a) Regular employees	1,453
b) Casual workers	27
6. Productive capital employed, total	18,230
a) Fixed capital, total	15,229
i) Land and buildings	6,808
ii) Plant, machinery and tools	8,421
b) Working capital, total	3,001
i) Stocks of raw materials, stores, fuels, etc.	26
ii) Stocks of finished products and by-products	531
iii) Other inventories	2,444

(Cont'd.)

E. DAIRIES (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	32,771
a) Fuels, electricity, lubricants, etc. consumed, total	744
b) Materials consumed, total	30,852
c) Materials consumed for repair & maintenance	259
d) Services purchased	-
e) Inward transport charges	916
8. Gross value of output, total	41,888
a) Products and by-products, total	41,888
b) Work done for other concerns (service charges)	-
9. Depreciation	1,631
10. Gross value added by manufacture (8 - 7)	9,117

Total Sample Size : 10

Note : Figures for items 5 to 10 are in thousands of rupees

Source : ORG Survey, 1971

F. EDIBLE OIL MILLS  
(Other than Hydrogenated Oils)

Item	Estimated State Total
1. Number of units	3,275
2. Average number of days worked	250
3. Number of regular employees, total	11,506
4. Man-shifts worked, total	4,246,969
a) Man-shifts, regular employees	3,009,433
b) Man-shifts, casual workers	1,237,536
5. Wages, salaries and benefits or privileges, total annual	14,480
a) Regular employees	10,597
b) Casual workers	3,883
6. Productive capital employed, total	171,818
a) Fixed capital, total	94,787
i) Land and buildings	64,985
ii) Plant, machinery and tools	29,802
b) Working capital, total	77,031
i) Stocks of raw materials, stores, fuels, etc.	21,160
ii) Stocks of finished products and by-products	20,300
iii) Other inventories	35,571

(Cont'd.)

F. EDIBLE OIL MILLS (Cont'd.)

Item	Estimated State Total
7. Gross value of input, total	716,296
a) Fuels, electricity, lubricants, etc. consumed, total	7,879
b) Materials consumed, total	693,082
c) Materials consumed for repair and maintenance	2,642
d) Services purchased	3,330
e) Inward transport charges	7,997
f) Other expenses	1,366
8. Gross value of output, total	780,235
a) Products and by-products, total	772,056
b) Work done for other concerns (service charges)	8,179
9. Depreciation	1,634
10. Gross value added by manufacture (8 - 7)	63,939

Total Sample Size : 132

Note : Figures for items 5 to 10 are in thousands of rupees

Source : ORG Survey, 1971

STANDARD ERRORS OF SOME SELECTED ESTIMATES

Category	Stratum Code	Sample Size	Product/ Raw material	Estimate of total quantity (Tonnes)	Standard error of estimate	
Dairies	21	8	Whole milk	31,399.4	3,241.5	
			Toned milk	1,097.8	527.8	
			Butter	200.2	56.4	
			Ghee	154.3	42.0	
Flour mills	13	4	Maida	57,300.0	7,945.8	
			Atta	13,550.7	3,402.9	
			Suji/Rava	16,110.8	1,508.1	
	21	8	Maida	95,212.0	24,502.4	
			Atta	18,227.7	4,685.2	
			Suji/Rava	27,132.1	6,488.7	
			Paddy	520.0	429.4	
	31	42	Suji/Rava	5,794.4	5,487.8	
			Paddy	18,878.0	6,931.2	
	41	29	Paddy	46,526.0	18,756.6	
	Rice mills	13	3	Rice	16,644.0	6,496.1
				Paddy	5,230.0	1,882.6
21		82	Rice	290,634.0	40,596.9	
			Paddy	369,887.0	59,350.9	
31		91	Rice	92,468.0	27,055.8	
			Paddy	504,317.0	64,919.9	
41		35	Rice	143,455.0	140,899.5	
			Paddy	1,184,925.0	238,253.4	

(Cont'd.)

Standard Errors of Some Selected Estimates - (Cont'd.)

Category	Stratum Code	Sample Size	Product/ Raw material	Estimate of total quantity (Tonnes)	Standard error of estimate	
Dal mills	21	12	Tur dal	9,955.5	2,887.2	
			Urid dal	1,542.1	553.8	
			Mung dal	98.2	51.2	
			Paddy	346.0	270.2	
	31	20	Tur dal	4,849.1	2,454.5	
			Urid dal	6,741.1	2,483.5	
			Mung dal	820.4	483.8	
	41	9	Tur dal	1,749.7	1,721.3	
			Urid dal	4,733.4	2,168.3	
			Mung dal	773.3	760.8	
	Bakeries	21	9	Bread	675.5	166.1
				Biscuits	223.3	51.2
Cake				174.5	39.5	
Bun				66.5	27.4	
Rusk				1.8	0.9	
31		56	Bread	7,666.3	2,719.3	
			Biscuits	3,436.4	679.0	
			Cake	487.3	88.5	
			Bun	1,612.4	365.6	
			Rusk	38.7	24.4	
41		35	Bread	11,218.5	1,822.7	
			Biscuits	4,009.5	695.1	
			Cake	1,204.4	345.3	
			Bun	5,389.0	883.0	
			Rusk	228.9	138.0	
Sugar	13	2	Sugar	101,654.0	93,444.3	

(Cont'd.)

Standard Errors of Some Selected Estimates - (Cont'd.)

Category	Stratum Code	Sample Size	Product/ Raw material	Estimate of total quantity (Tonnes)	Standard error of estimate
Edible oil mills	21	52	Groundnut oil	44,094.2	9,647.9
			Groundnut oilcake	56,799.5	12,565.4
			Gingelly oil	14,537.3	5,259.7
			Gingelly oilcake	21,618.2	7,765.6
			Coconut oil	4,915.6	3,044.2
			Coconut oilcake	3,259.3	1,985.1
			Paddy	8,188.0	5,078.5
	31	46	Groundnut oil	15,179.8	4,872.6
			Groundnut oilcake	20,441.0	6,669.7
			Gingelly oil	20,900.7	8,656.7
			Gingelly oilcake	28,258.7	11,480.7
			Coconut oil	1,109.1	717.7
			Coconut oilcake	722.4	411.5
			Paddy	15,462.0	14,929.9
	41	31	Groundnut oil	13,672.4	6,485.2
			Groundnut oilcake	19,334.4	8,040.3
			Gingelly oil	17,328.0	8,162.2
			Gingelly oilcake	24,107.2	11,159.0
			Coconut oil	1,398.4	605.2
			Coconut oilcake	1,048.8	449.7
			Paddy	126,920.0	120,247.8
Sago	13	8	Sago	7,496.0	1,122.0
	21	45	Sago	52,939.1	8,176.6

Note : Estimates of "paddy" refers to quantity of paddy serviced in the industry.