Body Weight Evolution in Suffolk x Turcana Crossbred Lambs Reared in Sibiu Region during Lambing up to Weaning Period

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Abstract
Current study was carried out in a commercial farm from Sibiu county. In autumn 2010, two group of Turcana breed ewes were established, first group was mated with Suffolk rams, while the second group was mated with Turcana rams. During the lambing season which occurred in February 2011, two experimental groups of lambs were established, made up of one of the two genotypes each, F\textsubscript{1} Suffolk x Turcana and Turcana purebreds, both male and female lambs, respectively. Lambs were allowed to suckle maternal milk from birth until weaning (90 days of age). Body weight of the lambs was evaluated at 30, 60 and 90 days of age. Body weight of the Suffolk x Turcana crossbreds from both sexes was significantly higher ($p \leq 0.001$) at all four stages of the evaluation (birth, 30, 60 and 90 days of age), compared with Turcana lambs. Differences in body weight between the two genotypes increased with age, and at the age of 90 days reached 6.33 kg in male lambs and 7.47 kg in females. Results have shown that Suffolk x Turcana crossbred lambs weaned at the age of 90 days register heavier weights of 25.52 kg in males and 23.87 kg in females, compared with purebred Turcana lambs, which register average weights of 18.58 kg in males and 16.69 kg in females.

Keywords: crossbred lambs, Suffolk breed, Turcana sheep, weaning weight

1. Introduction
Improving meat production in Romanian indigenous sheep breeds its one of the major objectives from the last 20 years, caused by the significant changes that occurred in the last two decades in the industry.
Wool was regarded as main production until the year 1990, which has rapidly changed, resulting the meat production as the main production, tendency which is expected to increase in the coming years.
Geographically, Romania is being situated in a favorable site from the two main markets for lamb meat, the European Union market, which imports around 50\% of the total production, and the Arab states markets, which import around 30\% of the lamb production of the country [1].
The vast majority of lamb meat commercialized worldwide, originates from cross-breeding meat specialised rams of with organic resistant native low-productive breeds [2].
In Romania, the genetic improvement of indigenous breeds for meat production is a relatively new activity, which lacks knowledge and it is not applied very often in the commercial farms. The reason is that in the last 40 years the main objective of selection was to improve wool production.
The first research projects concerning the improvement of lamb meat productions had started in 1972 at the Institute for Research and
Development in Sheep and Goat Breeding (Palas-Constanta) and at the Institute’s territorial research stations. Experiments carried out at the R&D Institute from Palas-Constanta and its territorial stations regarding the meat production of cross-breeds resulted from indigenous breeds (Palas Merino, Transylvanian Merino, Spanca, Tsigai and Turcana) and 10 specialised breeds, pointed out that cross-breeds of local breeds with Suffolk rams had the highest growth rate and carcass yield [3]. Thus, Suffolk x Turcana cross-breed lambs registered an average daily intake with 12.35% higher and an average carcass yield superior with 3.58% compared to Turcana purebreds.

Currently, all these research projects which has been conducted, were aiming to improve meat production of indigenous breeds throughout selection and cross-breeding [4].

Aim of the current study was to evaluate the effects of cross-breeding Suffolk rams with indigenous Turcana ewes on birth weight and growth rates of un-weaned cross-breed lambs, when compared with Turcana pure-breed lambs, reared under highlands conditions from Sibiu area.

2. Materials and methods

The study was carried out in an commercial farm from Sibiu county. Experimental groups were made out of both male and female lambs, each group consisted of 15 animals from the two genotypes, Turcana (TA) purebreds and Suffolk x Turcana (ST) cross-breeds, respectively. Each lamb was weighed immediately after birth using an electronically scale, ear tagged and opening of an individual record with date of birth, sex, birth type, genotype and weight at lambing, 30, 60 and 90 days. All lambs were born in a 3 days period, and during the first 90 days of life they were fed predominantly with their dams milk, and supplementary feeding of lambs was not practiced. Based on data registered during weighing of lambs, averages and dispersion indices were monitored, in order to test the significance of differences using the Mann-Whitney test [5].

3. Results and discussion

Results regarding the body weight evolution from birth to 90 days of life in Turcana (TA) pure-breeds and Suffolk x Turcana (ST) cross-breed lambs are being presented in Tables 1 and 2.

Data from Table 1 show that cross-breeds male ST lambs at birth had a significantly higher (p<0.001) body weight compared with TA male lambs, which registered a average birth weight of 3.69 kg, a weight lower with 22.49% compared to the dual-breeds.

<table>
<thead>
<tr>
<th>Age of lambs</th>
<th>F1 Suffolk x Turcana (M)</th>
<th>Turcana (M)</th>
<th>Differences</th>
<th>Mann-Whitney test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>X ± Sx</td>
<td>Cv%</td>
<td>n</td>
</tr>
<tr>
<td>Birth</td>
<td>10</td>
<td>4.52 ± 0.18</td>
<td>12.68</td>
<td>15</td>
</tr>
<tr>
<td>30 days</td>
<td>10</td>
<td>12.27 ± 0.15</td>
<td>3.92</td>
<td>15</td>
</tr>
<tr>
<td>60 days</td>
<td>10</td>
<td>19.43 ± 0.16</td>
<td>2.58</td>
<td>15</td>
</tr>
<tr>
<td>90 days</td>
<td>10</td>
<td>25.52 ± 0.22</td>
<td>2.73</td>
<td>15</td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01; *** p<0.001; E –experimental group; C – control group

<table>
<thead>
<tr>
<th>Age of lambs</th>
<th>F1 Suffolk x Turcana (F)</th>
<th>Turcana (F)</th>
<th>Differences</th>
<th>Mann-Whitney test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>X ± Sx</td>
<td>Cv%</td>
<td>n</td>
</tr>
<tr>
<td>Birth</td>
<td>10</td>
<td>3.87±0.08</td>
<td>6.90</td>
<td>15</td>
</tr>
<tr>
<td>30 days</td>
<td>10</td>
<td>11.37±0.18</td>
<td>4.94</td>
<td>15</td>
</tr>
<tr>
<td>60 days</td>
<td>10</td>
<td>18.37±0.22</td>
<td>3.78</td>
<td>15</td>
</tr>
<tr>
<td>90 days</td>
<td>10</td>
<td>23.87±0.29</td>
<td>3.79</td>
<td>15</td>
</tr>
</tbody>
</table>

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At the age of 30 days, the body weight differences were accentuated, and reach 2.56 kg (26.36%) in favor of the cross-breeds, which registered averages of 12.27 kg compared to 9.71 kg in TA lambs. Results are in accordance with those found by Gavojdian et al. (2011) who reported differences of 1.99 kg between F₁ German Blackheaded Mutton x Turcana compared to Turcana purebreds at the age of 28 days (p<0.001) [6]. These differences were increased (4.81 kg) at the age of 60 days, when ST cross-breeds reach 19.43 kg and TA lambs 14.62 kg. The differences registered at 30 and 60 days of age between the two genotypes were statistical significant (p<0.001). These results are in accordance with the ones published by Sauer et al. (2012), who found statistically significant differences in the body weight of the Lacaune back-crosses at the age of 56 days compared to Turcana purebreds (p<0.001) [7].

Body weight of lambs at the age of 60 days is an extremely important trait due to the fact that lambs at this age have the highest marketing values. At the age of 90 days, the difference in body weight between the two genotypes grew, to reach 6.94 kg (37.35%), therefore the ST cross-breeds had a final body weight of 25.52 kg, while the TA lambs had average weights of 18.58 kg. In ewe lambs the body weight evolution from birth up to the age of 90 days (table 1) had registered the same tendency as for male lambs. At birth ST female lambs had an average body weight of 3.87 kg, with 0.52 kg higher compared to TA female lambs (p<0.01). Up to the age of 30 days the female ST lambs showed a higher growth rate, extremely closed to male lambs, while in TA female lambs the growth rate was much lower, with the difference between the two genotypes to be statistically significant (p<0.001).

Between 30 and 60 days of life, ST ewe-lambs registered the same high growth rate, reaching at the age of 60 days weights of 18.37 kg, with 4.84 kg (35.77%) more when compared to TA female lambs (13.23 kg). At weaning, cross-breed female lambs reached 23.87 kg, with 1.65 kg less than male dual-breeds, and with 7.18 kg more than TA female lambs, differences between the two genotypes of females being significant (p<0.001).

These results are in accordance with those presented by Popa et al. (2011) which report that when weaning occurred at the age of 70 days, the Suffolk x Turcana cross-breed lambs registered significant (p<0.001) higher body weights compared to Turcana pure-breeds with 29.3% the male lambs and with 28.3% female lambs, respectively [8].

Overall, it can be appreciated that Suffolk x Turcana lambs registered higher body weights, while managed under the same feeding conditions as the Turcana controls.

4. Conclusions

Body weight of F₁ Suffolk x Turcana cross-breed lambs was significantly (p<0.01) higher irrespective of the lambs age, when compared with the purebred Turcana lambs, as follow: at birth with 22.49% and 15.52% in male and female lambs, respectively; at the age of 30 days with 26.36% and 32.83%; at the age of 60 days with 32.90% and 35.77%, respectively; and the age of 90 days, when weaning occurred, cross-breeds were heavier with 37.35% the males and 43.02% the females.

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