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## Impact of complete feed block and total mixed ration on productive performance in crossbred cows

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### Abstract

The aim of the current study is to determine the effect of feeding total mixed ration and complete feed block affects milk quality. Three groups of eighteen lactating crossbred cows (HF x Jr.) were formed (n = 6). The T<sub>0</sub> (control) group's animals received concentrate and roughage individually, while the T<sub>1</sub> and T<sub>2</sub> groups' animals received the total mixed ration and complete feed block, respectively. The milk's titratable acidity, specific gravity, pH, and total viable count were unaffected by the feeding system.

**Keywords:** Complete feed block, crossbred cows, milk quality, total mixed ration, total viable count

### Introduction

A complete feed is helpful in increasing productivity of cattle in developing nations like India where feed and fodder are scarce. Complete feed also increases the utilization of crop byproducts and low-grade roughages. Numerous researchers have employed complete feed in its various forms, including pellets, total mixed ration (TMR), and complete feed block (CFB) [1, 2]. It has been noted that feeding whole diets like TMR and CFB helps to improve the quality of milk [3]. As milk's acceptance is determined by its quality, it is crucial to determine it. System of feeding affects milk quality as nutrition can have an impact on the quality of milk. Consequently, the investigation was undertaken to analyze effect of feeding CFB and TMR on qualitative characteristics of milk.

### Materials and Methods

#### Ethical statement

The current study was conducted in compliance with the standard guidelines established by the Assam Agricultural University's Institutional Animal Ethics Committee (IAEC) in Khanapara, Guwahati.

#### Experimental procedure

Eighteen crossbred lactating cows (HF x Jr) were selected for study at the Instructional Livestock Cattle Farm, ILF(C), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati. They were divided into three groups (T<sub>0</sub>, T<sub>1</sub>, and T<sub>2</sub>), each consisting of six animals. The experiment was conducted for 90 days. While the animals in groups T<sub>0</sub> (control) were fed concentrate and roughage separately (60:40), the animals in groups T<sub>1</sub> and T<sub>2</sub> received CFB and TMR. Besides the use of molasses as binder at the 10% of CFB, the compositions of the three rations were the same. Table 1 demonstrate the estimated nutritional values of the experimental rations. The effect of different experimental ration on milk quality were observed. The milk from experimental animal was sampled on 15 days interval for the analysis of its titratable acidity, specific gravity, and pH. The total viable count (TVC) of milk was determined on the 0 and 90th day. To analyze the TVC the pour plate technique was used. The method of [4] was used to determine the milk's titratable acidity. The specific gravity of milk was determined according to [5]. A microprocessor pH meter was used to measure the milk's pH. SAS 9.3 [6] software was used to analyze the experimental data.

**Table 1:** Average estimated nutritive value of the different experimental rations

Particulars	T <sub>0</sub> (Control)	T <sub>1</sub> (CFB)	T <sub>2</sub> (TMR)
DCP (%)	7.37	7.82	8.00
TDN (%)	76.03	77.47	79.08

## Results and Discussion

Table 2 presented the average values for TVC, pH, specific gravity, and titratable acidity. The milk from experimental animals had a titratable acidity of 0.17 percent in each of the T<sub>0</sub>, T<sub>1</sub>, and T<sub>2</sub> groups. As a result, there was no significant difference in titratable acidity ( $p>0.05$ ) across the experimental groups. A normal range of 0.10 to 0.17 percent was maintained in the titratable acidity [7, 8]. Conducted an experiment on crossbred cows to investigate the impact of various feeding regimes on milk quality. They observed that feeding TMR did not change the titratable acidity of milk

The experimental animals' milk had a pH of 6.59, 6.57, and 6.59 in the T<sub>0</sub>, T<sub>1</sub>, and T<sub>2</sub> groups, respectively. A non-significant ( $p>0.05$ ) change in pH was found between the experimental groups. The pH of fresh cow milk typically ranges from 6.5 to 6.7 [9].

In T<sub>0</sub>, T<sub>1</sub>, and T<sub>2</sub> groups milk was found to have a specific gravity of 1.032, 1.034, and 1.034, respectively. It was found that differences in specific gravity between the experimental groups did not have statistical significance ( $p>0.05$ ). A normal milk's specific gravity is rarely less than 1.03 [10]. The results of this study are consistent with those of [8], who found no significant difference in specific gravity.

The TVC values for the T<sub>0</sub>, T<sub>1</sub>, and T<sub>2</sub> groups were 4.84, 4.81, and 4.82 Log<sub>10</sub> cfu/ml, respectively, which were comparable across the groups. The results were less than [11, 12]. Effect of providing complete feed was not significant on TVC.

**Table 2:** Average titratable acidity (%), pH, specific gravity and total viable count (Log<sub>10</sub> cfu/ml) of the different experimental groups

Parameters	Experimental group			SEM	P Value
	T <sub>0</sub> (control)	T <sub>1</sub> (CFB)	T <sub>2</sub> (TMR)		
Titratable acidity (%)	0.17	0.17	0.17	0.02	0.876
pH	6.59	6.57	6.59	0.01	0.823
Specific gravity	1.032	1.034	1.034	0.00	0.324
Total viable count (Log <sub>10</sub> cfu/ml)	4.84	4.81	4.82	0.02	0.186

cfu, Colony forming unit

## Conclusion

Based on the results, it can be concluded that feeding CFB and TMR did not change the milk's normal quality. The values of quality parameters were within an acceptable range. Thus, for lactating crossbred cows, CFB and TMR can be used as an alternative to the traditional method of feeding roughage and concentrate separately.

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