INTRODUCTION - Nepal has various topography ranging from high mountains (Mount Everest) to hills and low land, even below the sea level. Different types of buffalo are raised according to the ecological regions; swamp type and crossbred with high production are raised in mountains, swamp type and crossbred with Murrah in hills and crosses with Murrah or riverine type in plain (Neopane et al. 1999). Buffalo contributes with milk, meat, manure for crop production and draft power in plain areas. However, in the hills and mountains buffaloes are not used for draft purpose because of the hilly terraces. Majority of households raise at least one buffalo for milk and manure production and sell male calf or mature male for family income. In road accessible areas, buffaloes are the main contributor of urban milk supply. At present, about 4 millions buffaloes are found in Nepal, which is increasing every year in the last one and half decade (MOAC, 2005).

Historical and religious prospective. Domestication of buffalo started from Pouranik Era. Some of the Hindu religious book depicted buffalo as a giant animal. The greatest Hindu festival (Bada Dasain) celebration involves sacrifice of male buffalo as a Maikhasur (Giant), while cattle are religiously considered as holy animal.

Feeds and feeding resources. Any livestock enterprise requires balance feed supply. Nutrients content in feed and feeding materials, feeding standards according to the stage of production and body weight, and appropriate feed formulation package are the major requirements for optimum production. Fodder tree leaves, in mountain and hills, grasses, legumes, straw, stover and other agro byproducts are the major feeding resources in Nepal. Nutrients present in fodder tree leaves, grasses and legumes are limitedly assessed (Osti. et al 2006) and some species are still unidentified, although they are used for feeding livestock. The mean dry matter (DM), crude protein (CP), cellulose (Cell), hemicelluloses (Hem), lignin (Lig), calcium (Ca) and phosphorous (P) content were 33.10, 14.37, 21.90, 6.45, 18.20, 2.20 and 0.25 percent on dry matter basis respectively recorded from fodder trees leaves. Where as the same chemical content in grasses and legumes was found 24.70, 13.92, 34.21, 14.42, 12.38, 0.38 and 0.35 percent, respectively.

Breeds and breeding. Domestication of buffalo started after human civilization. Until 20th century, buffalo production was of nomadic type. Buffalo were let to graze in the forest and the breeders used to collect milk and process it for ghee (Local butter). This system of raising is still practiced in the high hills of Gorkha district (Khariboat) of Nepal. In the past, swamp type buffaloes were raised (Shrestha, 1995). The riverine buffaloes found in Nepal are either crossbred with wild buffalo or with domestic Murrah or Nili-Ravi. This cross breeding with wild buffaloes (Arna; Bubalus arni) and domestic buffaloes in Koshi
Tapu areas of Eastern Nepal is still practiced where wild buffalo bulls in farmers’ fields or in grazing lands are common breeding system (Shrestha and Shrestha 1998). Native buffalo (Gaddi) found in Western Nepal are the product of cross between swamp type with Nili-Ravi breed found in Pakistan because western part of Nepal is near to Pakistan and Punjab of India. Because of this evolutionary process few breeds have been established in Nepal; Gaddi, Lime, Parkote, and Murrah crosses. The Gaddi buffalo found in western parts of Nepal, comprises 50 (2n) chromosomes, having adult body weight 452 kg, yielding 2.9 kg milk per day and riverine type. They are black in colour, white round patches in forehead, having long face, flat head with long half curved horns (Mishra, et al. 2002). Lime buffaloes are found in hills and mountains of Nepal. The overall milk yield in 305 lactation days was found 1048 liters. The overall first calving age was 51.6 months, calving interval 535 days and calving to first service was found 190 days. Similarly, Parkote buffaloes are found in hills and mountains of Nepal. The overall 305 days milk production 1048 liters, the first calving age 55.2 months, calving interval 529 days and calving to first service 175 days. The chromosomes number of Lime and Parkote buffaloes was reported 48 (2n=48) and Swamp type (Shrestha, 1995) found in eastern parts of Nepal. This buffalo may be the product of domestication of wild buffalo from Koshi Tapu, but now a day, after crossbreeding with riverine buffalo the chromosomal characterization shows 50 (2n=50) chromosomes and riverine type (Rasali, et.al. 1998).

**PRODUCTION TRENDS AND POTENTIALITY**

Milk. One million milking buffaloes and 0.9 million milking cows are present in the country. Similarly 12.7 millions metric tons of milk has been produced in the country, where 70 percent is buffalo milk and 30 percent cow milk. From the last 14 years, buffalo milk production consistently increased, whereas cow milk production is not increased as expected (Figure 1). This may be due to the resistance of buffalo in diverse climatic and environmental conditions.

**Figure 1.** Milking buffaloes and cows and their respective production trend (MOAC, 2005).
The level of milk production is not adequate to fulfill the future demand. At present the per capita milk available is 50.28 liters per year, which is far below than the normal health point of view. Even the available milk is not equally distributed among the people. People living in the urban, semi urban and plain areas could get some milk but in the hills and mountain it is limitedly supplied. The less availability of milk in the hills and mountain could be due to long feed scarce period, land terrain and inappropriate breeds.

Meat. Migration of people into the urban areas and expansion of income generating activities in the rural areas has changed the meat consumption habit of people in the urban and rural areas. Actually, 0.215 metric tons of meat is annually produced, of which buffalo is the main contributor (65 %) followed by goat (19%), chicken (7%) and pork (7%). High demand of buffalo meat may be due to leanness, cheaper in price as compared to other meat and there is no religious taboo in buffalo meat. There has been an increasing trend on buffalo, chicken and goat meat production in the last 14 years and this trend will persist for the next 20 – 25 years. The per capita meat available is 8.48 kg per year, which is far below the normal requirement. The available meat is also not equally distributed in the mountains, hills, and plain areas due market access, difficulty in transportation and inadequate production.

Manure, hide and skin production. Buffalo manure is the main organic fertilizer in hills farming system, whereas in the plain areas, people make cooking fuel cake from buffalo manure. The skin or hide from buffalo are extensively used in leather industries and some indigenous people locally make leather products like shoes, agricultural implements etc from buffalo skin. About 33.30 mt. of buffalo hide produced in Nepal which is 4 percent of the world production (Ranjan and Qureshi 2006).

RESULTS AND CONCLUSIONS - Rice and wheat straws, maize stover, oilseed residues, fodder tree leaves in mountain and hills, local forages and pastures, improved fodder in few pockets are major feed resources in Nepal. Whatever available is low in quality and there is no methods adopted for quality improvement. Buffalo are thrive in this situation, if any improvement method like nutrient fortified feed block will introduced buffalo production will certainly improve in near future. Similarly low production potentials, undescrptive breeds and breeding practices and low adoption of improving breeding methods are the major constraints for buffalo development in Nepal. Development of suitable breeds in the hills and mountain and breeding improvement in plain areas are the areas for future research and development.

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