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Evaluation of the genetic compatibility between the Black-headed German
and the Turcană breed

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Abstract The production of hybrid lambs for meat depends on the ability to find the most favourable crossbreeding combinations between native and specialized breeds. The aim of this study was to assess the compatibility of the breeding stock, the growth performance up to 3 months of age and the survival rate of Black-headed German (paternal) x Turcana (maternal) hybrid lambs compared to Turcana lambs. Meat production control was carried out with the help of sheep weighing platforms Inscale Platform Scale EOE 150 K 100 X, at 10 o'clock on each control day. The hybrid lambs came from single (A, n=7) and double (B, n=8) lambings and the Turcana lambs from single lambings (C, n=10). The body weight was significantly higher ($p \leq 0.05$) in A than in C at birth, at one month of age and at weaning, as well as in B than in C at weaning. No significant differences ($p > 0.05$) were recorded between the two groups in terms of sheep reproduction indices, lactating capacity of ewes and survival rate of lambs.

• Introduction

Production hybrid lambs for meat between local and specialised breeds is a current method used by many Romanian shepherds for the last years. Many researchers showed that the obtained results of crossbreeding depend on used breeds and the ability to find out the most favourable crossbreeding combinations between local and specialised breeds.

• Material and method

The research was carried out on two mating groups, of 60 ewes each (multiparous ewes, 3-4 years of age, clinically healthy). In each group 3 rams were introduced, for 3 consecutive heats cycles (52 days), with a ram:ewe ratio of 1:20. One group received Black-headed German rams and the other group Turcana rams.

After birth, lambs were registered and oestrous, fecundity and prolificacy indices were calculated.

Lamb weaning occurred at average age of 90 days (± 3 days), and the meat production control was carried out using the weighing platforms for sheep Inscale Platform Scale EOE 150 K 100 XL, fitted with a software for animal weighing (movement software).

Evaluation method for performing the meat production control was respecting the standard ICAR method, which is to perform two measurements at 60-days interval. Thus, the weight was evaluated at birth, 28 days of age (milking capacity) and at 90 days of age.

Lamb mortality from birth to weaning has multiple influences: technological, welfare, sanitary veterinary and management.

Lamb survival rates up to weaning were evaluated by lambing type and per total.

Statistics were carried out using Statistica software, and differences were tested using Mann-Whitney non-parametric test for a low number of individuals.

• Results and discussions

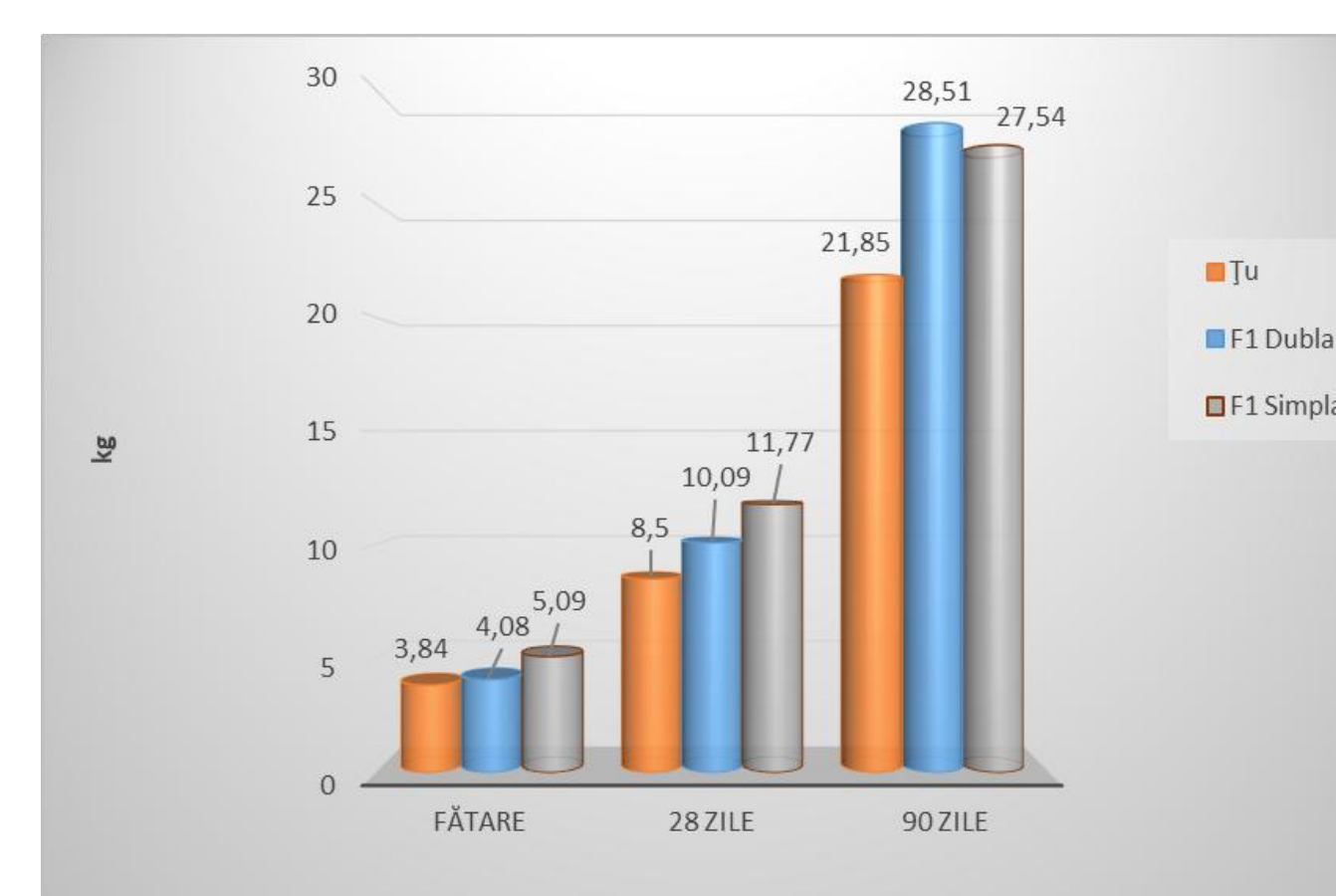
Turcana ewes mated with rams from the same breed had the following indices: ewes in heats 95.6%, fecundity 96.4%, prolificacy 115%. Turcana ewes mated with Black-headed German rams had lower indices, except for prolificacy. Thus, the oestrous index was 94.8%, fecundity was 95.9% and prolificacy was 130%.

All reproduction parameters ante- and post partum were within the breed normal limits, taking into account that animals were reared in extensive production system, without access to concentrates and were kept mostly on natural non-improved pastures.

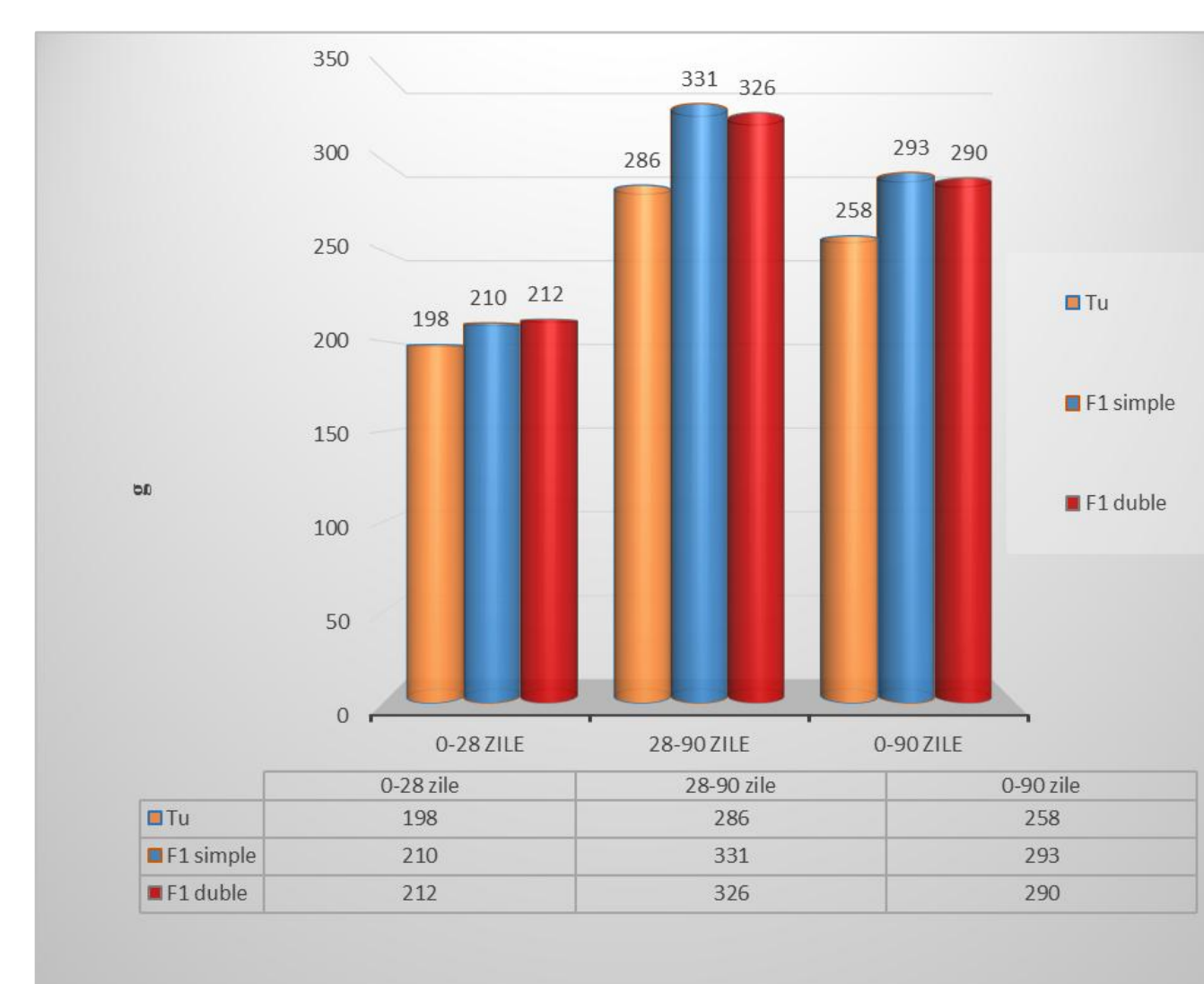


The two figures show the averages for body weight and average daily gain at birth, 28 and 90 days of age of the two studied genotypes: Turcana purebred and F1 hybrids Black-headed German x Turcana obtained from single and twin lambings.

Graphic representation of body mass in lambs of the Turcană breed and hybrids F1 GCN X Turcană



Graphic representation of the average daily increase in lambs of the Turcană breed and hybrids F1 GCN X Turcană



F1 lambs had, on average, a survival rate of 93.4%, with limits from 95.9% to 87.7%, for single and twin lambings, respectively. Turcana purebred lambs had a survival rate of 94.5%, with limits from 96.6% and 92.3% for single and twin lambings, respectively.

• Conclusions

Both F1 hybrid Black-headed German x Turcană lambs from single as well as those from twin lambing had a significantly higher body weight at weaning ($p \leq 0,01$) than Turcana lambs, by 17.2% and 12.88%, respectively.

There were no significant differences for reproduction and lamb survival indices between the two genotypes ($p \geq 0,05$).

Based on our results we could conclude that using Black-headed German rams to crossbreed the Turcana ewes is suitable in order to increase the meat production by 15%, indicating a satisfactory degree of genetic compatibility between these breeds.

• Acknowledgment

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