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Short Communication

Preliminary study on Evaluation of Effect of Lactation number on Milk yield and Milk composition in Murrah (*Bubalus bubalis*) Buffaloes

Meignanalakshmi Sundaram[1] and Gopi Harharan[2]
[1]Department of Animal Biotechnology, Madras Veterinary College, Tamilnadu Veterinary and Animal Sciences University, Vepery, Chennai, Tamilnadu., INDIA
[2]Postgraduate Research Institute in Animal Sciences, Tamilnadu Veterinary and Animal Sciences University, Kattupakkam, Kanchipuram, Tamilnadu, INDIA

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Abstract

The present study was undertaken to study the effect of lactation number on milk composition and milk yield in Murrah buffaloes. Milk samples were collected from 110 murrah buffaloes from Cattle breeding farm, Alamadi. Effects of lactation number on milk yield and milk composition were analyzed by completely random design by least square analysis. Lactation number were found to be having highly significant effect(P≤0.01) on milk fat %, protein %, total solids %, casein % and significant effect(P≤0.05) on 305 days milk yield. Third lactation was found to be superior to other lactation period in Protein %, Casein % and 305 days milk yield. First lactation was found to be superior to other lactation in milk fat % and total solid %

Keywords: Lactation number, milk yield, Murrah buffalo, milk composition, milk fat, total solids.

Introduction

Buffalo is an important dairy animal of the country. "The gross value of output of livestock sector contributes about 2.74% Tamilnadu's gross state domestic product (GSDP).The dairy sector contributed significantly to this growth. Annual milk production during 2009 – 10 was 5,778 thousand tones. As per the ICMR recommendation the per capita requirement of milk should be 250 grams/day. The per capita availability of milk in Tamilnadu is 237 grams/day. According to 18th 39 livestock census (provisional) buffaloes population is 20.09 lakhs. Buffalo comprises 15.22% of the total bovine population and 6.53% of total livestock in the state"[1].

Productivity of the dairy animal has to be increased and it is essential to understand the factors affecting milk production[2]. Muhammed Zakariyya et al[3]., reported significant correlation between length of lactation and persistency of lactation. The effects of season, year of calving and parity on lactation period, calving interval, no. of days open and dry period in Egyptian buffalo was studied by Aziz et al[4]., Aurelia coroian et al[5]., studied the somatic cell count and total number of germs from buffalo milk and reported lowest average values in first lactation and higher values in 6th lactation and also identified that seasonal variation influences somatic cell count and total number of germs.

Much work has not been done to study the effect of lactation number on milk yield and milk composition in buffaloes. The present study was undertaken to study the effect of lactation number on milk yield and milk composition in Murrah buffaloes.

Material and Methods

Milk samples of 75 ml (mid lactation milk samples) each were collected from 110 Murrah buffaloes in first, second ,third and fourth lactation period maintained at Central cattle breeding farm, Alamadi., Tamil Nadu, in clean sterile polypropylene containers. The fat % was estimated by Gerber's Butyrometer (Fucoma test), Protein % by Kjeldhals method. Casein % by Indian standards method and total solids by Gravimetric method[6]. 305 days milk yield data were collected from records.

Correlation studies and analysis of data: Effects of lactation number on milk yield and milk composition were analyzed by completely by random design by least square analysis[7]. Fat%, Protein%, casein% and Total solids% were less than 30%, so the values were converted to Arcine√p values and milk yield values were taken as such for analysis.

Results and Discussion

Fat%, protein%, Milk casein%, Total solids% and 305 days milk yield during four lactation period and least square analysis are given in table-1.

Table-1
Least square analysis of effect of lactation number on milk composition and milk yield in Murrah buffaloes

Lactation Number	Fat% Mean±SE	Protein % Mean±SE	305-d milk yield kg Mean±SE	Total solid % Mean±SE	Casein % Mean±SE
I	**15.00 ± 0.118** (6.70 ± 0.100)	**10.90 ±0.074** (3.62 ± 0.045)	**2051.42 ± 64.190**	**23.15 ± 0.115** (15.63 ± 0.078)	**9.69 ± 0.069** (2.90 ± 0.041)
II	**14.51 ± 0.141** (6.29 ± 0.120)	**11.01 ± 0.095** (3.70 ± 0.160)	**2147.33 ± 62.550**	**22.93 ± 0.053** (15.17 ± 0.057)	**9.58 ± 0.078** (2.86 ± 0.045)
III	**13.93** ± 0.118 (5.81 ± 0.096)	**11.27 ± 0.077** (3.88 ± 0.049)	**2291.48 ± 66.910**	**22.65 ± 0.078** (14.88 ± 0.096)	**10.03 ± 0.067** (3.07 ± 0.039)
IV	**14.01 ± 0.117** (5.66 ± 0.223)	**11.11 ± 0.095** (3.78 ± 0.056)	**2064.75 ± 88.590**	**22.78 ± 0.072** (14.09 ± 0.067)	**9.88 ± 0.076** (2.98 ± 0.045)
Statistical Values					
F	14.652**	3.416**	5.64*	6.955**	5.377**
SE	0.12	0.09	71.76	0.08	0.02
CD	0.45	0.24	136.34	0.29	0.08

NS: Non-significant (P > 0.05), *: Significant (P ≤ 0.05), **: Highly significant (P ≤ 0.01). Bold Numbers indicate transformed Arcine √p values. Numbers in parenthesis indicate original values.

Effect of lactation number on Milk fat %: The fat % of Murrah buffalo milk samples was found to be highly significantly (p < 0.01) affected by lactation number in the present study (table-1). First lactation mean fat % was found to be significantly superior to rest of the lactation that is second, third and fourth lactations. There was no significant difference between third and fourth lactation. Second lactation was found to be superior to third lactation; first lactation was found to be having 6.25% higher fat % than second lactation, 13.41% higher fat % than fourth lactation and 15.64% higher fat % than third lactation. Second lactation was found to be 7.63% higher fat % than fourth lactation in the present study.

Effect of lactation number on Protein %: The mean protein % in milk of Murrah buffalos was found to be highly significantly (p < 0.01) affected by lactation number in the present study (table-1). Third lactation mean protein % was found to be significantly superior to second and first lactation mean protein %. There was found to be no significant difference between third and fourth lactation. Similarly no significant difference between second and first lactation.

Effect of lactation number on 305 days milk yield: The mean 305 days milk yield of Murrah buffaloes were found to be significantly (P < 0.05) affected by lactation number in the present study (table-1). Third lactation milk yield was found to be significantly superior to second lactation, fourth and first lactation milk yield. There was found to be no significant difference between second and fourth lactation and also between fourth and first lactation. Third lactation was found to be having 6.29% higher milk yield than second, 9.89% higher milk yield than fourth and 10.48% higher milk yield than first lactation in the present study.

Effect of lactation number on Total solids %: The mean total solids % in milk of Murrah buffaloes were found to be highly significantly (P<0.01) affected by lactation number in the present study (table-1). First lactation mean total solids % was found to be significantly superior to second, third and fourth lactation. There was found to be no significant difference between second and fourth, and fourth and third lactation. First lactation mean total solids % was found to be 2.94% higher than second, 3.45% higher than fourth and 4.1% higher than third lactation in the present study.

Effect of lactation number on Casein %: The mean casein % in milk of Murrah buffaloes was found to be highly significantly (P< 0.01) affected by lactation number in the present study (table-1). Third lactation mean casein % was found to be significantly superior to fourth, first and second lactation. There was found to be no significant difference between fourth and first, first and second lactation. Third lactation mean casein % was found to be 2.93% higher than fourth lactation, 4.89% higher than first lactation, and 6.84% higher than second lactation in the present study.

Very limited numbers of reports are available on Buffalo milk samples correlation study. Mohran[8] reported that the concentrations of whey protein components were highly significantly influenced by the stage of lactation. Hagrass and EI-shabrawy[9] reported no significant differences in the whey protein fractions content as affected by the stage of lactation. No

report was available on effect of lactation number on milk composition and milk yield in Murrah buffaloes.

Conclusion

In Murrah buffaloes lactation number was found to be having significant effect on milk yield and milk composition. Third lactation was found to be superior to other lactation period in Protein %, Casein % and 305 days milk yield. First lactation was found to be superior to other lactation periods in milk fat % and total solid %.

References

1. Policy Note, Department of Animal husbandry, Govt of Tamilnadu, **(2012)**

2. Afzal M., Anwar M. and Mirza M.A., Some factors affecting milk yield and lactation length in nili ravi buffaloes, *Pakistan Vet. J.,* **27**, 113-117 **(2007)**

3. Muhammad Zakariyya M.E., Babar and Yaqoob M., Environmental factors affecting persistency of lactation and peak milk yield in nili-ravi, buffaloes, *Pak. J. Agri. Sci.,* **32**, 251-255 **(1995)**

4. Aziz M.A., Schoeman S.J., Jordaan G.F., El-Chafie O.F. and Mahdy A.T., Genetic and phenotypic variation of some reproductive traits in Egyptian buffalo, *S Afr J Anim. Sci.,* **31**, 195-198 **(2001)**

5. Aurelia Coroian Cristian O., Coroian O., Monica Trif., Vioara Mire., Camelia Răducu and Daniel Cocan., Evaluation of buffalo milk depending on the content of somatic cells and the total number of germs, *ABAH Bioflux.,* **4**, 54-57 *(***2012)**

6. IS: 1479 (Part II), Review Indian standard methods of test for Dairy Industry. Indian Standards Institution, New Delhi, 2 **(1961)**

7. Snedecor G.W. and Cochram W.G., *Statistical Methods*, 7th ed. The Iowa State University Press, Ames, Iowa, USA, 593 **(1961)**

8. Mohran M.A., Effect of stage of lactation on whey proteins of buffalo's milk, *Egyptian J. Dairy Sci.,* **19**, 77-82 *(***1991)**

9. Hagrass A.E. and El-Shabrawy S.A., Effect of stage of lactation on the protein fractions of abnormal buffalo's milk, *Egyptian J. Dairy Sci.,* **7**, 149-153 *(***1979)**