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Original Research Article

Influences of Various Environmental Factors on Test Day Milk Yield in Murrah Buffaloes

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Keywords

Non-genetic factors, Murrah buffalo, Four weekly test day milk yields, Peak yield

A B S T R A C T

The aim of present study was to find out the effect of various non-genetic factors on four weekly test day yield (WTDY), 305 days or less lactational milk yield (305MY) and peak yield (PY) in Murrah buffaloes. The data on 172 WTDY records of Murrah buffaloes calved from 2002 – 2011, collected from the dairy farm of NDUAT, Kumarganj, Faizabad Uttar Pradesh. To study the effect of non-genetic factors on WTDY, 305MY and PY, fixed model, least square maximal likelihood analysis was used for the analysis of data. The least square means for 305MY and PY were found to be 1931.37 ± 30.52 Kg and 11.15 ± 0.33 Kg respectively. The least square means of overall WTDY ranged from 3.37 ± 0.12 Kg (WTDY-11) in 40th week test day to 9.11 ± 0.15 Kg (WTDY-3) in 8th week test day. Analysis of variance showed that the difference were statistically significant ($P<0.05$) for the effect of season on 305MY and PY. The effect of period was significant ($P<0.05$) and PY and highly significant ($P<0.01$) on 305MY. The effect of lactation was significant ($P<0.01$) on 305MY.

Introduction

Dairying has become an important secondary source of income for millions of rural families and has assumed a most important role in providing employment and income generating opportunity. Now a days many countries adopts test day milk yields records in genetic genetic evaluation in place of 305 days or less lactational milk yield (305MY) and Total lactational milk yield of dairy animals. Presently India is the largest milk producing (approx 155.5 million tons) country (DAHD 2016). In Indian Dairying buffaloes play a vital role contributing about 51% of total milk produce in country. Murrah is the best buffalo breed with superior genetic potential for milk production. The total lactational milk yield is an old form of record keeping. The test day milk yield recording is an alternative and new form of record keeping, which is an economic and time saving proposition in field condition. Various advantages of using test day milk yield records are individual test day effect, more number of records per animal. The interval between records can be used for reducing generation interval, better adjustment of non genetic factors influencing the milk yield resulting to more accurate genetic evaluation of dairy animals. Although test day milk

yield records give greater advantage as compare to 305 days lactational milk yield in selection schemes. The present study was undertaken with the aim to study the influences various non genetic factors on four weekly test day, 305 days or less lactational milk yield (305MY) and peak yields (PY).

Materials and Methods

The data of 172 four weekly test day milk yield (WTDY) records were collected from individual buffalo history sheets and daily milk records registers of Murrah buffaloes calved during 2002 – 2011 at the dairy farm of NDUAT, Kumarganj, Faizabad Uttar Pradesh. The data were associated with the traits as WTDY, 305MY and PY. The abnormal data associated with culling in middle of lactation, abortion, still birth and the lactation records less than 280 days and less than 500 Kg of lactational milk yield were not included in present investigation. The whole data were classified into different seasons of calving, periods, and parities. Collected data were classified in Five periods [1st (2002-2003), 2nd (2004-2005), 3rd (2006-2007) 4th (2008-2009) and 5th (2010-2011)]; Four seasons [Rainy (July-September), Autumn (October-November), Winter (December-February) and Summer (March-June))]; Five group in parities [1st (1st parity), 2nd (2nd parity), 3rd (3rd parity), 4th (4th parity) and 5th (5th above parity)] in order to examine the effect of various non-genetic factors on traits as WTDY, 305MY and PY. Fixed model least square procedure (Harvey 1990) was used to analyzed the data using following model-

$$y_{ijkl} = \mu + s_i + p_j + l_k + e_{ijkl}$$

Where y_{ijkl} = WTDY, 305MY and PYof buffaloes calved in ith season of jth period under kth parity.

μ = Overall mean
s_i = Effect of ith season of calving (i = 1, 2, 3 & 4)
p_j = Effect of jth period of calving (j = 1, 2, 3, 4 & 5)
l_k = Effect of kth order of parity (k = 1, 2, 3, 4 & 5)
e_{ijkl} = Random error associated with y^{th}_{ijkl} observation, assumed to be NID (0, σ^2_e)
DMRT test as modified by Kramer (1957) was used for testing of differences among least square means.

Results and Discussion

The least square means along with their standard error (SE) for WTDY, 305MY and PY are presented in table: 1. The least square means for WTDY were ranged from 3.37 ± 0.12 Kg (WTDY-11) in 40th week test day to 9.11 ± 0.15 Kg (WTDY-3) in 8th week test day. In general the WTDY increased till 8th week test day and there after gradually decreases till the end of lactation, also observed that in latter stage of lactation, the CV% of WTDY was increased. The similar finding of highest 2nd month test day yield were observed in different cattle breed by Rekaya *et al.* (1991), Ilatisha *et al.* (2007), Bilal *et al.* (2008), Kokate (2009) and Monalisha *et al.* (2010), Sahoo *et al.* (2014). The least square means for 305DY and PY were observed that 1931.37 ± 30.52 Kg and 11.15 ± 0.33 Kg respectively. Sahoo *et al.* (2014) also observed 305 MY as 1853.49 ± 15.88 Kg ,Chakraborty *et al.* (2010) also reported the average 305MY1818.06 ± 22.46 Kg in Murrah buffaloes.

Effect of non genetic factors

The least square analysis of variance revealed that the effect of season of calving was significant (P<0.05) in 8th, 12th, 16th, 20th, 28th and 40th weak test day yield and

non-significant in 1st, 4th and 32th weak (table: 2). Rose (2008), Zafer *et al.* (2008), Kokate (2009), Rashia (2010) and Sahoo et al. (2014) reported significant effect. While Chakraborty *et al.* (2010) reported non-significant effect of season of calving on monthly test day yields in Murrah buffalo. Season of calving was on 305MY and PY. Similar results were found by Sahoo *et al.* (2014) and Verma *et al.* (2016).

Table.1 Least squares means of different WTDY, 305MY and PY (in Kg)

Traits	Mean	SE	CV%
WTDY-1	6.31	0.13	25.22
WTDY-2	8.87	0.16	21.43
WTDY-3	9.11	0.15	20.85
WTDY-4	8.97	0.15	20.84
WTDY-5	6.78	0.14	26.84
WTDY-6	6.53	0.14	26.15
WTDY-7	5.92	0.13	25.85
WTDY-8	5.06	0.12	29.09
WTDY-9	4.72	0.14	36.03
WTDY-10	4.12	0.12	35.25
WTDY-11	3.73	0.12	42.40
305MY	1931.37	30.52	19.22
PY	11.15	0.33	35.34

WTDY= four weekly test day milk yield, 305MY= 305 days lactational yield, PY= Peak yield

Table.2 Fixed model ANOVA showing mean sum of squares for factors affecting WTDY, 305MY and PY

Traits	Season	Period	Lactation	Error
DOF	3	4	4	160
WTDY-1	4.88^{NS}	11.03^{**}	35.40^{**}	2.51
WTDY-2	6.88^{NS}	23.77^{**}	48.66^{**}	3.50
WTDY-3	8.08^{*}	16.59^{**}	43.20^{**}	3.52
WTDY-4	8.89^{*}	15.06^{**}	21.27^{**}	3.44
WTDY-5	6.47^{*}	17.81^{**}	19.65^{**}	3.23
WTDY-6	6.09^{*}	17.31^{**}	13.48^{**}	2.86
WTDY-7	6.78^{*}	14.26^{**}	11.24^{**}	2.32
WTDY-8	5.70^{*}	7.46^{**}	3.51^{NS}	2.21
WTDY-9	3.90^{NS}	5.71^{*}	2.67^{NS}	2.89
WTDY-10	1.08^{NS}	2.24^{NS}	3.36^{NS}	2.06
WTDY-11	2.32^{*}	2.44^{NS}	3.98^{NS}	2.01
305MY	253149.07^{*}	673898.27^{**}	1292941.38^{**}	135249.37
PY	37.68^{*}	32.20^{*}	6.92^{NS}	15.72

*= $p \leq 0.05$, ** = $p \leq 0.01$, NS = non significant

Highly significant effect (P<0.01) of period of calving was observed on 305MY and all the WTDY except on 36th and 40th week test day yield, and significant effect on (P<0.05) on PY. Similar finding of period were reported by Machado *et al.* (1997), Rose (2008), Rana (2008) , Kumar *et al.* (2012), Chakraborty *et al.* (2010) and Sahoo *et al.* (2014) on the monthly test day yield in Murrah Buffaloes.

The effect of parity on 305MY and WTDY till 24th week and non-significant effect of parity on afterword WTDY and on PY. Similar significant effect of parity was reported by Sarkar *et al.* (2006) and Verma *et al.* (2016) on 305MY.

In conclusion, our study showed that the effect of season of calving was 305MY, PY and middle lactation four weekly test day yield. Period have significant effect on 305MY, PY and almost all four weekly test day yield. Effect of lactation order have significant on 305MYand upto middle of lactation length test day yield. The estimate of test day yield are significant in middle order of lactation with select suggesting that these test day yield could be used as the selection criteria for early evaluation and selection of animals.

References

Bilal, G., Khan, M. S. Bajwa, I. R. and Shafiq, M. 2008. Genetic control of test-day milk yield in Sahiwal cattle. Pakiatan Vet. J., 28(1): 21-24.

Chakraborty, D., Dhaka, S.S., Pander, B.L., Yadav, A.S., Singh, S. and Malik, P.K. (2010) Prediction of lactation milk yield from test day records in Murrah buffaloes. *Indian J. Anim. Sci.*, 80(3): 244-245.

DAHD. (2016). Annual Report 2016-17, Available from: www.dahd.nic.in/sites/default/files/Annual%20Report%202016-17. Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture & Farmer's Welfare, GOI.

Harvey, W.R. (1990). Guide for LSMLMW, PC-1 Version, mixed model least squares and maximum likelihood computer programme, January 1990. Mimeograph Ohio State Univ., USA.

Ilatsia, E. D., Muasya, T. K., Muhuyi, W. B. and Khai, A. K. 2007. Genetic and phenotypic parameters and annual trends for milk production and fertility traits of the Sahiwal cattle in semi arid Kenya. Trop. Anim. Heslth Prod., 39: 37-48

Kokate, L. 2009. Genetic evalution of Karan Fries sires based on test-day milk yield records. M.V.Sc. Thesis, NDRI (Deemed University), Karnal , India.

Kramer, C.R. (1957) Extension of multiple range tests to group correlated means. *Biometrics*, 13: 13-18

Kumar, A., Gupta, J.P., Kaswan, S. and Lathwal, S.S. (2012) Non-genetic factors influencing monthly test day milk yield records in Murrah buffaloes. *Indian J. Field Vet.*, 8(1): 41-43.

Machado, S. G. Freitas M. A. and Gadini, C. H. 1997. Factors affecting first lactation test day milk yield in Holstein cattle. Genetic and Mole. Bio., 2 (3): 383-386.

Monalisha, D., Gandhi, R. S., Raja T. V., Avtar Singh and Sachdeva, G. K. 2010. Influence of certain non-genetic factors on test day milk records in Sahiwal cattle. Indian j. Dairy Sci., 63 (6): 504-506.

Rana, J.S. (2008) Genetic evaluation of Murrah buffalo sires based on part lactation and test day milk yield records. Ph.D. Thesis Submitted to

CH. Charan Singh University, Meerut (UP).

Rashia Banu N. 2010. Genetic evaluation of the lactation curve in Karan Fries cattle. Ph. D. Thesis, NDRI, Ksarnal, India.

Rekaya. R., Bejar, F., Carabano, M. J., Alenda, R., 1995. Genetic parameters for test day measurements in Spanish Holstein Friesan, Proc. INterbull Meeting, Prague, Bulletin No. 11: Pp. 8.

Rose, K. 2008. Studies on lactation curve parameters for milk yield in Karan Fries animals. M. V. Sc. Thesis, NDRI, Karnal, India.

Sahoo SK, Singh A, Gupta AK, Chakravarty AK, Singh M, Ambhore GS. 2014. Estimation of genetic parameters of weekly test-day milk yields and first lactation 305-day milk yield in Murrah buffaloes. *Veterinary World* 7(12): 1094-1098.

Sarkar, U., Gupta, A.K., Mohanty, T.K., Raina, V.S. and Prasad, S. (2006). Genetic and non-genetic factors affecting milk yield and milk constituents in Murrah buffaloes. *J. Dairying, Foods & H.S.* 25 (2) : 125-128.

Verma, M. K. Sachdeva, G. K., Yadav, A. K., Gautam, S., Ali, M. M. and Bindal, S. 2016. Effect of genetic and non-genetic factors on milk yield and milk constituents on Sahiwal cattle. Indian J. Anim. Res., 50(5): 808-810.

Zafar, A. H., Ahmad, M. and Rehman, S. U. 2008. Study of some performance traits in Sahiwal cows during different periods. Pakistan Vet. J. 28: 84-88.