

Full length paper

BREED PREFERENCE AND BREEDING PRACTICES OF DAIRY FARMERS IN BHUTAN

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ABSTRACT: Cross breeding program started long ago but very little information has been documented. This study was conducted in all 20 districts with the objective to analyze breeding practices followed and breed preference by farmers. The study sampled 566 households spread across all four regions. Field interviews were conducted using a semi-structured open-ended questionnaire. Jersey with an exotic blood level of 62.5-81.25 percent was preferred mainly due to high milk yield and small body size requiring less feed. Both natural mating and Artificial Insemination (AI) were practiced. For breed improvement program, exotic breeding bulls were used since first Five Year Plan (1961-65), followed by AI in 1987. Farmers used AI more than other cross breeding methods. Along with improvement in genetic potential of animals, equal importance should also be given to factors such as good husbandry practices, appropriate genotypes suitable to different production systems, and proper recording system. This study suggests that there is a need for strategic investment and intervention by government to enable development of a dairy breed suitable to Bhutanese conditions. Further, a comparative study needs to be carried out to test whether Jersey outweighs other exotic dairy breeds in milk production and other parameters.

Keywords: Artificial Insemination; dairy; breed; cattle; cross breeding; milk.

1. INTRODUCTION

Dairy farming is widely practiced by Bhutanese farmers in the smallholder system. Farmers rear only dairy breeds for milk. The local breeds found in the country are Siri (*Bos indicus*), which is also called as “*Thrabum*” or “*Nublang*”. Siri breed is used as base stock for developing composite breed with exotic breeds. It is known to produce less milk and has small body size. It requires less feed and is highly adaptable to harsh environment, due to its sure footedness and ability to forage on steep terrain (Phangchung et al. 2002). Mithun and its crosses are also found in lower temperate and subtropical broadleaved forest (Phangchung et al.

2002; Tamang and Perkins 2005). Jersey and Brown Swiss were two principal exotic breeds introduced in the country for breed improvement program when the first five-year development plan started in 1961. Technical recommendations were to cross *Thrabum* with Jersey for mid to low altitude areas while Brown Swiss crossbreeding was recommended for upper altitude areas. However, upon farmers’ request, the breed barrier was lifted and the choice of breed was left open to farmers. Very recently, Holstein Friesian (HF) is also reared, especially in warmer southern belts after government allowed import of HF in 2014.

Ever since the first Five Year Plan (FYP) started, many programs and initiatives were put in

place to improve the local breed through crossbreeding with exotic breeds to increase milk production. The breed improvement program in the early 1960s used exotic breeding bulls, which was followed by Artificial Insemination (AI) after the institution of Semen Processing Centre (SPC) under National Artificial Insemination Program (NAIP) in 1987. Crossbreeding these exotic breeds with Mithun crosses was not recommended. However, although the breed improvement program started long time ago there is little information on breed preferred and breeding practices followed by dairy farmer. Therefore, a study was conducted with the main objective to understand the dairy breeds preferred and breeding practices followed by dairy farmers.

2. MATERIAL AND METHOD

2.1 Study sites

Four regions namely Western, West-Central, East-Central and Eastern, covering all 20 districts were included in the study. The study sampled 566 households spread across all four regions. Around 90% of members from eight districts, two in each region were randomly interviewed, using a semi-structured open-ended questionnaire. Where ever possible, informal discussions were held with some of the resourceful farmers to capture additional information on existing dairy breed improvement program and breeding practices.

3. RESULTS AND DISCUSSION

3.1 Breed composition and preference for dairy cattle breed

Breed composition and preference for dairy cattle breed by farmers are presented in Table 1. The herd comprised of both crossbred and local animals. Amongst breeds, the highest proportion was Jersey (88.29%), followed by Mithun (6.12%) and Holstein Friesian (3.17%). Brown Swiss and Thrabum were few in number. Although, Buffalo is found in the country, it was not reared by the respondents. In this study, from the total sample of 566 households, 521 respondents (92%) preferred

Table 1: Dairy cattle breed preference by dairy farmers.

Breed	Frequency	%
Jersey	521	92
BS	5	0.9
Mithun	5	0.9
Thrabum	5	0.9
HF	30	5.3
Buffalo	0	0.0
Total	566	100

Jersey, followed by Holstein Friesian (5.3%). Abundance of particular breed demonstrates the farmers' preference for that breed (Marius et al. 2011). While very few preferred Brown Swiss, Thrabum and Mithun breeds, none of the respondents preferred buffaloes. Jersey is one of prominent dairy breeds found in countries where cattle are primarily kept for milk production (Bebe et al. 2003; Misganaw et al. 2014).

3.2 Preference of exotic blood level

About 33% of respondents preferred exotic blood level slab 75-81.25%, followed by slab 62.5-75% (29.5%) and 50-62.5% slab (14%) (Table 2). About 11% of respondents opted for the higher slabs 81.25 and above. It shows that farmers have less preference for breeds with higher blood level, although several crossbreeding experiments have demonstrated that crossbreds with high blood level are undoubtedly better than native breeds (Singh 2016). It could also be because the yield in higher crosses falls short of theoretical expectations. Further, the total replacement of genes will not lead to higher production in cattle. However, in the Indian context, exotic inheritance of around 50% is most ideal for growth, reproduction and milk production. It is recommended that Holstein Friesian and Jersey inheritance with non-descript animals be maintained at around 50-62.5% exotic inheritance level for better production performance.

Table 2: Dairy cattle breed preference by blood level.

Exotic blood level	Frequency	%
50-62.5%	79	14.0
62.5-75%	167	29.5
75-81.25%	187	33.1
81.25-87.8%	67	11.9
87.5 & above	65	11.5
Total	566	100

3.3 Reasons for breed preference

Reasons for preference of cattle breeds are presented in Table 3. The preference for Jersey breed by over 71% of respondents was mainly due to high milk yield. The results are consistent with the findings of earlier studies in Africa where milk yield was ranked as top most preferred trait, followed by growth rate, adaptation, breeding ability, draught power, butter fat yield and coat colours of the cow (Bebe et al. 2003; Misganaw et al. 2014; Marshall et al. 2016). Such a great preference for high milk yield is common in cattle owners, who keep cattle primarily for milk (Misganaw et al. 2014).

Bhutanese dairy farming system is characterized by scarce pasture, rough terrain and smallholder system. In such farming system, the need for hardy breed that produces more milk and the dietary habits for liking butter might have determined farmers' preference for a particular breed.

Over 28% of respondents' preference for the same breed was because the cattle are docile and easier to manage. Jersey is the smallest of dairy breeds; they are easy keepers and performs better than Holsteins on rough scanty pastures; Jersey are general favorites as family cows on account of the richness of their milk, high persistency of milking and their easy keeping quality and gentleness (Anthony 2007).

The reasons for preferring Jersey suggests that when starting a herd, it is important to choose a breed of cattle most common in the community, having average production of milk and fat (Eckles and Anthony 2007). Bath et al. (1985) also mentioned that the most important consideration in choosing a breed is the present and future milk market situation.

3.4 Breeding practices

The breed improvement program in the country is carried out by natural mating and crossbreeding with the main objective to maximize exotic breed fraction in the herds. Natural mating is done by government as well as private breeding bulls while AI is carried out by the government AI technicians through Artificial Insemination Outreach Centres (AIOC), using the imported or locally produced frozen semen. Breeding bulls are mostly Jersey and few are Brown Swiss and Mithun, produced domestically in government farm. Private breeding bulls are those genetically superior, which are fit for breeding. Very recently, to overcome the shortage of AI technicians, early school leavers were trained as Community Artificial Insemination Technicians (CAIT) in some pockets who can provide AI services upon charging nominal service fee. Each subdistrict is provided with AIOCs and breeding bulls at strategic locations. All the

Table 3: Reasons for dairy cattle breed preference.

Reason	Frequency	%
More milk production	526	71.4
Easy to manage	210	28.5
Fetch high price if sold	1	0.10

services provided by the government are free of cost except for the nominal service charges paid to CAIT.

In this study, the most popular breeding practice followed was AI (66.3%), followed by natural mating with the use of government (42%) and private (22.6%) breeding bulls while CAIT had not yet gained popularity. Beside breeding bull, AI is also commonly used in India under the initiative of National Dairy Development Board (NDDB). AI, being a common breeding method in Bhutan, could be attributed to widespread of AI facilities in the country and increased accessibility to mobile AI (Tshering pers. coms. 2017). Moreover, AI can be done at farmers' doorsteps, avoiding the need to make animal walk long distance for getting mated with breeding bull (NDDB, India). On the contrary, bull services (63%) outweighed AI (37%) in small holders of Kenyan highlands (Bebe et al. 2003).

4. CONCLUSION

High milk production, ability to perform better under scarce pasture, gentle and easy keeping qualities have led to preference for Jersey breed. The most preferred exotic blood line slabs are between 62.5-75% and 75-81.25%. Natural mating by breeding bulls and AI, using frozen semen, are the two breeding practices followed in the study area. AI outweighs other breeding methods followed by farmers. Respondents are of the view that Jersey breed yields more milk than other dairy breeds. Nonetheless, further comparative study needs to be carried out to test whether Jersey outweighs other exotic dairy breeds in milk production and other parameters. Cross breeding is the most important component in dairy farming. However, together with the improvement in genetic potential of the animals, it is equally important to promote good husbandry practices and appropriate genotypes suitable to different production systems.

Acknowledgements

The authors would like to sincerely thank District Livestock Officers and officials from four Regional Livestock Development Centers and Livestock Extension Centers, for their unfailing support rendered to the team during the entire field work. We also thank Mr. A.N. Koirala, Mr. Mohan Raj Gurung and Mrs. Sangay Wangmo, for their assistance in field works. We also thank Mrs. Leela Maya Dahal and Mrs. Ganga Maya Rizal for their assistance in data management. We are grateful to all respondent farmers for sparing their valuable time and providing valuable information. Finally, we acknowledge the financial support, guidance and other logistic supports of NDRC, Yusipang.

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