BUFFALO MILK QUALITY IN RUCĂR AREA

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Abstract

The study was conducted in 2011 during spring in Romania, Rucăr area in the farm of an ecological farmer. This study research the quality of fresh buffalo milk in order to optimised the producing dairy products. Although we try to find how parameters of milk are changed during studied period and if this parameters are significant variable. The final results will be integrated in an larger study together with the research results regarding the quality of sheep and buffalo milk during studied period.

Key words: buffalo milk, milk freezing point, milk conductivity, lactose, protein content.

INTRODUCTION

For evaluation the buffalo milk quality we study organoleptical (taste, smell and color) and Physical – chemical parameters (Fat percent, %, Non fatty dry matter, %, Protein content, %, Acidity, Tº, Lactose ratio, %, Freezing point, Cº, Mineral content, %, Milk conductivity, mS/cm). Methods used for analysis are according with romanian standards and are quotation in latest studys. The device used was Lactostar from FunkeGerber producer. The sheep milk was colected from the farm of Duruianu Ionut. The milk was colected from 3 buffalo female, Romanian Buffalo breed. The milk was colected in the morning at first milking and the buffalo was in free stabulation on the hill pasture without fertilisation and without suplimentary dietary.

MATERIALS AND METHODS

Taking samples: We use to take samples glass probes. From surface and upper layers samples was taken with cilindrical probes after homogenisation. Procedure was according to S.T.A.S. 9535/1-74 and STA.S. 9535/2-74.

1.Organoleptical analysis: Was study colour, aspect, smell and taste of milk according with Georgescu Gh., 2005. If those parameters was out of normal range milk was considered out of standards and study of those samples was ended.
2. Physical analysis: We study follow parameters: fat percent, non-fat dry matter (SNF), protein content, acidity, lactose ratio, freezing point, mineral content and milk conductivity.

We use the LactoStar device from Funke Gerber with following parameters:

Table 1. LactoStar parameters

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Dissolving</th>
<th>Repetability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>0.01 %</td>
<td>+0.02 %</td>
</tr>
<tr>
<td>Protein</td>
<td>0.01 %</td>
<td>+0.03 %</td>
</tr>
<tr>
<td>Lactose</td>
<td>0.01 %</td>
<td>+0.03 %</td>
</tr>
<tr>
<td>SNF (nonfat dry matter)</td>
<td>0.01 %</td>
<td>+0.04 %</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-0.001 ºC</td>
<td>+0.02 %</td>
</tr>
<tr>
<td>Mineral content</td>
<td>0.01 %</td>
<td>+0.02 %</td>
</tr>
<tr>
<td>Conductivity</td>
<td>0.01 %</td>
<td>+0.02 %</td>
</tr>
</tbody>
</table>

3. Experimental Methodic

Samples were study according following schema:

- \( V_1 \) – 11 May
- \( V_2 \) – 12 May
- \( V_3 \) – 13 May
- \( V_4 \) – 14 May
- \( V_5 \) – 15 May
- \( V_6 \) – 16 May
- \( V_7 \) – 17 May
- \( V_8 \) – 18 May
- \( V_9 \) – 19 May
- \( V_{10} \) – 20 May
- \( V_{11} \) – 21 May
- \( V_{12} \) – 22 May

4. Biological material

We study milk collected from 3 buffalo female, Romanian Buffalo breed from Rucăr area, farm of Duruianu Ionuț.

5. Statistics methodic

We use ANOVA statistic tests for data processing.

RESULTS AND DISCUSSION

1. Organoleptical analysis:

Colour, Aspect, Smell and Taste was according with standards and there was no deviation from this point of view.

2. Physical analysis:

Table 1. Fat percent, %

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>( V_5 )</th>
<th>( V_6 )</th>
<th>( V_7 )</th>
<th>( V_8 )</th>
<th>( V_{10} )</th>
<th>( V_{11} )</th>
<th>( V_{12} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fat percent</td>
<td>7.62</td>
<td>7.13</td>
<td>7.39</td>
<td>7.31</td>
<td>7.23</td>
<td>7.87</td>
<td>7.62</td>
<td>7.45</td>
<td>7.31</td>
<td>7.30</td>
<td>7.45</td>
</tr>
</tbody>
</table>

The fat percentage was in the normal range of buffalo milk, close to the maximum value. This was a consequence of the period, because the lack of supplementary feeds during the week and a moderate milking.
Table 2. Non faty dry matter, %

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SNF, %</td>
<td>17,21</td>
<td>17,32</td>
<td>17,29</td>
<td>17,45</td>
<td>17,27</td>
<td>17,56</td>
<td>17,64</td>
<td>17,29</td>
<td>17,33</td>
<td>17,45</td>
<td>17,21</td>
<td>17,15</td>
</tr>
</tbody>
</table>

The SNF is at the higher rates because of the production level. That reveal the high value of the milk colected in this periods and it will valuable for cheese production.

Table 3. Protein content, %

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protein</td>
<td>6,23</td>
<td>6,12</td>
<td>6,45</td>
<td>6,34</td>
<td>6,73</td>
<td>6,23</td>
<td>6,54</td>
<td>6,29</td>
<td>6,49</td>
<td>6,31</td>
<td>6,78</td>
<td>6,45</td>
</tr>
</tbody>
</table>

The protein content have high rates because of the presence of green feed in this time and for this reason the milk will be very good for dairy products.

Table 4. Acidity, Tº

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acidity</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The milk was fresh, the acidity reveal that the milk was analyzed after milking and is suitable for processing.

Table 5. Lactose ratio, %

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lactose</td>
<td>5,87</td>
<td>5,77</td>
<td>5,83</td>
<td>5,91</td>
<td>5,44</td>
<td>5,83</td>
<td>6,11</td>
<td>6,08</td>
<td>6,01</td>
<td>5,84</td>
<td>5,92</td>
<td>5,96</td>
</tr>
</tbody>
</table>

High ratio of lactose are the consequence of the green feeds and the active metabolism of the buffalo, the high amounts are also influenced by specific high altitude flora present in the pasture.
Table 6. Freezing point, Cº

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Freezing point, Cº</td>
<td>0,758</td>
<td>0,754</td>
<td>0,761</td>
<td>0,732</td>
<td>0,741</td>
<td>0,744</td>
<td>0,723</td>
<td>0,765</td>
<td>0,738</td>
<td>0,741</td>
<td>0,744</td>
<td>0,723</td>
</tr>
</tbody>
</table>

Freezing point is normal and reveal that are no falsifications of the milk.

Table 7. Mineral content, %

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mineral content, %</td>
<td>0,85</td>
<td>0,84</td>
<td>0,91</td>
<td>0,92</td>
<td>0,90</td>
<td>0,93</td>
<td>0,95</td>
<td>0,96</td>
<td>0,91</td>
<td>0,92</td>
<td>0,90</td>
<td>0,93</td>
</tr>
</tbody>
</table>

Mineral content is high because of the feeding with fresh grass.

Table 8. Milk conductivity, mS/cm

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
<th>V11</th>
<th>V12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>milk conductivity, mS/cm</td>
<td>28,87</td>
<td>28,76</td>
<td>28,68</td>
<td>28,57</td>
<td>28,65</td>
<td>28,78</td>
<td>28,73</td>
<td>28,56</td>
<td>28,34</td>
<td>28,37</td>
<td>28,59</td>
<td>28,45</td>
</tr>
</tbody>
</table>

The milk conductivity reveal that was no exogen NaCl inside, the milk is authentic and there are no falsifications.

CONCLUSIONS

The analyzed milk sowed high contents in valuable components. The high content in lactose and proteins the milk analyzed is one of the row material proper for all kind of dairy products. That improves the organolepticall parameters of dairy products.

The high content in proteins recommends the milk also for cheese production.

Milk freezing point is at levels that reveal the absence of foreign substances for conservation or improving the milk stability.

The milk conductivity reveal that was no exogen NaCl inside, the milk is authentic.

Lacto Star electronic milk analyzer for basic physical – chemical parameters was the technical solutions for a better and quick feedback of the
milk quality management. The device was connected to a printer and also to a portable personal computer.

The analyzed milk had all parameters in normal range at the high levels, proper for dairy products.

There was no significant differences in the values of analyzed parameters.

REFERENCES

11. GEORGESCU Gh. and col., 2000, Laptele şi produsele lactate. Ed. Ceres, București,