

VALUE ADDITION OF PULSES IN WESTERN MAHARASHTRA

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ABSTRACT

The Maharashtra state contributes to 14.50 per cent of the total area and 14.66 per cent of the total production of pulses in India. It has been attempted to study the processing and value addition activities of selected medium investment pulse processing mills in Solapur district of western Maharashtra for enhancing the income as the pulse processing activities have been carried out on commercial basis by a large number of dal mills in this area. The sample of dal mills were divided into three size groups viz., small, medium and large on the basis of processing capacities range as 25-75, 100-150 and 175-200 q. of raw pulse per day, respectively. Out of 20 sample dal mills, 7 dal mills each were under small and medium size groups and 6 dal mills under large size group. The break-even and B:C ratios were worked out with appropriate formulae. The data pertained to the year 2010-11. The results indicated that the total investment in capital asset (inclusive of land) worked out to (₹ 77,63,462.90) per dal mill of the total investment cost, more than 19 per cent cost was on account of land. The investment on machineries and tiny equipment's was the major investment followed by buildings and other structures which individually shared, about 43.32 and 36.14 per cent of the total investment cost, respectively. The total quantity of pigeonpea, chickpea and green gram processed by the different sized dal mills during the year was thus, 2,93,654.55, 62,614 and 15,591 q., which constituted 78.97, 16.84 and 4.19 per cent of the total quantity of pulses processed, respectively. The out-turn of dal obtained from pulses processing by the small, medium and large sized dal mills was 77.17 per cent, 75.80 per cent and 74.34 per cent of the total quantity of pulse processed, respectively. The actual quantity of pulses processed by these mills during the year was 18,592.98 q. The total quantity of pulses processed by in all 20 dal mills will be 31,312.50 q per annum. The extent of capacity utilization was more over 59.38 per cent at the level of quantity of pulses processed. The overall level, the per dal mill net returns over total variable cost worked out to ₹ 77,27,688.52 and that over total cost came to ₹ 63,89,614.31 during the year. The magnitudes of the profitability of pulse processing was closely associated with the installed capacity and its utilization in the case of different sized of dal mills. The per dal mill break-even quantity of pulse was less than the actual quantity processed by the all sized groups dal mills. At the overall level, the benefit-cost ratio in pulse processing worked out to 1.09. Among the different size groups of dal mills, the benefit-cost ratio was estimated at 1.07, 1.11 and 1.15 for the small, medium and large sized dal mills, respectively. The foregoing discussions leads to state the actual volume of business performed by all the dal mills was much lower than permitted by their capacities. In this context, it is suggested that the millers should not only carried out the activity of procuring pulse, processing it and selling the finished products in the market but should perform the job of customer's processing by extending pulse processing services to the people as and when available. The study revealed that the substantial amount is retained by the private pulse units as profits. The producer-cultivators may invite as processors and sellers. They should sell dal after production and processing of pulse rather than selling it as a raw pulse in the market. In view of this, the mini dal mills developed at CFTRI, Mysore/PDKV, Akola be supplied to producers of pulses in a dispersed manner or otherwise cultivators may think of expanding the pulse processing units under co-operative sector.

Keywords: value addition, pulses, technology

INTRODUCTION

The role of agro-processing industries is significant in respect of value added by manufacturer in the developing as well as developed economies of the world. It helps to restrict the flow of people from villages to cities and on the other hand integrate rural and urban economies by eliminating regional imbalances. The food industry is beneficial to trade

for Indian agriculture. It also gives the crucial contribution in the nation's food security. The agro-processing industries generate large employment opportunities in the rural area.

Today, dal milling industry promises excellent potential to boost our economy, due to the enormous opportunities both in domestic and export market. Now, it would be profitable to have dal milling industries in the

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villages. So that proper milling is done soon after harvest and stored in the form of dal, rather than whole pulse. It reduces the transportation and handling losses to the extent of 3 to 7 per cent and this way people may get finished product at low price

India is the largest producer as well as consumer of the pulses in the world. Today, dal milling is the fourth largest processing industry in India after rice, wheat and oilseeds. By the end of 2010, the area under the total pulses in Maharashtra was 3.38 million ha with production of 2.37 million tonnes and productivity 702 Kg ha⁻¹, whereas, in India, 23.28 million ha area was under these pulses, with 14.66 million tonnes production and 630 kg ha⁻¹ productivity. The Maharashtra state contributes to 14.50 per cent of the total area and 14.66 per cent of the total production of India. There is a vast scope for processing industries of pulses in Solapur district since it a leading producer of pulses. Therefore, attempt has been made to study the value addition activities of selected medium investment pulse processing mills in Solapur district of Western Maharashtra.

OBJECTIVE

To know the value addition of pulses in western Maharashtra

METHODOLOGY

The choice of Solapur district (Barshi tahsil) was purposive because of the fact that the dal mills of different capacities have been established in this area. The pulse processing activities have been carried out on commercial basis by a large number of dal mills in this area. A list of dal mills in Barshi was obtained from APMC, Barshi along with required information. As per the information so collected, there were about 23 dal mills of which 20 were purposively selected for the present study due to their regular working

during the year.

To facilitate the analysis of data, the sample of dal mills were divided into three size groups viz., small, medium and large on the basis of processing capacities range as 25-75, 100-150 and 175-200 q. of raw pulse per day, respectively. Out of 20 sample dal mills, 7 dal mills each were under small and medium size groups and 6 dal mills under large size group.

The break-even quantity of pulse was estimated as

Where,

Q = Quantity of pulse processed in q required for break- even

TFC = Total fixed cost of dal mill per annum

Gi = Gross income per q of pulse processed

AVC = Average variable cost per q of pulse processed.

The benefit-cost ratios were worked out by applying the following formula.

Where,

B-C 'ratio' = Benefit-cost ratio

Tr = Total returns per quintal of pulse processed

Tc = Total cost per quintal of pulse processed

RESULTS AND DISCUSSION

Capital investment in dal mills

It is revealed from the Table 1 that, at the overall level, the total investment in capital asset (inclusive of land) worked out to ₹ 77,63,462.90 per dal mill of the total investment cost, more than 19 per cent cost was on account of land. The investment on machineries and tiny equipment's was the major investment followed by buildings and other structures which individually shared, about 43.32 and 36.14 per cent of the total investment cost, respectively. The other items of investment cost were office furniture and insurance premium which stood as negligible items of investment accounting for 0.69 and 0.79 per cent of total investment cost.

Table 1 : Capital investment in dal mill

(Figures in ₹)

Size Group	Land	Buildings & structures	Equipments	Office furniture	Insurance	Total Investment
Small	919259.48 (21.32)	1525487.82 (35.38)	1792383.52 (41.57)	41392.55 (0.96)	33200.27 (0.77)	4311723.60 (100.00)
Medium	1482869.87 (19.37)	2762103.50 (36.08)	3299519.43 (43.10)	50526.28 (0.66)	60478.43 (0.79)	7655497.50 (100.00)
Large	1909015.55 (16.02)	4421003.55 (37.10)	5439860.16 (45.65)	47665.81 (0.40)	98906.58 (0.83)	11916452.0 (100.00)
Overall	1413449.94 (19.05)	2826958.03 (36.14)	3414124.08 (43.32)	46471.33 (0.69)	62459.51 (0.79)	7763462.90 (100.00)

(Figures in parentheses indicate percentages)

Types of pulses processed

Table 2 revealed that, at the overall level, the total quantity of pigeonpea, chickpea and green gram processed by the different sized dal mills during the year was thus, 2,93,654.55, 62,614 and 15,591 q., which constituted 78.97, 16.84 and 4.19 per cent of the total quantity of pulses processed, respectively. The per unit quantity of pigeonpea, chickpea and green gram processed estimated to 14,682.73, 3,130.70 and 779.55 q,

respectively. Out of 20 sample dal mills, 3 number of dal mills have under taken the processing of chickpea and 2 dal mills have undertaken the processing of green gram during the year. The number of dal mills processing pulses were indeed 20. The total quantity of pulses processed by different sized dal mills during the year was, thus 3,71,859.55 q and the per unit quantity of these pulses processed arrived 18,592.98 q in the year of study.

Table 2 : Information on different pulses processed

(Quantity in q)

Size groups	Pigeonpea			Chickpea			Green gram			Total pulses		
	Total quantity processed	Per unit quantity processed	No. of dal mills processing pigeonpea	Total quantity processed	Per unit quantity processed	No. of dal mills processing chickpea	Total quantity processed	Per unit quantity processed	No. of dal mills processing green gram	Quantity processed	Per unit quantity processed	No. of sample dal mills
Small	23558.00 (46.38)	3365.43	4	11645.00 (22.93)	1663.57	1	15591.00 (30.69)	2227.29	2	50794.00 (100.00)	7256.29	07
Medium	113099.00 (82.35)	16157.00	6	24235.00 (17.65)	3462.14	1	.....	.....	.....	137334.00 (100.00)	19619.14	07
Large	156997.55 (85.45)	26166.26	5	26734.00 (14.55)	4455.67	1	.....	.....	.....	183731.55 (100.00)	30621.93	06
Overall	293654.55 (78.97)	14682.73	15	62614.00 (16.84)	3130.70	3	15591.00 (4.19)	779.55	2	371859.55 (100.00)	18592.98	20

(Figures in parentheses indicate percentages to their respective totals)

Performance of dal mills in pulse processing

It is observed from the Table 3 that the total number of working days in the year under study for small, medium and large sized dal mills were 179, 251 and 293 days, respectively. The quantities of pulse processed by the small, medium and large sized dal mills were 7,256.28, 19,619.14 and 30,621.92 q, respectively. As against this, the quantities of dal obtained by the small, medium and large sized dal mills were 5,599.67, 14,871.30 and 22,764.34 q, respectively. Additionally, the absolute quantities of dal, broken dal, chuni and insect infested grains with inert matter were closely related to the quantities of pulses processed by the dal mills of respective size groups.

The out-turn of dal obtained from pulses processing by the small, medium and large sized dal mills was 77.17 per cent, 75.80 per cent and 74.34 per cent of the total quantity of pulse processed, respectively. Thus, the proportion of dal obtained from the total quantity of pulses processed was relatively low in the case of large sized dal mills as compared to the small and medium sized dal mills. The quantity of chuni obtained by the small, medium and large sized dal mills were 1,130.53, 3,262.66 and 5,527.25 q which constituted 15.38 per cent, 16.63 per cent and 18.05 per cent of the total

quantity of pulses processed, respectively. The proportion of chuni obtained from the total quantity of pulse processed was, thus, relatively high in respect of the large sized dal mills as compared to the small and medium sized dal mills. That means the work efficiency of large sized dal mills was somewhat lower than that of small sized dal mills.

Capacity utilization

It is observed from Table 4 that, at the overall level, the total quantity of pulses processed by in all 20 dal mills will be 31,312.50 q per annum. The actual quantity of pulses processed by these mills during the year was 18,592.98 q the extent of capacity utilization was more over 59.38 per cent at the level of quantity of pulses processed.

The dal mills in study area remain closed on every Tuesday so due to holiday as per Factory Act and also due to power cut. Tuesday hails for 4-5 times in a month. One day from a month or two is needed for cleaning and repairing of machineries and equipments. Thus, on an average, the total working days in a month are 25. The dal mills remain closed at least for 2 months in a year either due to unavailability of raw material or because of that the rainy weather does not permit drying of pulses as well as dal.

Table 3 Performance of Dal Mills

(Quantity in q)

Sr. No.	Particulars	Size groups			Overall
		Small	Medium	Large	
1	Number of working days	179	251	293	238.40
2	Quantity of pulse processed	7256.29	19619.14	30621.92	18592.98
3	Main product : Quantity of whole dal				
4	By products : Total quantity	5599.67	14871.30	22764.34	13754.49
	Quantity of broken dal	1526.72	4335.83	7196.15	4150.68
(a)	Chuni	243.08	635.66	937.78	594.52
(b)	Powder fraction and powder	1130.53	3262.66	5527.25	3155.54
(i)	Husk	614.61	1667.63	3000.94	1624.42
(ii)	Insect infested grains and inert matter	515.92	1595.04	2526.31	1428.68
(c)	Total products (3+4)				
	Loss	153.11	437.51	695.12	400.61
5		7125.66	19207.14	29960.49	17905.16
6		129.89	412.00	661.43	388.83

Table 4 : Details of capacity utilization

Particulars	Size groups			Overall
	Small	Medium	Large	
Quantity of pulses at full capacity utilization (q)	15178.57	34821.43	46041.67	31312.50
Actual quantity of total pulses milled during the year (q)	7256.29	19619.14	30621.93	18592.98
Percentage capacity utilization (%)	47.81	56.34	66.51	59.38

Profitability of dal mills

It is observed from Table 5 that, at the overall level, the per dal mill net returns over total variable cost worked out to ₹ 77,27,688.52 and that over total cost came to ₹ 63,89,614.31 during the year. Among the different size groups of dal mill, the per dal mill net returns over total variable cost in the case of small, medium and large sized dal mills amounted to ₹ 28,41,135.54, ₹ 97,79,562.90, and ₹ 1,99,57,043.09, respectively. Similarly, the per dal mill net returns over total cost amounted to ₹ 20,94,283.80, ₹ 84,61,350.78 and ₹ 17,90,6,036.90 for small, medium and large sized dal mills, respectively. From the above discussion it is clear that the magnitudes of the profitability of pulse processing was closely associated with the installed capacity and its utilization in the case of different sized of dal mills.

Break-even point

The per dal mill break-even quantity of pulse was less than the actual quantity processed by the all sized groups dal mills. For small, medium, large and overall sized dal mills, the break-even quantity of pulse was 26.29 per cent, 13.48 per cent, 10.28 per cent and 17.31 per cent of the actual quantity processed by these mills, respectively. The estimated break-even quantity increased with the increase in the size of dal mills which was obviously related to their installed capacity. The foregoing discussion thus reveals that the actual quantity of pulse processed by the mills under study was higher than the one required to recover total annual cost of pulse processing units.

All the size groups of dal mills no doubt operate at a level higher than their break-even quantity but at a level lower than their intake capacity due to inadequate availability of raw material for processing.

Table 5 : Profitability of dal mills

(Figures in ₹)

Resources	Size groups			Overall
	Small	Medium	Large	
Gross returns	3961413.15	12112798.35	23484773.74	9994737.28
Fixed cost	746851.74	1318212.12	2051006.19	1338074.21
Variable cost	1120277.61	2333235.45	3527730.65	2267048.76
Total cost	1867129.35	3651447.57	5578736.84	3605122.97
Net returns over total variable cost	2841135.54	9779562.90	19957043.09	7727688.52
Net returns over total cost	2094283.80	8461350.78	17906036.90	6389614.31

Table 6 : Break-even analysis for different sized dal mills

Size groups	Break-even volume (q)	Actual quantity processed (q)	Percentage of break-even volume to actual quantity processed
Small	1907.47	7256.29	26.29
Medium	2644.51	19619.14	13.48
Large	3147.05	30621.93	10.28
Overall	3219.43	18592.98	17.31

Benefit-Cost Ratio

At the overall level, the benefit-cost ratio in pulse processing worked out to 1.09. Among the different size groups of dal mills, the benefit-cost ratio was estimated at 1.07, 1.11 and 1.15 for the small, medium and large sized dal mills, respectively. Thus, the Benefit-Cost ratio was lower in the case of small sized dal mills than medium and large sized dal mills. It is due to that the purchase of raw pulse and sale of its finished products made by small sized dal mills was mostly at nearby markets. Opposite was the case with medium and large sized dal mills. (Table 7)

Table 7 Benefit-Cost ratio for different sized dal mills

Size groups	Total cost Rs./q	Total returns Rs./q	Net benefit-cost ratio
Small	4037.31	4325.92	1.07
Medium	3855.19	4286.47	1.11
Large	3820.96	4405.70	1.15
Overall	3892.70	4236.36	1.09

CONCLUSION

The actual volume of business performed by all the dal mills was much lower than permitted by their capacities.

The efforts should, therefore, be made to utilize the available capacity of the dal mills. In this context, it is suggested that the millers should not only carried out the activity of procuring pulse, processing it and selling the finished products in the market but should perform the job of customer's processing by extending pulse processing services to the people as and when available.

The study revealed that the substantial amount is retained by the private pulse units as profits. The producer-cultivators may invite as processors and sellers. They should sell dal after production and processing of pulse rather than selling it as a raw pulse in the market. In view of this, the mini dal mills developed at CFTRI, Mysore/PDKV, Akola be supplied to producers of pulses in a dispersed manner or otherwise cultivators may think of expanding the pulse processing units under co-operative sector.

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