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## Productivity of Fruit and Vegetable Manufacturing Units in Kerala

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### INTRODUCTION

Indian food processing industry is widely recognized as the ‘sunrise sector’ having huge potential for uplifting agriculture economy, creation of large scale processed food manufacturing and food chain facilities, and resultant generation of employment and export earnings. Food processing involves any type of value addition to agricultural or horticultural produce and also includes processes such as grading, sorting, packaging which enhance shelf life of food products. The food processing industry provides vital linkages and synergies between industry and agriculture. Rapid urbanization, increased literacy, changing life style, increased number of women in workforce, rising per capita income- leading to rapid growth and new opportunities in food and beverages sector. “Productivity” plays a key role in determining competitiveness of the sector estimation of productivity is vital in understanding the relative performance of the sector. Food processing sector is crucial to the economy as it provides employment to about 48 million people (i.e., direct about 13 million people and about 35 million people indirectly). In this study an attempt is made to estimate productivity levels for major factor inputs such as raw material and labour.

Higher productivity means accomplishing more with the same amount of resources or achieving higher output in terms of volume and quality for the same input. This is usually stated as.

$$\text{Productivity} = \frac{\text{Output}}{\text{input}}$$

European productivity council defines productivity as “an attitude of mind. It is the mentality of progress, of the constant improvement of that which exists. It is the certainty of being able to do better than yesterday and continuously. It is constant adaptation of the economic and social life to changing conditions. It is the continual effort to apply new techniques and methods. It is the faith in human progress”.

### SIGNIFICANCE OF THE STUDY

Raw material is the major input in an organization and form bulk which get converted into output. Raw material is one of the basic inputs which constitute 50 to 70 percentage of total value of the output of the organization. Material productivity in a manufacturing concern is a

vital factor in measuring the effectiveness and efficiency. Business firms employ workers to do several types of jobs. A hundred per cent automation to any type of firm is not possible. Thus, it is a fact that labour is an unavoidable input. Labour productivity is used to assess the efficiency in utilization of labour input by the firms. Labour productivity is often used as an index of economic development of the society. Labour is the most appropriate index of measuring the productivity of food processing industry as it is a labour intensive industry. Productivity of labour affects the labour cost. A low productivity increase labour cost and vice versa. Constant effect should be made to increase labour productivity.

## OBJECTIVE OF THE PAPER

1. The objective of the present paper is to examine the raw material and labour productivity of fruit and vegetables processing units in the state of Kerala

## HYPOTHESIS

Ho: There is no significant difference in the raw material productivity of different types of fruit and vegetable processing units.

## METHODOLOGY

An interview schedule was developed for the collection of primary data. Stratified Random sampling technique was used to carry out the study. Based on the geographical, cultural and social environment the state of Kerala was divided into three regions, viz., Southern region, Central region and Northern region. The fruit and vegetable units operating in the state of Kerala is functioning under four divisions viz., large scale, small scale, cottage and home scale sectors. One district from each region having all the four types of fruit and vegetable processing units were selected on random base. Accordingly, Alappuzha from Southern region, Ernakulam from Central region, and Kozhikode from Northern region are selected as the sample study districts. A total of 93 units from Alappuzha, Ernakulam and Kozhikode districts were selected for the study.

## RAW MATERIAL PRODUCTIVITY

Material productivity is measured by material yield. Material yield means the weight of finished products accepted by the customer when compared with weight of all materials used for production

$$\text{Material productivity} = \frac{\text{Value of finished goods}}{\text{Value of raw materials used}}$$

The particular of the productivity of raw material of fruit and vegetable processing units is presented below.

**Table 1**

**Frequency distribution of raw material productivity**

Raw material productivity	Number of units	Percent
<1	51	54.8
1 – 2	28	30.1
>2	14	15.1

Source: Primary Data

It is clear that 54.8 per cent of the units have their rawmaterial productivity less than one. Only 15.1 per cent of the sample units have material productivity greater than two. Remaining 30.1 per cent of the sample units have material productivity between one and two. The average productivity and their standard deviations are shown in the following table 2

**Table 2**

**Distribution of raw material productivity based on selected variables**

Selected Variables		Mean	SD	N	F	P
Sectors	Large scale sector	13.6	31.7	9	4.63**	0.005
	Home scale sector	1.4	0.7	28		
	Small scale sector	1.1	0.6	23		
	cottage sector	0.8	0.8	33		
District of the units	Alappuzha	1.7	2.8	15	0.43	0.649
	Ernakulum	3.2	13.8	49		
	Kozhikode	1.1	0.7	29		
Number of products Produced	1	1.2	0.8	55	2.38	0.099
	2	1.1	0.9	19		
	>=3	6.7	22.2	19		
Category	Vegetable	1.1	0.8	44	0.93	0.399
	Fruit	4.3	17.7	30		
	Both	1.8	2.5	19		

Source: Primary Data

\*\* Significant at 0.01 level

As per the table 2, material productivity is high among large scale sector (13.6) followed by home scale sector (1.4) small scale sector (1.1) and least among cottage sector (0.8). The statistics shows significant variation at 0.01 level ( $F=4.63$ ). Among the district wise analysis, the statistics does not exhibit any significant variation. But material productivity is high in Ernakulum district (3.2) and low in Kozhikode district (1.1). Material productivity of the sample units as per number of product produced are not significant and the sample units which produce three or more than three products have high material productivity value (6.7). The sample units that produce only fruit products have high material productivity (4.3) than units that are producing both fruits and vegetable products.

From the table 3, it is clear that there exist relation between material productivity with sectors of sample units. To make clear, which one among the sector has more material productivity Scheffe multiple comparisonis presented below.

**Table 3**

**Scheffe multiple comparison of raw material productivity based on sectors**

Sectors	Pair	F	Sig.
Large scale sector (A)	A & B	3.68*	0.02
Home scale sector (B)	A & C	3.67*	0.02
Small scale sector (C)	A & D	4.18**	0.01
Cottage sector (D)	B & C	0	1.00
	B & D	0.02	1.00
	C & D	0	1.00

Source: Primary Data

\*\* Significant at 0.01 level

\*Significant at 0.05 level

Scheffe multiple comparison is used to compare the mean material productivity of different sector taken two at a time to assess where a significant mean difference exist. The material productivity of large scale sector and home scale sector statistically differ ( $F = 3.68$ ) at 0.05 level. It means that material productivity of large scale industries is significantly higher than that of home scale sector. A similar result can be observed for large scale sector and small scale sector ( $F=3.67$ ) and large scale sector and cottage sector ( $F=4.18$ ). Thus it can be concluded that material productivity of large scale sector is significantly high as compared to the other sector and these three type of sectors do not show any difference in material productivity between them. Earlier a hypothesis was formulated that the raw material productivity of the units differs based on the size of the units. As per the analysis shown above, it is proved that the raw material productivity of large scale sector is better in comparison to its counterpart, hence the hypothesis is accepted.

## LABOUR PRODUCTIVITY

Labour is an important and indispensable factor of production Labour productivity of the sample units are given below.

**Table 4**  
**Frequency distribution of labour Productivity**

Labour Productivity	Number of units	Per cent
<0.50	67	72.0
0.51 - 0.99	17	18.3
>=1	9	9.7

Source: Primary Data.

As per the table 4, the labour productivity of the majority of the sample units lies below 0.50 and 72 per cent of the sample units come under this category. The value of labour productivity ranges from 0.51 to 0.99 having 18.3 per cent of sample units. While 9.7 per cent of the sample units, are having labour productivity greater than or equal to one.

To know the relationship, labour productivity should be compared with selected variables like sector, district where sample units are located, number of products produced and type of products produced by the sample units. The following table displays such comparison.

**Table 5**  
**Distribution of labour productivity based on selected variables**

Selected Variables		Mean	SD	N	F	P
Sectors	Large scale sector	4.7	0.5	9	1333.1**	0.000
	Home scale sector	0.2	0.1	28		
	Small scale sector	0.5	0.2	23		
	Cottage sector	0.4	0.2	33		
District of the units	Alappuzha	0.7	1.1	15	0.13	0.881
	Ernakulam	0.8	1.4	49		
	Kozhikode	0.8	1.3	29		
Number of products produced	1	0.5	0.9	55	6.22**	0.003
	2	0.7	1.0	19		
	>=3	1.7	2.0	19		
Category	Vegetable	0.5	0.8	44	4.31*	0.016
	Fruit	0.8	1.3	30		
	Both	1.5	1.9	19		

Source: Primary Data

\*\* Significant at 0.01 level

\* Significant at 0.05 level

Table 5 shows that labour productivity is high in large scale sector (4.7) followed by small scale sector (0.5), cottage sector (0.4) and home scale sector (0.2). There exist small differences between average labour productivity between the different sectors. The statistics shows that there exist a significant variation among different sectors of sample unit at 0.01 level ( $F = 1333.1$ ). The average value of labour productivity is low in Alappuzha district (0.7). Ernakulam and Kozhikode district have same labour productivity value (0.8). The statistics shows that variation in the value of labour productivity among the industries in the three districts is not significant. The value of productivity increases as the number of products produced increase. The table shows that the value of labour productivity is low in the units where only one product is produced (0.5) followed by two types of products (0.7) and high in units, where three or more than three types of products are produced (1.7). The statistics shows significant variation at 0.01 level ( $F = 6.22$ ). The labour productivity is high in sample units where both fruits and vegetables are used to produce products. The statistics shows that the variation in the value of labour productivity of the sample units are statistically significant at 0.05 level ( $F = 4.31$ ).

From the table 6, it is inferred that the labour productivity is directly dependent on the sector, number of products and category of products of the sample units. To know the differences that exist between variables, the pair test is used.

**Table 6**  
**Scheffe multiple comparison of labour productivity based on selected variables**

Selected Variables		Pair	F <sup>^</sup>	Sig.
Sectors	Large scale sector (A)	A & B	1190.51**	0.00
	Home scale sector (B)	A & C	996.94**	0.00
	Small scale sector (C)	A & D	1124.64**	0.00
	Cottage sector (D)	B & C	8.22**	0.00
		B & D	5.64**	0.00
		C & D	0.52	0.67
Number of products produced	1 (A)	A & B	0.1	0.892
	2 (B)	A & C	6.1**	0.003
	>=3 (C)	B & C	3.1	0.051
Category	Vegetable (A)	A & B	0.7	0.512
	Fruit (B)	A & C	4.3*	0.016
	Both (C)	B & C	1.6	0.200

Source: Primary Data

\*\* Significant at 0.01 level

\* Significant at 0.05 level

Scheffe multiple comparison is used to compare the labour productivity of different sectors taken two at a time to assess the significant mean difference that exist. The value of labour productivity of large scale sector and home scale sector are statistically different ( $F = 1190.51$ ) at 0.01 level. Similar result can be observed at large scale sector and small scale sector ( $F = 996.94$ ) at 0.01 level and large scale sector and cottage sector ( $F = 1124.64$ ) at 0.01 level. In short, this means that while comparing large scale sector with other sectors, labour productivity is high in large scale sector. Likewise, home scale sector and small scale sector are significant at 0.01 level ( $F = 8.22$ ) and home scale and cottage sector are also significant at 0.01 level ( $F = 5.64$ ). This means that, labour productivity is very low in home scale sector when compared to small scale and cottage sector. Scheffe multiple test compare the labour productivity of number of products produced by the sample units. The units that produced one product and three or more than three products are statistically significant ( $F = 6.1$ ) at 0.01 level. The sample units, that produce vegetable products and both fruit and vegetable products have significant variation at 0.05 level ( $F = 4.3$ ).

## CONCLUSION AND RECOMMENDATIONS

Food processing industry in India is a sunrise sector. Fruit and vegetable is the most important diet of all human beings. India exported fruits and vegetables worth Rs. 5986.72 crores in 2012-13. India annually produces 205 million tones of fruits and vegetables. Hence there is lot of scope for development of the industry. Material and labour productivity in a manufacturing concern is a vital factor in measuring the effectiveness and efficiency of how the input used.

Farmers should be given proper information and training regarding the quality, hygienic and sanitary practice of farming. Government should setup centralized agencies to look after the procuring, storage and distribution of raw materials. KINFRA were started in various districts which help to overcome certain infra structure difficulties faced by the units. But units are scattered along the 14 districts of Kerala, only few enjoyed the facilities provide by the KINFRA. So mini KINFRA can be started in the districts were the concentration of units are high.

Lack of skilled labour leads to huge financial constrain to units. Proper training facilities should be given to the workers before they were employed in the units. Starting up of food processing courses at various technical institution will solve the problems of trained skilled labour to very great extent.

In Kerala agro-processing industries are under industry department and agriculture is under agriculture department. Hence, there is only limited scope for activities. Therefore, agro processing industry must be shifted from industry department to a separate department under agricultural department. This will facilitate proper addition of agricultural production with procurement, processing and marketing.

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**REFERENCE**

- i. Annual report of Ministry of Food Processing
- ii. Joseph Prokopenko. Productivity Management. A Practical Hand Book. International Labour Office: Geneva.1987
- iii. Peter Fellow. Guidelines for small scale fruit and vegetable process. New Delhi: Daya,1997
- iv. V.S. Mahajan. Growth of Agriculture and Indusry in India. New Delhi: Deep and Deep, 1983.
- v. B.M. Nigam Lall and I.C. Jain. Cost Accounting. New Delhi: Prentice hall, 2001.

www.ijahms.com