



Farmer Participatory Research on Effect of Balanced Feeding on Production and Quality of Milk in Micro Water Shed Areas of Davanagere District

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Abstract – A participatory study was undertaken to solving the problem of lower Fat and SNF of milk through feeding a balanced ration of crossbred cows in micro water shed areas of Harapanahalli taluk of Davanagere district, Karnataka, India. Eight lactating animals were selected and Milk yield, milk fat and net daily income of milk producers were recorded before and after feeding a balanced ration. On feeding a Fodder Maize+ Cowpea+ Dry fodder+ concentrates balanced feed for 2 months; there was improvement in average daily milk yield from 0.5 to 1.2 l and milk fat from 8.1 to 28.6%, SNF from 3.8 to 6.9% and lactometer reading from 1 to 1.5 units on feeding a balanced ration. This translated into an additional daily monetary benefit to the milk producers. The study revealed that feeding of a cereal based legume balanced ration helped in improving milk production, fat content of milk and resulted in improve daily income of milk producers.

Keywords – Dry Fodder, Fat, Fodder, Production, SNF.

I. INTRODUCTION

Milk is an important component of diets for all humans as it is high in essential amino acids that are most likely to be deficient in diets based on vegetable protein. Since milk is generally viewed as nutritious food with lots of vitamins, minerals and fats, proteins etc. thus used for drinking. Because of industrialization degrading the land resulted lower availability of green fodder and rising population also effect on qualitative and quantitative degradation of natural resources. Improving milk production is therefore an important tool for improving the quality of life particularly for rural people in developing countries.

Low productivity of animals with higher genetic potential can be primarily attributed to the imbalanced and inadequate feeding. Considerable potential exists to increase production levels across the range of growing, milch and beef animals by addressing the problem of imbalanced nutrition. The limited data on improving milk production efficiency in dairy animals through balanced feeding suggests that there is considerable scope for the enhancement of milk production with the existing feed and animal resources. This can be made possible through the transfer of scientific knowledge, in an easy to use and easy to implement manner to rural milk producers. The aim should be to promote feeding of a balanced ration in sufficient quantities and containing all essential nutrients (FAO, 2012).

The milk price is determined by its fat and SNF content. Sometimes due to low fat and SNF of milk producer had heavy deduction on payment. Quality and quantity of milk

are depends on animals genes and feeding practice. Imbalanced feeding leads to excess feeding of some nutrients whist others remain deficient. This not only reduces milk production and increases costs per kg milk, but also affects various physiological functions including long term animal health, fertility and productivity (Vaghmashi *et al.*, 2016). To ensure improved productivity it is necessary to augment and secure feed resources through short and long term planning. It is also essential that milk producers feed their animals the nutrients in amounts that match the physiological needs. Keeping these facts in mind, this study was planned to assess the balanced feeding and help to improve production and health. Davanagere district rural farmers are small fragmented land holding and these marginal farmers having occupation of agriculture with animal husbandry in their farm. Primary objective of these farmers are growing seasonal crops such as ragi, paddy, maize etc. in their farm and less emphasis for cultivation of green fodder for farm animals. The survey was conducted across the watershed areas of Harapanahalli taluk of Davanagere district which comprised of 14 villages and identified the gaps and constraints in dairy farmers. The constraints identified were such as imbalanced feeding; low Fat and SNF in milk, lower lactometer reading, lower productivity, low quality and unpalatable dry fodder, low quality milk and loss of production and unhealthy dairy animals were recognized. The programme was initiated in the water shed villages where the farmers can be motivated towards to participate in the research activity with identified problem and intervention. Based on these observations the objectives were formulated and selected three interested farmers in Harapanahalli taluk for participatory research activity. The study was adopted as participatory action oriented approach for promoting scientific feeding practices in milch animals among dairy farmers. A live demonstration with participatory research was undertaken to know the effect of different feeding practices on the performance of lactating animals especially w.r.t. milk yield, SNF and Fat during 2016-17 was under taken at Ragimasalwada village of Harapanahalli taluk, Davanagere district, Karnataka.

II. MATERIALS AND METHODS

The study was adopted as participatory action oriented approach for promoting balanced feeding of animals with cereals, legumes and concentrates. Dairy farmers of Ragimasalwada village of Harapanahalli Taluk Davanagere district in Karnataka state were selected for

this intervention. Eight lactating animals with lower Fat and SNF content were selected for the study. Before the start of the study, milk production, Fat and SNF content of the milk was recorded. The lactating animals were divided into two groups i.e. treatment group and control group. For treatment group, the composition of feeding practices were tested are, Cereal fodder (CO4)+ Dry fodder+ Concentrates, Hedge lucerne+ Dry fodder+ Concentrates and Fodder Maize+ Cowpea+ Dry fodder+ Concentrates. The known quantity of these feeds was fed to the lactating animals. For control group, only known quantity of dry fodder and concentrates were fed to the animals. The performance of feeding composition were recorded and results were depicted in Table No. 1

The dairy farmer with the herd size of 2- 4 lactating animals was selected randomly. Shri. Nagaraj S/o Basavarajappa, Shri. Nanjappa S/o Channabasappa and Shri. Kotresh S/o Basappa at Ragimaslawada village of Harapanahlli Taluk, Davanagere district was identified for this activity. Farmers were given 1-2 varieties of fodder crops and critical inputs such as fodder root slips, fodder seeds and fertilizers for establishing the fodder crop in their farm plot. Each fodder crop was grown in 2 gunta area respectively. The 4 different fodder crop varieties viz., Napier Grass (CO-4), fodder maize (South African Tall), Hedge Lucerne (*Desmonthus vergatis*) and Cowpea (FS 18) were grown in 2 gunta land each. The scientific practice such as line spacing, fertilizer application and cultivation practices were adopted scientifically. Similarly the milk yield of animals, fat and SNF content were recorded from the farmer who participated in the study.

III. RESULTS AND DISCUSSION

In the dairy farm of Shri. Kotresh S/o Basappa, the formulated feeding regimens were instituted and fed to the cross bred animals. The daily feed fed to the animals as combination of 2 kg of green fodder Maize, 1.5 kg of Cowpea, 5 kg of dry fodder and 2 kg of concentrate mixture to these animals. The results were analyzed as compared to control group and found that the average daily milk yield, Fat, and SNF content of milk was increased to by an average of 20.2%, 6.9% and 17.7% respectively in Jersey animal and 6.1%, 54.3% and 6.5% respectively in HF cross bred animals (Table 2 and Table 3). There was an increase in milk yield corresponding to increase in the quality of milk in the diet of the crossbred cattle indicating that the animals were suffering from energy malnutrition. Increase in milk yield may be attributed to increase in nutrient availability/digestibility in the total tract as indicated by Knowlton et. al. (1996). This may be due to the balanced feeding with cereal, legume combination with a good quality mineral supplementation. The farmers were happy with that the refusal of milk at the milk collection centers was not happened.

In another farm i.e. Nanjappa S/o Channabasappa, the daily feed combination included 1.5 kg of Hedge lucerne, 5 kg of dry fodder and 2 kg of concentrate mixture to Jersey animal. The results were analyzed as compared to control group and it revealed that the average daily milk

yield, Fat, and SNF content of milk was increased to an average of 11.5%, 3.7% and 13.5% respectively in Jersey animal (Table 2 and Table 3). The improvement may be due to balancing of nutrients which might have improved rumen environment and maximum utilization of nutrients. Also in balancing ration, essential minerals requirement full fill for better performance. On feeding a balanced ration, dietary energy and protein could be utilized in a more efficient manner in lactating cows (Garg and Bhandari, 2011). Findings are similar to that of Haldar and Rai (2003) and Bhandari et. al. (2016).

In Nagaraj S/o Basavarajappa farm, the daily feed included the combinations of 2.0 kg of cereal fodder (CO4), 5 kg of dry fodder and 2 kg of concentrate mixture to HF cross animal. The results were analyzed as compared to control group and observed that the average daily milk yield, Fat, and SNF content of milk was increased to an average of 2.0%, 3.7% and 21.8% respectively in HF cross animal (Table 2 and Table 3). This may be due balanced feeding of cereal crop alone with known quantity of dry fodder and concentrate feeds are lower in improving the Fat and SNF content of the milk as compared to legume and cereal legume combination of feeding. Lactating cows' physiology is more demand of minerals because of synthesis of milk and drainage in milk. Supplement of minerals in diet of lactating ruminants has been reported to improve milk yield along with improvement in milk composition. (Kannan et al 2010).

Advantages of Selected Former Got:

1. Improved milk production (0.5 to 1.0 l/ day).
2. Increased the Fat (0.5 to 1.0 %) and SNF (0.5 to 0.8%) content of the milk.
3. Increased lactometer reading (0.5 to 1.0 OC).
4. Developed entrepreneur skills among dairy farmers.
5. Supports livelihood and living standards of dairy farmers.
6. Earned income around the year to the rural farmers.

IV. CONCLUSION

The participatory approach will enhance wider adoption of the technologies even if the most proactive farmers may be upset because they feel they are making effort for the weaker farmers who gain benefits they feel should remain with them. Moreover, the participatory approach may be more sustainable as the farmers will be sources of information on the technologies long after the project has withdrawn from the area. The study concluded that the supply of cereal based legume crop with known quantity of dry fodder and concentrate mixtures to lactating animals will help in increasing the quality of milk and performance of the animals. Participatory research further emphasized that the participation of farmers in solving the field problems faced by them is more convincing and led to long-term adoption of scientific practices.

ACKNOWLEDGMENT

The authors are grateful to the following organizations for funding the work reported in this paper: We sincerely

thank to the World Bank funding KWDP SUJALA III project by Watershed department of Karnataka to KVAFSU Bidar.

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Table 1. Details of list of beneficiary farmers at Davanagere

Farmer Name	Village	Ph. No.	Combinations	Animal population	Milk production (l/day)	Fat (%)	SNF (%)	Lactometer reading	Irrigated	Rainfed
Nagaraj S/o Basavarajappa	Ragimasa-lawada	97401-48582	Cereal fodder (CO4)+ Dry fodder+ Concentrates	1 (HF)+ 1 (Baffalo)	8 to 10	2.0-2.5	7.0-8.0	22-24	4.0 ac.	-
Nanjappa S/o Channabasappa	Ragimasa-lawada	73533-84886	Hedge lucerne+ Dry fodder+ Concentrates	2 (Jerry)+ 1 (Calf)+ 1 (Nati)	12 to 14	2.5-3.0	6.0-7.0	24-26	4.0 ac.	3.0 ac.
Kotresh S/o Basappa	Ragimasa-lawada	97405-98540	Fodder Maize+ Cowpea+ Dry fodder+ Concentrates	2 (HF)+ 2 (Calf)+ 1(Jerry)	14 to 15	2.5-3.0	7.0-7.5	25-27	2.0 ac	1.0 ac.

Table 2. Effect feeding combination in the average daily milk production of the animals

Farmer Name	Village	Animal Breed	Combinations	Quantity of fodder fed (Kg/animal/day)			Milk production (l/day)			Average milk yield (l/ day)
				Crop (Perr. Sorghum/ CO4/ Maize/Cowpea/ Hedge lucerne)	Dry fodder (Rice/ Maize/ Ragi)	Concentrate -feed	Before initiation of the study	After 1 month of study	After 2 month of study	
Nagaraj S/o Basavarajappa	Ragimasa-lawada	HF	Cereal fodder (CO4)+ Dry fodder+ Concentrates	2 (Napier- CO4)	5	2	4.5	4.8	5.2	5.00
		Baffalo		2 (Napier- CO4)	5	2	1.8	1.9	2.0	1.95
Nanjappa S/o Channabasappa	Ragimasa-lawada	Jerry (C-1)*	-	-	5	2	4.2	3.9	4.0	4.03
		Baffalo (C-2)*	-	-	5	2	1.5	1.8	1.6	1.63
		Jerry	Hedge lucerne+ Dry fodder+ Concentrates	1.5 (Hedge lucerne)	5	2	4.0	4.5	4.5	4.50
Kotresh S/o Basappa	Ragimasa-lawada	HF (C-3)*	-	-	5	2				
		HF	Fodder Maize+ Cowpea+ Dry fodder+ Concentrates	2 (Maize)+1.5 (Cowpea)	5	2	5.2	5.0	4.5	4.90
		Jerry		2 (Maize)+1.5 (Cowpea)	5	2	4.6	4.9	5.5	5.20

*C- Control group

Table 3. Effect feeding combination in the performance of quality of milk of the animals

Farmer Name	Animal Breed	Combinations	Fat (%)				SNF (%)				Lactometer reading			
			Before initiation of the study	After 1 month of study	After 2 month of study	Average Fat (%)	Before initiation of the study	After 1 month of study	After 2 month of study	Average SNF (%)	Before initiation of the study	After 1 month of study	After 2 month of study	Average Lactometer reading
Nagaraj S/o Basavarajappa	HF	Cereal fodder (CO4)+ Dry fodder+ Concentrates	2.9	3.1	3.4	3.25	6.8	7.2	7.5	7.35	22.7	23.4	23.8	23.60
	Buffalo		2.8	3.1	3.3	3.20	7.2	7.5	7.6	7.55	24.2	24.8	25.5	25.15
Nanjappa S/o Channabasappa	Jerry (C-1)*	-	3.1	3.0	3.3	3.13	6.3	6.0	5.8	6.03	26.8	26.1	27.0	26.55
	Buffalo (C-2)*	-	2.5	2.2	2.3	2.33	6.5	6.0	6.2	6.23	26.6	26.0	26.3	26.15
	Jerry	Hedge lucerne+ Dry fodder+ Concentrates	3.0	3.3	3.2	3.25	6.5	6.8	6.9	6.85	24.7	25.8	26.2	26.00
Kotresh S/o Basappa	HF (C-3)*	-	2.5	2.2	2.3	2.33	7.5	7.0	7.2	7.23	25.8	25.4	26.0	25.70
	HF	Fodder Maize+ Cowpea+ Dry fodder+ Concentrates	2.8	3.5	3.7	3.60	7.2	7.8	7.6	7.70	25.2	26.7	26.5	26.60
	Jerry		3.1	3.3	3.4	3.35	6.8	7.2	7.0	7.10	25.9	27.3	27.2	27.25

*C- Control group