

Analysis of Milk Production Parameters of Crossbred Murrah Buffaloes in a Large-scale Buffalo Farm in Southern Sri Lanka

CJ Gajaweera¹, HDA Wimalaratne¹, JJWK Gamage² and IN Pathirana^{1*}

¹Department of Animal Science, University of Ruhuna, Kamburupitiya

²Government Veterinary Surgeon's Office, Akuressa, Sri Lanka

Abstract

Buffaloes are the second largest source of milk supply in Sri Lanka; however, studies have reported that buffalo farming operates below its potential. It is worth analyzing the status of buffalo production in regular time intervals. The objective was to analyze some selected milk production parameters of a large-scale buffalo farm in the Southern Province of Sri Lanka, based on the farm records. Records of 130 crossbred Murrah buffaloes during the period of 2006-2013 were used. The following production parameters were calculated for the first five lactations, i) average milk yield per cow per day (MYD) ii) average milk yield per cow per lactation (MYL) iii) average lactation length (LL) iv) average length of the dry period (LD). The lowest and the highest values obtained for first five lactations, and the overall average for each parameter were i) MYD (liters): 2.84±0.07, 3.74±0.12 and 3.21±0.07 ii) MYL (liters): 654.00±78.36, 960.78±79.23 and 814.29±27.19 iii) LL (days): 197.29±26.77, 285.97±17.29 and 262.11±7.57 vi) LD (days): 154.80±19.75, 237.01±17.89 and 215.96±11.56, respectively. The individual lactation (1st to 5th lactations) curves and the curve for overall average revealed that the maximum yield was obtained during 3rd to 5th month of the lactation and that it decreased gradually, thereafter. In conclusion, the milk production parameters obtained from Murrah crossbred buffaloes were found to be suboptimal during the studied period. Arriving at peak milk production was delayed for one to three months in first five lactations. It is highly probable that suboptimal productivity is due to poor nutrition of the animals led by non-availability of quality roughages throughout the year.

Key words: Crossbred Murrah buffalo, Dry period, Lactation, Milk production parameters, Yield

***Corresponding author:** indunilvet@ansci.ruh.ac.lk

Introduction

The buffalo (*Bubalus bubalis*) is originated in Asia and Africa and domesticated about 5000 years ago in Indus Valley. The domestic water buffalo has an important role in providing milk, meat and draught power. Buffaloes are the second largest source of milk supply in Sri Lanka, as 375,562 of buffaloes produce 18% of the total milk production in 2014 (Livestock Statistical Bulletin, 2014). Although buffalo can adapt to harsh environments and live on low quality forage, their production efficiency is often compromised by such conditions.

Poor nutrition, usually related to seasonal fluctuations in availability and quality of feed reduces their productivity (Perera, 1999). Furthermore, their performance is generally lower in tropics than in more temperate zones. Therefore, it is important to assess the level of productivity in buffaloes in regular time intervals to identify possible remedial measures.

The objective was to analyze some selected milk production parameters based on the farm records available from 2006 to 2013 at a large-scale buffalo farm in the Southern Province of Sri Lanka.

Materials and methods

Records of 130 cross bred Murrah buffaloes from 2006-2013 were used in the analysis. Short records with less than 180 days were omitted for yield and lactation analyses. These short records were due to calf mortality, diseases or culling of animals. Information was collected to calculate following production parameters for first five lactations, i) average milk yield per cow per day (MYD) ii) average milk yield per cow per lactation (MYL), iv) average lactation length (LL), v) average length of the dry period (LD). Data analysis was done by using Microsoft Excel.

Results and Discussion

The average milk yield per cow per day (MYD; liters) ranged from 2.84±0.07 to 3.74±0.12 and overall average for first five lactations was 3.21±0.07 (Table 1). The average milk yield per cow per lactation (MYL; liters) ranged from 654.00±78.36 to 960.78±79.23 and overall average for first five lactations was 814.29±27.19 (Table 1). Using Murrah crossbred animals in a large scale buffalo farm located in Kurunegala District, a similar study has shown a better productivity compared with the present study (Christa Charlini and Sinniah, 2015). The availability and quality of feed resources could be markedly low in the farm used for the present

study, as it is located semi-arid zone of Sri Lanka. This could have been the main reason for the low level of milk production which operates far below its potential. The average lactation length (LL; days) ranged from 197.29 ± 26.77 to 285.97 ± 17.29 and overall average for first five lactations was 262.11 ± 7.57 (Table 1). The LL was markedly low in 5th lactation compared to other four lactations. The average length of the dry period (LD; days) ranged from 154.80 ± 19.75 to 237.01 ± 17.89 and overall average for first five lactations was 215.96 ± 11.56 (Table 1). Though the LL of the present study is comparable to the study conducted in Kurunegala District by Christa Charlini and Sinniah (2015), LD was remarkably higher in the present study compared with the above study. This shorter LL has been influenced by longer LD. It is highly probable that poor nutrition-induced reproductive problems have influenced the lengthened LD in buffaloes.

Monthly changes in average milk yield per day per buffalo cow provide valuable information about the pattern of milk production in a given

lactation. It depends on the number of mammary epithelial cells and their secretory activity (Capuco *et al.*, 2003). The individual lactation curves (1st to 5th lactations) and the curve for overall average revealed that maximum yield was obtained during 3rd to 5th month of the lactation and thereafter it was decreased gradually (Figure 1).

The peak production in all five lactations seem to be delayed (3rd to 5th month of the lactation) compared with the usual peak (2nd to 3rd month of the lactation) in buffaloes (Komori, 1994; Sahoo *et al.*, 2014). The low productivity resulted from poor nutrition has possibly delayed peak milk production. From 2nd to 6th month, the average daily milk production was low in the first lactation compared with other four lactations.

Conclusions

The milk production parameters obtained from Murrah crossbred buffaloes were found to be suboptimal during the studied period. Arriving

Table 1: Milk production attributes for first five lactations in crossbred Murrah buffaloes

	Lactation					Overall Average
	First	Second	Third	Fourth	Fifth	
MYD	2.84 ± 0.07	3.74 ± 0.12	3.38 ± 0.13	2.91 ± 0.10	3.41 ± 0.28	3.21 ± 0.07
MYL	794.14 ± 40.48	814.77 ± 53.92	960.78 ± 79.23	769.02 ± 74.91	654.00 ± 78.36	814.29 ± 27.19
LL	283.35 ± 11.69	236.37 ± 15.18	285.97 ± 17.29	242.41 ± 19.40	197.29 ± 26.77	262.11 ± 7.57
LD	237.01 ± 17.89	199.83 ± 23.01	206.96 ± 30.67	154.80 ± 19.75	196.67 ± 52.01	215.96 ± 11.56

MYD, average milk yield per cow per day; MYL, average milk yield per cow per lactation; LL, average lactation length; LD, average length of the dry period

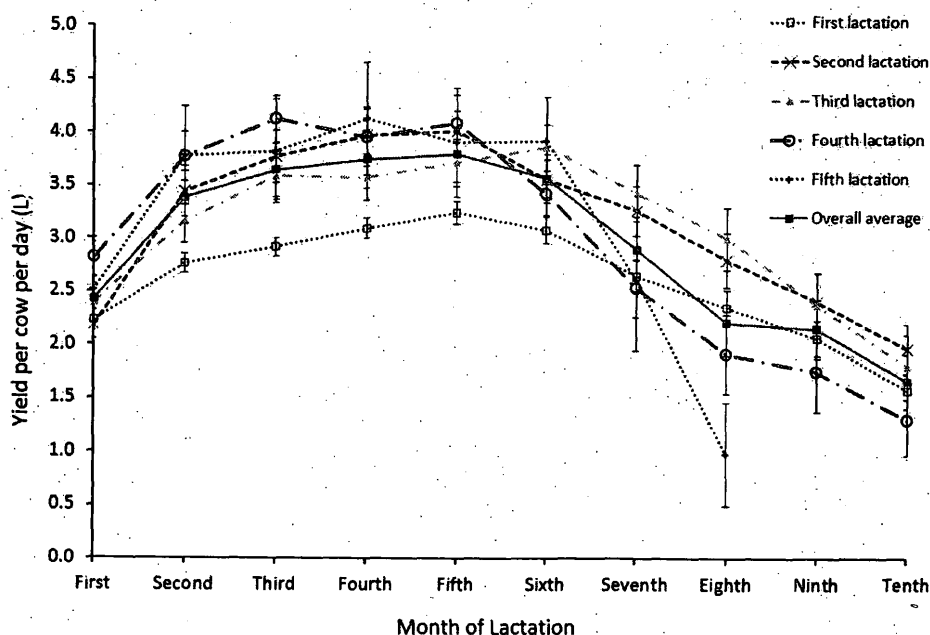


Figure 1: Monthly dynamics in average milk yield per day per buffalo cow (\pm SEM) at different lactations in crossbred Murrah buffaloes

at peak milk production was delayed for one to three months in first five lactations. It is highly probable that suboptimal productivity is due to poor nutrition of the animals, led by non-availability of quality roughages throughout the year.

Acknowledgement

This study was supported by Faculty Research Grants (to CJG and INP) from the Faculty of Agriculture, University of Ruhuna, awarded in 2012 and 2013.

References

Capuco AV, Ellis SE, Hale SA, Long E, Erdman RA, Zhao X and PaapeMJ 2003 Lactation persistency: Insights from mammary cell proliferation studies. *J Anim. Sci.* 81: 18-31.

Christa Charlini B and Sinniah J 2015 Performance of Murrah, Surti, Nili-Ravi buffaloes and their crosses in the intermediate zone of Sri Lanka. *Livestock Research for Rural Development*.27: Article #47. <http://www.lrrd.org/lrrd27/3/char27047.html>

Livestock Statistical Bulletin 2014 Division of Livestock Planning and Economics, Department of Animal Production and Health, Sri Lanka.

Komori M, Perera ERK, Perera ANF and Rajaguru ASB 1994 Productive and reproductive performances of Nili-Ravi buffaloes in Sri Lanka. *Journal of National Science Council Sri Lanka* 22: 201-211.

Perera BMO 1999 Reproduction in water buffalo: comparative aspects and implications for management. *J. Reprod. Fert.*54:157-168.

Sahoo SK, Singh A, Shivahre PR, Singh M, Dash S and Dash SK 2014 Prediction of fortnightly test-day milk yields using four different lactation curve models in Indian Murrah Buffalo. *Adv. Anim. Vet. Sci.* 2: 647-651.