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## Effect of feeding complete feed block and total mixed ration on milk quality in crossbred lactating cows

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### Abstract

The present study was undertaken to investigate the effect of feeding complete feed block and total mixed ration on quality of milk. Eighteen crossbred (HF x Jr) lactating cows were divided into three groups (n=6). Animals of group T<sub>0</sub> (control) were provided roughage and concentrate separately and complete feed block and total mixed ration were fed to the animals of T<sub>1</sub> and T<sub>2</sub> groups, respectively. System of feeding did not affect the milk quality in terms of titratable acidity, specific gravity, pH and total viable count.

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

### Introduction

In developing countries like India, where availability of feeds and fodder is low, complete feeding system is a boost to livestock production. Complete feed not only uses low grade roughages and crop by product but also improves their utilisation. Complete feed in their different forms such as total mixed ration (TMR), complete feed block (CFB) and pellets have been used by many researchers (Lailer *et al.*, 2005, Khan *et al.*, 2010) [1,2]. It has been observed that feeding of complete diet as TMR and CFB has been beneficial for improving milk quality (Sarker *et al.*, 2019) [3]. It is important to determine the quality of milk as it decides its acceptability. System of feeding may have some effect on quality of milk as nutrition also plays an important role in determining qualitative characteristics of milk. Therefore, present study has been carried out to ascertain the effect of feeding CFB and TMR on qualitative characteristics of milk.

### Materials and Methods

#### Ethical statement

The present study was carried out according to the guidelines set by Institutional Animal Ethics Committee (IAEC) of Assam Agricultural University, Khanapara, Guwahati.

### Experimental procedure

Eighteen crossbred lactating cows (HF x Jr) were allocated to three groups (T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub>) with six animals in each group at the Instructional Livestock Cattle Farm, ILF(C), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati. The experiment was conducted for 90 days. Animals in group T<sub>0</sub> (control) were maintained on separate feeding of roughage and concentrate (60:40) whereas in T<sub>1</sub> and T<sub>2</sub> groups CFB and TMR were provided to the animals. The compositions of the three rations were the same except for the use of molasses as binder at the level 10% in CFB. The estimated nutritive values of the experimental rations have been presented in Table 1. Effects of the feeding systems were observed in terms of milk quality. Milk sample was collected from the experimental animal at 15 days intervals for analysis of titratable acidity, specific gravity and pH. The total viable count (TVC) was investigated on 0 day and 90<sup>th</sup> day. The titratable acidity of milk was determined as per the method of (Atherton and Newlander 1977) [4]. The specific gravity of milk was determined by the method of (Eckles *et al.*, 1957) [5]. Milk pH was determined by using microprocessor pH meter. The TVC was analysed using pour plate technique. SAS 9.3 [6] software was used for analysis of the experimental data.

**Table 1:** Average estimated nutritive value of the 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 Discussions

The average values of titratable acidity, specific gravity, pH and TVC have been presented in Table 2. The titratable acidity in milk of the experimental animals was 0.17 percent in all three groups i.e., T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups. Hence, there was no significant difference (P>0.05) among the experimental groups in terms of titratable acidity. The values were found to be in normal range of 0.10 to 0.17 percent (BIS 1960) [7]. Hussain (2018) [8] conducted an experiment in crossbred cows to study effect of different feeding systems on milk quality where he found that feeding of TMR did not alter the titratable acidity.

The pH of milk of the experimental animals was 6.59, 6.57 and 6.59 in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups, respectively. Statistical

analysis showed non-significant (P>0.05) difference among the experimental groups in terms of pH. Fresh cow milk generally has pH in the range of 6.5 to 6.7 (Marouf and Sara 2018) [9].

The specific gravity of milk of the experimental animals was found to be 1.032, 1.034 and 1.034 in T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups, respectively. It was revealed that differences among the experimental groups in terms of specific gravity did not attain statistical significance (P>0.05). Normal milk seldom has a specific gravity below 1.03 (Kanwal *et al.*, 2004) [10]. The findings of the present investigation are in good agreement with Hussain (2018) [8] who did not observe significant difference in terms of specific gravity of milk in cows fed total mixed ration and conventional diet.

The values for the TVC were comparable among the groups which were 4.84, 4.81 and 4.82 Log<sub>10</sub> cfu/ml for T<sub>0</sub>, T<sub>1</sub> and T<sub>2</sub> groups, respectively. Values obtained were lower than (Khan *et al.*, 2008, Nanu *et al.*, 2007) [11, 12]. The effect of feeding complete diet on TVC has not been observed yet.

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

From the result obtained it can be inferred that feeding of CFB and TMR did not alter the normal quality of milk. Values of the quality parameters were in acceptable range. Therefore, CFB and TMR can be adopted as an alternative to the separate feeding of roughage and concentrate in conventional way for lactating crossbred cows.

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