



INVESTMENT AND FEEDING PATTERN ON SAMPLE DAIRY FARMS IN BIKANER DISTRICT OF RAJASTHAN- AN ECONOMIC ANALYSIS

KUMAWAT RAJU* AND SINGH N.K.

Department of Agricultural Economics, College of Agriculture, SKRAU, Bikaner – 334001

*Corresponding Author: Email-rajageco7@gmail.com

Received: February 20, 2016; Revised: February 25, 2016; Accepted: February 26, 2016

Abstract- The present study was carried out to determine the trends for investment, feeding and milk supply pattern on all sample Dairy farms obtained and five dairy farms having herd size of more than 20 milch animals was obtained were selected randomly in Bikaner district of Rajasthan- IC zone (a hyper AIW Plain Partially Area) during the year 2010-11. The results shows that including total cost of maintenance feed and fodder accounted for the major share (59.52 %) followed by labour cost (33.95 %), fixed cost (25.31 %) and miscellaneous expenses (1.15 %) on sample dairy farms. The C cost was 1867599.61 per dairy farm and 333449.99 per milch animal and the net income was 1053011.60 per dairy farm and 18803.77 per animal. The annual consumption of fodder and feed per dairy farm was 238.27 q. concentrates 740.41 q green fodder, 1189.17 q dry fodder and 5.03 q salt. Whereas the annual consumption of feed per animal was 7.74 q concentrates 24.76 q green fodder 39.69 q dry fodder and 0.18 q salt. The average milk production per lactation was 129374 liters per dairy farm and 4173 liters per animals. The average cost of production and net return and net return per liter of milk was 14.27 and 8.28, respectively.

Keywords- Dairy Farms, Supply patterns, Feeding, investment, Labour & fixed cost

Citation: Kumawat Raju and Singh N.K., (2016) Investment and Feeding Pattern on Sample Dairy Farms in Bikaner District of Rajasthan- An Economic Analysis. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 8, Issue 8, pp.-1090-1093.

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Introduction

Indian Agriculture has been the main stay of Indian economy as 64 per cent of the population depends on it. This sector plays a crucial role in the economic development of the country. At present Agriculture and allied sector contribute nearly 14.6 per cent of country's GDP at 1999-00 prices. One of the most significant changes in India's agricultural economy over the past three and half decades has been the rising contribution of livestock sector in the agricultural gross domestic product (Ag. GDP). Between 1970 and 2008, the share of livestock in Ag GDP has risen from 17 per cent to 29 per cent. Dairying accounts for more than two-third of the live stock output and is largely responsible for the rising importance of the livestock sector in the country. India has emerged as the world's largest milk producer and milk producing continues to grow at a fairly high rate. Despite trebling of milk production between 1970 and 2008, the dominance of traditional marketing large. Livestock sector contributes about 4.0 per cent of the total GDP and 23 per cent of the agricultural GDP in the year 2008-09. Milk is an important commodity not only as a source of dairy industrial raw material but also a nutritive food for the people. Milk has been considered nearly a complete food for the infants and growing children. In the year 2009 the country projected human population was 1145 million while milk production was 108.5 Mt making a per capita availability of 258 g per day against 265 g per day per capita recommended by World Health Organization (WHO). In global context, the performance of the Indian dairy sector appears impressive in term of livestock population and total milk production but extremely poor in term of productivity. The average milk productivity per year per cow increased from 731 kg in 1989-91 to about 1,044.10 kg in 1999. Although average annual milk production per animal has improved substantially, it is far below the world average (2071 kg per year) and that of countries such as Israel (8785 kg), the United States (8,043 kg) and Denmark (6565 kg). The available data on milk yield indicate that average productivity went up substantially in the case of cows during the 1970s and 1980s.

There is an increase in the yield of buffaloes also, but it is less sharp than that of cows. A key factor accounting for the sharper increase in cow milk yield is the increasing proportion of crossbred cows [4].

Indian Arid zone, where livestock rearing is generally main occupation of rural masses, consists of 12 per cent of country's geographical area and 61 per cent of India's arid zone is Rajasthan. Climate of this zone is not suitable for crop rising. The milk production is influenced to a great extent by the feeding pattern, the quality of feed and the ingredients in the feed. The feeds and fodder accounts for 50 to 75 per cent of the total cost depending upon the condition under which the milch animals are kept for milk production. Feed consists of green fodder, including pasture grass and tree lopping, dry fodder, concentrates and balanced cattle feed [1]. During the 1950s and 1960s, India was one of the largest importers of dairy products, importing over 40 per cent of milk solids in dairy industry. The commercial import of milk powder reached its peak at about 53 thousand tonnes in 1963-64. This caused alarm to policy makers and a decision was made to achieve self-sufficiency in milk production. The major step forward, came in mid-sixties with the establishment of the National Dairy Development Board (NDDB) to see over dairy development in the country [2]. There are large inter-regional and inter-state variations in milk production as well as per capita availability in India. About two-third of national milk production comes from Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Andhra Pradesh and Haryana. However, there have been some shifts in milk production share of different states. In 2007-08, U.P. was the largest milk producer in the country with about 18.8 Mt of milk, followed by Rajasthan (9.95 Mt), Punjab (9.3 Mt), M.P. (6.1 Mt), Maharashtra (6.0 Mt) and Gujarat (5.6 Mt). Major milk producing regions in country have good resource endowment and infrastructure [3].

Materials and Methods

The present Study was conducted on Bikaner District of Rajasthan. For the

selection of dairy farms, a complete list of all dairy farms operating in Bikaner was obtained and five dairy farms having herd size of more than 20 milch animals were selected randomly.

Dairy farming costs (D-costs) -

- I. **D-cost A** = Cost of feed, fodder, concentrates, up-keep labour (hired), medicines, veterinary and other costs and depreciation on livestock, livestock equipments and cattle-shed.
- II. **D-cost B** = D-cost A + interest on fixed investment on dairy animals, shed, equipments etc.
- III. **D-cost C** = D-cost B + imputed value of family labour.

Dairy Incomes -

- IV. Dairy Gross Receipts (DGR) = Value of milk + Value of dung.

V. Dairy Farm Business Income (DFBI) = D.G.R. – D-cost A.

VI. Dairy Family Labour Income (DFLI) = D.G.R. – D-cost B.

VII. Dairy Net Income (DNI) = D.G.R. – D-cost C.

The DCP (digestive crude protein) and TDN (total digestive nutrients) intake was worked out on the basis of feed and fodder fed to each type of milch animal by dairy owner. To study the milk supply patterns, the collected data was analyzed on the basis of milk produced, consumed, converted into milk product by producer and milk sold within the dairy farms and outside the dairy farm.

Results and Discussion

[Table-1] shows investment pattern of various milch animals, heifers, young stock and other items. From the table it can be revealed that all dairy owners invested highest amount on Holstein Friesian cow.

Table-1 Investment Patterns on sample dairy farms (Rs.)

Particulars	Dairy Farms					Average
	1	2	3	4	5	
1. Milch Animals						
(i) Local cow	40,000	102000	32,000	45000	27000	49,200
(ii) Holstein Friesian cow	180000	324000	204,000	300,000	374,000	276400
(iii) Jersey cow	126000	192000	135,000	120,000	170,000	148600
(iv) Buffalo		51,000			80,000	65500
Sub Total	346,000	669000	371,000	465000	651,000	500,400
2. Heifers	1,500	17050	13200	21,600	19,200	14,510
3. Young stock	14,300	34500	11,600	13,500	8,200	16,420
Sub Total	15,800	51550	24800	35,100	27,400	30,930
4. Others items						
(i) Cattle shed and storage	50,000	100,000	70,000	85,000	74,000	75,800
(ii) Dairy equipment	8,000	12,000	9,000	11,000	11,000	10,200
(iii) Power drawn	25,000	40,000	35000	35000	40,000	35,000
(iii) Bullock drawn	14,500	12,050	15,000	15,400	10,500	13,490
(v) Cattle yard	15,000	35,000	22,000	33,000	24,000	25,800
Sub Total	112,500	199,050	151,000	179,400	159,500	160,290
Grand Total	474,300	919,600	546,800	679,500	837,900	691,620
Investment per Animal	13950	10947.62	12151.11	11325	14700	12,615

Average 276400, which is 51 per cent of the total investment on milch animals and the next preference they given for Jersey cow which, is 27.53 per cent. Investment on Buffalo was made by only two dairy owners, which was workout only 12 per cent. The investment on Local cow was about 9 per cent among all milch animals. Investment among all particular (Milch animals, Heifers and other items) was highest on milch animals (73.83%) in all dairy farms followed by cattle shed (10.37%). The average investment on heifers and young stocks was 1.98 and 2.25 per cent respectively, among all the dairy farms. They invested lowest amount on dairy equipments which was only 1.39 per cent of the total investment.

Feeding pattern of milch animals

The feed and fodder, fed to the milch animals by dairy owner is shown in [Table 2-4]. The milch animals were mostly fed jawar, bajra, maize, barley and berseem as green fodder. Concentrates were mainly given to milch animals in gestation period. The concentrates mainly includes cotton seeds, mustard cakes, wheat bran, mung churi and the dry fodder given to milch animals was wheat, ground nut, and barley straw, bajra and jawar stover. The availability of green fodder continued round the year because jawar and bajra were available during the summer season and berseem was available during the winter season. The feeding pattern of cows and buffaloes per day per animal shown in [Table-1] the table reveals that among milch cow, more quantity of fodder and feed was given to Holstein Friesian cow by all dairy owners due to higher quantity of milk production. However, dairy owners having buffalo fed more dry and green fodder to buffalo than Holstein Friesian cow but they fed less quantity of Concentrate in comparison to Holstein Friesian. On an average dairy owner provides dry fodder 7.73 kg, 12.33 kg, 11.01 kg to local, Holstein Friesian and Jersey cow, respectively per day

per milch cow. The quantity of green fodder fed to these cows was 5.73 kg, 7.20 kg and 6.80 kg respectively. However, average quantity of Concentrate fed by dairy owners to local, Holstein Friesian and Jersey cow was 1.32 kg, 2.48 kg and 2.24 kg per day per animal. The quantity of salt given for each type of milch animal was approximately. Per year per dairy farm, feeding pattern of cows and buffaloes is shown in [Table-3]. It is evident from the table that on an average, 7.74 q concentrates, 24.76 q green fodders, 39.60 q dry fodders, and 0.17 q salt was given to each animal in a year, which is very low as compared to the recommended doses except dry fodder. Due to less availability of green fodder in the area, all dairy owners feeding more dry fodder to their milch animals as a substitute of green fodder which is more than the recommended quantity. Dairy farm no. 2 and 5 had all types of Milch animals, viz., local cows, buffaloes, Holstein and Jersey cows, therefore, the feed and fodder requirements were more for these two dairy farms. Amount of concentrates, green fodder and dry fodder varied from, one dairy farm to another, according to the number and types of animals, raised on different dairy farms, but amount of salts feed were almost same at all dairy farms. In general, the share of dry fodder was the highest (39.60 q) followed by green fodder (24.76 q) and concentrates (7.74 q) in the total consumption of feed and fodder per animal in a year during the study period. The DCP and TDN intake supplied by dairy owners in different season to various type of milch animal through various dry fodder, green fodder and concentrates is presented in [Table-4]. It can be seen in the table that DCP and TDN intake was higher during winter season in all type of milch animal due to high Berseem feeding. While DCP and TDN intake was lowest during summer season due to less availability of leguminous fodder. It was further revealed that among all milch animals. The quantity of DCP and TDN intake was supplied more to Holstein

Friesian cow followed by buffalo in all the season. No major difference was found in supply of DCP and TDN among dairy farms in respect to all type of breed milch animals. The DCP and TDN calculated by using DCP-TDN present into each type of feed and fodder supplied by dairy owners to their milch animals in per cent multiply by the total quantity of feed supplied to milch animals. Information

according to nutritional intake (DCP and TDN) is presented in table 4.10. The DCP and TDN was calculated by using DCP and TDN present into each type of feed, and fodder given to milch animals by dairy owners. It is evident from the table that the nutrient supplied by dairy owners in the form of DCP and TDN was less than the recommended quantity for each type of milch animals [5].

Table-2 Feeding pattern of cows and buffaloes on sample dairy farms (Kg./Day/Animal)

Dairy farms	Dry fodder	Green Fodder	Concentrates	Salts
Dairy farm 1				
Local	7.67	6.67	1.32	0.04
Holstein Friesian	13.67	8	2.75	0.05
Jersey	11.67	8	2.6	0.05
Dairy farm 2				
Local	7.33	5.67	1.33	0.04
Holstein Friesian	11.33	6.67	2.6	0.05
Jersey	10.67	6.67	2.27	0.05
Buffalo	13.33	8	2.2	0.05
Dairy farms 3				
Local	7.67	6	1.25	0.04
Holstein Friesian	13.33	6.67	2.63	0.05
Jersey	11.67	7	2.33	0.045
Dairy farms 4				
Local	8	5	1.33	0.04
Holstein Friesian	11.67	7.33	2.33	0.05
Jersey	10.33	6.33	2.03	0.045
Dairy farms 5				
Local	8	5.33	1.4	0.04
Holstein Friesian	11.67	7.33	2.07	0.05
Jersey	10.67	6	2	0.045
Buffalo	12	9.33	1.73	0.05

Table-3 Feeding pattern of cows and buffaloes on sample dairy farms (Qt./Year/Farm)

Dairy farms	Dry fodder	Green fodder	Concentrates	Salts
Dairy farm 1				
Local	139.92	121.67	24.03	0.73
Holstein Friesian	448.95	262.8	90.34	1.64
Jersey	298.08	204.4	66.43	1.15
Total	886.95	588.87	180.8	3.52
Dairy farm 2				
Local	321.2	248.2	58.4	1.75
Holstein Friesian	744.6	438	170.82	3.28
Jersey	467.2	292	99.28	1.97
Buffalo	146	87.6	24.09	0.55
Total	1679	1065.8	352.59	7.55
Dairy farms 3				
Local	111.93	87.6	18.25	0.58
Holstein Friesian	584	292	115.34	2.19
Jersey	340.67	204.4	68.13	1.31
Total	1036.6	584	201.72	4.09
Dairy farms 4				
Local	175.2	109.5	29.2	0.87
Holstein Friesian	638.75	401.5	127.75	2.74
Jersey	301.73	184.93	59.37	1.31
Total	1115.7	695.93	216.32	4.93
Dairy farms 5				
Local	87.6	58.4	15.33	0.44
Holstein Friesian	723.92	455.03	128.24	3.11
Jersey	389.33	219	73	1.64
Buffalo	219	170.33	31.633	0.91
Total	1227.6	767.47	239.93	5.24
Average/animal	39.60	24.76	7.74	0.17
Recommended	21.90	73	18.25	0.18

Table-4 Feeding pattern of various milch animals (DCP & TDN) on sample dairy farms (Kg/Day/Animal)

Dairy farm		Summer		Rainy		Winter	
		DCP	TDN	DCP	TDN	DCP	TDN
1	Local	0.62	5.90	0.62	5.89	0.75	6.04
	H.F.	0.94	8.50	1.01	9.25	1.30	11.10
	Jersey	0.84	7.01	0.92	7.80	0.91	7.45
2	Local	0.62	6.04	0.69	5.25	0.78	6.80
	H.F.	0.98	9.70	1.01	10.27	1.08	10.24
	Jersey	0.83	7.24	0.87	8.05	0.71	8.15
	Buffalo	0.96	8.06	0.95	7.84	1.21	8.96
3	Local	0.63	6.04	0.70	6.07	0.71	6.71
	H.F.	1.10	9.592	1.10	9.85	1.23	11.52
	Jersey	0.85	7.03	0.87	7.35	0.10	7.80
4	Local	0.63	5.81	0.62	5.89	0.73	7.04
	H.F.	1.05	10.05	1.04	10.00	1.12	11.54
	Jersey	0.79	7.50	0.81	7.50	1.04	8.35
5	Local	0.61	5.98	0.68	5.98	0.75	6.98
	H.F.	1.02	10.08	1.10	10.25	1.20	11.52
	Jersey	0.82	7.15	0.95	7.05	1.02	8.04
	Buffalo	1.06	8.45	0.98	8.01	1.18	10.08

Conclusion

The results shows that the total cost of maintenance of feed and fodder accounted for the major share (59.52 %) followed by labour cost (33.95 %), fixed cost (25.31 %) and miscellaneous expenses (1.15 %) on sample dairy farms. The cost C was 1867599.61 per dairy farm and 333449.99 per milch animal and the net income was 1053011.60 per dairy farm and 18803.77 per animal. The annual consumption of fodder and feed per dairy farm was 238.27 q. concentrates 740.41 q green fodder, 1189.17 q dry fodder and 5.03 q salt. Whereas the annual consumption of feed per animal was 7.74 q concentrates 24.76 q green fodder 39.69 q dry fodder and 0.18 q salt. The average milk production per lactation was ` 129374 liters per dairy farm and 4173 liters per animals. The average cost of production and net return and net return per liter of milk was ` 14.27 and ` 8.28, respectively.

Conflict of Interest: None declared

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