

## **PROLIFICACY IMPROVEMENT OF POLISH MOUNTAIN SHEEP BY CROSSBREEDING WITH HIGH PROLIFIC OLKUSKA RAMS**

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*Polish Mountain sheep is a breed keep in Polish Mountain such as Tatra, Beskidy and Bieszczady and is very well adapted to local conditions. Its lambs production is low. The aim of this study was to improve of prolificacy of Polish Mountain sheep by crossing with high prolific Olkuska rams. F<sub>1</sub> crossbreeds ewes have average 2,31 litter size which is nearly 1 lamb higher than litter size of Polish Mountain sheep. This results indicate that Olkuska rams have significant influence on efficiency lambs production of Polish Mountain sheep.*

Now days in Europe mine direction of sheep husbandry is meat production. In Poland most of sheep breads have intermediate ability for lamb production. The genetic production potential of those sheep flocks can be increased through selection and crossbreeding. Progress in selection for economic traits is slow and requires patience and time compared to the improvement that can be achieved by crossbreeding. Different breeds of sheep are superior in different traits. Not all economically important traits can be found in one breed. Crossbreeding can be used to incorporate the strengths of different breeds into a sheep producers program. In addition to the improvement that can be realized through the use of complementary breeds, are the advantages obtained from heterosis. In general, crossbreeds tend to be more vigorous, more fertile and grow faster than the average of the purebreds included in the cross. One of our local breeds Polish Mountain sheep has about 45-50 kg of body weight, low prolificacy (120-135%) and her lamb production is also not satisfactory enough (Ciurus and Drozd, 1990). Those traits of this breed have to be improved for getting profitability. Other our local breed the Olkuska sheep weight about 60-65 kg and is characterized by high prolificacy (220%) (Murawski et al., 2006). This breed seems to be a good candidate for crossbreeding used to increase prolificacy of Polish Mountain sheep.

The aim of this study was to investigate weather is possible to improve lamb production of Polish Mountain sheep by crossing with the high prolific Olkuska sheep.

### **Materials and methods**

In this experiment were used 40 ewes and 84 lambs of high prolific Olkuska sheep, 60 F<sub>1</sub> generation ewes (crossbreed -Polish Mountain ewes were mated to Olkuska rams) and their 139 lambs and 60 ewes of Polish Mountain sheep with their 82 lambs. All ewes were 2-5 years old. Ewes crossbreeds F<sub>1</sub> were mated to Charolaise rams. Observation were carried out in Experimental Station of Sheep and Goats Breeding Department of Agricultural University in Krakow in Bielany since January to April 2007. Animals whole time of investigation were kept in the sheepfold had free access to water and were fed on hay, hay silage, and lambs since second week of live get *ad libitum* concentrate based on oat and barley with addition of minerals. Data were collected about ewes reproduction ability, litter size, lamb body weight and growth rate until 56 day of age and were statistically analyzed by t-Student test.

### **Results and discussion**

Among breed groups, F<sub>1</sub> crossbreed had the highest litter size at birth, Polish Mountain sheep had the lowest performance, and the Olkuska ewes were intermediate. For litter weight at birth and at 28 days lambs of F<sub>1</sub> generation had the heaviest litters and ewes of Polish Mountain sheep had the lightest litters. Weight of litter size of F<sub>1</sub> crossbreed ewes is more than one third heavier than litter of Polish Mountain sheep at 56 day and this difference is statistically significant

( $p \leq 0,001$ ). The highest daily growth rate had lambs from F<sub>1</sub> crossbreed group, the Polish Mountain sheep had the lowest and the Olkuska lambs intermediate (Table 1.). Similar beneficial influence on lambs growth rate of Olkuska rams in crosses with Polish Merino have been reported by Piękoś and Fiszdon (1990). Results for litter size observation indicate that prolificacy of F<sub>1</sub> crossbreeds were the highest among genetic groups and were statistically higher than litter size of Polish Mountain sheep (table). Crossbreed F<sub>1</sub> ewes gave almost 1 lamb more per litter than Polish Mountain sheep.

Table

**Prolificacy of Olkuska sheep, F<sub>1</sub> crossbreed, Polish Mountain sheep and growth characteristic of their lamb during the first 56 day after birth**

	Number of ewes	Litter size (lamb/ewe)	Litter wg [kg] (day of birth)	Litter wg [kg] (28 day)	Litter wg [kg] (56 day)	Daily growth rate [g] (0-28 day)	Daily growth rate [g] (29-56 day)
Olkuska sheep	40	2,12 <sup>a</sup>	7,33	21,1	34,8 <sup>A</sup>	234	231
F <sub>1</sub> crossbreed	60	2,31 <sup>a</sup>	8,37	21,3	34,6 <sup>A</sup>	245	246
Polish Mountain sheep	60	1,36 <sup>b</sup>	4,8	13,00	20,7 <sup>B</sup>	218	222

<sup>a, b</sup>Values with different superscripts are statistically different ( $p \leq 0,01$ )

<sup>A, B</sup>Values with different superscripts are statistically different ( $p \leq 0,001$ )

This results are similar to observation carried out by Piekos and Fiszdon (1990) on crossbreeds Polish Merino with Olkuska rams which had 0.7 lamb more per litter then Merino ewes. Olkuska rams were used by Ciuryk et al. (1999) for crossing with Polish Long Wool sheep and their crossbreeds characterized higher prolificacy than maternal breed. Also preliminary results concerned ovulation rate in crossbreeds (Polish Mountain sheep mated with Olkuska rams) reported by Murawski et al. (1994) indicate that it was higher about 0,8 corpora lutea per ewe than in Polish Mountain sheep.

Presented results clearly indicate that Olkuska rams have high potential for prolificacy improvement in Polish Mountain sheep. This feature of Olkuska rams have also significant influence on lambs production profitability of Polish Mountain sheep.

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## **ПІДВИЩЕННЯ БАГАТОПЛІДНОСТІ ПОЛЬСЬКОЇ ГІРСЬКОЇ ПОРОДИ ОВЕЦЬ ШЛЯХОМ СХРЕЩУВАННЯ З ВИСОКОПЛІДНИМИ ОЛЬКУСЬКИМИ БАРАНАМИ**

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### **S u m m a r y**

Польська гірська порода овець утримується в Польських Горах, таких як Татри, Бескиди і Бешчади і є добре пристосована до місцевих умов. Однак вихід ягнят низький. Метою цього дослідження було підвищити багатоплідність польської гірської породи овець шляхом схрещування з високоплідними олькуськими баранами. Від помісних овець F<sub>1</sub> одержали в середньому 2.3 ягнят на вівцематку, що приблизно на одне ягня вище, ніж у польських гірських овець. Ці результати свідчать про те, що олькуські барани суттєво впливають на багатоплідність овець польської гірської породи.

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