

An economic analysis of production & marketing of milk in Markazi Behsud, Maydan Wardak, Afghanistan

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Abstract

This paper discussed to find out the cost of maintenance/lactation of milch cow, milk production per liter, the cost benefit ratio of milk production, the disposal pattern of milk in different size of farms groups, the price spread, producer share in consumer Afghani and marketing efficiency in different channel of marketing, the various constraints/problems faced by the milk producers in production of milk and suggest suitable suggestion to overcome in the study area. Markazi Behsud district and its ten villages were selected randomly also a sample of 69 farmers. The farms were divided into small, medium and large farm groups with the help of cumulative total method. The sample included 36 small, 22 medium and 11 large farms. On an overall basis, cost of maintenance per cow is AFs.12130.7 (1st size group), AFs.15636.76 (2nd size group) and AFs. 17159.36 (3rd size group), Cost of milk production per liter is AFs.7.09 (1st size group), AFs.6.39 (2nd size group) and AFs.4.44 (3rd size group), on an average, the gross income of cow milk production is AFs.47582.075 (1st size group) AFs.67121.87 (2nd size group) and AFs. 103500.93 (3rd size group), the net business income of cow milk production is AFs.30669.28 (1st size group) AFs.45513.24 (2nd size group) and AFs. 79490.64 (3rd size group), the family labour income of cow milk production is AFs.35731.62 (1st size group) AFs.51420.36 (2nd size group) and AFs. 85902.03 (3rd size group), the farm business income of cow milk production is AFs.35251.38 (1st size group) AFs.50904.26 (2nd size group) and AFs.85147.12 (3rd size group), the farm investment of cow milk production is AFs.31149.52 (1st size group) AFs.46029.34 (2nd size group) and AFs. (3rd size group), the benefit cost ratio of milk production is AFs.2.81 (1st size group) AFs.3.11 (2nd size group) AFs. 4.31 (3rd size group), and disposal of milk is lit.787 (1st size group) lit.1830.6 (2nd size group) lit.3600.0 (3rd size group). The thesis concluded by proffering solutions to livestock production" problems through appropriate recommendations. It is hoped that with present administration's quest to improve the economy by rigorously pursuing its five-point-agenda to logical conclusions, farmers should be educated regarding proper feeding and management of livestock, as to reduce the dry period, limited herd size group is preferable to lower the cost of milk production, to supply the sufficient quantity of fodder in the whole year, the farmers should have holding with fodder crop, balanced diet should be maintained to reduce the cost of milk production per liter. The major constraints in milk production in Markazi Behsud are that most of the farmers are illiterate and unaware of proper feeding, health and maintenance and management of milch cattle. Another problem of milk production in Markazi Behsud is unavailability of sufficient fodder for milch cattle and lack of veterinary drugs which result in reduces the milk production.

Keywords: cost of maintenance, milk production, cost benefit ratio, disposal pattern of milk, price spread, producer share in consumer Afghani, marketing efficiency, problems faced by the farmers, suggest suitable suggestion

1. Introduction

Dairy is a universal agricultural production: people milk dairy animals in almost every county across the world, and up to one billion people live in dairy farms (IFCN). It is a vital part of the global food system and it plays a key role in the sustainability of rural areas in particular. It is a well-known fact that the dairy industry actively contributes to the economies of a number of communities, regions and countries. An increasing demand worldwide is noticeably emerging at present, and the industry is globalizing, thus increasing the scope and intensity of the global dairy trade. However, the question of how and on what criteria we can objectively assess the economic benefits of the dairy sector still remains. The following factsheet aims to summarize the different aspects of dairy economy, as attested by multiple existing, comprehensive data sources. Economic dairy benefits can be accessed from the point of view of: production of milk and dairy products, trade and employment. Although livestock numbers were drastically reduced during

the drought years of 1998/1999 to 2001/2002 and have not yet fully recovered, raising cattle, sheep and goats is estimated to make up about 20 percent of Afghanistan's gross domestic product, not taking into accounts the narcotics trade. There are few villages in which all households own livestock. In many, only a minority do, because feeding animals through the winter requires access to the products and by-products of crop farming. The bulk of dry fodder is based on the by-products of grain and pulse crops cultivated for human consumption. The importance of wheat straw as the dominant bulk fodder cannot be overestimated – as wheat is cultivated throughout the country, at all altitudes, under both irrigated and rain fed conditions. Quality forage and fodder is provided by the cultivation of legumes and pulses, which are an integral part of Afghan cropping systems and essential to good crop management. Both maize and barley are commonly cultivated as green forage crops. Farmers supporting large households with limited land must carefully balance the need to grow food

and cash crops with the cultivation of fodder. Crops that serve both purposes are part of the answer, but fodder crops cultivated specifically to feed cattle and small stock are also important. The most widely cultivated fodder crops in Afghanistan are perennial Lucerne, alfalfa, and annual Persian clover, trifolium. Both are species of ancient origin which have been cultivated in the Near East and Central Asia for thousands of years. Both crops may be cut and fed as green forage or dried as hay. A number of other legumes and pulses are cultivated; some feed both the human population and their animals, while some are cultivated primarily to feed livestock.

2. Data and methodology

The methodology contains the sampling design; selection of country, province, district, village’s milk producers, markets, and its functionaries. The other parts which known as materials will be constituted the method of enquiry, interview schedule, data analysis etc.

2.1 Sampling design

For the present study Multistage Random Sampling technique was adopted.

2.2 Selection of the samples

- **Stage i-** Selection of the Country – Purposively
- **Stage ii-** Selection of the Province – Purposively
- **Stage iii-** Selection of the district – Purposively
- **Stage iv-** Selection of the Village – Randomly
- **Stage v-** Selection of the milk producers – Randomly
- **Stage vi-** Selection of the Markets – purposively
- **Stage vii-** Selection of the Market Functionaries - Randomly

Afghanistan was selected purposively for the present study because researcher is from Afghanistan. Afghanistan has 34 provinces and Maidan Wardak province was selected purposively for the present study due to the researcher is conversant with the local language, geography, agricultural situation and other aspects of the country. It has 8 districts and Markazi Behsud which is the largest district and has the most population, the largest number of milch animals and vastest pasture was selected purposively for the present study. It has 434 villages and 10 villages (2.3%) were selected randomly for the present study. Out of 345 milk producers in the selected villages 69 of those (20%) were selected randomly. List of all milk producers/responding was prepared with the help of held villages of each selected villages of respected district, thereafter a complete list of milk producers/responding was arranged in ascending order on the basses of their milch animals. Then these milk producers were categorized in to three size groups on the basses of their milch animals:

- 1st Size Group: Small milk Producers having 1 or 2 milk cows.
- 2nd Size Group: Medium milk producers having 3 or 4 milk cows.
- 3rd Size Group: Large milk producers having 5 and more.

Then 20% milk producers/respondents were selected randomly from the all milk producers/responding, thus all together 69 milk producers /households (36 small, 23 medium and 11 large size milk producers/households) were selected by random sampling method from each selected villages.

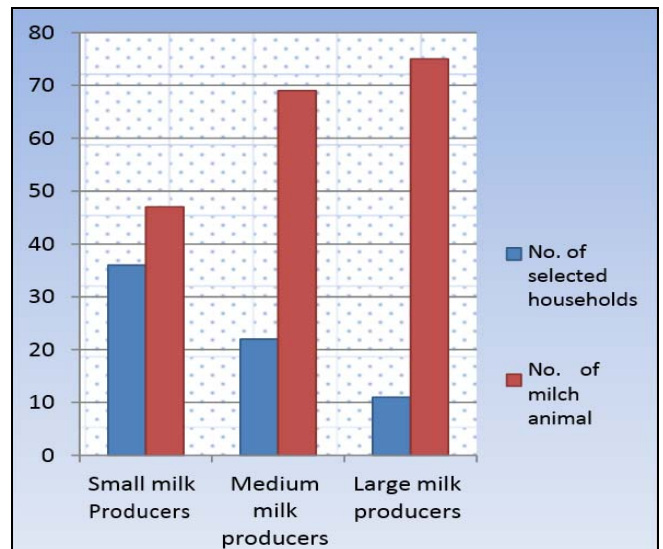


Fig 1: Distribution of milch animals in different size groups

A primary, by the name of “Bazar-i-Markaz” in the district, and secondary, by the name of “Mandawi” in the Kabul, milk marketing were selected for this study purposively. The main market functionaries/intermediaries were shopkeeper, wholesaler and retailers which totally are 241 and as a sample 20 percent of them were selected randomly.

A.3 Basic terms used in the study

A) Costs and returns

I) Total working cost

Total working cost includes costs on dry fodder, green fodder, concentrates, Upkeep labour charges, veterinary and other miscellaneous items.

II) Fixed cost

The depreciation charges on capital investment and interest on owned as well as borrowed fixed capital has been included in the fixed cost. The depreciation on pucca housing was worked out considering 25 years life span and depreciation on equipment was worked out considering 2-10 years only.

III) Total cost of maintenance

Total cost of maintenance includes cost of feed, upkeep labour charges, veterinary and other miscellaneous items, interest on working capital, depreciation on fixed capital, and interest on fixed capital.

IV) Net cost of maintenance

Net cost is arrived after deducting income of dung and appreciation of calf etc. from gross/total cost of maintenance of animals.

V) Returns/by product

The returns realized from various sources like, sale of milk, appreciation of calf, sale of manures and gunny bags, and etc.

B) Cost concepts

Determination of the profit level is very much affected by the element of cost taken into consideration. Cost concepts are widely used because of their relevance in the decision making process. The concepts of cost have been classified into three

categories for the purpose of study. Further, to ascertain the various cost concepts, the formula of Acharya *et al.* 1987 were used in the study, which is as under the following heads:

- **Cost A:** Expanses on feed and fodder + Veterinary and medical expenses +miscellaneous recurring expenses + Up-keep labour charges Depreciation on fixed capital + Interest on working capital
- **Cost B:** Cost A + Interest on fixed capital.
- **Cost C:** Cost B + imputed value of family labour.

C) Measures of farm profits

There are various measures, which can be used to evaluate farm profits. The measures listed below were used for measuring farm profit.

i) Gross income

$$\text{Gross Income} = \text{Value of milk/lactation} + \text{Cost of dung} + \text{Appreciation of calf}$$

ii) Net income

$$\text{Net income} = \text{Gross income} - \text{Cost C}$$

iii) Farm Business Income (FBI)

$$\text{FBI} = \text{Gross income} - \text{Cost A}$$

iv) Family Labour Income (FLI)

$$\text{FLI} = \text{Gross Income} - \text{Cost B}$$

v) Farm Investment Income (FII)

$$\text{FII} = \text{Net Income} + \text{Interest on fixed capital}$$

vi) Input- Output Ratio ‘OR’ Benefit cost ratio (BCR)

$$\text{BCR} = \text{Gross Income} \div \text{Cost C}$$

D) Measures of price spread

i) Producer’s Price

This is the net price received by the milk producer at the time of first sale. If PA is the wholesale price in the market and CF is the marketing cost incurred by the milk producer, the producer’s price (PF) was worked out as followed:

$$\text{PF} = \text{PA} - \text{CF}$$

ii) Producer’s share in consumer’s Afghanis

The producer’s share in consumer’s Afghanis is the price received by the producer expressed in terms of percentage of the retail price (the price paid by consumers which is the producer’s share), it may be expressed as:

$$\text{Ps} = (\text{PF} / \text{Pr}) 100$$

Where,

Ps = Producer share is consumer’s Afghanis in terms of percentage

Pr = Retail price of the milk or consumer price

PF = Price received by the producer of milk

iii) Total Marketing Cost

The total marketing cost incurred in the marketing of milk

either in cash or kind by the producer-seller and by the various intermediaries involved in the sale and purchase of the milk till the milk reaches the ultimate consumer. It may be expressed as:

$$C = \text{CF} + \text{Cm1} + \text{Cm2} + \text{Cm3} + \dots + \text{Cmn}$$

Where,

C = Total marketing cost of milk.

CF = Charges are borne by the producer from the time when produced milk leave the farm till the milk is sold to ultimate consumer.

Cm = Costs incurred by the middleman in the process of handling of milk (buying and selling of milk through intermediaries).

iv) Marketing Margin of Middleman

This is the difference between the (P) total payments (costs + purchase price) and receipts (sale price) of the middleman (1th agency) in the marketing of milk. This may be expressed by two terms.

a) Absolute margin of middlemen (Ami)

$$\text{Ami} = \text{Pri} - (\text{Ppi} + \text{Cmi})$$

b) Percentage margin of 1th middlemen (Pmi)

$$\text{Pmi} = \frac{\text{Pri} - (\text{Ppi} + \text{Cmi})}{\text{Pri}} \times 100$$

Where,

Pri = total value of receipt per unit (sale price)

Ppi = purchase value of milk per unit (purchase price)

Cmi= costs incurred on marketing per unit

v) Marketing efficiency

Marketing efficiency is essentially the degree of market performance. According to Kohls and Uhl, “Marketing efficiency is the ratio of market output (satisfaction) to marketing input (cost of resources). An increase in this ratio represents improved efficiency and a decrease denotes reduced efficiency. A reduction in the cost for the same level of satisfaction or an increase in the satisfaction at a given cost results in the improvement in Efficiency”.

According to Jasdanwalla, “The term marketing efficiency may be broadly defined as the effectiveness” or “competence with which a market structure performs its designated function”.

2.4 Shepherd’s Index of Marketing Efficiency

In the present study, Shepherd’s method was employed for determining the efficiency of different marketing channels involved in the marketing of milk. Shepherd’s Index of Marketing Efficiency (ME) was calculated by following formula:

$$\text{M.E} = \frac{V}{I}$$

Where,

V = Output of marketing (Retailer’s sale price or consumer’s purchase price)

I = Total marketing costs & margins

3. Result and discussion

Maintenance cost of milk cattle

Table 1: cost of maintenance per cow/lactation

No.	Particulars		1 st size group	2 nd size group	3 rd size group	Sample Average
1	Roughages	Green	2812.41	3634.69	3818.84	3421.98
			18.33%	18.17%	16.58%	17.69%
		Dry	5506.67	7721.46	8400.07	7209.40
			35.89%	38.60%	36.47%	36.99%
2	Concentrate		1811.65	1888.17	2239.17	1979.66
			11.44%	9.16%	9.46%	10.02%
3	Electric Charges		112	220.04	490.60	274.21
			0.73%	1.10%	2.13%	1.32%
4	Miscellaneous charges/Medicines		21.48	36.01	87.52	48.34
			0.14%	0.18%	0.38%	0.23%
5	Up-keep labour charge / Humane labour	Hired labour	230.32	424.08	560.48	404.96
			1.45%	2.06%	4.06%	2.52%
		Family labour	4582.1	5391.02	5656.48	5209.87
			27.09%	24.95%	23.56%	25.20%
6	Humane labour		4812.42	5815.10	6216.96	5614.83
			28.45%	26.91%	25.89%	27.09%
7	Total working cost		15076.63	19315.47	21253.16	18548.42
			89.14%	89.39%	88.52%	89.02%
8	Interest on working capital @6%		840.41	1098.93	1241.56	1060.30
			2.22%	2.47%	3.57%	2.75%
9	Depreciation on fixed asset		515.52	678.13	760.66	651.44
			3.36%	3.39%	3.21%	3.32%
10	Interest on fixed asset @10%		480.24	516.1	754.91	583.75
			3.13%	2.58%	3.19%	2.97%
11	Total/gross cost of Maintenance		16912.8	21608.63	24010.29	20843.91
			100.00%	100.00%	100.00%	100.00%
12	By product	Dung	855.75	880.91	1005.2	913.95
			17.89%	14.75%	14.67%	15.77%
		Calf	3926.325	5090.96	5845.73	4954.34
			82.11%	85.25%	85.33%	84.23%
		Total	4782.075	5971.87	6850.93	5868.292
			100.00%	100.00%	100.00%	100.00%
13	Net cost of maintenance/cow/lactation		12130.725	15636.76	17159.36	14975.62

Gupta & Agrawal (1996) reported that the maintenance cost of cow was increased with increase in the size of the farm on account of better feeding. The cost incurred on human labour was higher in small size group followed by medium and large size group with 28 percent, 26.80 percent and 25.15 percent respectively. The share of family labour was also higher in small size followed by medium and large size group. The employment of more number of family members in small size group compared to medium and large size group is due to the fact that as the size of farm increases the number of hired labour also increases. But the average use of human labour declined with the increase of farm size. The possible reason might be that the small and medium farm size group milk producers have used the labour intensively on their farms than the large.

Sharma *et al.* (1986) reported that feeding was the major component costing on an average 60 to 65 percent of total maintenance cost. However the miscellaneous cost was also higher in large size group followed by medium and small size group 1.9 percent, 0.9 and 0.7 percent respectively. The sample average of miscellaneous cost was 1.17 per cent respectively.

Sharma *et al.* (1986) also reported that the same trend is also observed in case of human labour utilization. It is higher in large size group Rs.4267.84 (22.69 percent) followed by

medium Rs 4147.50 (24.85 percent) and in small size group Rs. 3848.15 (27.74 percent) respectively. The sample average was Rs. 4020.45 (25.68 percent) respectively.

Sharma *et al.* (1986) also reported that labour cost to be second important component costing on an average (20 percent) of total expenditure in maintenance cost. The share of family labour was higher in small size group followed by medium and large size groups. It is clearly shows from the table that in small size was 27.74 percent followed by medium size 24.85 percent and in large size group 22.69 percent respectively.

The employment of family labour was higher in small size and medium size groups compared to large size group.

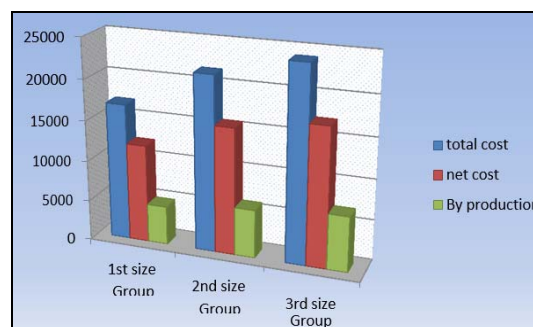


Fig 2: Maintenance cost of milk /cow/lactation

Table 2: Cost of production of cow milk/liter (AFs. /liter)

S. No.	Size Group	Milk Yield in liters/day	Milk Yield in liters/lactation	Net cost of Maintenance	Total cost of maintenance	Cost of milk production /liter
1	1st size group	5.91	1712	12130.725	16912.8	7.09
2	2 nd size group	8.44	2446	15636.76	21608.63	6.39
3	3 rd size group	13.34	3866	17159.36	24010.29	4.44
4	Sample Average	9.21	2674.67	14975.62	20843.91	5.97

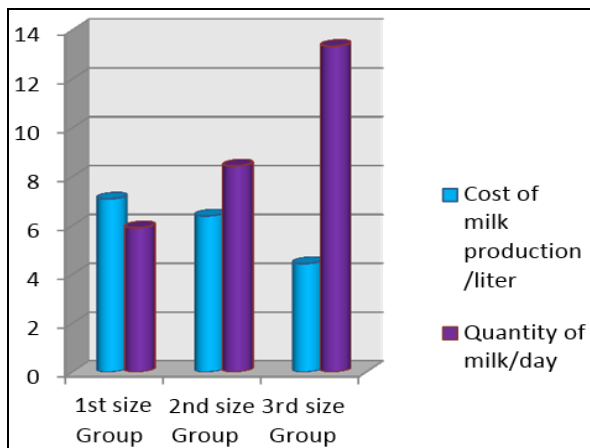


Fig 3: Cost of milk production AFs. /liter

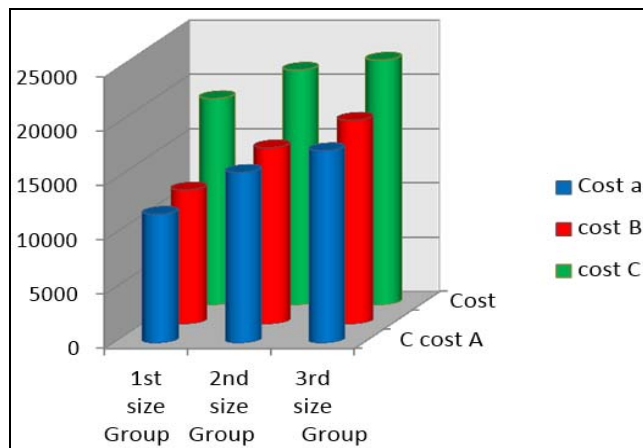


Fig 4: Cost estimate of milk production of cows

Table 3: measures of farm profit

S. No.	Particulars	Cow			Sample average
		1 st size group	2 nd size group	3 rd size group	
1	Gross income	47582.08	67121.87	103500.93	72734.96
2	Net income	30669.28	45513.24	79490.64	51891.05
3	Family labour income	35731.62	51420.36	85902.03	57684.67
4	Farm business income	35251.38	50904.26	85147.12	57100.92
5	Farm investment	31149.52	46029.34	80245.55	52474.80
6	Cost benefit ratio	2.81	3.11	4.31	3.41

Table 4: Disposal of milk

S. No.	Size group	Milk yield	Consume at home	Sell to the market
1	1st size group	1712	925	787
		100.00%	54.03%	45.97%
2	2nd size group	2446	615.4	1830.6
		100.00%	25.16%	74.84%
3	3rd size group	3866	266.0	3600.0
		100.00%	6.88%	93.12%
4	Sample average	2674.67	494.0	2180.7
		100.00%	18.47%	81.53%

Table 5: producer share in consumer Afghani in different marketing channel

S. No.	Objectives	First channel	Second channel	Third channel	Fourth channel
1	Marketing cost	-	13.33%	20.86%	23.25%
2	Marketing margin	-	10%	13.43%	19.25%
3	Producer share in consumer Afghani	100%	76.67%	65.71%	57.5%
4	Marketing efficiency		4.29	2.92	2.35

First channel: Producer – consumer

Second channel: Producer – shopkeeper – consumers

Third channel: Producer – shopkeeper – wholesaler – consumer

Fourth channel: Producer – shopkeeper – wholesaler – retailer – consumer

Table 6: Problems faced by the farm producer households/respondents N: No of respondents. R: respondents in percentage.

S. No.	Problems/constraints	N=69	100%
A Production, Feeding and Management Constraints			
1	Lack of knowledge of balanced ration	26	38
2	Green fodder production in winter	34	49
3	Feed and fodder at the time of drought conditions	10	14
4	Regular feeding of mineral mixture	37	54
5	Preparation of balanced ration	29	42
6	Feeding of newly born calf	14	20
7	Feeding of mineral mixture	11	16
8	Feeding of pregnant animals	20	29
9	Feeding of milch animals	23	33
10	Feeding of urea treated straws	13	19
11	Lack of clean water for drinking	20	29
12	Feeding of sick animals	25	36
13	Fertilizer doses	12	17
14	Irrigation	12	17
15	Care at calving	21	30
16	Care of new born calves	25	36
17	Insurance facility	33	47
18	Problems of proper calving	21	31
B Breeding-led Constraints			
1	Non-availability of improved bulls for breeding	42	61
2	Lack of pregnancy diagnosis (P.D.) facility	28	41
3	Lack of knowledge about insemination at proper heat time	10	14
4	Longer calving	38	54
C Health-led Constraints			
1	Lack of centenary doctor facility	19	27
2	Diseases diagnosis	19	28
3	Weaning	15	22
4	Castration	49	71
5	Deworming of animal	22	32
6	Care of sick animals	21	31
7	Dehorning of calves	23	33
8	Vaccination schedule	25	37
9	First aid treatment	38	54
10	Deficiency diseases of animals & their symptoms	27	39
11	Diagnosis of mastitis and treatment	31	44
12	Contagious diseases and their symptoms	23	33
13	Knowledge about common diseases of animals	9	13
14	Worms infestation in animal	10	14

4. Conclusion

Finally, the study concluded and revealed that the milk production is a viable source of income and employment for rural people of the study area. The economic analysis in term of Net Income and Input output ratio indicate that the milk production is economically viable. It is also observed that large milk producer households are better managed by trained people and getting higher yield as compared to small and medium milk producer households. It was also concluded that small size milk producer household are not economically viable as compared to large size and medium size milk producer households. Moreover the study also indicated that there is a scope to increase the producers share in consumer’s Afghani by making the market more effective so that the number of intermediaries is restricted and marketing cost and marketing margins reduced. This will pave the way for making milk production more lucrative and viable source of income to the rural people and society as a whole.

5. Suggestions

The following suggestions have been made with keeping in view the problems, related to production, disposal pattern and marketing of milk faced by the milk producer households in the study area.

5.1 Animal health

1. Prevention of animal losses due to diseases through several reasons especially by polythene bags. There should be the major area in focus with emphasis on development of diagnostic kits and vaccine.
2. The health of the human population is intimately connected to the health of the animal with several fatal and debilitating diseases being common to both man and animal.
3. Serious care to animal health, disease diagnosis needs to be given

5.2 Access to services

A. Credit

1. Maximum emphasis of the government to provide adequate and timely institutional financial help for initial requirements of infrastructure
2. Credit has grown at unprecedented rates to other sectors. Therefore, credit facility should be given to small, marginal land holders and women who are lacking collateral security in milk production.
3. Need to encourage a „group approach“ for the poor and especially to women’s to reap economies of scale and be effective farmers in milk production with a number of safeguards for risk protection, etc.
4. Co-operative Credit Societies need to be formed and Institutional credit (banks) needs to be improved

B. Insurance

1. At least 50% of the Premium should be subsidized by government.
2. Micro-insurance products need to be developed.
3. To encourage the milk production of rural areas, farmers should be benefited under the live-stock insurance scheme and at least 75 percent cost of premium of the insurance will be borne by the local government.

5.3 Research & Extension

1. Large gaps between what can be attained at farmers’ fields with the adoption of improved technology and what is obtained with the existing practices followed by the farmers. This gap should be minimized.
2. Trainings should be arranged specially for the women’s to encourage by province and district level by Province Animal Husbandry Department on feeding practices, breeding practices, health care practices, management practices, fodder production practices, input supplies and record keeping and preparation of milk products. So large

number of milk producers can take benefit by such trainings.

5.4 Processing, cold storage and co-operatives societies

1. Livestock food is highly perishable and it needs to be processed, packaged and store properly in order to reach the customer in a fresh form. For the industry to scale up, packaging and cold storage needs to be urgently improved.
2. With large quantities of animal products now being produced, research on process technologies, value addition, packaging, storage facilities, transportation, and marketing should receive high priority.
3. Export potential can also be met if proper processing, packaging and storage facilities are available.
4. Establishment of quality control labs and panels at province and district level.
5. The necessity of establishment of Co-operative societies to strengthening the organized sector of milk marketing, so that milk producers can get optimum price for their milk and milk products.

5.5 Government policies and awareness programme

1. The agencies concerned with dairy farming such as province and district level Animal Husbandry Department and Milk Co-operatives Union may become aware of the findings of the rural areas and should aware and adopt encouraging measures to augment the level of milk production.
2. Strict quality control checks and alert intelligence system are needed to discourage unethical practices in milk and milk products i.e. sale of Synthetic milk, Soya milk, other adulterated milk, cheese, yogurt, butter, and etc.
3. Policies measures should be planned by concerned of dairy development authorities in the province, district, and village level and adoption of scientific dairy farming practices to increase the level of milk production as well as marketed surplus of milk.

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