COMPARATIVE STUDIES ON PHYSICO-CHEMICAL PROPERTIES OF MARATHWADI BUFFALO MILK

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ABSTRACT

The Marathwadi buffaloes inhabit Marathwada region particularly the district of Parbhani, Beed, Jalna and part of adjoining districts of Maharashtra State. Marathwadi buffaloes on account of the sizable population contributes significantly to the economy of the farmers. The studies on physico-chemical properties of Marathwadi buffalo milk recorded the mean values for specific gravity, acidity and pH at 1.031 + 0.001, 0.154 + 0.001 and 6.544 + 0.007, respectively. Highly significant correlation coefficients existed for the specific gravity and acidity. The comparative differences in these parameters with those of Nagpuri buffalo milk were minimum.

INTRODUCTION

Marathwadi buffaloes constitute a major section of buffalo breeds of Marathwada region of the State of Maharashtra. A sizable buffalo population in Parbhani, Jalna, Beed, Osmanabad, Latur, Nanded and some parts of Buldhana and Akola districts of Vidarbha contribute significantly to the farmers economy. It has not been recognized as a distinct breed and is considered as a local buffalo (Gavaran) in its home tract. In this paper, an attempt has been made to know and establish the legal standards for some physico-chemical parameters of Marathwadi buffalo milk. The comparison is also done between Marathwadi buffalo milk with the milk of other improved breeds in respect of these parameters.

MATERIAL AND METHODS

A total of 205 milk samples were collected from Marathwadi buffaloes and 10 from other improved breeds viz., Murrah, Surti, Nagpuri and Jaffarabadi from the villages adjoining to Parbhani city. The complete morning milking was taken as the representative samples at the rate of 5 to 10 samples daily.

Analysis: Specific gravity of milk was determined by using Quevenne’s lactometer as per IS 1479, Part-I (1960) The acidity was determined by adopting the procedure recommended in IS 1479 (Part-I), 1960. The pH of milk was determined by the digital pH meter according to IS 1479 (Part-I) 1960.

RESULTS AND DISCUSSION

Specific gravity: It may be revealed from the Table 1 that the main value for the specific gravity was at 1.031 + 0.00012 with standard deviation 0.002 indicating positive differences. The results obtained in the present study were comparable with those reported by Mohran et al. (1992) and Nadre et al. (1996). The mean specific gravity value of Marathwadi buffalo milk was found lower than the values reported by Roy and Chandra (1978), Furtado (1980) and Han et al. (1994).

It may be visualized from Table 2 than statistically significant differences were exhibited at 5 % and 1 % level for specific gravity in case of Murrah buffalo milk valued at 1.98 and Jafarabadi buffalo milk valued at 2.71, respectively. Whereas, the milk of other two breeds, Surti and Nagpur did not show significance differences.

Acidity: The acidity values of Marathwadi buffalo milk exhibited a range of 0.12 % to 0.19 % whereas the maximum number of samples occurred in the range 0.14 to 0.16 %, which contributed 78.05 % of total samples.
The common mean value for titratable acidity was observed at 0.154 + 0.001 %.

The results obtained for titratable acidity may be compared with those reported by Sontakke et al. (1978), Haggag et al. (1991) and Dubey et al. (1998). The significant differences of 2.20 and 3.75 were registered for Murrah and Jaffarabadi buffalo milk respectively at 5 and 1 per cent level of probability. The Nagpuri and Surti buffalo milk samples seemed to be at par with non-significant differences at 1.52 of 1.53, respectively.

**pH:** As may be evidenced from Table 1 the frequency percentage of a total number of 17.56, 35.12 and 29.76 of samples were registered with the mean pH value at 6.49, 6.57 and 6.69, respectively. Whereas, the average mean value for 205 samples was notably at 6.544 + 0.007. The standard deviation values (i.e. 0.105) indicated positive differences in the frequency percentages of samples under study. However, the results were comparable with those reported by Furtado (1980), Singh and Patil (1989) and Dubey et al. (1998).

**TABLE 1:** Physico-Chemical properties of Marathwadi Buffalo Milk

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>Average</th>
<th>SE±</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>1.027-1.035</td>
<td>1.031</td>
<td>0.0001</td>
<td>0.002</td>
</tr>
<tr>
<td>Acidity (%) lactic acid</td>
<td>0.12-0.19</td>
<td>0.154</td>
<td>0.001</td>
<td>0.13</td>
</tr>
<tr>
<td>pH</td>
<td>6.29-6.79</td>
<td>6.544</td>
<td>0.007</td>
<td>0.105</td>
</tr>
</tbody>
</table>

**TABLE 2.** A comparative study of physico-chemical properties of Marathwadi buffalo milk with milk of other improved buffalo breeds.

<table>
<thead>
<tr>
<th>Breeds</th>
<th>Specific gravity</th>
<th>Acidity (%)</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marathwadi</td>
<td>1.031</td>
<td>0.154</td>
<td>6.544</td>
</tr>
<tr>
<td>Jaffrabadi</td>
<td>1.032 (2.71)**</td>
<td>0.143 (3.75)**</td>
<td>6.537 (0.39)</td>
</tr>
<tr>
<td>Surti</td>
<td>1.0313 (1.2)</td>
<td>0.47 (91.53)</td>
<td>6.515 (1.0)</td>
</tr>
<tr>
<td>Murrah</td>
<td>.1032 (1.98)*</td>
<td>0.144 (2.20)*</td>
<td>6.526 (0.62)</td>
</tr>
<tr>
<td>Nagpuri</td>
<td>1.0312 (0.83)</td>
<td>0.148 (1.52)</td>
<td>6.556 (0.32)</td>
</tr>
</tbody>
</table>

Note: The bracket figures indicate significance.

**** significant at 1 % level

* significant at 5 % level

It may be clarified that the pH values of Marathwadi buffalo milk showed non-significant differences with other improved breeds.

**CONCLUSION**

The development of the breed has been certainly related to the plains near the important rivers which may not be over looked. The region of Marathwada where this the Marathwadi buffalo population has been dominant situated in the valleys of three important rivers *viz.*, Dudhana, Purna and Godhavary. Moreover the buffaloes are often referred as Purna, Thadi or Gang Thadi in the rural zones of this region. It is too early to draw any conclusive remarks from the field on the lines of present study, because the scope of preview of present study does not permit to do this thing.

However it may be added that systematic work on the characterization of this breed and the basic studies on milk composition and physico-chemical status of this milk may be regarded as the order of the day to establish and evaluate this valuable breed of local animals.
REFERENCES


