

LABOUR UTILIZATION FOR MILKING OPERATON ON A DAIRY FARM

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ABSTRACT

A study was undertaken to establish time requirement for various activities involved in milking Gir, Kankrej and Crossbred cows maintained at Livestock Research Station, College of Veterinary Science and Animal Husbandry, AAU, Anand. The time taken for bringing the dam and calf from its shed to the milking parlour along with activities in the milking parlour and for taking them back from the milking parlour to its shed was recorded both during morning and evening sessions. The total time (seconds) spent / labour / adult unit / day for milking operation in crossbreds (1228.94) was higher than that recorded in Kankrej (1136.19) and Gir (1069.64) cows. This is due to higher milk yield and machine milking practiced in crossbred cows as compared to lower milk yield and hand milking followed in Kankrej and Gir cows. Variations in milking time might also be due to the intrinsic characteristics and diverse breed behavior.

Key words : Crossbred, Gir, Kankrej, Milking operation, Labour utilization.

Milking is a major work in managing milking animals^[5] making labour requirement for milking an important aspect of management. To maximise the profit from production, it is absolutely necessary to decrease the labour cost by optimum labour utilisation. However, the quantum of work done on labour utilisation in animal farms is very meager and majority of the reported work is old. Hence, the present investigation was planned to study the time utilised by the labour for milking operation under the Indian farm conditions.

MATERIALS AND METHODS

Time (seconds) required to perform various activities associated with milking of animals was noted in three breeds of cows maintained under isolateral management conditions at Livestock Research Station, College of Veterinary Science and Animal Husbandry, AAU, Anand. Labour activities in the milking parlour were observed both

during morning and evening sessions for 54 days (3 days/week for 18 weeks from 21st November, 2011 to 31st March, 2012) for 35 milch cows comprising of 10 Gir and 10 Kankrej cows (hand milked) and 15 crossbred (25% Jersey, 25% H.F. and 50% crossbred) which were machine milked. Cows were milked twice a day (at 5.30 AM and 5.30 PM) in the milking parlour by the same group of 4 milkmen. The average time (seconds) taken for different activities right from releasing the cow from its shed and bringing it to the milking parlour, all the activities on the milking parlour and the time taken for taking the cows back to their respective sheds from the milking parlour (details listed in Table 1) was recorded with the help of a standard stop watch, both for hand milking and machine milking. Total milking time spent by labour / adult unit (cow) / day was calculated. The data obtained from the study was analyzed using the statistical tools as per the procedure³.

RESULTS AND DISCUSSION

The average time (seconds) recorded for various activities during milking operation in cows are presented in Table.1.

From Table.1., it is evident that for various activities studied, minimum time among the three breeds and between the two sessions was recorded during morning session in Gir cows for bringing animal from shed to parlour, tying of animal, concentrate feeding, calf sucking, udder washing, milk handling before weighing and taking animal from parlour to shed. The time was noted to be lowest during evening session in Gir breed for tying hind leg, actual milking time, weighing and recording milk yield. The lowest time was consumed by Kankrej breed during morning session for bringing calf from calf pen to dam and taking back and carrying empty pail from recording room to animal shed. Animal release time was noted to be least for crossbreds during morning session.

Milking time is proportion to milk yield was maximum for milking operation in crossbred cattle. The average total daily yield during the period of study was found to be significantly ($P<0.01$) higher in crossbred (11.86 ± 0.06) followed by Kankrej (6.54 ± 0.04) and Gir (5.19 ± 0.04) cows. Higher milk yield in crossbreds also indicated that the crossbred cows had adapted well to local environment.

The total (morning plus evening) time taken for each activity varied significantly ($P<0.01$) between the three breeds (except for time taken to bring calf from calf pen to dam and taking back, and calf sucking time between Gir and Kankrej breeds).

Significant ($P<0.01$) variation was observed between morning and evening session for all three breeds for bringing animal from shed to parlour, and for taking animal from parlour to shed. The lower time observed during morning to travel from animal shed to parlour was because the animals and labourers are fresh, more active and enthusiastic in morning than in the evening when they would be partly tired and disinterested in

activities. The travel time from milking parlour to the animal shed was more in evening in all the three breeds. Travel time depends on the distance (more in cross breeds – so more time was taken) between the two points and the temperament of the animal which plays a major role in the time taken for handling the animal by the labour. Kankrej cows generally are more nervous than Gir (comparatively docile nature), and hence took more time to travel from milking parlour to its shed, more time to be tied and for being released after milking.

Significant ($P<0.01$) variation was noted between morning and evening session in Gir and Kankrej breeds for concentrate feeding time, for bringing calf from calf pen to dam and taking back, calf sucking and tying hind legs.

There was a variation of less than 60 seconds between the sessions in the average time taken to bring the calf from pen to dam and to be taken back. Apparent variation ^[4] between sessions might be due to the speed of calf to reach its dam which in turn is dependent on hungriness and freshness of calf. This may be the reason for less time taken by the calf in morning session. The difference in calf sucking time between the sessions may be as the milkmen cannot monitor exactly the quantum of time taken by the calf for sucking the dam and they have a tendency to allow the calf to suck a little longer during evening time to ensure that the calf does not remain hungry at night. Significantly ($P<0.01$) higher actual milking time was observed in Gir and crossbreds during morning session. The time for attachment of machine to udder in crossbred cows was noted to be significantly ($P<0.01$) higher during evening session. The attachment and detachment of milking machine in the crossbred cows contributed significantly in increasing the total time for milking operation.

As the crossbreds are high yielders, more time and labour is needed to feed the animals with more concentrate and carry the milk from animal

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to weighing balance and for dispensing it into the weighing balance container.

Lower time was recorded by [4] than in the present study, for time taken for weighing and recording milk yield. It ranged from 3.50 ± 0.50 to 6.00 ± 1.15 seconds and [1] reported a higher time of 38.14 ± 1.90 seconds for weighing and recording the milk yield in Red Sindhi, Sahiwal and Tharparkar breeds. The authors attributed it to the waiting of milkers in queue for emptying their milk in to the weighing container.

The time (seconds) spent / labour / adult unit (cow) / day was found to be least in Gir cows 534.78 (8.91 min) and maximum in Crossbred cows 615.35 (10.25 min) during evening session. The total (morning plus evening) time (seconds) utilised by the labour for each animal per day (Time / labour / adult unit / day) varied nonsignificantly and was found to be lowest in Gir (1069.64), followed by Kankrej (1136.19) and was highest in crossbred (1228.94) cows. The findings

were lower than those reported by [1] of 25 minutes / animal / day. Higher milking time was also recorded by [2] in crossbred cows for machine milking (7.35 min) than in hand milking (6.70 min) due to more massage and stripping time in machine milking. Significant differences were noticed between the three breeds. Milking was also observed by [1] who opined the differences were due to unequal milking intervals between morning and evening sessions. Significant differences among the breeds may be attributed to the difference in milk yields of animals, may be partly due to difference in softness of teat of animals and the breed characteristics.

Time motion studies help to establish accurately the time requirements for various activities on the farm [4]. An understanding of the time motion studies on a farm would help the farm manager to utilise labour efficiently and reduce production cost. Further, it could also help in setting labour norms for organized farms.

Table 1. Average time (seconds) spent for various milking operations in different breeds

Note: M- Morning; E- Evening; T/Day- Total time per Day;

au- Adult unit

Means having similar superscript within the row vary significantly ($P < 0.01$) from each other.

Sl. No.	Activities	Gir			Kankrej			Crossbred		
		M	E	T/day	M	E	T/day	M	E	T/day
1.	Animal shed to Parlour time	50.67± 0.57**	52.50± 0.60	103.17± 1.04	54.71± 0.40	57.30± 0.49**	112.01± 0.74	82.96± 0.52	87.58± 0.64**	170.55± 1.04
2.	Animal tying time	10.06± 0.14	10.20± 0.12	20.29± 0.24	12.35± 0.20	13.45± 0.17**	25.80± 0.33	10.92± 0.09	11.00± 0.10	21.93± 0.17
3.	Bringing calf from calf pen to dam & taking back	63.44± 0.15	64.07± 0.19**	127.51± 0.26	63.32± 0.22	64.31± 0.22**	127.64± 0.40	---	---	---
4.	Concentrate feeding time	16.29± 0.07	16.54± 0.08**	32.84± 0.13	16.41± 0.11	16.69± 0.09*	33.10± 0.16	17.49± 0.13	17.59± 0.12	35.08± 0.21
5.	Calf sucking time	24.61± 0.18	25.41± 0.21**	50.02± 0.36	25.59± 0.10	26.35± 0.13**	51.94± 0.19	---	---	---
6.	Carrying empty milk pail from recording room to animal	13.85± 0.10	13.76± 0.08	27.62± 0.15	13.26± 0.15	13.44± 0.15	26.69± 0.26	13.87± 0.17	13.87± 0.16	27.74± 0.30
7.	Tying milk man's rope (hind limbs) time	9.94± 0.08*	9.79± 0.06	19.73± 0.13	10.28± 0.08	10.64± 0.89**	20.93± 0.14	10.52± 0.08	10.67± 0.08	21.19± 0.12
8.	Udder washing time	6.60± 0.06	6.72± 0.09	13.32± 0.16	6.00± 0.06	6.28± 0.07**	12.29± 0.13	6.76± 0.09	6.90± 0.09	13.67± 0.15
9.	Attachment of machine time	---	---	---	---	---	---	26.18± 0.07	26.55± 0.07**	52.73± 0.10
10.	Actual milking time	250.16± 1.59**	344.06±1.8 6	494.23± ±2.89	264.77± 2.06	262.90± ±1.76	527.68± 3.86	283.14± 1.69**	271.84±1.57	554.99± 2.84
11.	Detachment of machine time	---	---	---	---	---	---	17.12± 0.11	17.27± 0.10	34.39± 0.41
12.	Milk handling before weighing time	13.58± 0.14	13.75± 0.11	27.34± 0.23	13.75± 0.11	13.71± 0.11	27.47± 0.17	17.77± 0.10	18.06± 0.07**	35.86± 0.14
13.	Weighing milk and recording time	10.86± 0.10	10.74± 0.10	21.59± 0.17	10.80± 0.09	10.87± 0.10	21.67± 0.17	11.82± 0.14	12.11± 0.14*	23.93± 0.25
14.	Release animal time	8.11± 0.09	8.22± 0.10	16.33± 0.17	8.98± 0.26	9.79± 0.16	19.78± 0.39	8.02± 0.11	8.12± 0.10	16.14± 0.19
15.	Parlour to animal shed time	54.71± 0.48	57.06± 0.54**	111.78± 0.92	60.64± 0.56	62.66± 0.57**	123.30± 0.99	105.08± 0.79	111.76± 0.92**	216.89± 1.45
16.	Time (seconds) spent/labour/au/day	534.86	534.78	1069.64	564.8	571.39	1136.19	613.59	615.35	1228.94
17.	Milk yield (kg)	2.94± 0.02**	2.54± 0.02	5.19± 0.04	3.29± 0.02	3.25± 0.02	6.54± 0.04	6.04± 0.02*	5.82± 0.03	11.89± 0.06

Superscript: ** - between morning and evening sessions. a,b,c - Total time/day between the three breeds for each operation

CONCLUSION

Time motion study undertaken in three breeds (Gir, Kankrej and Crossbred) of cattle during morning and evening session for various activities related to milking operation revealed that time (seconds) utilized by labour / adult unit / day was maximum for crossbred followed by Kankrej and Gir cows.

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