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# Nutritional Status of Buffaloes (*Bubalus bubalis*) in Tribal District Mandla of Northern Hills Region of Central India

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## ABSTRACT

A participatory field study on nutrient management of *Bubalus bubalis* (L.) by farmers was carried out in Bichhia Block of Mandla District in Central India with forty one buffalo owners. A fifteen point questionnaire was developed to gather information of the feeding management and milk production of buffaloes. The body weight of the buffaloes was calculated by the Schaeffer's formula. The average body weight of buffaloes was 508 ± 7.5 kg. The average milk production and 4% FCM yield was 4.08 and 6.06 kg, respectively. The total nutrient fed (DCP, TDN) was compared with nutrient requirement and found that DCP, TDN and phosphorus was deficit by 13.53, 6.09, 22.75 percent, respectively. It was concluded that the low milk production in buffaloes was due to nutrient deficit ration fed to the lactating buffaloes.

**Key Words:** Buffaloes, Lactating, Management, Nutrient.

## INTRODUCTION

India, though is the largest milk producer in the world (Anon, 2014) with 132.4 Mt of milk production, but the productivity of the dairy animals is very low *i.e.,* 4.5 kg/day (Hegde, 2006). Low milk production in Indian dairy animals is attributed to several reasons including pre and post parturient disorders (Blood and Radostitis, 2007). Among these, inadequate nutrition is the most widely reported factor in India for low milk production (Qureshi *et al*, 2002).

According to the 19th Livestock Census, 2012, buffalo population in India is 108.7 million constituting 57 percent of world's buffalo population. Madhya Pradesh with 8.18 m buffalo population ranks 6th in India. Mandla is a predominant tribal district of M.P. and harbours a buffaloes population of 54,681. The milk production of the district is 92,500 t, while the mean milk productivity is 1.21 l/ day/animal. The present intensive field study was carried out among 41 buffalo owners to explore the nutrient management and milk productivity in Mandla district.

## MATERIALS AND METHODS

Geographically district Mandla, is located between 81° E Longitude and 22.70° N latitude, and has nine development blocks. The study was conducted in Bichhia block which has a population of 217,838. Sixty buffaloes belonging to forty-one Buffalo owners who were willing to participate in the study were selected and information was collected through a set of fifteen point questionnaire and group discussion. The socio-economic characteristics of buffalo owners i.e. age of farmers, category, literacy status, marital status, occupation and landholdings are presented in figure 1. The primary information collected was verified with sources and personnel in the Department of Veterinary Services, Government of Madhya Pradesh.

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**Body weight**

Body weight (BW) of all the buffaloes was recorded before feeding and watering in the morning and BW was calculated following the Schaeffer's formula suggested by Sastry *et al*. (1982)

**Daily feed intake**

The daily feed intake of all the selected animal was calculated by measuring feed offered and residue left, for three consecutive days.

**Proximate analysis**

Representative samples of various feeds (concentrate, mustard seed cake, wheat bran, left over chapatis- baked Indian wheat bread and green fodder) were collected for proximate analysis as per AOAC (1995), while that for Ca and P method suggested by Talapatra *et al* (1940) was followed. Intake of crude protein (CP), Ca and P digestible crude protein (DCP) and total digestible nutrient (TDN) were calculated following Sen *et al* (1978). On the basis of DMI of each animal and chemical composition of the feed, nutrient supply was determined. Deficiency/excess of various nutrients was calculated by following Ranjhan (1998).

**Milk analysis**

The milk samples collected in the morning and evening were pooled for the fat estimation by the Gerber's method. The solid not fat (SNF) percentage in milk was estimated by evaporating the water content of milk and by subtracting its fat percentage following the method suggested by Agarwala and Sharma (1961). The morning and evening milk yield of individual lactating buffaloes as well as 4 percent fat corrected milk (FCM) was recorded using the following formula suggested by Gains (1928).

4% FCM = 0.4 x milk yield (kg) + 15 x fat yield (kg)

## RESULTS AND DISCUSSION

**Socio-economic status of Buffalo owner**

Most of the Buffalo owners belonged to the age group of 41-45 yr. Out of the 41 buffalo owners, 18 (43.90 %) belonged to other backward class (OBC) category. Sabapara *et al* (2014) reported that age of dairy animal owners has no significant role on improved animal husbandry practices but Sharma and Singh (2008) observed that caste of dairy animal owners had highly significant and positive correlation with the improved dairy husbandry practices. In a study (Sharma *et al*, 2009) it has been reported that caste of dairy animal owners though had non-significant with the enterprise but had a positive correlation with dairy husbandry practices.

Out of 41 buffalo owners, 15 had been high school pass out, 5 higher secondary and 3 were graduates, while the remaining were either semi-literate or illiterate. According to Sharma *et al* (2009) and Shekhawat *et al* (2013) education of dairy animal owners had highly significant correlation with knowledge on improved dairy husbandry practices. This indicate that educated animal owners possessed more knowledge due to the fact that they tended to have more interaction with extension agencies and did not hesitate to discuss their problems related to animal husbandry with veterinarians and other extension personal as compared to old illiterate respondents.

Majority of the buffalo owners were small landholders. Land holding of dairy animal owners had high significant positive relationship with improved dairy husbandry practices (Mande *et al,* 2008 and Kumar *et al*, 2009). This might be due to the fact that the dairy farmers, who have large land holder, generally have good financial and leadership qualities so they easily adopt new improved and innovative dairy husbandry practices.

In the present study 70 percent of buffalo owners were married, and had no effect on knowledge of improved buffalo rearing and management. Similar findings were also reported by Chander and Chand (2022), Kumar *et al* (2012) and Cakmur *et al* (2015). Thirty four percent of buffalo owners were only dependent on animal husbandry and forty eight percent on agriculture as their main occupation. However, Vithanage *et al* (2013) found that seventy

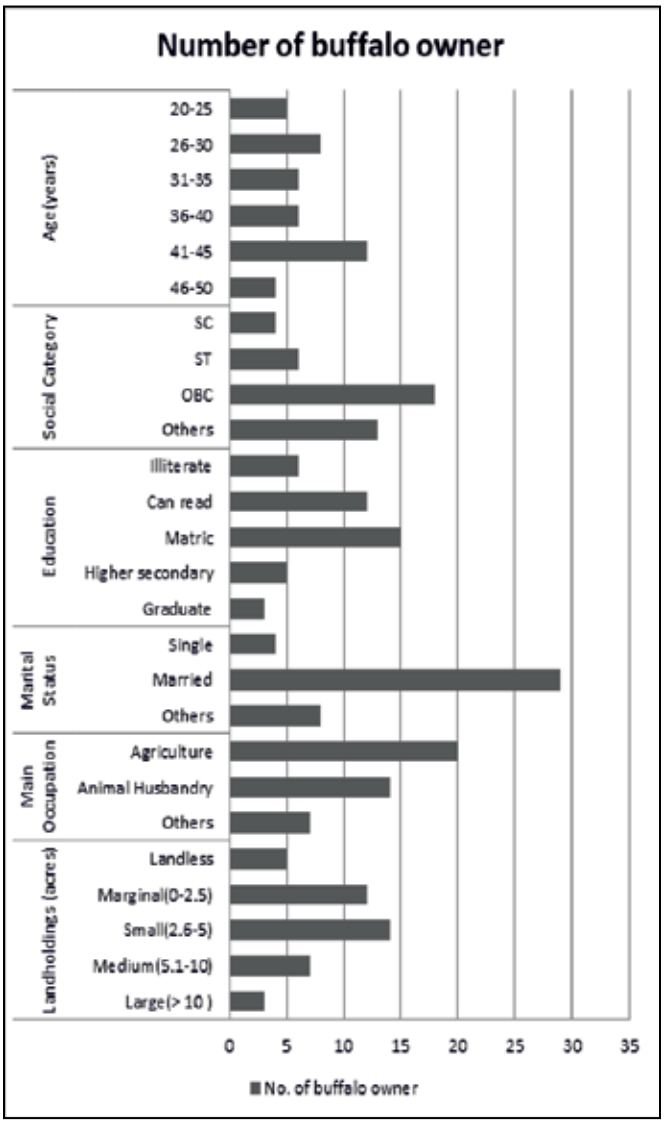


Fig.1 Socio-Economic Characteristics of buffalo owner (SC, Schedule Caste; ST, Schedule Tribe; OBC, Other Backward Class)

seven percent farmers were totally dependent on animal husbandry. The dependency varies from region to region and resources of the dairy owners.

## Composition of Feed

The chemical composition of feed used for feeding buffaloes is presented in Table 1, which was in agreement with earlier findings (Ranjhan, 1998) values. The left-over of human food like chapatis (Bread) were used very frequently for feeding of dairy buffaloes in villages as a non-conventional feed resource. The wheat bran was also the most commonly used feed. Feeding in-milk animals with wheat bran and left over chapatis has been reported by Bakshi *et al* (2010). Buffaloes' owners prepared their own feed concentrates from locally available mustard-seed cake and available green fodder for feeding animals. The poor performance might be due to the non-descript type of buffaloes, having low genetic potential to produce milk. The buffalo owners never used readymade mineral mixture for feeding their buffaloes. The role of mineral in biological systems, growth, production and reproduction is vital (McDowell *et al,* 1984).

## Milk production, Milk quality and Feed intake of Buffaloes

The average Milk yield (kg), calculated 4% FCM yield (kg), fat, SNF and ash percentage, DMI (kg/d), DMI/100 kg BW, DMI/$w^{0.75}$ and Body weight (kg) of the buffaloes presented in Table 2, were in consistent with the standard values (Sharma *et al,* 2007). Agarwal *et al* (1988) described that the

**Table 1. Chemical composition of feed stuffs (91.83% DM in concentrate).**

| Sr. No. | Feed stuffs | OM±SE | CP±SE | EE±SE | Ash±SE |
|---|---|---|---|---|---|
| 1. | Concentrate (self made) | 91.70±7.20 | 19.45±3.55 | 04.40 ±0.3 | 8.30 ±0.90 |
| 2. | Mustard-seed cake | 91.63±3.60 | 28.25±2.78 | 12.70±1.03 | 8.37±0.54 |
| 3. | Wheat bran | 93.3±5.10 | 14.90 ±3.41 | 03.40±0.80 | 6.70±0.90 |
| 4. | Chapati (Bread) | 92.2±6.56 | 13.25 ±1.75 | 03.50±0.09 | 7.80 ±1.05 |
| 5. | Green fodder | 91.50±9.52 | 07.65±1.18 | 02.95±0.75 | 8.50±1.22 |

*(OM, Organic Matter; CP, Crude Protein; EE, Ether Extract)*

**Table 2. Milk Yield, Milk composition and Dry Matter Intake in Buffaloes.**

| Sr. No. | Particular | Value |
|---|---|---|
| 1. | Milk Yield(kg) | 4.08±0.70 |
| 2. | 4% FCM yield(kg) | 6.06±0.65 |
| 3. | Fat (%) | 7.23±0.20 |
| 4. | SNF (%) | 7.42±0.09 |
| 5. | Ash (%) | ± 0.006 |
| 6. | DMI (kg/d) | 11.58 ± 0.49 |
| 7. | DMI /100 kg BW(kg/d) | 2.27 ± 0.15 |
| 8. | DMI /$w^{0.75}$ kg(g/d) | 107.00 ± 4.96 |
| 9. | Body Weight (kg) | 508 ± 7.50 |

mean DMI in milch buffalo ranged from 11.1kg to 15.4kg, while Pathak and Verma (1993) reported the DMI in buffaloes as 2-2.5 kg/100 kg BW that is equivalent to 90-125 g/$w^{0.75}$ kg in buffaloes of different body weight and milk yield. Infact these factors depends on the BW, age and physiological stages of buffaloes.

The daily feed intake, requirements and deficiency/ excess of nutrients in the lactating buffaloes are presented in Table 3. Results indicated a shortage of DCP was to the tune of 13.53 percent when compared with standard requirements suggested by Ranjhan (1998) for buffaloes. It has also been reported that prolonged inadequate protein intake reduced the reproductive performance of cattle (Blood and Radostitis, 2007). In case of TDN, the shortage was to the tune of 6.09 in the present study, while that of Ca was 14.02 excess and P was and 22.75 percent deficit.. In pregnant buffaloes on wheat straw based diet the DCP, TDN, Ca and P was deficit by 60.32, 38.26, 41.06 and 79.57 percent respectively (Jain *et al*, 2012).

Phosphorus deficiency was one of the main causes of infertility (Moellers and Riese, 1988) as its severe deficiency delays the onset of puberty, postpartum anoestrus and increases the incidence of cystic follicles, because of inactive ovaries, leading to moderate and low conception rates (Dixon, 1998). Thus imbalance or inadequate nutrient intake as compared to their requirement lowers the productivity among buffaloes as observed in Bichhia.

## CONCLUSION

The rations fed to lactating buffaloes, were deficit in almost all of the macro and micro nutrients and these deficiencies of nutrients may have contributed to low milk production. Therefore, an extension follow up programme for creating awareness on nutrient management of buffaloes should be started

**Table 3. Intake, requirements and deficiency / excess of nutrients in buffaloes**

| Particular | DCP(g) | TDN(kg) | Ca(g) | P(g) |
|---|---|---|---|---|
| Maintenance Requirement (for 500 kg BW) | 268.0 | 3.70 | 13.00 | 13.00 |
| Milk production Requirement (4.08 kg) | 257.04 | 1.88 | 13.46 | 10.60 |
| Total Requirement | 555.04 | 5.58 | 26.46 | 23.60 |
| Total Intake | 479.95 | 5.24 | 30.17 | 18.23 |
| Deficit/Excess | -75.09 | -0.34 | 3.71 | -5.37 |
| Deficit/Excess (%) | -13.53 | -6.09 | 14.02 | -22.75 |

by the state veterinary department in collaboration with other stake holders.

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