In this work paper are presented and done the analysis of the main phenotypic traits values in bovines of Bruna breed, in Maramures county, established basing on data from evidences belonging to Animal Husbandry Amelioration and Reproduction Offices in Maramures county, after data bank of ANARZ and after primary evidences from every selection center. Researches were done on a total live stock of 2632 cows, Bruna breed, bred in Maramures county. Main productive traits were established in dynamic on 6 lactations, having in view milk quantitative and qualitative production during normal and total lactations, but also reproduction index. Researches done regarding main productive traits have led to Bruna breed bovine characterization per total population, in Maramures county. The analysis of milk production index and variability on successive lactations shows us that the population taken in study is characterized by favorable productive traits such as milk quantitative production report as also on qualitative production. Concerning reproduction index researches done in farms from Maramures county localities have put in evidence the fact that average values of reproduction index (age of first parturition, mammary repose, calving interval and service period) certify an adequate state of reproduction function.

Keywords: bovine Bruna, phenotypic, milk, Maramures.

Introduction

Bovine breeding on Romanian territory was and will be in the future a productive activity of high importance, for agro-food goods ensurance, necessary for population food, for food industry manufacturing, as also for export.

Main objective of researches which were done, is to establish and to know the potential of biologic material in Bruna breed of Maramures and its variability estimation in population submitted to official production control in Maramures area.
Researches were done with the purpose to know and put in evidence the productive level of hereditary transmission of main morpho-productive traits of Bruna breed in Maramures county.

In all the cases researched, the state official production control was taken as basis (COP), effected by trained personal of The Unit for Amelioration and Reproduction in Animal Husbandry (UARZ), main index of milk production having in view age of first parturition, quantitative production of milk, fat, protein during total and normal lactations, milk content in fat and protein view in dynamics on lactation and on total, function of followed objectives.

**Materials and Methods**

Researches were effected on live stocks of Bruna, bred and exploited in Maramures county, being taken in study a total live stock of Bruna 2632 cows in Maramures county.

Biologic material taken for research was identified under origin aspect and performances from data bank evidences belonging to Amelioration and Reproduction Offices in Animal Husbandry, Maramures county, from data bank of ANARZ and from primary evidences of each selection center.

Main production traits were established in dynamics on 6 lactations, being followed milk quantitative and qualitative production during normal and total lactations.

Milk production index were calculated in all cases on normal and total lactation.

Data were statistically processed, using recommended methodology from specialty literature for animal husbandry research.

**Results and Discussion**

Main results obtained regarding traits characterization for milk production in Bruna cows, Maramures county are shown synthetically in table 1. and pictures 1, 2, 3, 4, 5, 6.

A first aspect which retains attention is represented by age of first parturition, which on research material is of 866 days.

Between reproduction index established, the calving interval in research material is on average of 425,35 days (picture 1.), with some variations function of lactation referring to.
### Table 1.
Dynamics of main production and reproduction phenotypic index in cow live stock of Bruna breed, in Maramureș county

<table>
<thead>
<tr>
<th>Feature</th>
<th>U/M</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>total Average / total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N heads</td>
<td></td>
<td>959</td>
<td>665</td>
<td>464</td>
<td>275</td>
<td>165</td>
<td>104</td>
<td>2632</td>
</tr>
<tr>
<td>DLT days</td>
<td></td>
<td>365,06±2,77</td>
<td>377,49±3,79</td>
<td>368,47±4,35</td>
<td>369,36±6,41</td>
<td>364,81±7,31</td>
<td>363,19±8,13</td>
<td>369,16±1,81</td>
</tr>
<tr>
<td>Milk quantity kg</td>
<td></td>
<td>4477,05±41,05</td>
<td>5057,84±56,01</td>
<td>5138,42±66,78</td>
<td>5256,79±92,24</td>
<td>5313,62±106,22</td>
<td>5309,92±117,28</td>
<td>4907,21±27,62</td>
</tr>
<tr>
<td>Fat content %</td>
<td></td>
<td>4,06±0,01</td>
<td>4,08±0,01</td>
<td>4,09±0,01</td>
<td>4,10±0,02</td>
<td>4,08±0,03</td>
<td>4,09±0,03</td>
<td>4,08±0,01</td>
</tr>
<tr>
<td>Fat quantity kg</td>
<td></td>
<td>181,79±1,84</td>
<td>206,62±2,44</td>
<td>210,05±3,08</td>
<td>215,63±3,88</td>
<td>217,00±4,23</td>
<td>217,41±5,24</td>
<td>200,20±1,22</td>
</tr>
<tr>
<td>Protein %</td>
<td></td>
<td>3,57±0,01</td>
<td>3,59±0,01</td>
<td>3,54±0,01</td>
<td>3,51±0,01</td>
<td>3,45±0,02</td>
<td>3,37±0,02</td>
<td>3,56±0,01</td>
</tr>
<tr>
<td>Protein kg</td>
<td></td>
<td>159,98±2,06</td>
<td>181,68±2,44</td>
<td>182,1±2,87</td>
<td>184,65±3,52</td>
<td>183,16±4,36</td>
<td>178,88±4,30</td>
<td>175,45±1,22</td>
</tr>
<tr>
<td>DLT zile days</td>
<td></td>
<td>299,80±0,58</td>
<td>300,97±0,45</td>
<td>299,86±0,60</td>
<td>300,02±0,74</td>
<td>300,62±0,78</td>
<td>300,95±1,1</td>
<td>300,22±0,28</td>
</tr>
<tr>
<td>Milk quantity kg</td>
<td></td>
<td>3899,13±24,39</td>
<td>4375,99±35,10</td>
<td>4499,46±42,77</td>
<td>4599,95±48,25</td>
<td>4705,08±68,07</td>
<td>4723,62±90,65</td>
<td>4281,77±17,62</td>
</tr>
<tr>
<td>Fat content %</td>
<td></td>
<td>4,03±0,01</td>
<td>4,06±0,01</td>
<td>4,07±0,02</td>
<td>4,09±0,02</td>
<td>4,07±0,03</td>
<td>4,10±0,03</td>
<td>4,06±0,01</td>
</tr>
<tr>
<td>Fat quantity kg</td>
<td></td>
<td>157,14±1,16</td>
<td>177,87±1,65</td>
<td>183,19±2,04</td>
<td>188,19±2,75</td>
<td>191,30±6,51</td>
<td>193,47±0,43</td>
<td>173,79±0,84</td>
</tr>
<tr>
<td>Protein %</td>
<td></td>
<td>3,57±0,01</td>
<td>3,60±0,01</td>
<td>3,56±0,01</td>
<td>3,51±0,02</td>
<td>3,45±0,02</td>
<td>3,34±0,02</td>
<td>3,54±0,01</td>
</tr>
<tr>
<td>Protein kg</td>
<td></td>
<td>139,03±1,21</td>
<td>158,52±1,53</td>
<td>160,07±1,81</td>
<td>161,65±2,29</td>
<td>162,26±2,76</td>
<td>157,91±2,94</td>
<td>153,50±0,78</td>
</tr>
<tr>
<td>C.I. zile days</td>
<td></td>
<td>422,30±3,66</td>
<td>436,50±4,92</td>
<td>423,19±6,69</td>
<td>422,78±6,01</td>
<td>417,88±9,53</td>
<td>414,57±10,03</td>
<td>425,35±2,37</td>
</tr>
<tr>
<td>R.M. zile days</td>
<td></td>
<td>57,24±1,26</td>
<td>59,01±2,24</td>
<td>54,72±0,95</td>
<td>53,42±1,37</td>
<td>53,07±1,55</td>
<td>51,38±1,97</td>
<td>56,19±0,80</td>
</tr>
</tbody>
</table>

On total lactation VPF=866,40±5,67 (zile)

On normal lactation
As length, total lactation presents values which vary on the 6 followed lactations in very closed limits, being almost uniform between 363 days in 6th lactation and 377 days in 2nd lactation. This length of total lactation influences also the length of normal lactation, which is almost uniform equal with 300 days.

Milk production on total and normal lactation was influenced by lactation length, but also by other technologic factors, first, by feeding and milking technology.

On entire population production on normal lactation, this one was situated at the level of 4281.77 kg and 173.79 kg fat.

Under qualitative traits report, we underline average content of fat of 4.06 % on normal lactation and of 4.08 % fat on total lactation, aspect which puts in evidence a favorable effect of breeding stock used to obtain this biologic material. We do the same appreciation also for milk content in protein, this one being on average of 3.54 % in normal lactation and 3.56 % in total lactation.

![Dynamics of mammary repose in cow live stock of Bruna breed in Maramureș county](image.png)
Picture 2. Dynamics of kindling interval in cow live stock of Bruna breed in Maramureș county

Picture 3. Lactation period of time in cow live stock of Bruna breed in Maramureș county
Picture 4. Dynamics of milk quantitative production in cow of Bruna breed in Maramureș county

Picture 5. Dynamics of fat and protein quantitative production in cow of Bruna breed in Maramureș county
Conclusions

1. Analysis of milk production index and of variability on successive lactations, shows us that population studied has realized productive performances which can be appreciated as being modest.

2. Bovines in farms situated in Maramures county have realized an average production of 4281.77 kg milk and 173.79 kg fat on normal lactation, with limits between 3899.13 kg milk and 157.14 kg fat in first lactation and 4723.62 kg milk and 193.47 kg fat in 6th lactation.

3. Length of total lactation in bovine population in Maramures county is on average of 369.16 days.

4. Concerning reproduction index, researches done in exploitations in Maramures county localities have put in evidence the followings: mean values of reproduction index (age of first parturition, mammary repose, calving interval and service period) certify an adequate state of reproduction function.

5. Average calving interval (CI) reflects a good reproduction activity in population studied, being followed the realization of an optimum service-period (SP) and of an ideal purpose to obtain a calf every year.

6. Calving interval (CI) to the population in Maramures county is on average of 425.35 days, with variations between 414.57 days to 6th lactation and 436.5 days to 2nd lactation. It is observed a sufficient high uniformity on successive lactations regarding this indicator, that prove the attention give by breeders and specialists to obtain a calf in every year.

7. By global appreciated, reproduction activity is surrounded in normal parameters and reveals that Bruna breed has superior qualities by this point of view facing to other improved breeds.
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