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REVIEW ARTICLE

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To Estimate the Processing Cost of Tonned Milk in Rohtak and Jind Milk Plant

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The state of Haryana, one of the major milk producing state in India was chosen to ass's possible development in the Indian dairy sector. India has vast resource of livestock which play an important role in the national economy and in the socio-economic Development of millions of rural areas., in order to meet the objectives, the milk plants have got the efficiency in the volume of raw milk purchased, processing of collected milk for its conversion into various milk products in demand and packaging, storage, distribution and proper marketing of the milk and its products. The whole process of efficiency of a milk plant essentially boils down to controlling of the cost of all the individual operations carried out by the plant. The cost effectiveness of all the operations is bound to the effect on the overall efficiency of the plant. Analysis of the cost of various operations in the plant is thus a major determinant of the resource use for the efficiency of the enterprise.

MATERIAL AND METHODS:

The yearly data has been collected from plants for the cost analysis of tonned milk. The data were recorded for the ten years period, beginning from 2000-2001 to 2009-2010. All the expenses incurred on processing of milk, right from the point of the receipt of milk at the reception dock till it is converted into final product, fall under this head .The processing cost is divided in two heads; fixed costs and Variable costs. These heads further divided in sub heads like; Fixed costs includes: Management, Administration and Office, Depreciation on building, Interest on building, Depreciation on machinery, Miscellaneous and variable costs includes; Electricity, Steam, Refrigeration, Repair and maintenance, Labour and Supervision, Quality Control and Detergent and Sanitizer.

PROCESSING COST:

The procedure milk is processed for its conversion into various grades of market milk as well as different milk products. The processing cost is composed of fixed and variable costs. Fixed cost includes five main cost components, i.e., management administration and office (Mgd. Adm. And office), depreciation on building, interest on building, depreciation on machinery, and miscellaneous. In the same way variable cost has seven main cost components, viz., electricity, steam, refrigeration, repair and maintenance, labour and supervision, quality control, detergent and sanitizers. Nearly 85 percent of the marketed milk was handled by the informal segment comprising middlemen, private milk traders and direct sale from producer to consumer. Moreover, nearly 85 percent of all the milk that entered the exchange economy found its way into the urban areas. Thus, it is the urban demand that is the main source of cash for rural milk producers. There is significant variation in the share of informal segment in total marketed surplus. For example, in 1998, the share of unorganized trade in Orissa was estimated about 95 percent. Some observers attribute the low share of organized sector to unimaginative and staid procurement policies and the inflexible practices of the milk cooperatives (Kurup & Mittal, 1999).

The details of component wise processing cost for the study plants for ten years for fat corrected whole milk for both the plants A and plant B only are presented in tables 1, 2, respectively and the respective statistical attributes of component wise processing cost of these are presented in tables 3.

Toned milk was manufactured by the plants during all the years under study. It, on an average, contains 3% fat and 8.5% milk solids not fat is priced lower than the higher grades of milk for lower income group of consumers. The component wise analysis of processing cost (Table 1& 2) of toned milk reveals that. Processing cost of toned milk at two milk plant in Meerut was (Rs. 26.84 & Rs. 42.61) and (Rs.77.81 & Rs. 96.65) in 1988 & 1990 respectively. (Sangu, 1993)

PLANT A TABLE 1

PROCESSING COST OF TONED MILK

Rs./100 kg

COST COMPONENT/YEAR	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
I. FIXED COST										
1.MANAGEMENT ADMIN & OFFICE	14.40	21.94	21.26	14.18	26.63	19.08	17.57	15.63	16.29	18.69
2.DEPRECIATION ON BUILDING	0.36	0.94	0.70	1.82	0.71	0.74	0.88	0.74	0.57	0.48
3.INTEREST ON BULIDING	0.45	1.79	1.68	1.29	2.17	7.48	1.98	1.70	1.46	1.35
4.DEPRECIATION ON MACHINERY	3.46	9.40	7.72	7.21	9.48	5.93	4.90	3.81	2.10	2.46
5.MISCELLANEOUS	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04
SUB-TOTAL – I	**18.69**	**34.10**	**31.38**	**24.53**	**39.02**	**33.27**	**25.38**	**21.92**	**20.45**	**23.01**
II. VARIABLE COST										
1.ELECTRICITY	17.69	17.79	15.67	13.70	20.14	20.87	18.69	16.79	14.80	15.19
2.STEAM	4.55	5.13	4.82	5.10	6.93	5.82	7.17	5.07	5.83	6.37
3.REFRIGERATION	0.06	0.07	0.12	0.07	0.23	0.59	0.81	0.45	0.58	0.51
4.REPAIR & MAINTENANCE	2.14	2.97	4.97	3.12	5.22	5.58	5.11	4.85	3.39	6.22
5.LABOUR & SUPERVISION	1.53	1.26	3.63	2.33	0.66	1.97	3.45	1.69	1.09	1.39
6.QUALITY CONTROL	0.50	0.61	0.56	0.64	0.94	1.48	2.06	1.74	1.56	1.44
7.DETERGENT & SANITIZER	0.52	0.77	0.66	0.50	0.63	0.91	0.60	0.64	0.47	0.56
SUB-TOTAL II	**27.00**	**28.60**	**30.43**	**25.45**	**34.76**	**37.22**	**37.89**	**31.24**	**27.71**	**31.69**
GRAND -TOTAL (I+II)	**45.69**	**62.70**	**61.81**	**49.98**	**73.77**	**70.50**	**63.28**	**53.16**	**48.16**	**54.70**
TOTAL QUANTITY OF MILK	712017.28	665094.09	772947.01	877419	652947	667354.45	868226.55	1010368.8	1182858.4	1272377.4

PLANT B TABLE 2

PROCESSING COST OF TONED MILK

Rs./100 kg

COST COMPONENT/YEAR	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
I. FIXED COST										
1.MANAGEMENT ADMIN & OFFICE	9.37	11.38	14.11	15.67	14.41	17.04	26.27	26.72	32.41	30.46
2.DEPRECIATION ON BUILDING	0.12	0.29	0.27	0.17	0.76	0.88	0.95	1.01	1.08	1.14
3.INTEREST ON BULIDING	0.74	1.24	1.10	1.22	1.54	1.31	1.36	1.47	1.44	1.56
4.DEPRECIATION ON MACHINERY	3.13	3.58	3.32	3.63	5.10	5.16	5.84	7.63	5.38	5.81
5.MISCELLANEOUS	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
SUB-TOTAL – I	**13.39**	**16.51**	**18.83**	**20.73**	**21.85**	**24.43**	**34.45**	**36.87**	**40.36**	**39.01**
II. VARIABLE COST										
1.ELECTRICITY	41.70	37.47	30.93	27.64	32.89	29.46	22.27	22.89	19.47	22.87
2.STEAM	10.74	10.81	9.52	10.30	11.32	8.22	8.54	6.91	7.67	9.59
3.REFRIGERATION	0.15	0.15	0.23	0.13	0.37	0.84	0.97	0.61	0.76	0.77
4.REPAIR & MAINTENANCE	5.04	6.25	9.81	6.29	8.53	7.88	6.09	6.61	4.45	9.37
5.LABOUR & SUPERVISION	3.61	2.65	7.17	4.69	1.08	2.78	4.11	2.31	1.44	2.09
6.QUALITY CONTROL	1.19	1.29	1.10	1.29	1.54	2.08	2.45	2.37	2.05	2.17
7.DETERGENT & SANITIZER	1.23	1.61	1.30	1.02	1.03	1.28	0.72	0.88	0.61	0.85
SUB-TOTAL II	**63.65**	**60.24**	**60.06**	**51.35**	**56.76**	**52.54**	**45.14**	**42.58**	**36.45**	**47.71**
GRAND -TOTAL (I+II)	**77.04**	**76.75**	**78.90**	**72.09**	**78.61**	**76.97**	**79.60**	**79.44**	**76.81**	**86.72**
TOTAL QUANTITY OF MILK	302017.28	315810.9	391599.9	434859	399830	472816.84	728798.73	741353.78	899297.41	845040.62

The total processing cost of toned milk is compared in the below and it was observed that total cost of fixed components of plant B is more than plant A. This difference between the two was due to the difference between the variable cost. The cost of electricity and steam at plant B was higher than plant A. At plant B

the total cost was gradually increased during the study but at plant A there were ups and downs throughout the period.

The total processing cost of toned milk at plant A in 2000-01 was Rs. 45.69 and Rs. 54.70 in 2009 -10 at plant A and at plant B the cost were 77.04 and 86.72 in 200-01, and 2009-10 respectively**.** It was observed that total cost of fixed components of plant B is more than plant A. This difference between the two was due to the difference between the variable cost. The cost of electricity and steam at plant B was higher than plant A. At plant B the total cost was gradually increased during the study but at plant A there were ups and downs throughout the period.

Within the cost of fixed components, the contribution of management admin. & office cost was the highest at both the plants during all the years under study. It was about 50% to 80% of the total fixed cost. Among other costs interest on building was second highest for plant A and for plant B the second highest cost was depreciation on machinery. The contribution of other fixed components hardly ranged from 1% to 10% of the total fixed costs for both the plants.

In the processing cost of toned milk the cost of fixed components of plant B was continuously on increase but at plant A this cost was highest in 2004-05. And then it starts decreasing till 2009-10.

Fixed cost percentage of plant A was from 40% to 55% of the total processing cost and at plant B this percentage was from 17% to 52%. At plant B it was increasing continuously except 2009-10. The cost of variable components plays significant role in the processing cost. At both the plants during the study the cost of electricity within variable costs was the highest and it contribute from 50% to 65% of the total variable cost for both plants.

At plant A among other variable costs the cost of steam and repair and maintenance was higher than rest of the costs like refrigeration, quality control and labour and supervision. At plant B the electricity cost was highest in 2000-01 instead of 2009-10. And as in plant A the steam cost and repair and maintenance costs were highest among other variable coats.

It was observed that the total cost variable components of plant A less than the plant B and it was also observed that the cost at plant B was continuously decrease during the study but at plant A it was first on increase till 2007-08 and then starts decreased .

In terms of percentage the cost percentage of variable components at plant B was highest in 2000-01 i.e. 82.62% and it keep on decreasing till 2009-10 and became 55%. For plant A it ranged from 45% to 57% and there was fluctuation in the percentage throughout the study.

Table 3

STATISTICAL ATTRIBUTES OF PROCESSING COST OF TONNED MILK

Rs. 100/kg

COST COMPONENT/ATTRIBUTES	PLANT A			PLANT B			DIFFERENCE OF MEAN/PLANT
	MEAN	S.E.	C.V.	MEAN	S.E.	C.V.	
I. FIXED COST							
1.MANAGEMENT ADMIN & OFFICE	18.57	3.68	19.82	19.79	7.93	40.06	1.22
2.DEPRECIATION ON BUILDING	0.79	0.38	47.79	0.67	0.39	57.94	0.13
3.INTEREST ON BULIDING	2.14	1.84	85.92	1.30	0.23	18.08	0.84
4.DEPRECIATION ON MACHINERY	5.65	2.59	45.87	4.86	1.36	27.95	0.79
5.MISCELLANEOUS	0.03	0.01	31.29	0.04	0.00	12.39	0.01
SUB-TOTAL – I	**27.18**	**8.49**	**230.69**	**26.64**	**9.91**	**156.42**	**2.98**
II. VARIABLE COST							
1.ELECTRICITY	17.13	2.22	12.98	28.76	6.82	23.70	11.62
2.STEAM	5.68	0.86	15.06	**9.36**	**1.40**	**14.97**	3.68
3.REFRIGERATION	0.35	0.26	74.14	0.50	0.31	61.92	0.15
4.REPAIR & MAINTENANCE	4.36	1.28	29.26	7.03	1.70	24.22	2.68
5.LABOUR & SUPERVISION	1.90	0.93	48.85	3.19	1.70	53.40	1.29
6.QUALITY CONTROL	1.15	0.54	46.62	1.75	0.50	28.28	0.60
7.DETERGENT & SANITIZER	0.63	0.13	20.02	1.05	0.29	27.51	0.43
SUB-TOTAL II	**31.20**	**6.20**	**246.94**	**51.65**	**12.72**	**233.99**	**20.45**
GRAND -TOTAL (I+II)	**58.37**	**14.70**	**477.63**	**78.29**	**22.63**	**390.41**	**23.43**

Table 3 presents the results of statistical analysis of processing cost components of toned milk. This table reveals that the mean value of all the variable cost components were more for plant B than for plant A. The means of processing total cost was Rs.27.18 ± 8.49 and 26.64 ± 9.91 per hundred kg at plants A and B respectively. The corresponding cost of variable parts of the processing cost were Rs.31.20 ± 6.20 and 51.65 ± 12.72 at plant A and at plant B.

Within fixed cost components the average cost incurred on management admin & office was found to be highest at both the plants followed by depreciation on machinery and interest on building. The mean values of all the variable cost components were more for plant B than for plant A. The mean of electricity cost was more than any other cost among variable components followed by steam, repair & maintenance, labour & supervision, quality control, detergent & sanitizer and refrigeration.

Magnitude of CV reveals that at plant A, among fixed cost components the interest on building was highest i.e. 85.92 and was followed by 47.79 of deprecation on building, then depreciation on machinery 45. 87. CV of miscellaneous had 31.29 and at least CV was of management admin & office for plant A but for plant B highest CV was for depreciation on building followed by management admin & office, depreciation on machinery, interest on machinery and miscellaneous.

As far as CV for variable cost are concerned for plant A it was maximum for refrigeration,(74.14) followed by labour & supervision, (48.85) quality control, (46.62) repair & maintenance, (29.26) detergent & sanitizer, (20.02) steam (15.06) and at last it was of electricity (12.68) but for plant B highest CV was of refrigeration (61.92) followed by labour & supervision, (53.40) quality control, (28.28) detergent & sanitizer, (27.51)

repair & maintenance, (24.22) electricity (23.70) and steam(14.97).

CONCLUSION :-

Globalization and liberalization are the mantra's of the new economy today which is now on the fast track. It is observed in tables that total processing cost of tonned milk in plant B is more than plant A and this is because of the variable cost. Through the help of tables, the total cost of plant B is gradually increased but at plant A their were up's and down through out the period. Within the cost of fixed component the contribution of management, administration and office cost was the highest at both the plant during all the years under study. The cost of processing, packaging and marketing was almost same for the plant during the study. The cost of variable component plays important role in the processing cost, if cost of variable component will be under controlled condition then, processing cost automatically under controlled condition for this marketing should be improved so that plant get more profit and the production will also increase.

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