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Effect of temperament on let-down time, milking time, milk yield and milk flow rate in different months in Gir Cows

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Abstract

The aim of the study was to investigate the effect of temperament on let-down time, milking time, milk yield and milk flow rate in different months in Gir cows. The experiment was conducted on 32 milking Gir cows which were divided into four equal groups on the basis of their parity. The cows were selected on the basis of 15 days to 2 months after calving before starting the experiment. Milk let down time was recorded lowest for docile groups of animals (0.76 ± 0.03 min) followed by restless (0.88 ± 0.05 min), nervous (1.05 ± 0.06 min) and aggressive (1.11 ± 0.6 min) animals. The overall average let down time was recorded to 0.87 ± 0.02 min. Milking time was recorded to be lowest (2.69 ± 0.03 min) in docile animals followed by restless (2.96 ± 0.04 min), nervous (2.99 ± 0.06 min) and aggressive (3.12 ± 0.06 min) animals. The overall average milking time was recorded to be 2.84 ± 0.02 min. Milk yield was recorded maximum in docile animals (3.07 ± 0.05 kg) followed by restless (2.76 ± 0.07 kg), nervous (2.51 ± 0.09 kg) and aggressive (2.32 ± 0.09 kg) animals. The overall average milk yield was recorded to be 2.82 ± 0.03 kg.

Keywords: Gir, let down, milking time, milk yield, temperament

Introduction

Preparing the cow for milking is an important task for dairymen for harvesting clean and maximum milk in optimum time with a minimum disturbance to the animals. Hand or machine milking is a mechanical operation. It requires a full co-operation of the milch animals. Some cows have dispositions which require cautious management in order to obtain a normal flow of milk. The study on the dairy temperament was initiated by ^[1] and also carried out by ^[2, 3]. Observed that the social dominance order largely dependent on age, weight and productivity of animals. The rate of milk flow has hereditary basis, selection for this trait may be suggested as a mean to reduce the milking labour ^[4]. Time for evacuation of udder's contents is a direct function of the quantity contained and the rate of evacuation. Thus, the rate of milk flow is the critical parameter affecting variation in milking time among cows.

Thus, it is generally considered that efficient milking method, can save milking time, maintains lactation at higher level and lowers the incidence of mastitis. The cows may be fed well and treated as she should be, but unless she is properly milked, she will not produce its maximum, consequently resulting in lower milk yield and reduced profits. Thus, milking requires a relatively more skilled labour as compared with the other operations to be performed by a labour on dairy farm. Milk production contributes 80-85 per cent of income on a dairy farm. Hence, if the milk is not removed efficiently, there will be a setback to the synthesis of milk in the udder. As a whole the temperament of cow plays a vital role in its milking efficiency.

Materials and Methods

The present experiment was conducted at Kasturba Gandhi National Memorial Trust, Dairy Farm, Kasturba Gram, Indore (M.P.). The district comes under Malwa plateau and enjoys sub-tropical, semi-arid climate having temperature of 4 °C and 21 °C as minimum and 29 °C and 43 °C as maximum in winter and summer season respectively and is situated at 553 meters above the Mean Sea Level. January month remains coldest month while the temperature attains the peak towards the end of May. The average annual rainfall of the area is 952.2 mm.

Maximum part of annual rainfall is received during mid-June to mid-September, winter rains are occasional and uncertain and South West monsoon is responsible for major part of precipitation. Its geographical coordinates are 22° 49' 0" North, 75° 56' 0" East. The area comes under semi-arid tropical climate.

Management of Animals

The experiment was conducted on 32 milking Gir cows which were divided into four equal groups on the basis of their parity. The cows were selected on the basis of 15 days to 2 months after calving before starting the experiment. During the experimental period the cows were subjected to uniform routine feeding and management practices followed at the farm. The cows were milked in 27 m x 10 m, East-West directional milking shed having a R.C.C floor. Remaining area of the farm is open and partially covered with shady trees, surrounded by wire fencing. The centrally located parlour is built on conventional housing pattern with tail to tail type arrangement. The parlour has a cemented sheet roof at the height of 3 meter above the floor at borders. Remaining area of the parlour is open and surrounded by brick wall of 1.5 m height. To study the milking temperament in Gir cows, the data were collected on two consecutive days in a week (Tuesday and Wednesday), both during morning and evening milking. The experiment was started on first July (Tuesday), 2008 and completed on last week of 24th September (Wednesday) 2008. Thus, the experiment was conducted for about three months (13 weeks).

Let Down Time

Milk is secreted in the udder of the cow continuously but the rate of its secretion changing during the course of the day. The most distinctive feature of milk let down is the fact that the outflow of milk from the alveoli during milking is strictly time

bound. The let-down time was taken as time interval from touching of teat by a calf to the first drop of milk drawn in the pail. Time was measured in minutes by using stop watch.

Milking Time

One of the important factors that make dairy industry profitable is realizing maximum efficiency in the milk yield/cow/day in productive life with minimum time required for milking. Milking time is an important economic trait because labour for milk harvesting may account for as much as 30% of annual milking costs. The milking time was measured as the time interval from starting of milking to end of milking (last drop of milk) and was measured in minutes.

Milk Yield

Milk producing ability is the main consideration for selecting the dairy cattle. The importance of all other characters is in proportion to their influence on the milk production. After end of milking, the total milk produced by the cow per milking was weighed in kilogram.

Milk Flow Rate

Time for evacuation of the udder's content is a direct function of the quantity contained and the rate of evacuation. Thus, the rate of milk flow is the critical parameter affecting variation in milking time amongst cows. This was obtained by dividing total milk yield (Kg) by total milking time (Minutes) per cow and is recorded in Kg/minute.

Temperament

Before and during milking, the temperament of cows was recorded according to score card developed by [5] presented in Table 1.

Table 1: Score card for temperament

Temperament score	Temperament	Description
1	Docile	The cows which stand quietly at feeding and milking rarely move except to raise or lower their heads. Do not give any trouble. Extremely docile during milking preparations. The ideal milker and generally unaffected by the whole procedure.
2	Restless	The cows which move almost continuously pulling and pushing at feeding and disturbing the side animals. Flick tail, frequently snort. May lift feet during preparation for milking but do not kick, may be stubborn.
3.	Nervous	Appear very restless during preparation, milking and at feeding. Generally quiver when hand is placed on their back. Defecate on feeds and fodder. Flick tail frequently and kick at handlers occasionally.
4.	Aggressive	Very restless cows which struggle violently, bellows and froths. Attack observers/milkers by kicking or butting. Move from side to side always and very difficult in handling.

Statistical Analysis

The data collected was subjected to analysis of variance employing Complete Randomised Design (CRD).

Results and Discussion

The means of LDT, MT, MY and MFR was calculated (Table 2) for docile, restless, nervous and aggressive animals. The effect of temperament was found to be highly significant ($P < 0.01$) on LDT and MY and significant ($P < 0.05$) on MT and MFR. It is evident from the Table 1, that milk let down time was recorded lowest for docile groups of animals (0.76 ± 0.03 min) followed by restless (0.88 ± 0.05 min), nervous (1.05 ± 0.06 min) and aggressive (1.11 ± 0.6 min) animals. Docile animals showed a significant difference from restless, nervous and aggressive animal. Restless animals showed a significant difference from nervous and aggressive animals. There was no

significant difference between restless and nervous animals. Overall average let down time was recorded to 0.87 ± 0.02 min. Milking time was recorded to be lowest (2.69 ± 0.03 min) in docile animals followed by restless (2.96 ± 0.04 min), nervous (2.99 ± 0.06 min) and aggressive (3.12 ± 0.06 min) animals. Docile cows had significantly lower MT as compared to cows of remaining three temperaments. There was no significant difference recorded between restless and nervous and between nervous and aggressive animals but there was significant difference between restless and aggressive animals. The overall average milking time was recorded to be 2.84 ± 0.02 min. Milk yield was recorded maximum in docile animals (3.07 ± 0.05 kg) followed by restless (2.76 ± 0.07 kg), nervous ($2.51 \pm$

0.09 kg) and aggressive (2.32 ± 0.09 kg) animals. Docile animals had significantly higher milk yield as compared to restless, nervous and aggressive animals. Restless animals also showed a significant difference from nervous and aggressive

animals. There was no significant difference was recorded between nervous and aggressive animals. The overall average milk yield was recorded to be 2.82 ± 0.03 kg.

Table 2: Means and standard error for let-down time, milking time, milk yield and milk flow rate per milking for different temperaments

Temperament	L. D.T. (Min.)	M. T. (Min.)	M. Y. (Kg.)	M. F. R. (Kg/Min.)
Docile	0.76 ± 0.03^a	2.69 ± 0.03^a	3.07 ± 0.05^c	1.15 ± 0.04^c
Restless	0.88 ± 0.05^b	2.96 ± 0.04^b	2.76 ± 0.07^b	0.94 ± 0.06^b
Nervous	1.05 ± 0.06^c	2.99 ± 0.06^{bc}	2.51 ± 0.09^a	0.84 ± 0.07^{ab}
Aggressive	1.11 ± 0.06^c	3.12 ± 0.06^c	2.32 ± 0.09^a	0.75 ± 0.08^a
Over All Average	0.87 ± 0.02	2.84 ± 0.02	2.82 ± 0.03	1.01 ± 0.03
C D	0.17	0.20	0.24	0.16

In the present study, the difference in the milk let down between animals of different temperament was highly significant ($P < 0.01$). The lowest milk let down time was observed in docile group of animal (0.76 ± 0.03 min) and the highest in aggressive animals (1.11 ± 0.06 min). Similar observations have been reported by ^[6] and ^[7] in Murrah buffaloes. However ^[8], reported longer let down time in nervous animals in Karanfries cattle and Murrah buffaloes.

The milking time was found the lowest in docile animals (2.69 ± 0.03 min) and highest in aggressive animal (3.12 ± 0.06 min). Similar observations have been reported by ^[9] in Karan Swiss.

The milk yield was found to be significantly higher in docile animals (3.07 ± 0.05 kg). There was a significant difference in milk yield of docile with restless, nervous and aggressive animals. However, no significant difference was seen between nervous and aggressive animals. Our findings are in close agreement with the finding of ^[10] in buffaloes ^[9]. Reported highest milk yield in docile animals of Karan Swiss cows and ^[8] Karan Fries cows these workers have also reported significantly high MY in docile animals as compared to other temperaments. The poor performance of nervous type animals might be due to disturbances of neuro-humoral mechanisms which in turn affect the quantum of milk.

Conclusion

Average let down time for Gir cows 0.87 ± 0.02 minutes, average milking time for Gir cows was 2.84 ± 0.01 minutes, was highly affected by temperament and parity. Average milk yield for Gir cows was 2.02 ± 0.02 kg per milking and it was affected by month, temperament and parity. Average milk flow rate for Gir cows was 1.01 ± 0.02 kg per minute and temperament and parity have significant effect on the milk flow rate. Temperament had great influence on all the milking attributes. Aggressive cows took maximum time for both let down time as well as milking time with less milk flow rate and milk yield, while docile cows performed best.

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