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Performance of Pickle Production Processing and Marketing in Sindh Pakistan

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Abstract
Pickle products are packed in polythene bags then are placed in the Glass bottles or bucket. The pickle producers in Shikarpur area on average spent a total cost of production of Rs.1575700.00 in the Rs.607500.00 raw material cost, Rs.320900.00 packaging material cost, Rs.536000.00 human resource cost and Rs.130000.00 marketing cost respectively on capital inputs. The selected pickle producers in Shikarpur area on average revenue generate of Rs. 2350000.00 and pickle net income per unit Rs.1340700.00, Rs.2350000.00 gross income and Rs.1575700.00 total expenditure respectively in the study area. The pickle production unit gross income Rs. 2350000.00 and total expenditure is Rs.1575700.00 in the study area therefore they availed input output ratio of 1:1.49 and pickle production unit net income Rs. 774300.00 and total expenditure Rs.1575700.00 in the study area therefore they availed input output ratio of 1:0.49 respectively in the study area.
Keywords: Pickle, raw material, polythene bags, bucket, input output ratio, Shikarpur

1. Introduction

Pickle is one of the oldest and most successful methods of food preservation known to human. The optimization of pickle quality depends on maintenance of proper acidity, salt concentration, temperature and sanitary conditions. Pickle products add spice to meals and snacks. The skillful blending of spice, sugar and oil with fruit and vegetable gives crisp, firm texture and pungent, sweet-sour flavor. Pickles serve as appetizers and help in digestion by aiding flow of gastric juices. Fermented pickles also have beneficial bacteria that can control harmful intestinal microbes.

Pickle in Shikarpur is manufactured in twenty-five different agriculture products like mango (carry), chillies, lemon onion etc. and is manufactured in three categories oil, vinegar, and water. The export quality of pickle is manufactured in soybean oil. There are twelve pickle manufacturing factories in Shikarpur and fifteen pickle selling shops in the city. Different manufacturers have opened their outlets in different cities of the country like in Quetta to export the product to Afghanistan and Iran. Pickle manufacturing process is consisting on six steps. When raw material are brought from different parts of the province/country (like mango) is being cut into different parts according to the requirement of buyer after then it is washed with fresh water, then it is mixed in mixing machine at this stage different spices are mixed with raw material. The raw material is stored in brine tank where they can be preserved for twelve months. After that according to the requirement of buyer mixed raw material is taken from the brine tank and are washed. After washing raw material are mixed in mixing tub(container) where different spices are mixed after then manufactured pickle is packaged in different sizes of jars and are sold. Pickle manufactured in vinegar takes fifteen days to be ready for eating purpose while pickle manufactured in soybean oil takes one month to be eaten (Hashmi *et al.* 2007).

Pickles are generally of three types namely pickles in vinegar, citrus juice, brine and oil. Besides the basic fruit/vegetable, the substances that are generally added to pickles are vinegar, sugar, salt, oil and spices. The presence of these ingredients makes the product highly acidic in nature. Due to the acid nature and/or the presence of oil in the pickle, the packaging material to be used should be oil and acid resistant. Spoilage of pickles could be due to microbial contamination or oxidation/ rancidity of the oil used. A good packaging material for pickle can prevent spoilage. A good package for pickles should have the attributes such as aroma retention, excellent protection against light, moisture and oxygen, excellent seal integrity for containment, grease, oil and acid resistance, good aesthetics and appearance. When food is available in ample it is preserved for further consumption (Khan *et al.* 2005).

Pickle has a large variety of pickles (known as Achar in Punjabi, Hindi, Bengali, Uppinakaayi in Kannada, Lonacha in Marathi, orukai in Tamil, oragaya in Telugu), which are mainly made from varieties of mango, lime, tamarind and Indian gooseberry (amla), chilli. Vegetables such as brinjal, carrots, cauliflower, tomato, bitter gourd, green tamarind, ginger, garlic, onion, and citron are also occasionally used. These fruits and vegetables are generally mixed with ingredients like salt, spices, and vegetable oils and are set to mature in moisture less medium. In Pakistan, pickles are known locally as Achaar (in Urdu) and come in a variety of flavors. A popular item is the traditional mixed Hyderabadi pickle, a common delicacy prepared from an assortment of fruits (most notably mangos) and vegetables blended with selected spices (Hassan *et al.* 2001).

Pickling process in India differs from other regions mainly due to additional spice mixture added to them post anaerobic fermentation. Pickles are main side dishes and many varieties of vegetables are used. However, raw mango or tender mango is the most popular variety of fruit used for pickling. There are multiple varieties of mango pickles prepared depending on the region and the spices used but, broadly there are two types of - whole baby mango pickle or cut mango pickle. Whole baby mango pickle is a traditional variety very popular in Southern India and uses baby mangoes that are few weeks old. There are special varieties of mangoes specifically used just for pickling and they are never consumed as ripe fruit. Baby mangoes are pickled and added with spice mixture in a very careful process which ensures pickles are preserved for years (Verma *et al.* 2012).

Keeping in the view competitiveness of Shikarpur district Sindh province of Pakistan pickle production processing and marketing, the study was conducted with the following specific objectives.

2. Objectives

1. To describe socio-economic status of pickle producers in the study area.
2. To study the economics of production and marketing in Shikarpur Sindh.
3. To identify issues and suggest policy measures for promoting on pickle production in the study area.

3. Methodology

The Shikarpur district of Sindh province was selected purposively for the present study because it is largest pickle producers it is one of the district within Sindh province in terms of pickle production. The district Shikarpur is situated in the northern part of Sindh Pakistan. The summers are very hot and the winters are mild to cold.

Data Collection

This study was used the primary data in present study. Primary data was collected from sample of 60 respondents. A list of pickle producers of each selected producers were prepare selection was made on proportional random sampling method. They were purposively selected from Shikarpur district Sindh.

Secondary Data

Secondary data collected from various Government departments used to determine the overall growth rate of pickle production. The Secondary data was collected from literature and publication including report, research papers etc.

Economic analysis Estimation Methods

Data were analyzed by developing equations for estimating fixed costs, variable costs, total cost of production, total revenue, net revenue Input-Output ratio and benefit cost ratio. A brief description of each term is given as follows:

Estimation of factory inputs

For estimation of factory inputs for pickle on the sample unit, the following formula was used.

Fip = (Fm x Fss) + Ap + Rfe) /Af

Where;

Fip = Factory input per unit of pickle
Ap =Area pickle production
Fm= Factory Machine
Fss= Factory Support Structure
Rfe =Rate of factory expenditures.
Af=Area factory

Estimation of human resource cost

The extent of labour inputs for various cultural operations involved in pickle production was estimated by applying the following formula:

Lit = (Mn x Hc) + (Lwd xWr) + (Swd x Hc) / Af

Where;

Lit =Labour input per unit of pickle production
Hc =Hiring charges.
Mn =Machine work hour.
Lwd=Labour work day.
Wr =Wage rate
Swd=Supervisor work day
Af=Area factory

Estimation of Capital Inputs

The following formula was used to compute per unit (factory) cost of the capital inputs.

Cipu = (Qs x Pr) + (Qe x Pr) + Qr x Pr) / Af

Where ;
Cipu =Capital inputs per unit/factory of pickle
Qs = Quantity of used.
Pr = Price per unit of input.
Qe = Quantity of electricity
Qr = Quantity of Raw Material Inventory
Af=Area factory

Marketing Cost

The marketing cost was estimated by using the following formula:
Mc = Qm (Rl + Tr / Af)
Where ;
Mc = Marketing cost.
Qm = Quantity of produce marketed.
Rl = Rate of loading.
Tr = Transportation rate.
Af=Area factory

Estimation of Returns

The estimation of returns was developed by using the following formula:
VP = (Qs x Pr) / Af
Where;
VP = Value of Product.
QS = Quantity Sold.
Pr = Price per unit.
As = Area factory

Total Cost of Production

Total cost of production was estimated by using the following formula:
TC=TFC+TVC
Where;
TC =Total Costs of Production

Net Returns

Net returns were estimated by using the following formula:
NR = TI- TC
Where;
NR = Net Returns
TI = Total Income
TC = Total Cost

4. Results

This chapter provides results of the study including current status of pickle production practices and issues of pickle producers. Pickle has always been in consistent demand in the subcontinent as a compulsory add-on to be served with food. This indicates that there is a substantial potential for this business.

Age

Table 1: Distribution of the respondents according to their age

Age	No. of respondents	Percentage
Young (< to 30)	22	36.66
Middle aged (30-50)	28	46.66
Old (> 50)	10	16.66
Total	60	100.00

Table-1 shows that majority 46.66 percent of the respondents were middle aged followed by young 36.66 percent and old 16.66 percent. It means that half of the respondents belonged to middle age category.

Literacy level

Table 2: Distribution of the respondents according to their literacy level

Literacy level	No. of respondents	Percentage
Primary	4	6.66
Middle	8	13.33
Matric and Collage	12	20.00
Graduation	36	60.00
Total	60	100.00

Table-2 shows that 6.66 percent of the respondents were primary education while 13.33 percent had literacy level middle standard, 20.00 percent were metric and college level education and 60.00 percent of the respondents had literacy level graduation.

Experience

Table 3: Distribution of the respondents according to their experience

Experience	No. of respondents	Percentage
Up to 10 years	18	30.00
11-25 years	27	45.00
Above 26years	15	25.00
Total	60	100.00

Table-3 shows that pickle 30.00 percent respondents were Up to 10 years experience, 45.00 percent respondents were 11-20 years and 25.00 percent respondents were above 26 years in the study area.

Type of business

Table 4: Distribution of the respondents according to their type of tenure

Type of business	No. of respondents	Percentage
Owner	23	38.33
Rental	37	61.66
Total	60	100.00

Table-4 shows that the majority 61.66 percent of the respondents was owner and only 38.33 percent respondents were renter/tenant.

Varieties pickle

Table 5: Different varieties of pickle production in the study area

Varieties pickle	Number	Percentage
Mango oil	52	86.00
Lemon oil	28	46.00
Mixed oil	44	73.30
Mango vinegar	46	76.60
Lemon vinegar	20	33.30
Chili vinegar	10	16.60
Others pickle	15	25.00

Table-5 shows that 86.00 percent of the respondents were make mango oil pickle, 46.00 percent of the respondents were make lemon oil pickle, 73.00 percent of the respondents were make mixed oil pickle, 76.60 percent of the respondents were make mango vinegar pickle, 33.30 percent of the respondents were make lemon vinegar pickle 16.60 percent of the respondents were make chilli vinegar pickle and 25.00 percent of the respondents were make other pickle in the study area.

Product pack/ weight

Table 6: Different product pack/ weight of pickle in the study area

Product pack	Units	Pack weight
Glass bottles/ polythene bags	Grams	330
Glass bottles/ polythene bags	Grams	450
Glass bottles/ polythene bags	Kg	1
Glass bottles/ polythene bags	Kg	1.8
Polythene bags	Kg	5
Bucket	Kg	16
Bucket	Kg	32

Table-6 shows that pickle product will first be packed in polythene bags which will then be placed in the Glass bottles or bucket. Therefore, polythene bags requirement would be equal to the number of bottles and buckets produced.

Machinery and Equipment

Table 7: Different machinery and equipment used in the pickle production

Description	Capacity Unit/Hr	Cot Rs/unit	Total Rs.
Mixing Machine	100 kg / hr	50,000.00	50,000.00
Utensils, sieve, pans	100 kg / hr	50,000.00	50,000.00
Filling Machine	100 kg / hr	100000.00	100000.00
Packing Machine	100 kg / hr	40000.00	40000.00
Labeling Machine	100 kg / hr	60000.00	60000.00
Laser print/coding Machine	100 kg / hr	80000.00	80000.00
Generator 10 KVA	_	200000.00	200000.00

Table-7 shows that pickle production machinery like mixing, filling, labeling packaging and others production capacity of per hour above 100 Kg and different costs/prices of machinery in the study area.

OfficeEquipment

Table 8: Different machinery and equipment used in the pickle production

Description	Quantity	Cost	Amount
Computers	1	25000.00	25000.00
printer	1	12000.00	12000.00
Telephones	1	5000.00	5000.00
Fax machines	1	8000.00	8000.00
Furniture	__	80000.00	80000.00

Table-8 shows provision of Rs.80000.00 for procurement of office furniture and equipments. This would include computer, printer, fax, table, desk, chairs etc.

Raw Material

Table 9: Different raw materials and costs used in the pickle production

Ingredients	Quantity (Kg)	Cost (kg)	Amount(Rs.)
Mango/ Chilli/Garlic/Lime	20500	15.00	307500.00
Salt	800	05.00	4000.00
Chilli (Red)	700	140.00	98000.00
Saunf	300	170.00	51000.00
Methi Seeds	300	50.00	15000.00
Kalongi	300	160.00	48000.00
Rai	300	80.00	24000.00
Cooking oil	500	120.00	60000.00
Total			607500.00

Table-9 shows that overall total raw material cost incurred towards various product was estimated and observed to be Rs.607500.00 followed by Rs. 307500.00 in Mango/ Chilli/Garlic/Lime, Rs.4000.00, Rs.98000.00, Rs.51000.00, Rs.15000.00, Rs.48000.00, Rs.24000.00, Rs.60000.00 in salt, Chilli (Red), Saunf, Methi Seeds, Kalongi, Rai and Cooking oil for the production in the study area.

Packaging Materials

Table 10: Different packaging materials and cost used in the pickle production

Description	Quantity (Unit)	Cost(Unit)	Amount(Rs.)
Glass bottles/ polythene bags 330 gram	15000	10.00	150000.00
Glass bottles/ polythene bags 450 grams	10000	12.00	120000.00
Glass bottles/ polythene bags 1 kg	1000	15.00	15000.00
Glass bottles/ polythene bags 1.8 kg	800	18.00	14400.00
Polythene bags 5 kg	300	20.00	6000.00
Bucket 16 kg	250	50.00	7500.00
Bucket 32 kg	100	80.00	8000.00
Total			320900.00

Table-10 shows that overall total packaging material cost incurred towards various product was estimated and observed to be Rs.320900.00 followed by Rs.150000.00, Rs.120000.00, Rs.15000.00, Rs.15000.00, Rs.14400.00, Rs.6000.00, Rs.7500.00, Rs.8000.00 in glass bottles/ polythene bags 330 gram, glass bottles/ polythene bags 450 grams, Glass bottles/ polythene bags 1 kg, Glass bottles/ polythene bags 1.8 kg, Polythene bags 5 kg, Bucket 16 kg and Bucket 32 kg for the production in the study area.

Human Resource

Table 11: Different human resource cost used in the pickle production

Description	No. of Employees	Salary per month (Rs.)	Amount(Rs.)
Owner /Manager	1	25,000.00	25,000.00
Supervisor	1	15000.00	15000.00
Machine operators	2	12000.00	24000.00
Packaging Staff	5	7000.00	35000.00
Workers/labours	6	5000.00	30000.00
Watchman	1	5000.00	5000.00
Total			134000.00
Grand total Rs. 134000.00 x 4 months season of production =			536000.00

Table-11 shows that overall total human resource cost incurred towards various products was estimated and observed to be Rs.134000.00 followed by Rs.25,000.00, Rs.15000.00, Rs.24000.00, Rs.35000.00, Rs.30000.00, Rs.5000.00 in owner /manager, supervisor, machine operators, packaging staff, workers and watchman respectively.

Marketing Costs

Table 12: Per unit expenditure incurred on marketing cost in the study area

Particulars	Mean
Loading	22500.00
Transportation	85000.00
Unloading	22500.00
Total	130000.00

Table-12 shows that marketing cost spent a sum of Rs.130000.00, this included Rs.22500.00 for loading, Rs.85000.00 for transportation and Rs.22500.00 of unloading respectively on marketing cost in the study area.

Total Cost of Production

Table 13: Per unit total cost of production in the study area

Particulars	Mean
Raw material cost	607500.00
Packaging material Cost	320900.00
Human resource cost	536000.00
Marketing cost	130000.00
Total	1575700.00

Table-13 shows that the selected pickle producers in Shikarpur area on average spent a total cost of production of Rs.1575700.00 in the Rs.607500.00 raw material cost, Rs.320900.00 packaging material cost, Rs.536000.00 human resource cost and Rs.130000.00 marketing cost respectively on capital inputs.

Revenue Generation

Table 14: Per unit revenue generate in the study area

Description	Production (Unit)	Sale price	Amount(Rs.)
Glass bottles/ polythene bags 330 gram	15000	40.00	600000.00
Glass bottles/ polythene bags 450 grams	10000	70.00	700000.00
Glass bottles/ polythene bags 1 kg	1000	130.00	130000.00
Glass bottles/ polythene bags 1.8 kg	800	200.00	160000.00
Glass bottles/ polythene bags 5 kg	300	500.00	150000.00
Bucket 16 kg	250	1500.00	375000.00
Bucket 32 kg	100	3000.00	300000.00
Total			2350000.00

Table-14 shows that the selected pickle producers in Shikarpur area on average revenue generate of Rs. 2350000.00 respectively in the study area.

Net Income

Table 15: Per unit net income in the study area

Particulars	Mean
Gross Income (Rs) A	2350000.00
Total Expenditure (Rs) B	1575700.00
Net Income (Rs) A-B=C	774300.00

Table-15 shows that pickle net income per unit Rs. 774300.00, Rs.2350000.00 gross income and

Rs.1575700.00 total expenditure respectively in the study area**.**

Input – Output ratio

Table 16: Per unit input-output in the study area

Production Area	Gross Income(Rs.)	Total Expenditure(Rs.)	Input-output ratio
Unit	(A)	(B)	A/B=C
1	2350000.00	1575700.00	1:1.49

Table-16 shows that pickle production unit gross income Rs. 2350000.00 and total expenditure is Rs.1575700.00 in the study area therefore they availed input output ratio of 1:1.49 respectively in the study area**.**

5. Conclusion and suggestions

The research study on an analysis of pickle production processing and marketing in Shikarpur district Sindh was concluded for the findings during study were the most efficient to produce the pickle at profitable level. The industrial infrastructure is the web of personal, economic, social and legal relationships that support the production of pickle commodities. It includes, most visibly, input suppliers and output processors. However, it also includes the formal and informal business relationships between individual farms.

Shikarpur district is a main pickle production processing and marketing area in Sindh Pakistan. Thus, the district can have a potential to produce more pickle for demand of growing population, there is also need for study the efficient pickle production and issues in the production process for policy making.

In our survey we found that pickle consumption is very popular in Sindh Pakistan and with the exception of one respondent rest all the respondents consume some or the other type of pickle. We also found that in spite of availability of readymade pickles the popularity of homemade pickles has not decreased. Thus there is large market for pickle producing units which goes untapped because people go for homemade pickles. We also found that that popularity of mango pickles is fairly consistent among the respondents with almost one-third preferring mango pickles. Communication and sharing of knowledge on interventions in production, processing and utilization of pickle and pickle by products is recommended

- Pickle companies should more aggressively tap the Mango pickle and Lemon pickle segment.
- Packaging of 250 gms should be produced by the companies as it contains optimum quantity which is sufficient for a nuclear family of 3-4 people.
- As consumers are educated and well aware now a days, they are very health conscious and hence nutritional value, manufacturing and expiry date should be mentioned on the packaging very clearly.
- Companies should aggressively advertise coupled with effective sales promotions for improving customer recall and brand image.
- Good packaging, proper oil content, certification from food agencies etc. should be maintained to give customers a home -made taste and push him to buy from market rather than making at home.
- Attempt to manage human resource cost should be focused through performance measurement and performance based compensation.
- Encouraging training and skill of self & employees through experts and exposure of best practices is route to success.
- Small business loans should be provided on soft and simple terms and conditions to producers.

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