

QUANTITATIVE AND QUALITATIVE IMPROVEMENT OF THE MEAT PRODUCTION IN THE SHEEP EXPLOITATIONS

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Abstract

Due to the increase the interest for the lamb meat on international and national level we aimed to optimize the technology of fattening the lambs and to obtain the improvement of the carcasses through the use of crossbreeding the local sheep breeds with sheep breeds for meat. It was done the intensive fattening of 100 days. The weigh increasing rates were bigger at the lots of half-bred lambs, being big differences between the half-bred lambs and the lambs from the witness lots formed from lambs of maternal breeds: F1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed) made a daily average increasing rate of $234.11 \pm 9.9735g$, the lambs from Merinos de Palas breed $190.05 \pm 9.0261g$, the lambs of Meat Breed of Palas $219.40 \pm 8.7212g$ the F1 half-bred lambs (Meat Breed of Palas x Țigaie) $193.50 \pm 7.5896g$, lambs of Țigaie Breed $130.71 \pm 2.1045g$, half-bred lambs of F1 (Suffolk x Merinos) $200.60 \pm 4.1035g$, lambs of Merinos Breed $167.31 \pm 2.1735g$ at first sheep breeder, half-bred lambs of F1 (Charollais Breed x Merinos Breed) $238.12 \pm 3.1735g$ lambs of Merinos Breed $185.23 \pm 2.1525g$, at the second sheep breeder. At the slaughtering of control there were obtained bigger values of the output at the half-bred lambs. At the appreciation of the carcasses through EUROP grid the half-bred lambs had the carcasses classified in U class, and the carcasses of the parental breeds (Țigaie and Merinos) in R class.

Key words: fattening, intensive system, half-bred lambs, output

INTRODUCTION

The Romanian researchers, were concerned with the increase of the meat production at the local sheep breeds because the adaptation and breeding of the sheep that are specialized for meat production that come from other countries did not have results, they did not adapt to the conditions from Romania, loss through mortalities and necessity slaughtering occurred, the prolificacy and birth rate decreased a lot [1]. Thus, the solution for improving the quality of the meat production at the Romanian sheep breeds is to create F1 half-bred, for this production using the local breeds as maternal breeds and specialized breeds that were created in other countries as paternal breeds [3].

In the present economic internal and international conjuncture, the sheep breeding

and exploitation should be oriented to make a production based on the requirements of the market, to be favourable to the environment and to improve the technologies of breeding and fattening the sheep youth, aiming also to create certain breeds, lines of sheep with special aptitudes for such production, obtaining carcasses of superior quality (according to EUROP grid) and which to protect the environment, taking into account the biological particularities of the breeds. It is also necessary to re-evaluate the possibilities to make the exploitations more profitable.

The most used method in the developed countries, in England, France, USA or Australia and New Zealand is that of industrial crossbreeding to make half-bred of the first generation to make de carcasses of superior quality [4].

In this work it is aimed the improvement of the sheep meat production, the make of certain technologies of obtaining F1 half-bred from the maternal breeds of Merinos

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and Țigaie crossbred with paternal breeds specialized for meat: Meat Breed of Palas, Suffolk, Charollais. It was aimed to increase the quantity of lamb meat, to increase the quality of the carcasses by industrial crossbreeding which determine the improvement of the performances of the obtained products, associating the quality of two breeds, also having benefit of the effect of complementarity and heterosis, used in the intensive technologies of fattening [1,5].

MATERIAL AND METHODS

The animals included in the researches were individually regarded in the way of their own performances, registering data regarding: control; the weight of lambs during the fattening period, calculus of the increasing rate, and control of the foddering consumption.

The sheep maintenance was done in stable for 150-160 days and 205-215 days in the pasture, there were assured fodder ratios depending on the physiological estate of the animals. Feeding the youth started with the age of 8-10 days, when the lambs were provided, in stables especially arranged, hay of very good quality, vitamins' hays and concentrated foddors, until weaning, after that the intensive fattening being done, a period of 100 days, using The **Recipe of mixed fodder** (made by AGROZOOOTEHNICAL company of PIETROIU); the structure of the mixed fodder was: cereals, soy grouts, grouts of sunflower, calcium carbonate, chide of de sodium, flavouring mineral-vitamin pre-mix. The mixed fodder used at fattening the lambs had the following nutritive value: 2570 kcal/kg, 16% raw protein, 3.50% raw fat, 8,50% raw cellulose.

In the end of the fattening period there were made the control slaughtering, the slaughtering output (output 1 and output 2) were calculated.

Slaughtering output was calculated as follows:

$$\text{Output 1} = \frac{\text{Weight of the cooled carcass (kg)}}{\text{Living weight (kg)}}$$

$$\text{Output 2} = \frac{\text{Weight of the cooled carcass (kg)}}{\text{Empty Living Weight (kg)}}$$

Empty Living Weight = Living weight from which the content of alimentary duct was subtracted.

It was effectuated the meat carving of the carcass, according to the French system of meat carving.

The meat carving of the carcasses - each carcass was cooled for 24 hours at +2 - +4°C; after weighing it was cut in two with the help of the meat chopper and of the wattle introduced into the vertebral vessel. All determinations were done on the right side of the carcass.

The classification of the carcasses was done after "EUROP" grid. The data were statistically processed through usual methods [2].

RESULTS AND DISCUSSIONS

The evolution of the increasing rate of weight at the fattened male lambs can be seen in table 1. The weighing increasing rates were higher at the lots of half-bred lambs, being big differences between the half-bred and the lambs from the witness lots of lambs from maternal breeds: F 1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed) did an average daily increasing rate of 234.11±9.9735g, the lambs of Palas Merino Breed 190.05 ±9.0261g, lambs of Meat Breed of Palas 219.40±8.7212g, F 1 half-bred lambs (Meat Breed of Palas x Țigaie) 193.50±7.5896 g, lambs of Țigaie Breed 130.71±2.1045 g, F1 half-bred lambs (Suffolk x Merino Breed) 200.60±4.1035g, lambs of Merino Breed 167.31±2.1735 g at the first sheep breeder. F 1 half-bred lambs (Charollais x Merino Breed) 238.12±3.1735g lambs of Merino Breed 185.23±2.1525, at the second sheep breeder.

On determination of the fodder consumption per kg of increasing rate it was noted that the highest consumption was obtained at the lambs of Tîgaie breed, 4.50 kg and the lambs of Merino breed, between 5.55 kg and 5.82 kg/ kg weight increasing rate. At the half-bred lambs the consumption was lower. At F1 half-bred lambs (Meat

Breed of Palas x Palas Merino Breed) the consumption was of 4.42 kg/kg increasing rate, at F 1 half-bred lambs (Meat Breed of Palas x Tigaie) of 4.84 kg/kg increasing rate,

at F 1 half-bred lambs (Suffolk x Merino Breed) 5.25 kg/kg increasing rate and at F 1 half-bred lambs (Charollais x Merino Breed) 4.87 kg/kg increasing rate.

Table 1 The average daily weight increasing rate made at the control fattening from the half-bred lambs, comparatively to the lambs from parental breeds and the fodder consumption per kg of increasing rate

| No. | Specification | Average daily increasing rate (g) | | | Fodder consumption per kg of increasing rate (kg) |
|-----|--|-----------------------------------|-------------------|-------|---|
| | | n | $\bar{X} \pm s_x$ | V% | |
| 1 | Palas Merino Breed | 20 | 190.05 ± 9.0261 | 21.24 | 5.55 |
| 2 | Meat Breed of Palas | 20 | 219.40 ± 8.7212 | 17.78 | 4.64 |
| 3 | F 1 half-bred (Meat Breed of Palas x Palas Merino Breed) | 18 | 234.11 ± 9.9735 | 19.05 | 4.42 |
| 4 | F 1 half-bred (Meat Breed of Palas x Tigaie Breed) | 20 | 193.50 ± 7.5896 | 17.54 | 4.84 |
| 5 | Tigaie Breed | 20 | 130.71 ± 2.1045 | 7.20 | 4.50 |
| 6 | F 1 half-bred (Suffolk Breed X Merino Breed) | 20 | 200.60 ± 4.1035 | 9.14 | 5.25 |
| 7 | Merino Breed | 20 | 167.31 ± 2.1735 | 5.81 | 5.65 |
| 8 | F 1 half-bred (Charollais Breed x Merino Breed) | 20 | 238.12 ± 3.1735 | 5.96 | 4.87 |
| 9 | Merino Breed | 20 | 185.23 ± 2.1525 | 5.20 | 5.82 |

At the control slaughtering there were got higher values of the output 1 and 2 at the half-bred lambs comparatively to the lambs of the maternal breeds (table 2).

Table 2 Slaughtering output of the fattened male youth

| No. | Breed | Output 1(%) | | | Output 2(%) | | |
|-----|---|-------------|-------------------|------|-------------|-------------------|------|
| | | n | $\bar{X} \pm s_x$ | V% | n | $\bar{X} \pm s_x$ | V% |
| 1 | F 1 half-bred (Meat Breed of Palas X Palas Merino Breed) | 3 | 47.68 ± 1.060 | 3.86 | 3 | 54.81 ± 1.0900 | 3.45 |
| 2 | Meat Breed of Palas | 3 | 49.54 ± 1.1100 | 3.90 | 3 | 56.08 ± 0.7500 | 2.32 |
| 3 | Palas Merino Breed | 3 | 43.64 ± 0.6300 | 2.50 | 3 | 49.50 ± 0.6000 | 2.08 |
| 4 | F 1 half-bred (Meat Breed of Palas x Tigaie Breed) | 3 | 42.32 ± 0.5326 | 2.18 | 3 | 52.23 ± 0.4623 | 1.53 |
| 5 | Tigaie Breed | 3 | 37.21 ± 0.2354 | 1.10 | 3 | 47.23 ± 0.5633 | 2.07 |
| 6 | F 1 half-bred (Suffolk Breed X Merino Breed) | 3 | 48.68 ± 0.3251 | 1.16 | 3 | 51.23 ± 0.3225 | 1.09 |
| 7 | Merino Breed | 3 | 43.22 ± 0.3354 | 1.34 | 3 | 49.33 ± 0.4332 | 1.52 |
| 8 | F 1 half-bred (Charollais Breed x Merino Breed) | 3 | 48.23 ± 0.3233 | 1.16 | 3 | 52.32 ± 0.5233 | 1.73 |
| 9 | Merino Breed | 3 | 43.67 ± 0.5322 | 2.11 | 3 | 48.77 ± 0.7633 | 2.71 |

F 1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed) did an output 1 of 47.68 ± 1.060% and an output 2 of 54.81 ± 1.0900%, the lambs of Palas Merino Breed did an output 1 of 43.64 ± 0.6300% and did an output 2 of 49.50 ± 0.6000%, the lambs of Meat Breed of Palas had an output 1- 49.54 ± 1.1100% and output 2- 56.08 ± 0.7500%,

F 1 half-bred lambs (Meat Breed of Palas x Tigaie Breed) had output 1- 42.32 ± 0.5326% and output 2- 52.23 ± 0.4623%, the lambs of Tigaie Breed had output 1- 37.21 ± 0.2354% and output 2- 47.23 ± 0.5633%, F 1 half-bred lambs (Suffolk Breed x Merino Breed) had output 1- 48.68 ± 0.3251% and output 2- 51.23 ± 0.3225%, lams of Merino Breed had

output 1- $43.22 \pm 0.3354\%$ and output 2 - $49.33 \pm 0.4332\%$ at the first sheep breeder. F 1 half-bred lambs (Charollais Breed x Merino Breed) had the output 1- $48.23 \pm 0.3233\%$ and output 2 - $52.32 \pm 0.5233\%$, the lambs of Merino Breed had the output 1- $43.67 \pm 0.5322\%$ and output 2- $48.77 \pm 0.7633\%$ at the second sheep breeder.

It was made the chopping of the semi-carcasses, the main parts of the carcass were weighted and it was established the proportion of each main part of the carcass from the total of the semi-carcass (table 3). F1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed) had a proportion of gigot of $32.71 \pm 0.2800\%$, a proportion of the ridge of $34.03 \pm 0.4200\%$ and a proportion of the rest of the carcass of $33.26 \pm 0.5200\%$, the lambs of Palas Merino Breed had a smaller proportion of the gigot, of $29.33 \pm 0.5200\%$, a proportion of the ridge of $36.41 \pm 0.0800\%$ and a proportion of $34.26 \pm 0.5100\%$ of the rest of the rest of the carcass, the lambs of the Meat Breed of Palas had a proportion of gigot of $37.65 \pm 0.2300\%$, a proportion of the ridge of $20.54 \pm 0.4700\%$ and a proportion of $41.81 \pm 0.4700\%$ of the rest of the carcass, F1 half-bred lambs (Meat Breed of Palas x

Țigaie Breed) had a proportion of gigot of $35.74 \pm 0.6321\%$, a proportion of the ridge of 34.25 ± 0.5223 and a proportion of $30.01 \pm 0.3665\%$ of the rest of the carcass, the lambs of Țigaie Breed had a smaller proportion of the gigot of $28.33 \pm 0.3251\%$, a proportion of the ridge of $35.21 \pm 0.3255\%$ and a proportion of $36.46 \pm 0.5522\%$ of the rest of the carcass, F 1 half-bred lambs (Suffolk Breed x Merino Breed) had a bigger proportion of the gigot of $36.25 \pm 0.3254\%$, a proportion of the ridge of $32.45 \pm 0.3215\%$ and a proportion $31.30 \pm 1.2115\%$ of the rest of the carcass, Merino lambs had a proportion of the gigot of $31.23 \pm 1.2212\%$, a proportion of the ridge of $32.52 \pm 0.3133\%$ and a proportion of the rest of the carcass of $36.25 \pm 1.2335\%$ at the first sheep breeder. F 1 half-bred lambs (Charollais Breed x Merino Breed) had a proportion of the gigot of $35.82 \pm 0.5522\%$, a proportion of the ridge of $33.26 \pm 0.3325\%$ and a proportion of the rest of the carcass of $30.92 \pm 0.6322\%$, Merino lambs had a proportion of the gigot of $28.32 \pm 0.3322\%$, a proportion of the ridge of $32.33 \pm 0.6322\%$ and a proportion of the rest of the carcass of $39.35 \pm 1.0223\%$, at the second sheep breeder.

Table 3 Chopping of semi-carcasses from the fattened sheep youth

| Specification | Obtained values | | | | | |
|---|-------------------------|-------------------|-------------------------|-------------------|---------------------------------------|-------------------|
| | Proportion of gigot (%) | | Proportion of ridge (%) | | Proportion of the rest of carcass (%) | |
| | \bar{X} | $\pm s_x$ V% | \bar{X} | $\pm s_x$ V% | \bar{X} | $\pm s_x$ V% |
| F1 half-bred (Meat Breed of Palas x Palas Merino Breed) | 32.71 | ± 0.2800 1.48 | 34.03 | ± 0.4200 2.14 | 33.26 | ± 0.5200 2.71 |
| Meat Breed of Palas | 37.65 | ± 0.2300 1.06 | 20.54 | ± 0.4700 3.96 | 41.81 | ± 0.4700 1.95 |
| Palas Merino Breed | 29.33 | ± 0.5200 3.07 | 36.41 | ± 0.0800 3.81 | 34.26 | ± 0.5100 2.58 |
| F 1 half-bred (Meat Breed of Palas x Țigaie Breed) | 35.74 | ± 0.6321 3.06 | 34.25 | ± 0.5223 2.64 | 30.01 | ± 0.3665 2.12 |
| Țigaie Breed | 28.33 | ± 0.3251 1.99 | 35.21 | ± 0.3255 1.60 | 36.46 | ± 0.5522 2.62 |
| F1 half-bred (Suffolk Breed x Merino Breed) | 36.25 | ± 0.3254 1.55 | 32.45 | ± 0.3215 1.72 | 31.30 | ± 1.2115 6.70 |
| Merino Breed | 31.23 | ± 1.2212 6.77 | 32.52 | ± 0.3133 1.67 | 36.25 | ± 1.2335 5.89 |
| F 1 half-bred (Charollais Breed x Merino Breed) | 35.82 | ± 0.5522 2.67 | 33.26 | ± 0.3325 1.73 | 30.92 | ± 0.6322 3.54 |
| Merino Breed | 28.32 | ± 0.3322 2.03 | 32.33 | ± 0.6322 3.39 | 39.35 | ± 1.0223 4.50 |

At the appreciation of the carcasses through EUROP grid the results presented in table 4 were got. The carcasses of F1 half-

bred lambs (Meat Breed of Palas x Palas Merino Breed), of F1 half-bred lambs (Meat Breed of Palas x Țigaie Breed), of F1 half-

bred lambs (Suffolk Breed x Merino Breed) and of F1 half-bred lambs (Charollais Breed x Merino Breed) were included in U group,

as also the lambs of Meat Breed of Palas. The carcasses of Merino lambs and Țigaie were included in R group.

Table 4 Classification of the carcasses by EUROP grid

| No. | Specification | Class by conformation | | | | Class by degree of fattening | | | |
|-----|--|----------------------------|--------|-----------------------|-------|------------------------------|-------|---------------------------|-------|
| | | U (very good carcasses) | | R (good carcasses) | | 2 Thin carcasses | | 3 Medium fat carcasses | |
| | | no. | % | no. | % | no. | % | no. | % |
| 1. | F 1 half-bred (Meat Breed of Palas X Palas Merino Breed) | 2 | 67.00 | 1 | 33.00 | 1 | 33.00 | 2 | 67.00 |
| 2. | Meat Breed of Palas | 3 | 100.00 | - | - | 1 | 33.00 | 2 | 67.00 |
| 3. | Palas Merino Breed | - | - | 3 | 100.0 | 1 | 33.00 | 2 | 67.00 |
| 4 | F 1 half-bred (Meat Breed of Palas x Țigaie Breed) | - | - | 3 | 100.0 | 2 | 67.00 | 1 | 33.00 |
| 5 | Țigaie Breed | - | - | 3 | 100.0 | 1 | 33.00 | 2 | 67.00 |
| 6 | F1 half-bred (Suffolk Breed X Merino Breed) | 3 | 100.00 | - | - | 1 | 33.00 | 2 | 67.00 |
| 7 | Merino Breed | - | - | 3 | 100.0 | 2 | 67.00 | 1 | 33.00 |
| 8 | F 1 half-bred (Charollais Breed x Merino Breed) | 3 | 100.00 | - | - | 2 | 67.00 | 1 | 33.00 |
| 9 | Merino Breed | - | - | 3 | 100.0 | 2 | 67.00 | 1 | 33.00 |

CONCLUSION

1. At calculating the average daily increasing rate made by the intensively fattened lambs (100 days) and using **The recipe of mixed fodder** (made by the Agro-zoo technical company of Pietroiu); with the structure of: cereals, grouts of soy, grouts of sunflower, carbonate of calcium, chloride of sodium, mineral-vitamin premix, aromatizing, having the following nutritive value: 2570 kcal/kg, 16% raw protein, 3.50% raw fat, 8.50% raw cellulose, the highest weight increasing rates were obtained by the F1 half-bred, comparatively to the increasing rates of the lambs from maternal breeds (234.11± 9.9735g) the F1 half-bred (Meat Breed of Palas x Palas Merino Breed), at F 1 half-bred lambs (Meat Breed of Palas x Țigaie Breed) 193.50±7.5896 g, at F 1 half-bred lambs (Suffolk Breed x Merino Breed) 200.60±4.1035g, and at F 1 half-bred lambs (Charollais Breed x Merino Breed) 238.12±3.1735g). High increasing rate was obtained also at Meat Breed of Palas (219.40±8.7212 g).

2. At determining the fodder consumption per kg of increasing rate it was noted that the biggest consumption was done by the lambs of Țigaie breed, 4.50 kg and at the lambs of

Merino Breed, between 5.55kg and 5.82 kg/kg of weight increasing rate and the smallest at the F1 half-bred lambs, 4.42 kg at F1 half-bred (Meat Breed of Palas x Palas Merino Breed), 4.84 kg at the F1half-bred lambs (Meat Breed of Palas x Țigaie Breed) 5.25 kg at F 1 half-bred lambs (Suffolk Breed x Merino Breed) and 4.87 kg at F 1 half-bred lambs Charollais Breed x Merino Breed).

3. At the chopping of the carcasses it was noted a big development of the gigot at F1half-bred, F 1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed) made a proportion of the gigot of 32.71±0.2800%, F 1 half-bred lambs (Meat Breed of Palas x Țigaie Breed) had a proportion of the gigot of 35.74±0.6321%, F 1 half-bred lambs (Suffolk Breed x Merino Breed) had a proportion of the gigot of 36.25±0.3254%, F1 half-bred lambs (Charollais Breed x Merino Breed) had a proportion of the gigot of 35.82±0.5522%, and at the lambs of Țigaie breed and of Merino breed, the development of the gigot was lower (at the lambs of Țigaie breed 28.33±0.3251%, at the lambs of Merino Breed 31.23±1.2212% and 28.32±0.3322%).

4. At the appreciation of the carcasses through EUROP grid it was noted the

inclusion of the carcasses from F 1 half-bred lambs (Meat Breed of Palas x Palas Merino Breed), of F1 half-bred (Meat Breed of Palas x Țigaie Breed), of F1 half-bred (Suffolk Breed x Merino Breed) and of F1 half-bred (Charollais Breed x Merino Breed) in U group, and also of the lambs of Meat Breed of Palas. The carcasses of the lambs of Merino breed and Țigaie Breed were included in R group.

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