Gaddi Buffalo: An Indigenous Breed of Far-Western Nepal

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ABSTRACT: A study on indigenous Gaddi buffalo of far-western region of Nepal was conducted to understand the production parameters and husbandry practices intending to make future strategy for improvement. The breed is well known in the far-western districts of Nepal and adapted in hills and mountains of the region with diverse climatic conditions. Among 3 identified buffalo breeds (Gaddi, Lime and Parkote) and one under study (Terai), Gaddi was found morphologically larger (p<0.01) and docile in temperament. Major population of Gaddi was found to be black in color and some brown and light brown. Morphologically, it looks like Indian Murrah, however white round patch on the middle of forehead and tuft of the tail, and semi-curved horn shape are the distinguished characters. The average ages at puberty, first calving and calving interval was 3.8, 5.7 and 2.0 years respectively. Lactation length varied from 14 to 22 months and milk yield from 2.5 to 5.5 liters/day. Major problems recorded were lack of pure breeding bulls, negative selection, feed scarcity, poor technical know-how and health management. The paper discusses on the overall buffalo management system in the far-western region of Nepal and suggests improvement plan with maximum utilization of locally available farm resources.

Key words: Gaddi, Buffalo, Nepal, Characterization.

INTRODUCTION - Buffalo occupies an important place in agricultural economy of Nepal. It is a major livestock commodity for milk and meat production, and scattered throughout the country from Terai plain land of southern border to high mountains of northern hills. Buffalo alone contributes 52.9 % of the livestock share in the national GDP (APP, 1995). Except milk and meat, they are used for draught and pack purpose, hides and bones, and for manure. They also have cultural, social and religious values in the certain ethnic community. About 48.5% of the households keep buffaloes for regular farm activities. Buffalo annually provides 70 % and 64 % of the total milk and meat respectively in the country (MoAC, 2005). Despite such a great contribution to the rural economy, there is insufficient systematic approach for their improvement. In this context, a study was undertaken to identify and characterize Gaddi buffalo indigenous to the far-western region of the country. Gaddi are located in the Dadeldhura, Baitadi, and Doti districts of Far-western Nepal. The breed is scattered in about 5482 sq. km. area and found at an elevation between 1500 and 4500 masl and temperature between 18.8°C in winter and 28°C in summer, and with an annual rainfall ranging from 860 to 1242 ml. It
is estimated that out of 101,500 buffaloes found in this area, approximately 16 thousand are purebred Gaddi and remaining are their crosses.

“Gaddi” are the tribe living in the plains of far-western region of Nepal and adjoining territories of India. They were traditionally buffalo raisers in trans-migratory system. Although, no document is available about the origin of Gaddi buffaloes, it has been said that in those days, hills of Dadeldhura, Baitadi and Doti districts were covered with abundant amount of highly lustrous and nutritious fodder and grasses. Gaddi used to bring their animals to these areas for grazing. As the Gaddi buffalo looked attractive and were good milkers compared to the local ones, people got interest on the breed and requested “Gaddi” for buffaloes, heifers or even calves. Gaddi used to give them the buffaloes in exchange of food, cloth or money. The purchased animals were hence renamed after the tribe “Gaddi” - Gaddi buffalo. The breed “Gaddi” was established in this region at least three centuries ago.

MATERIAL AND METHODS: An interview with semi-structured questionnaire was made to gather the information about production, reproduction and management system of Gaddi buffalo. A total of one hundred households from Baitadi, Dadeldhura and Doti were visited for collection of information. Forty-eight female and two male buffaloes of Gaddi were measured for morphological and physical characterization. Production and reproduction performances were estimated according to the farmers’ response. Morphological characteristics were measured with the help of cotton tape. Body weight was calculated by using Mullick’s formula (Body weight (lb) =25.156 X Chest girth in inch - 960.232). Data gathered through questionnaire and measurements were analyzed by linear model program of SAS procedure.

RESULTS AND CONCLUSIONS: Gaddi buffaloes are quite distinct from the other indigenous buffaloes. They are bigger in size, better in milk production and adaptable in harsh feeding system. This breed is docile in temperament and well tractable. They are found predominantly black in coat color (92%), but some time in brown and light brown color also (4% each). They have long face and flat head with long curved horns. White big patch on forehead is the distinguished feature of this animal. Horns of the Gaddi buffalo are long, flat and curved backwards to the neck. Ears are in hanging position. They have tough dewlap and hump is absent. This breed has comparatively short and strong legs with broad hoofs. Tail and switch are reasonably long and extended below hock. Udder is tough, teats are cylindrical in shape and equal in placement. Size of fore-quarter is smaller than the rear-quarter. They are built up compact and massive with angular body shape and sloped hip position. Growth and production characteristics of this breed seem to be better compared with other indigenous buffaloes breeds. The average body length, height at wither, chest girth and height at hip bone of she Gaddi buffalo were found to be 141.2±1.63, 131.3±1.1, 194.98±1.8 and 122.69±1.07 cm. respectively, which are significantly (P < 0.01) higher than Lime and Terai buffaloes.

A simultaneous study was undertaken to verify the physical conformity of Gaddi buffaloes in comparison with other indigenous and exotic buffalo breeds. A graph is prepared to compare the morphological characteristics of these breeds in comparison to other buffaloes found in the country and are presented in Figure 1. In the figure, measurements of Gaddi buffalo have been considered as 100 % to depict a better concept regarding morphological structure of other exotic and indigenous breeds to Gaddi. The figure has elucidated that
most of the body parts especially body length, body height, chest girth and body weight of Gaddi are significantly ($P<0.001$) higher than the other local breeds, but are lower compared to Murrah ($p>0.05$). Productive and reproductive traits of Gaddi buffaloes showed the average age at puberty (3.8 yrs), age at first calving (5.7 yrs) and calving interval (23.4 months) is comparatively longer. Most of the buffaloes’ parturitions are concentrated from mid June to mid September. As a good milker, they have well developed udder and prominent milk veins. Lactation length of these buffaloes varied from 14 to 22 months and depends on feeding, management and economic status of farmers. Average daily milk yield for the first three months from two teats was found to be $4.69\pm0.15$ l. In the next three months, the yield was $4.62\pm0.13$ l from 3 teats. Milk yield of this breed is comparatively better than the other local breeds.

The study revealed that both controlled and uncontrolled mating systems are practiced in this species. Where, there semi-intensive management system was practiced controlled breeding was common. Major constraints in the breeding and genetic improvement of this breed were lack of availability of purebred bull. Disposal of male calves in early age was the prevailed management practice to save the milk for market purpose and was the main reason of unavailability of breeding bulls. Up-grading with Murrah bull gives no considerable results in milk yield as crosses showed poor adaptability. Besides, high calf mortality due to poor care and management, difficulty in rearing male calves and selling young animals for meat were some of the problems due to which farmers were compelled to use any available bulls for breeding.

Nutritional management of buffaloes at different stages of growth and development, and for level of production was found different. Concentrate feeding was poor and based on household leftovers as kitchen waste mixed with rice or wheat bran and some salt given to the buffaloes before milking. Some farmers provided maize grains/flour and oil cakes to their animals.
ths of March to June were the feed deficit period when green grasses are difficult to found. Very few fodder trees were noticed in the area for buffalo feeding. In general, fulfillment of nutritional requirement of buffalo was based on grazing in the forest. Unavailability of sufficient and nutritious fodder in the forest round the year and improper nutritional management of buffalo restricted the utilization of full genetic potential of the breed.

There was a practice of housing buffaloes with other animals in the ground floor, using upper floor for living farmers themselves. In ground floor, provision of ventilation, sunlight and drainage was very poor or even none. The shed was dark and muddy. Floor space for the animals was also insufficient. The condition of the animal barn showed that farmers had very little knowledge on housing management. Most of the buffalo farmers of the region were unaware about the health management. The use of vaccines against various buffalo diseases is not common. Some farmers showed concern about the drenching and control of internal parasites especially liver fluke.

Gaddi buffalo was found superior than any other indigenous breeds available in the country. However, due to poor management practices and lack of awareness, their productivity and number of purebred animals is declining gradually. Introduction of imported sires from abroad for crossbreeding program without evaluating adaptability and acclimatization creates the threats on existence of the breed. Relying on their importance in the region and in the country a systematic approach for conservation and improvement need to be identified and implemented as soon as possible. For the improvement of productivity and to control the dwindling population an awareness and training program among the farmers seems essential. Appropriate selection program within the breed, literacy and consciousness on overall buffalo management, exploitation of advance breeding tools as AI in the areas, and a conservation plan are some of the those activities which certainly resolve the problem.

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