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REVIEW ARTICLE

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Estimation of Processing of Standardized Milk in Haryana Dairy Co-Operative Societies

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Standardization of milk in to a precisely specified or desired value.

It is of key importance for dairies which face the challenge of transforming a gift of nature into standardized serial products for daily consumption.

The efficiency of milk plants is conditioned by the efficiency in the volume of raw milk purchased, processing of collected milk for its conversion into various milk products in de mand 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 full cream 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 nine products are presented in tables 3.

STANDARDIZED MILK

The product was manufactured by the plants it contains, 4.5% fat and 8.5% milk solids not fat. The component wise processing cost of standardized milk has been presented in Table 1& 2. A perusal of these tables reveals that the average processing cost per hundred kg milk was more at plant B. In 2000-01 for plant B it was 133.51 and at plant A it was 54.83.The highest value for plant A was 80.02 but for plant B it was 384.82. It was observed that processing cost at plant A was constant but at plant B it was fluctuated throughout the study.

At plant A & plant B management admin & office cost was highest among other fixed costs. But if we compared this cost between both plants Plant A has more cost than plant B. The fixed cost of standardized milk at plant B was very –very less as compared to plant A. It is clear from the table below that the total costs of all fixed components in the processing of standardized milk were higher at plant B it was due to high expenditure on management admin & office cost by plant B.

It was observed that percentage of fixed components in total cost it was also high for plant B than plant A. The reason was same because the costs of fixed components were much – much higher than plant A.

The percentage for plant A was minimum, 40.91% and maximum, 54.38% in the years 2000-01 and 2001-02 respectively. For plant B it was continuously on increase in 2000-01 it was 71.95% and in 2009-10 it was 83.26%. This increase in variable percentage was mainly due to electricity cost at plant B.

The costs of variable components in the processing of standardized milk for both the plants the cost of electricity was highest and second highest cost was of steam for both plants. The least cost was of refrigeration at both the plants. Other costs of variable components were very less as compared to electricity and steam.

The electricity alone consumes 50% to &70% coat of the total variable cost at both the plants during the study even plant B consumes more than plant A. All other variable cost hardly reaches up to 20% for both the plants.

The total cost of variable components of both the plants revels that at plant B this cost was higher than plant A because of electricity and steam costs.

As far as the percentage contribution of variable costs are concerned these cost was higher in plant A than plant B. At plant A this percentages was from 45% to 60% of the total cost and at plant B this percentage was from 16% to 30% of the total cost.

PLANT A TABLE 1

PROCESSING COST OF STANDARDISED 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	17.28	23.51	23.79	15.94	28.89	20.18	18.92	15.63	16.29	19.94
2.DEPRECIATION ON BULDING	0.43	1.01	0.78	2.04	0.77	0.78	0.95	0.74	0.57	0.51
3.INTEREST ON BULIDING	0.54	1.92	1.89	1.45	2.35	7.91	2.14	1.70	1.46	1.44
4.DEPRECIATION ON MACHINERY	4.15	10.08	8.64	8.10	10.28	6.27	5.28	3.81	2.10	2.62
7.MISCELLANEOUS	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.05	0.05
SUB-TOTAL – I	**22.43**	**36.53**	**35.12**	**27.56**	**42.32**	**35.18**	**27.33**	**21.92**	**20.46**	**24.56**
II. VARIABLE COST										
1.ELECTRICITY	21.22	19.06	17.54	15.40	21.85	22.07	20.13	16.79	14.80	16.21
2.STEAM	5.47	5.50	5.40	5.74	7.52	6.16	7.72	5.07	5.83	6.80
3.REFRIGERATION	0.08	0.08	0.13	0.07	0.25	0.63	0.87	0.45	0.58	0.55
4.REPAIR & MAINTENANCE	2.57	3.18	5.56	3.50	5.67	5.90	5.51	4.85	3.39	6.64
5.LABOUR & SUPERVISION	1.84	1.35	4.06	2.61	0.72	2.09	3.71	1.69	1.09	1.48
6.QUALITY CONTROL	0.60	0.66	0.63	0.72	1.02	1.56	2.21	1.74	1.56	1.54
7.DETERGENT & SANITIZER	0.63	0.82	0.74	0.57	0.68	0.96	0.65	0.64	0.47	0.60
SUB-TOTAL II	**32.40**	**30.65**	**34.05**	**28.61**	**37.70**	**39.36**	**40.81**	**31.24**	**27.71**	**33.81**
GRAND -TOTAL (I+II)	**54.83**	**67.18**	**69.17**	**56.17**	**80.02**	**74.54**	**68.14**	**53.16**	**48.17**	**58.38**
TOTAL QUANTITY OF MILK	593347.74	620754.49	690744.71	780695	601935	631141.42	806210.37	1010368.8	1182858.4	1192353.7

PLANT B TABLE 2										
PROCESSING COST OF STANDARDISED 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	91.23	140.88	121.05	130.36	122.56	150.53	223.35	243.14	313.74	286.49
2.DEPRECIATION ON BUILDING	0.15	3.55	0.32	0.21	0.91	1.01	1.13	1.13	1.13	1.23
3.INTEREST ON BULIDING	0.88	15.30	1.30	1.50	1.84	1.51	1.63	1.65	1.52	1.69
4.DEPRECIATION ON MACHINERY	3.76	44.29	3.94	4.44	6.10	5.94	6.98	8.53	5.66	6.29
5.MISSCELLANEOUS	0.05	0.47	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04
SUB-TOTAL – I	96.06	204.49	126.65	136.54	131.45	159.03	233.12	254.47	322.09	295.74
II. VARIABLE COST										
1.ELECTRICITY	24.87	32.60	33.36	33.81	34.11	38.80	36.49	40.67	43.14	40.09
2.STEAM	4.94	4.47	5.84	5.85	7.56	7.03	6.94	7.24	8.06	7.69
3.REFRIGERATION	0.20	1.61	2.14	0.22	0.24	0.24	0.27	0.38	0.47	0.52
4.REPAIR & MAINTENANCE	3.78	4.12	4.37	4.32	4.52	4.56	4.66	4.68	5.85	6.30
5.LABOUR & SUPERVISION	1.15	1.41	1.53	1.72	1.62	1.66	2.47	2.58	2.68	2.26
6.QUALITY CONTROL	1.03	1.10	1.22	1.32	1.41	1.67	1.78	1.79	1.89	1.71
7.DETERGENT & SANITIZER	1.48	2.00	1.54	1.24	1.23	1.48	0.86	0.98	0.65	0.92
SUB-TOTAL II	37.45	79.68	69.71	48.48	50.69	55.45	53.48	58.33	62.73	59.48
GRAND -TOTAL (I+II)	133.51	284.17	196.36	185.02	182.14	214.47	286.61	312.79	384.82	355.22
TOTAL QUANTITY OF MILK	251681.1	25517.52	330109	355480	334233	410507.6	609067.5	663041.8	855581.6	781264

The results of statistical analysis of component wise processing cost of standardized milk are presented in Table 3. The mean values of processing cost of fixed components of both the plants are shown in tables.

The mean values of fixed cost of plant A and plant B are almost same for interest on building i.e. 2.28 and 2.88 respectively for plant A & plant B. the highest difference between mean values of plant A & plant B is between management admin. & office was 20.04 and 182.33 respectively. The least difference was between miscellaneous costs that was 0.05. The mean values of variable cost was highest for electricity that was 18.51 for plant A and 35.80 for plant B and steam cost was second highest for both plants. The least mean value for plant A was refrigeration that was 0.37 and for plant B it was for quality control that is 1.49. The least difference between mean values was for labour & supervision and highest difference was between electricity.

It was observed that coefficient of variation of plant B is more than plant A for fixed components and the difference was almost double. All values are shown in the tables. Coefficient of variation for costs of variable components is shown in table.The highest variation was observed as cost of refrigeration and least for quality control for plant A and detergent & sanitizer for plant B.

TABLE 3

STATISTICAL ATTRIBUTES OF PROCESSING COST OF STANDARDISED 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	20.04	4.05	20.19	182.33	73.86	40.51	162.30
2.DEPRECIATION ON BUILDING	0.86	0.43	50.16	1.08	0.91	85.02	0.22
3.INTEREST ON BULIDING	2.28	1.93	84.81	2.88	4.15	143.90	0.60
4.DEPRECIATION ON MACHINERY	6.13	2.86	46.58	9.59	11.65	121.41	3.46
5.MISCELLANEOUS	0.03	0.01	34.23	0.08	0.13	161.80	0.05
SUB-TOTAL - I	29.34	9.28	235.96	195.96	90.70	552.64	166.62
II. VARIABLE COST							
1.ELECTRICITY	18.51	2.58	13.96	35.80	4.98	13.91	17.29
2.STEAM	6.12	0.88	14.30	6.56	1.16	17.64	0.44
3.REFRIGERATION	0.37	0.27	73.55	4.04	7.56	187.05	3.67
4.REPAIR & MAINTENANCE	4.68	1.33	28.36	4.72	0.73	15.50	0.04
5.LABOUR & SUPERVISION	2.06	1.04	50.38	1.91	0.51	26.83	-0.16
6.QUALITY CONTROL	1.22	0.54	44.26	1.49	0.30	19.98	0.27
7.DETERGENT & SANITIZER	0.68	0.13	19.44	3.03	5.65	186.27	2.36
SUB-TOTAL II	33.63	6.77	244.24	57.55	20.88	467.18	23.91
GRAND -TOTAL (I+II)	62.97	16.05	480.21	253.51	111.58	1019.82	190.54

CONCLUSION:-

It was observed that coefficient of variation of plant B is more than plant A for fixed components and the difference was almost double. Of all the processing, cost component, the share of management admin. and office, electricity was highest which accounted for

electricity at both the plant respectively. The average of the processing cost was significantly higher at plant B than plant A. Throughout the study it was observed that processing cost at plant A was constant but plant B it was fluctuated.

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