Studies on Growth Rate of Limousine Calves Maintained on Pasture and Free Stabulation

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Abstract
The aim of this study was to monitor the growth process from birth to weaning (six months old) of the females and males Limousine calves maintained on pasture or shelter. The research was performed in a private farm situated in Covasna County. In this farm, the rearing of the calves was done without a technological guide. The calves were reared along with the mother cows for six months. The introduction of vegetal food into the calves ration was done at 3 weeks of age. In the first period (first month), all calves were housed in shelter, having free access to the paddock. The daily gain was 666.7 g in females and 800 g in males. In the second period (from one month of age until weaning), a group was maintained on pasture, and the other group in shelter. The daily gain was 1120 g in females and 1200 g in males on pasture; 1067 g and 1140 g, respectively in shelter. The stress of weaning was present only to the young females; for ten days, these were restlessness, having the desire for sucking and the appetite for food has decreased. Their bodyweight has decreased with 12%, the differences being significant (p≤0.05).

Keywords: growth performances, Limousine calves

1. Introduction
Romania does not have a tradition in raising cattle for beef and beef consumption is lower compared to other UE countries. In our country, Limousine breed was introduced since 2001 and it is an alternative for Romanian farmers, being appreciated for precocity, adaptability, resistance, feed efficiency and strong maternal instinct [1]. The investments are relatively low; the male calves are raised for fattening and the female calves for reproduction and crossbreeding programs [2].

The aim of this study was to monitor the growth process from birth to weaning (six months old) of the female and male Limousine calves maintained on pasture or free confinement.

2. Materials and methods
The research was performed in a private farm situated in Covasna County.
The experimental period was six months (from birth to weaning). A total of 44 Limousine calves were used in the study. The calves were divided into two groups (n=22, 12 female and 10 males). The difference between the groups was the housing system (pasture or shelter).

In this farm, the rearing of the calves was done without any technological guide. The calves were reared along with the mother cows. The cows in the herd calved in April and the grazing season began in May. In the first period (first month), all calves were housed in shelter, having free access to the paddock. In the second period (from one month of age until weaning), a group (L1) was maintained on pasture, and the other group (L2) in shelter, fed with green fodder at the paddock. In this period, all calves had no additional concentrate, except a protein-vitamin-mineral mixture (T1-40).
The calves were weighted at 1, 30 and 180 days of age. The average daily weight gain was calculated for each of the two periods of growth. The performance data were statistically tested by t-test.

3. Results and discussion

The cows had an eutocic calving and did not require supervision. A rate of 83% of cows calved in the paddock. The data concerning the weight dynamics are presented in Table 1.

During the first period, both groups were maintained in shelter. At calving, females had an average weight of 40 kg, and the males 47 kg. Literature data showed that the birth weight was 39 kg for female calves, and 42 kg for male calves [3]. At 30 days of age, before the beginning of the grazing season, the females had an average weight of 60 kg, and the males 71 kg. At 180 days of age, before weaning, the average weight of female calves from L1 was 3.3% higher than that of L2 calves, the difference not being significant (p>0.05). For the males, the average weight in L1 was 3.9% higher (p>0.05). The literature data showed that at weaning (196 days of age) the weight was 202.8 kg for female calves, and 214 kg for male calves raised at pasture [4]. The data concerning the average daily weight gain are presented in Figure 1.

In the second period (from one month of age until weaning), the average daily gain for females was 1120 g in L1 and 1067 g in L2; and for males 1200 g in L1 and 1140 g in L2.

The average daily gain during the whole period was 1039 g in L1 females, 1005 g in L2 females, 1136 g in L1 males, and 1081 g in L2 males. The differences between groups were not statistically significant (p>0.05).

The data from literature showed that the calves reared only on pasture (from birth to weaning time) had an average daily gain up to 8% higher [5] than those raised in confinement. In this study, calves reared on pasture had 3.4% higher daily weight gain for females and by 5.1% for males. After weaning, it was observed that the bodyweight of females decreased by 12% (Table 2) compared to their weight before weaning, the differences being significant (p≤0.05). In males, the bodyweight increased by 4.4% after weaning, value that was not statistically significant (p>0.05).

### Table 1. Dynamics of weight in Limousine calves (kg±SEM)

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>1 day</th>
<th>30 days</th>
<th>180 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Females</td>
<td>40.60±0.43</td>
<td>59.67±0.57</td>
<td>227.67±23.54</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>46.88±0.63</td>
<td>71.27±0.74</td>
<td>251.27±26.77</td>
</tr>
<tr>
<td>L2</td>
<td>Females</td>
<td>39.40±0.51</td>
<td>60.33±0.62</td>
<td>220.38±23.18</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>47.12±0.67</td>
<td>70.73±0.65</td>
<td>241.73±24.64</td>
</tr>
</tbody>
</table>

Significance: ns ns ns

### Figure 1. Daily weight gain (g) of Limousine calves

The data from literature showed that the 210 days weight for weaned males was 286 kg and 258 kg for weaned females [6]. In this study, the female calves were affected by weaning; the weight at 210 days being lower, even though there were no other factors that influenced them.

### Table 2. Weight of Limousine calves after weaning (kg)

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>210 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Females</td>
<td>200.42±19.22</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>262.56±21.43</td>
</tr>
<tr>
<td>L2</td>
<td>Females</td>
<td>193.84±19.07</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>252.57±26.13</td>
</tr>
</tbody>
</table>

The literature data showed that the 210 days weight for weaned males was 286 kg and 258 kg for weaned females [6]. In this study, the female calves were affected by weaning; the weight at 210 days being lower, even though there were no other factors that influenced them.
4. Conclusions

The weight and average daily gain were not significantly influenced by the sex of calves and the system of maintenance (pasture or shelter). The stress of weaning was present in both sexes, but was more evident to the female calves. For ten days, these were restlessness, having the desire for sucking, the appetite for vegetable food has decreased and their bodyweight decreased significant.

References