

INFLUENCE OF SEX AND LITTER SIZE OF BIRTH WEIGHT AND INCREASE LAMBS SJENICA IMPROVED TUFT SHEEP IN INTENSIVE BREEDIN SYSTEM

Amir GANIC*, Admir DOKSO, Ervin ZECEVIC

Faculty of Agriculture and Food Science, University of Sarajevo, Bosnia and Herzegovina

*(Corresponding author: ganicamir@yahoo.com)

Abstract

In the two years on the family farm in the vicinity of Visoko, were monitored parameters in 35 animals Sjenicka pramenka. The sheep were kept in intensive farming systems. During the year the stock has been held for at least 10 months in a barn (in stable breeding). Annually, a minimum of seven to eight months of basic diet of sheep is corn silage. The aim of this study was to determine the influence of litter size and sex on birth weight and weight gains of lambs to weaning (90 days). The average birth weight of male singles was 5,61 kg and was significantly ($P<0,05$) higher compared with women singles (5,03 kg). Male twins are sought after lambing and 4,74 kg also significantly ($P<0,05$) were heavier than female twins (4,05 kg). Overall, singles of lambing had a mass of 5,24 kg and 4,32 kg twins. The difference was statistically significant ($P<0,05$). Final weight (90 days) of male singles amounted to 42,17 kg and 32,75 kg female. On average, singles the three months weighed 36,06 kg and 28,91 kg twins. In both cases the differences were compared values were statistically significant ($P<0,05$). The average weight gain of male singles in the period from 0 to 90 days was 406,24 g and 306,75 g female. The highest increase male singles achieved in the first 15 days (420,67 g), and female, between 0 to 30 days of age (329,57 g). Sex differences in the biggest and average increment between singles were significant ($P<0,05$). Male twins are the largest gain (324,22 g) were between 60 and 90 days and the female (314,02 g) from 30 to 60 days of age. Differences biggest gain of male and female twins, were not statistically significant ($P>0,05$). The average weight gain of male twins at the age of three months was 289,65 g and 250,08 g female. Differences in the average gain of male and female twins were significant ($P<0,05$). The biggest daily gain (354,69 g) singles are achieved from 0 to 30 days of age, the twins from 0 to 90 days (271,39 g). Average daily gain singles during the test period was 344,06 g and 271,39 g twins mentioned.

Keywords: sjenicka sheep, birth weight, weight gain, intensive farming

Introduction

In the economy of Bosnia and Herzegovina, sheep farming is an important branch of livestock production, and favorable natural conditions make it possible to grow large numbers of sheep (Hodži , 2005). The advantage of the sheep is in the fact that the ruminant and is able certain amount of roughage, different backgrounds and shapes into a high-grade products (Mio et al. 2007). Existing sheep population in Bosnia and Herzegovina in the high percentage of indigenous pramenka makes a large number of strains (Omanovi , 2006). Sjenica improved tuft sheep was named after the village Sjenica the Pešter plateau. Pešter plateau with these sheep, in recent decades, spread to nearly healed western part of Serbia, the northern part of Montenegro, has been found in Bosnia and Herzegovina. Sjenica's sheep is one of the largest domestic sheep with wool C and D varieties (Jovanovi & Savi , 2007). According to some sources this fine assortment of wool sheep have because they participated in its creation Asian sheep with fine wool, which the Turks were reared in the Balkans grew

during his reign. Her breasts are quite deep but narrow chest. Head of sheep is covered with hair which is mostly white with black rings around the eyes, with a black snout lined upper and lower lips and ears with black tips. Of the 100 sheep will be 110-130 lambs. Sjenica's sheep belongs to the group of long-tailed sheep. Late physique a fertility and growth ends at the age of 3-4 years. The sheep are hornless, and the rams have well-developed horns in the form of a spiral (Guti et al. 2006). In our production conditions, of all livestock, sheep farming has been achieved the lowest intensity of development. The reasons for this situation are poor genetic potential, as well as insufficient and unbalanced nutrition some categories of sheep, especially in the winter. In other words, the diet of sheep during this period should be introduced silage or haylage, and a number of other feeds, especially by-products of agriculture and food industry (Handži et al. 1986). The introduction of silage in winter feeding of sheep is one of the most significant changes in order to improve production (Djordjevi & Dini 2003). Antov et al. (2004) suggest that the diet of livestock introduced silage, particularly in sheep that are not milking, breeding offspring in fattening lambs to the higher weight. In order to develop livestock production need to forage on a manifold increase and make cheaper (Fedhofer et al. 1987).

The aim was to establish whether and how the impact of sex and litter size on birth weight and weight gains of lambs Sjenica improved sheep. In terms of the food, sjenicka sheep is destined traditional summer grazing and winter feeding hay with the addition of concentrated feed. Therefore, an additional aim of this study was to recognize the possibility of introduction of corn silage in the diet of sheep during most of the year and determine its production properties.

Materials and methods

Studies were conducted on a private farm near Visoko on 2011 / 2012th and 2012, / 2013th , during two cycles of lambing ewes. Of the investigation, followed by 35 adult Sjenica improved tuft sheep. Animals were purchased as offspring of repro center Resi i – Rudo. Mothers and, further ancestors examined cattle originating in the Pešter of the most important breeder of the sheep (of the family Bihorac, Milevi , Mujezinovic, Kanjevac, Burovi , etc.). Ewes were first mated with 13-15 months of age. Sheep during the year a minimum of seven months (November-May) fed silage. The rest of the year diet of sheep consisting of meadow hay, with the evening meal of barley or wheat straw. The amount of corn silage during the last two months of pregnancy until just before lambing was about 2 kg / ewe. With silage for the evening meal sheep fed barley or wheat straw. Sheep are for the evening meal until the lambing received by approx. 200 g of concentrate feed (80% wheat bran and 20% grains of barley and oats). Three to four days after lambing, sheep gradually increase the amount of silage to a maximum of 3 kg / ewe per lambing 10-15 days. The evening meal was lambing ewes quality meadow hay at a rate of about 1-1.5 kg and 400 g / sheep concentrate feed (70% wheat bran and 30% barley and oats). Water and mineral supplements in the form of blocks, horses were available ad libitum. Lambs with their mothers continuously resided in the first 15-20 days after lambing. After this period, the lambs were separated from their mothers, with the month of breastfeeding replayed four times a day. At the age of one and a half to two months, until weaning to three months of age, lambs were replayed three times a day to breastfeed. Lambs were separated in special boxes where they were available concentrate feed, water, mineral and vitamin supplements ad libitum. Concentrated feed for the lambs during the first and second months were comprised of: 27.30% ground corn, 32.80% pellets (16% protein), 32.80% bran, 3.80% soybean meal (a by-product in the production of bio-diesel), 3.20% sunflower meal (a by-product in the production of bio-diesel) and 100 g Muvisel's (mineral-vitamin supplement). At a later stage from the second to third month of

concentrated feed for the lambs had the following composition: 50% corn, oats 20%, barley 10%, sunflower meal 10%, wheat 5%, and soybean meal 5%. All components are coarsely ground and mixed. Sheep are a minimum of 24 hours before lambing segregated in special boxes, where they remained together with lambs 7-10 days. Measuring the weight of lambs was performed immediately after lambing, after the sheep lick the lamb. Determining the mass was performed on a digital scale with a precision of 0.00 kg. Measured mass after lambing, with 15, 30, 60 and 90 days of age, when the lambs were rejected by their mothers. During the processing of the results obtained for the purpose of mutual comparison, the lambs were grouped into the following categories: men's singles (MS), single women (ŽS), twin boys (MB), the female twins (ŽB), and total male (ZM) and total female (ZŽ) lambs. During the two-year study measurements were performed on 105 lambs. The average fertility during two pregnancy amounted to 1.5 lamb per ewe. In the first year of monitoring (2011/2012.godina) animals were tested in the first pregnancy, and in the second year, in the second pregnancy. The research results were analyzed using SPSS 16.0. To test the mean values were used Tukey test.

Results and Discussion

Table 1 shows the weight of lambs shortly after birth until weaning, with three months of age. The results from the above table represent the aggregate average value of two years of research. The highest birth weight (5,61 kg) had a single male lambs. Also, the same category lambs had the greatest final weight (42,17 kg). Significantly lower weight at lambing had a female lambs units (5,03 kg) and total male lambs (5,00 kg). At least they were birth weight in female twins 4,05 kg. From the table it is evident that men's singles achieved a fairly high mass at 90 days, and the average of all male lambs (34,21 kg). Meki et al. (2008) found significantly lower birth weight (3,52 kg) Sjenica's improved sheep. Also, the same authors for the same lambs give a lower weight at the age of 30 days (8,72 kg), 60 days (14,47 kg) and 90 days (20,56 kg). Ramljak et al. (2005) are measuring birth weight lambs Kupres's sheep, found significantly lower values (4,51 kg and 4,36 kg male female). Memiši et al. (2006) found that the birth weight of lambs at bardok amounted to: 3,60 kg single male and 3,30 kg single female. The same authors in their research report that lambs of Bardoka weight at the age of three months amounted to 17,60 kg single male, respectively, 16,80 kg single female. Approximate weight of lambs maternity Tsigai (5,39 kg) was found Antunovi et al. (2012). Meki et al. (2007) point out that the birth weight of lambs in the Svrlijig sheep were 3,82 kg (single) and 2,91 kg (twins).

Table 1. Weight of lambs

Age	Kategorija					
	MS n=12	ŽS n=20	MB n=28	ŽB n=45	ZM n=40	ZŽ n=65
after lambing	5,61±0,38 ^a	5,03±0,16 ^b	4,74±0,25 ^c	4,05±0,14 ^d	5,00±0,24 ^b	4,35±0,16 ^{cd}
15 days	12,22±0,12 ^a	9,48±0,49 ^c	9,38±0,28 ^c	7,33±0,36 ^d	10,80±0,54 ^b	7,95±0,38 ^d
30 days	17,50±0,28 ^a	14,91±1,64 ^b	11,86±0,68 ^d	10,37±0,30 ^e	13,98±1,02 ^c	11,89±0,77 ^d
60 days	29,86±0,70 ^a	23,43±2,03 ^b	21,08±1,11 ^{bc}	19,54±1,02 ^c	23,71±1,55 ^b	21,65±1,02 ^{bc}
90 days	42,17±0,44 ^a	32,75±1,38 ^{bc}	30,81±1,20 ^c	27,32±1,25 ^d	34,21±1,92 ^b	29,29±1,14 ^{cd}

MS - single male; ŽS - single female; MB - male twins; ŽB - female twins; ZM - total men; ZŽ - total female

From the table 1 it can be concluded that the sex and number of litters Sjenica improved sheep significantly ($P < 0,05$) influenced the birth and weight of lambs to weaning. Numerous

scientific studies confirm the previous conclusion. Thus, Mio et al. (2003 cit. Mio et al. 2007), Rusty et al. (1995), Jurkovi (2003), Yilmaz et al. (2007) in their research report similar conclusions.

Table 2. The growth of lambs

Days	Category (g)					
	MS n=12	ŽS n=20	MB n=28	ŽB n=45	ZM n=40	ZŽ n=65
0-15	420,67±29,94 ^a	304,83±25,97 ^c	261,67±3,39 ^d	220,13±19,07 ^e	341,17±30,58 ^b	244,33±17,62 ^{de}
0-30	396,56±4,31 ^a	329,57±46,08 ^b	237,77±16,41 ^d	209,00±9,19 ^e	297,31±28,01 ^c	232,46±15,86 ^d
15-30	369,00±18,78 ^a	277,42±46,03 ^b	218,83±43,03 ^c	183,96±11,75 ^e	293,92±34,91 ^b	219,22±19,05 ^c
0-60	404,25±16,76 ^a	310,56±29,40 ^b	272,37±15,77 ^{de}	256,23±16,04 ^e	311,93±23,25 ^b	295,28±13,65 ^c
30-60	411,94±29,21 ^a	328,40±14,99 ^{bc}	314,87±22,52 ^c	314,02±30,87 ^c	351,27±22,99 ^b	319,55±21,62 ^d
0-90	406,24±5,83 ^a	306,75±10,78 ^c	289,65±11,68 ^d	250,08±13,75 ^e	324,63±19,57 ^b	275,84±11,36 ^d
60-90	410,22±19,17 ^a	245,53±9,01 ^d	324,22±8,84 ^c	200,11±18,12 ^e	350,02±15,28 ^b	220,75±12,28 ^e
30-90	411,08±6,90 ^a	286,97±9,55 ^d	317,72±15,24 ^c	273,46±21,17 ^d	352,73±18,18 ^b	279,60±12,68 ^d

MS - single male; ZS - single female; MB - male twins; ŽB - female twins; ZM - total men; ZŽ - total female

Average daily gain of lambs Sjenica improved sheep from 15 days of age until weaning (90 days) is shown in table 2. It is evident that the male lambs had higher ($P < 0,05$) daily gains compared with female. Also, differences were present ($P < 0,05$) and within the same sex and of different types (single or twin). It is important to note the high daily gains in male single who were highest in the first 15 days (420,67 g/day). Female lambs (single) the highest daily gains achieved in the first month of age (329,57 g/day). On the other hand, at least daily gains of lambs were between the fifteenth and thirtieth day (218,83 g/day male twins and female twins 183,96 g/day). It is evident that on the average daily gain sex and type of lambs had statistical significance ($P < 0,05$).

Table 3. Comparative review of maternity and weight gain single and twins

Age	mass at lambing		daily gains	
	Singles n=32	Twins n=73	Singles n=32	Twins n=73
after lambing	5,24±0,19 ^a	4,32±0,15 ^b	-	-
15 days	10,39±0,67 ^a	7,67±0,39 ^b	343,44±33,02 ^a	227,05±17,18 ^b
30 days	15,89±1,09 ^a	10,87±0,37 ^b	354,69±32,59 ^a	218,59±9,43 ^b
60 days	25,57±1,62 ^a	20,26±0,82 ^b	341,79±25,05 ^a	263,76±12,19 ^b
90 days	36,06±1,94 ^a	28,91±1,14 ^b	344,06±19,62 ^a	271,39±11,65 ^b

In the table 3 presented comparative values maternity weight and daily gain singles and twins. It is evident that singles of the same age had a higher weight ($P < 0,05$) and had significantly ($P < 0,05$) greater daily gains than twins. The conclusion of the preceding sentence is consistent with research Notter et al. (1991), Greef et al. (1992), Nawaz and Meyer (1992), Owen (1996).

Conclusion

Exploring the effects of sex and litter size at birth and weight of lambs at the age of 15, 30, 60 and 90 days, it can be concluded that:

1. The average weight of male lambs at lambing was 5,00 kg and females 4,35 kg. The differences found in the effects of sex and type of litter size were statistically significant ($P < 0,05$).
2. The final average weight of male lambs at weaning (90 days old) has been 34,21 kg and 29,29 kg female. The differences are also due to the impact of these factors were statistically significant ($P < 0,05$).
3. The highest average daily gain (420,67 g/day) were determined in male singles in the first 15 days. On the other hand, the lowest average daily gains were established in female twins between 15 and 30 days of age (183,96 g/day). The impact of sex and type of litter had statistical significance ($P < 0,05$).
4. During the two-year study using corn silage in the diet of Sjenica improved sheep showed quite reasonable. Neither sheep during feeding cycle is not had any health problems. In addition, during the use of silage in sheep suckling period did not significantly lost their shape, which certainly contributed to the relatively high fertility in cattle (150%). In economic terms silage also confirmed all its advantages compared to other forages.

References

- Antov G., Čobić T., A. Antov (2004): Ensiling and silage. University of Novi Sad, Faculty of Agriculture, Novi Sad.
- Antunović Z., Senić I., Tomašić G., Novoselec J., Klir Ž. (2012): Fattening and carcass traits of lambs Tsigai breed. Proceedings 47th Croatian and 7th International Symposium on Agriculture, Opatija, Croatia (650-653).
- Čorović N., Dinić B. (2003): Silage legumes. Institute for Research in Agriculture Serbia, Belgrade.
- Fedhofer S., Herman K., Matic A., Gašpar M., Mundžić K. (1987): Preservation of fresh apple coma with "Ubeom 70". 36 Veterinaria, Sarajevo. 187-193.
- Greef J.C., Hofmeyer J.H., Lourens D.J., Wyma G.A., Maijala K. (1992): Reproductive performance at first lambing and in twice-yearly lambing in a flock of Finnish Landrace sheep in Finland. *Animal Production* 25, 319-329.
- Gutić M., Petrović M., Kurubić V., Bogosavljević-Bosković S., Mandić L., Dosković V. (2006): Sheep production technologies. Faculty of Agriculture.
- Handžić R., Bugarskić I., Čusević Z. (1986): Possibilities of sheep silage and haylage in the intensive production of meat and milk. Sarajevo, *Veterinaria* 35, 461-471.
- Hodžić H. (2005): Economics of sheep production in the area of Livno. Master's thesis; Agricultural and Food Science.
- Jovanović S., Savić M., Petrujković T., Vučinić M. (2007): Current trends in health care and breeding of sheep and goats. Faculty of Veterinary Medicine and the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia.
- Jurković D. (2003): Some production characteristics of Slovenka Sheep in Croatia. Graduate work. Faculty of Agriculture Zagreb.
- Mekić C., Trifunović G., Perišić P. (2007): Reproductive Indicators and lamb to refusal of Svrlijska sheep. *Savremena poljoprivreda* Vol. 56, 1-2, 37-42.
- Mekić C., Trifunović G., Perišić P., Vujić R., Petrović M.P. (2008): Impact of the farm, sex and type of birth on body weight of lambs during the suckling time in Sjenica improved sheep. *Biotechnology in Animal Husbandry*, 24, 137-142.

- Memiši N., Bauman F., Pavlov B. (2006): White Metohija sheep - Bardoka. Book of scientific paper PKB Agroekonomik, Vol.12, no. 3-4, 135-143.
- Mio B., Pavi V., Suši V. (2007): Sheep farming. Croatia Zagreb Dairy Association.
- Nawaz M., Meyer H.H. (1992): Performance of Polypay, Coopworth, and crossbreed ewes: Reproduction and lamb production. *Journal of Animal Science* 70, 62-69.
- Notter D.R., Kelly R.F., McClaugherty F.S. (1991): Effects of ewe breed and management system on efficiency of lamb production: II. Lamb growth, survival and carcass characteristics. *Journal of Animal Science* 69, 22-33.
- Owen J.B. (1996): The Cambridge breed. In: *Prolific Sheep* (edited by Fahmy, M.H.), CAB International, Wallingford, UK.
- Rastija T., Beri B., Mirjana . (1995): Influence of crossing three breeds of sheep to lamb weight gain. *Sto arstvo* 49, 3-4, 95-100.
- Yilmaz O., Denk H., Bayram D. (2007): Effect of lambing season, seks and birth type on growth performance in Norduz lambs. *Small Ruminant Research* 68, 336-339.