



Effect of temperament on production, reproduction and milking behaviour of Vrindavani cows in an organized herd

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Temperament, an important contribution to the domestication process of livestock, can be defined as the type and level of reaction of an animal to external stimulations. It is the outcome of an interaction between heredity and the life history of the animal (Phillips 2002). Evaluating temperament can be useful for security of the farmers, who are more likely to work under safe conditions, and handling of animals as it has direct relationship with various production and reproduction abilities (Breuer *et al.* 2003). The temperament of the mother after calving and during suckling suggested to influence the anabolic process and neonatal growth (Lupoli *et al.* 2001). Temperament of dairy animals plays an important role in their management and welfare implications, since calmer animals are likely to less stress and less prone to injury than vicious animals during handling and restraint. Therefore, the present investigation was taken to study the temperament score and its relation with various production and reproduction parameters in Vrindavani cows.

Vrindavani cows (81) (parity order from first to fifth lactation with average milk production of 3,450 kg/lactation) was selected randomly from the dairy farm, maintained at LPM section, ICAR-IVRI, Izatnagar and observed till 120th day of their lactation. The animals were maintained under loose housing system. Feeding schedule was laid down according to the age group, considering the requirements for maintenance, growth and production. Adult animals were provided with green and dry fodders *ad lib.* at their shed, whereas concentrate were provided (based on milk yield) at the time of milking. There was no change in feeding schedule during the experiment period. Milking was done twice/thrice by either full hand milking or machine milking, depending on their production status. Cows producing milk more than 10 kg were milked thrice, otherwise twice daily. Further, milk yields were recorded after every milking. Breeding of animals was done after

proper detection of heat by teaser bull. Artificial inseminations were followed with the frozen semen, according to the breeding plan of the farm.

The milking temperament in lactating Vrindavani cows was observed as per Tulloh (1961). Animals were observed for temperament score during morning and evening milking time. Experimental animals were categorized on their milking temperament, as there was no animal found in nervous and aggressive category. Further, docile and slightly restless animals were merged and placed into single category i.e. docile category with a score of up to 2 (group 1). The second category of animals was of restless animals with score of more than 2 (group 2).

Milk let-down time was calculated as the duration (sec) between touching the udder and the complete let-down of milk. It was determined by observing the following phenomenon: when teats are engorged with milk; the teat looked glossy, lubricating and waxy; good flow of milk should come out after pressing the teat. Total milking time (TMT) was duration in hand milking time plus routine time required for cleaning of udder, attachment and detachment of teat cups. Total milk yield per milking (TMY/milking), the yield (kg) was recorded at each milking. Total milk yield at 120 days for both morning (MYM) and evening (MYE) milking was recorded. Average milk flow rate (MFR) was calculated by dividing milk yield / milking (g) with total milking time (minute). Physical parameters of the cows, viz. wither height, heart girth, hook height, abdominal girth, inter-costal space, tail thickness and ratio of body weight to wither height were measured as per Sarkar *et al.* (2007). The production and reproduction parameters, viz. peak milk yield (kg), days to attain peak, service period (days) and number of services per conception were recorded at fortnightly interval. The collected data were analyzed using Duncan's Multiple Range Test (Snedecor and Cochran 1994).

Docile temperament was observed in 74.10 % cows (60) and remaining 25.90 % of cows (21) showed restless temperament. The mean temperament score was 1.92 ± 0.03 and 2.27 ± 0.04 for groups 1 and 2 animals, respectively, which differed significantly ($P < 0.05$). The mean body condition score were 2.81 ± 0.07 and 2.82 ± 0.12 , respectively,

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in groups 1 and 2 cows which were not significantly different (Rao *et al.* 2002).

The least squares means (cm) of wither height, hook height, intercostal space, abdominal girth, heart girth, tail thickness and ratio of body weight to wither height for cows in group 1 were 124.62±0.72, 123.10±2.16, 5.44±0.08, 195.84±3.54, 174.64±1.33, 18.97±0.17 and 3.16±0.05, respectively. Cows in group 2 had slightly higher least square means (cm) of 125.36±1.07, 129.36±3.2, 5.59±0.12, 204.52±5.24, 173.91±1.97, 19.06±0.26 and 3.13±0.08, respectively, for the above parameters. The least squares means significantly ($P<0.05$) differed for heart girth and ratio of body weight to wither height in 2 temperament groups (Kayastha *et al.* 2011).

The least squares means of peak milk yield were 18.56±0.85 and 19.31±1.25 kg for groups 1 and 2, respectively. Although, peak yield was more in restless group animals but there was no significant difference between these temperament groups. Days to attain peak milk yield was 46.94±4.25 and 52.77±6.29 days for groups 1 and 2, respectively. Cows having restless temperament took 6 more days to attain the peak milk yield but there was no significant difference between these temperament groups. Milk yield at morning milking was 958.02±49.16 and 982.53±72.80 kg for groups 1 and 2, respectively. It was 390.86±16.52 and 403.77±24.46 kg at the evening milking for groups 1 and 2, respectively. At both milking time, temperament of the animal did not affect the milk yield significantly ($P<0.05$). While, others (Nema *et al.* 1999, Ramasamy and Singh 2004, Sewalem *et al.* 2011) found that animals having lower temperament score yielded more milk, which might be due to proper hormonal homeostasis with let-down of milk in relation to temperament. The least squares means for total milk yield was 1659.18±83.58 and 1688.59±123.76 kg for groups 1 and 2, respectively, which were not differing significantly in 2 temperament groups. In temperament group 2, milk yield was more than temperament group 1, which was in contrary to findings of others (Nema *et al.* 1999, Ramasamy and Singh 2004). The least squares means for days to observe first heat after parturition were 84.29±6.98 and 98.64±10.34 days for temperament groups of 1 and 2, respectively, but there was no significant difference between these 2 temperament groups. The post-partum heat in cows was higher in group 2 than 1.

The least squares means of milk let-down time were 16.74±1.42 and 18.41±2.11 sec in the morning milking, whereas 15.90±1.43 and 18.03±2.12 sec in the evening milking for groups 1 and 2, respectively. At both milking time, milk let-down time was less in temperament group 1 but did not differ significantly with each other. Similar to the present finding, Nema *et al.* (1999) found that animals having low temperament score had lesser milk let-down time. But, Ramasamy and Singh (2004) found that a decrease in milking temperament score increased the milk let-down time in buffaloes. The least square means for total milking time were 6.25±0.33 and 6.74±0.48 min during

morning milking, whereas 5.56±0.25 and 6.02±0.37 min during evening milking for temperament groups of 1 and 2, respectively. There was no significant difference between temperament groups for total milking time. However, total milking time was lesser in docile animals than restless animals. Further, total milking time at morning was more than evening milking due to more milk production over night duration. The least square mean for average milk flow rate was 1348.59±91.18 and 1343.80±136.03 g/min during morning milking whereas, 594.94±27.47 and 573.51±40.68 g/ min during evening milking for temperament groups of 1 and 2, respectively. Although at both milking occasion average milk flow rate was higher at temperament group 1, however, there was no significant difference between temperament groups. The present findings are in agreement with findings of Abe *et al.* (2002) who reported that milk yield and production traits are greatly affected by temperament of dairy animals. This was in contrary to Pramanik (2000), who found significant difference between the different temperament animals, which might be due to variation in milk yield and let-down time. As most of the animals were milked 3 times a day, the time interval between successive milking of noon and evening was less which accounted for less milk production at the evening milking hours (Nema *et al.* 1999).

SUMMARY

The present investigation was taken to study the temperament score and its relation with various production and reproduction parameters in Vrindavani cows. Docile temperament was observed in 74.10% of the cows and restless temperament in 25.90%. The mean temperament scores were 1.92±0.03 and 2.27±0.04 for docile and restless animals, respectively. The least squares means significantly differed for heart girth and ratio of body weight to wither height in two temperament groups. However, the temperament score of cows had no significant effect on most of the production and reproduction traits, but the milking behavior traits were better for less temperament scored animals than higher one. Evaluating temperament score could be quite useful tool to the farmers as well as dairy producers in view of selection and management of dairy cattle for better productivity and profitability.

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