

Full Length Research Paper

Impact distribution of crossbred (Friesian- Horro) heifers on livelihoods per-urban dairy farm of Nekemte, Bako and Gimbi towns, Western Oromia, Ethiopia

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Accepted 12 December, 2011

An increase in the global population coupled with the increasing demands for milk as an economic food and as an industrial raw food product has necessitated an increase in production by dairy farms. The study was conducted in Nekemte, Gimbi and Bako per urban towns of Western Oromia. The results obtained reveal that the total daily milk yield improved five-fold through improving the gene of Horro breeds. The overall mean of daily milk yield was 12.4, 6.9 and 7.8 L/day at Nekemte, Bako and Gimbi, respectively. The crossbreed cows produced more milk at Nekemte and Gimbi when compared with Bako due to some managerial and environmental factors. Therefore, it can be concluded that the daily milk and income of small scale farmers improved through crossbreeding of indigenous breeds with exotic breeds; with reasonable management of the animals. Future research will include the view of participating farmers in the realization of this project.

Key words: Bako, Crossbreds, Gimbi, Nekemte, per urban dairy.

INTRODUCTION

Dairy production in the tropics is mainly based on local cows. However, different studies (Albero and Haile Mariam, 1982; Sendros et al., 1987a) indicated the indigenous cattle breeds of Ethiopia have a reputation for milk yield, long calving interval, and late age at first calving. The demand in consumption of milk and milk product is steadily increasing in the country. Given the considerable potential for smallholder income and employment generation from high-value dairy products (Staal, 2002), the development of the dairy sector, can significantly contribute to poverty alleviation and nutrition in the country. Ethiopia holds a large potential for dairy development.

Despite the existing high potential for dairy development due to huge livestock resources and vast

climatic conditions, the performance of the dairy industry in Ethiopia has not been encouraging when evaluated even against the dairy performance of Eastern African countries. The annual growth rate in cow milk production during the last decade (1979/80 to 1990) in Ethiopia was nearly 1% as opposed to 6.2% in East Africa and 3.3% in the whole of Africa. The per capita milk consumption in Ethiopia has sharply dropped to 16 L compared to the global average of 100 L (Azage and Asfaw, 2004). To this effect peri-urban dairy farms are growing around cities and towns (Satal and Shapiro, 1996).

Ethiopia annually spends over 45 million Birr for importation of milk and milk products. This will be worsening with the high population growth rate. It is therefore obvious that there is going to be a serious shortage of milk and milk products unless both horizontal and vertical expansion of dairy industry needs to be seriously pursued in areas where favorable climatic conditions exist and feed resources are not limiting (Azage and Asfaw, 2004). Study on the status of peri-

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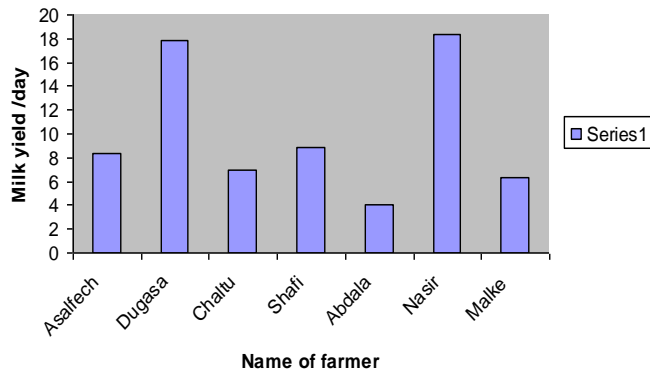


Figure 1. Performance of crossbred cows at Nekemte town.

urban dairying in the western Oromia revealed also the high demand for dairying (Ulfina et al., 2005). The effort done by Bako Agricultural Research Center in demonstrating these dairy technologies played a significant role in changing the overall dairying scenario in western Oromia. The objectives of the study were to assess impact distribution of in calf's heifers in per urban dairy production and lay of foundation for future urban dairy development in the area.

MATERIALS AND METHODS

Study area

The study was conducted in Nekemte, Gimbi and Bako towns of Western Oromia. The area is known to be mixed crop-livestock producers and reported to be the origin of both Horro sheep and Horro cattle.

Farmer selection

A total of seventeen dairy farmers, seven from Nekemte, five from Gimbi, and five from Bako were selected based on the following criteria: willingness/interest, capability to pay the initial cost of the inputs (1000 birr), allocate at least ½ a hectare for improved forage production, experience in dairy production, tendency to pass on the technologies and capable for record keeping (education). In all sites the female candidates were at least 50%. This is because of the fact that dairy is the most gender related agricultural sector and also for the empowerment of the female households.

Training and visit

Training was arranged for the host farmers at their respective areas. The training was given by the dairy team (Economics, Extension, Animal feeds, Animal Health and Animal Production and Management). Visits were arranged to expose the dairy farmers to some successful dairy projects and marketing facilities at Nekemte, Bako and Gimbi, respectively.

Heifer production and management

One hundred and twenty fertile Horro cows were used for crossbred

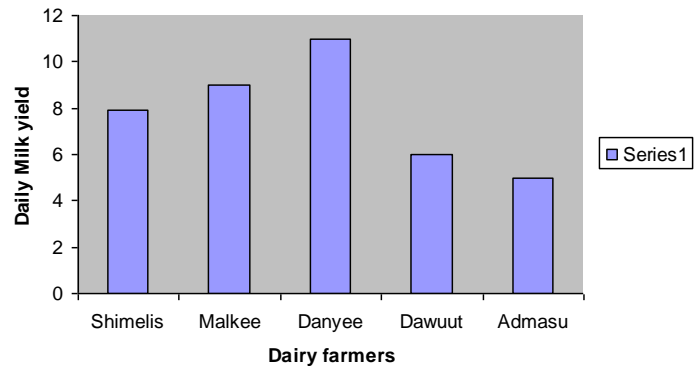


Figure 2. Performance of crossbred dairy cows at Gimbi town.

(Friesian-Horro) heifer production. Considering the conception rate, calving rate, mortality rate and 50:50 sex ratios, the number of cows required was increased. The heifers were reared on cow-calf management system assuming better performances than weaning system. Starting 15 months of age or when they weigh around 200 kg the heifers were closely be observed for service (AI or natural). After confirming pregnancy at 3 month the calf heifers were sold to the selected dairy farmers.

Sustainability of the program

Lack of on-farm AI service was reported as primary weakness in the sustainability of small-scale dairying. Even though the sustainability of the program is largely depends on the feasibility and participatory nature of the program, the center were provided at least one breeding bull per each site to decrease the problem of on farm breeding. Moreover, the multidisciplinary approach (Feeding, health care, and breeding) were proving the sustainability of the program.

Data collection and analysis

Monitoring and evaluation were a continuous process, at three months of interval, after the farmers received the heifers from 2005 to 2008. Data were collected on daily milk yield, milk price and milk consumed by household and the calves. Data analysis was done by using General linear model SAS (1999), descript statistics and Excel.

RESULTS AND DISCUSSION

Dairy products, particularly from the improved genotypes supported by relatively better management inputs, extend the family income through daily milk sales in the form of fresh milk. The results were revealed that the total daily milk yield improved by five fold through improving the gene of Horro breeds. The overall mean Friesian-Horro of daily milk yield was 12.4, 6.9 and 7.8 L/day at Nekemte, (Figure1) Bako (Figure 3) and Gimbi (Figure 2), respectively. Similarly, Tesfaye (1995) the crossbred cows produced four times more milk than that of the indigenous cow's per day. The crossbred cows produce more milk at Nekemte and Gimbi when compared with Bako (Figure 4). Even though the daily milk yield of the

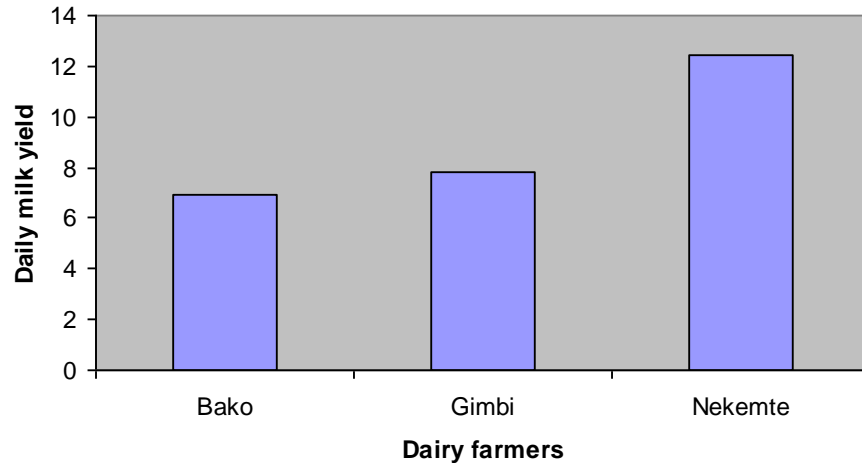


Figure 4. Comparisons of crossbred dairy cows at Bako, Nekemte and Gimbi towns / two time.

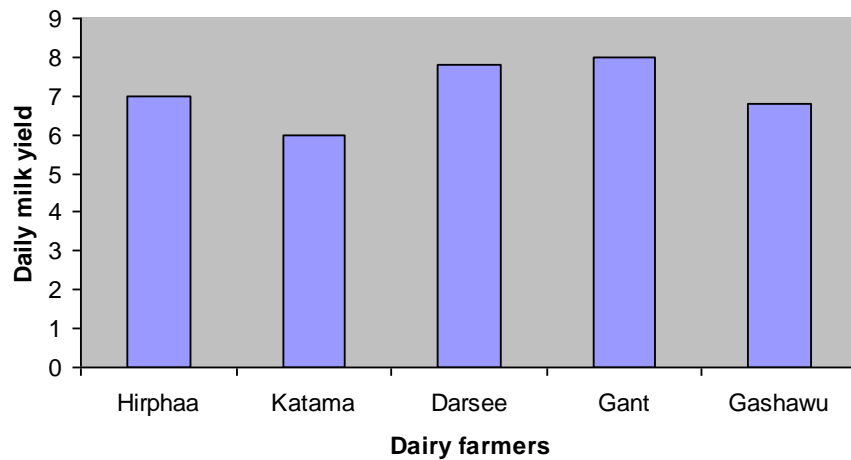


Figure 3. Performance crossbred dairy cows at Bako town.

breed was different from different household. This result is coinciding with that of Tesfaye (1995) who reported increased milk production due to reasonable management practices. Similarly, Brumby and Scholtens (1986) indicated that higher altitude and more temperate areas of Sub-Saharan Africa crossbred cattle can out yield indigenous stock four fold, provided that modest improvement are made in their management and nutritious. Forty-five percent of the total livestock population is estimated to be in milk any one given time in the year, producing an average daily milk yield of 1.17 L, over short lactation periods of 195 days (Getachew, 2005). The low ratio of milking cows in the total family population (1:3), the insignificant proportion of pure exotics or crosses in the national herd (0.3%) coupled with the low in put production system have contributed to the low national milk yield (Tesfaye and Yohannes,

2006). Also, Ahmed et al., (2003) stated that the adoption of market oriented dairy production technology significantly raises per capita income and income effect extends positively to expenditure and nutrient consumption. Similarly, Shapiro et al. (1998) indicated that market oriented dairy production has the potential to make smallholder farming systems more viable and sustainable. From the results farmers who have been engaging the dairy technology packaged over the last 3-6 years revealed that they have realized a growing annual income (Tesfaye and Yohannes, 2006). Overall mean of daily income of participating farmers in Nekemte and Bako were 12.5 and 10.5 birr/day, respectively. However, the daily income of the top ten farmers grew nearly two fold with the range from birr 15 to 25 birr/day. The price of milk also affects the income of the farmers (Table 1) in Nekemte which ranges from 0.5 to 3 birr/L and Bako

Table 1. Daily milk yield and price of milk of crossbred cows around Nekemte.

Variable	Name of farmers around Nekemte							Overall mean
	Asalfech	Dugasa	Chaltu	Shafi	Abdala	Nasir	Malke	
Milk yield morning (L)	4.2	10.1	3.7	4.9	2.1	9.7	3.4	6.7
Milk yield Evening (L)	4.2	7.7	3.2	3.9	1.9	8.7	2.8	5.6
Total milk yield (L)	8.4	17.8	6.9	8.9	4.01	18.4	6.3	12.4
Total milk seal (L)	4.4	15.4	4.9	6.9	3.2	13.5	5	9.5
Price (L)	1.65	1.65	2	1.5	3	0.5	2	1.56
Total prices	7.3	25.75	9.79	10.35	9.45	6.75	10	12.3
Milk consumed by family	1.5	2.4	1.9	2	0.95	4.8	1.5	2.5
Milk consumed by calves	2.4	0	0.9	0	0	0	0	0.46

Table 2. Daily milk yield and price of milk per day of crossbred cows around Gimbi.

Variable	Name of farmers around Gimbi					Overall mean
	Shimelis	Malkee	Danyee	Dawuut	Admasu	
Milk yield morning (L)	4	5	6	3.5	3	4.3
Milk yield Evening (L)	3.8	4	5	2.5	2	3.5
Total milk yield (L)	7.9	9	11	6	5	7.8
Total milk seal (L)	7.5	5	8	0	2	5
Price (L)	3	0.6	3	0	3	2.1
Total prices	22.5	3	24	0	6	13
Milk consumed by family	0	4	3	6	3	2.7
Milk consumed by calves	2.5	0	4	3	3	2.4

Table 3. Daily milk yield and price of milk of crossbred cows around Bako.

Variable	Name of farmers around Bako					Overall mean
	Hirphaa	Katama	Darsee	Gant	Gashawu	
Milk yield morning (L)	4	3.3	3.9	4	3.8	3.7
Milk yield Evening (L)	3	2.7	3.9	4	2.9	3.2
Total milk yield (L)	7	6	7.8	8	6.8	6.9
Total milk seal (L)	6	5.8	6	2	0	4.4
Price (L)	2.3	2.3	2.5	3	0	2.04
Total prices	13.9	13.6	15	6	0	10.5
Milk consumed by family	0	0	1.8	2	0	0.57
Milk consumed by calves	1	0	2	2	0	0.78

(Table 3) 2 to 3 birr/L and Gimbi (Table 2) 0.6 to 3 birr/L respectively. The utilization of the dairy technology benefited farmers not only increased daily income of household but also assisted in diversifying the source of incomes. In addition to improved daily income, economic and social benefits also accrued to participating farmers. These included enhanced food security, improved investment opportunities and change the life standard of the participating farmers.

CONCLUSION AND RECOMMENDATION

The results showed that crossbred (Friesian- Horro) cows (50%) are profitable, which improve milk production and income of the participating household. This additional source of income increased the demand of the project farmers to have more number of crossbred cows and initiated the demand of non-project farmers, AI service to produce F1 heifers, dairy investment and F1 heifer's

multiplication center. Therefore, it seemed concluded that the daily milk and income of small scale farmers improved through crossbreeding of indigenous with exotic breeds with reasonable management of the animals. The future research will be including the view of participating farmers to make more realizing the projects.

ACKNOWLEDGEMENTS

Authors are grateful to Mr. Negash Teshome, Mr. Mohammad Abdella, Mr. Mulugeta Shifa, Mr. Tamene Garedew and Mr. Yohannes Kejela for their help in data collection. Participating farmers and Bureau of Agriculture of the Woreda is also acknowledged for helping with data collections.

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