

1. INTRODUCTION

Cows were originally identified as three separate species. These were *Bos taurus*, the European cow, including similar types from Africa and Asia; *Bos indicus*, the Zebu or humped cow found in India; and the extinct *Bos primigenius*, the aurochs. The aurochs are considered ancestral to both Zebu and European cow. More recently these three have been grouped as subspecies under one species: *Bos taurus*; although some have suggested using the names *Bos primigenius taurus*, *Bos primigenius indicus*, and *Bos primigenius primigenius* as the subspecies.(ICZN,2003)

The average life span of *Bos indicus* is 20 years (Kolensnik,1979). Heifer is the term giving to cows undergoing the first calving pregnancy (Jochle,1972). The gestation period is 293 days (Plasse *et al.*1968b) and estrous cycle is 22-23 days (Anderson,1944).

Cows, like other bovids, are ruminants. They have a unique digestive system that allows them to digest cellulose and other otherwise unpalatable plant materials with the aid of symbiotic microorganisms living in their rumen, or first stomach. Cows eat mainly grasses and seeds. Like all mammals, cows produce milk to feed their young. Cows are very protective of their calves. New born calves are removed from their mothers quickly by the dairy practitioners, usually within three days, as the mother - calf bond intensifies over time and delayed separation can cause extreme stress on the calf.

The Indian cow *Bos indicus* breeds are as follows, namely :- Brahman, Gir, Guzera, Nellore, Ongle, Kankrej, Holstein, Haryana, Sahiwal, Red sindhi, Butana, Boran, Baggera. (Taneja and Bhat, 1986).

1.1 Need for behavioral studies

The major emphasis of research has been on the milk production of cow (Visscher and Goddard,1995; Bruckmaier,2003). Certain other key associated areas of research have been – reproduction, genetics and nutrition (Jockle,1972). But very few scientists have worked on mother - calf welfare and behavioural aspects of cow (Marina *et al.* 2007).

1.2 Oxytocin's role in cow welfare

Oxytocin hormone plays an important role in eliciting milk ejection in dairy cow (Sagi *et al.*,1980). Injection oxytocin is widely being misused in India for getting milk from cattle. As per the report prepared by Dr. R.P.Parashar, President, D.A.V. Research Society for Health, in a survey conducted in Uttar Pradesh, Haryana and Delhi, it was found that 82% cattle breeders were using Injection oxytocin in the NCR and upto 32% in remote areas of Uttar Pradesh & Haryana were using oxytocin for milking cows and buffaloes.

Due to the effect of oxytocin, the pressure of milk increases to very high inside the udder of cattle and even the most obstinate animals give milk very easily in order to get rid of the unbearable pressure. Little quantity of this hormone preparation is secreted with milk, acting as a slow poison after regular consumption and with passage of time, may give rise to different diseases like the shortening of estrus cycle in animals, early pregnancies that cause loss of contractility of uterus, diseases of G.I.T., liver, kidneys, uterus etc. Usually after 5 to 6 months of parturition, animals stop giving milk but cattle breeders continue milking the cattle three to four months further by injecting oxytocin. This milk is even more harmful to the health. The most unkind aspect of the use of Injection oxytocin to animals is that cows and buffaloes writhe in pain due to the unbearable pressure in their udder after administration of injection oxytocin until the milk is not expelled fully. Secondly, to save the consumption of milk by the calf (minimum one litre daily), the innocent animal is killed by the cattle breeders. In this way, the cattle breeders save more than 200 litres of milk in 7 months- the approximate period of milking (Parashar, 2010)

1.3 Maternal behavior is crucial for calf welfare

The genetics of maternal behaviour in cattle is important for survival of the young. Improved maternal behaviour could increase the welfare of mother and offspring. Beef breeds show more intense maternal behaviour than dairy breeds, because calves from dairy cattle have been reared artificially for many generations and there has been no selection pressure for this behavioural trait (Takeuchi and Houpt, 2003).

1.4 Bioacoustics is a non - invasive tool to understand species specific behavior

Bioacoustics is the study of sound in animals and animal communication with associated behavior, sound production anatomy and neurophysiology, auditory capacities and auditory mechanisms, and animal welfare (Pond *et al.*, 2010).

Vocalizations provide information on the age, sex, dominance status and reproductive status of the caller. Calves can recognize their mothers using vocal cues but it is not clear whether cows recognize their offspring in this way. Vocal behaviour may play a role in estrus advertisement and competitive display by bulls (Watts and Stookey, 2000).

Therefore, this study focused on behavioral aspects of cows since the enrichment of information in this area in form of empirical and descriptive research may have implications in their welfare and better intensive management.