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THE EFFECT OF INTENSIVE FEEDING, BREED AND SEX ON GROWTH, MEATINESS AND FATTINESS OF LAMBS

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Abstract

The aim of the study was the evaluation of the effects of intensive feeding, breed (Suffolk, Merinoladschaf, Oxford Down and Charollais) and sex on growth, meatiness and fattiness in lambs. The study was carried out on the school farm in Zabcice in 2008. Ultrasound measurements of meatiness and fattiness (depth of *musculus longissimus lumborum et thoracis* (Dm.l.l.t.) and fat thickness (FT)) was carried out between last pectoral and first lumbar vertebrae after tease out of wool, by ultrasound Aloka SSD 500 with 5 MHz linear probe. The breed had not a significant effect on all growth parameters under study. On the other hand the sex had a significant effect on live body weight at 100 days of age and on daily gain in the period from 30 to 70 days of age. The breed had a signifcant effect on Dm.l.l.t. only at the age of 100 days. The breed and sex had a significant effect on FT at the age of 70 days.

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Keywords: growth, meatiness, fattiness, breed, sex, lamb

Introduction

The meat production is main product of Czech sheep industry today, when a lot of breeders is producing heavy lambs. Growth of lambs is affected from many factors, the most important of them is the effect of breed, feeding, health, sex and litter size. The effect of breed and sex on lambs growth evalued *Fernandez et al* (1997), *Larsgard and Olesen* (1998), *Gutierrez et al* (2005) and *Dobes et al* (2007). The ultrasounds machines are using in meatiness and fattiness evaluation in lambs for many years. Ultrasound measurements of depth of *musculus longissimus lumborum et thoracis* (Dm.l.l.t.) and fat thickness (FT)) was carried out between last pectoral and first lumbar vertebrae.

This results are necessary for sheep breeding, especially in meat breeds. Studies on this theme published in last years *Milerski* (2001), *Puntila et al* (2002), *Cloete et al* (2007) and *Maxa et al* (2007). The aim of the study was the evaluation of the effects of breed, intensive feeding and sex on growth, meatiness and fattiness in lambs.

Material and methods

The study was carried out on the Mendel university Brno - School farm in Zabcice in 2008. There was 30 lambs four different breeds under study, Suffolk (Sf, n = 8), Oxford Down (OD, n = 6), Charollais (CH, n = 6) and Merinolandschaf (ML, n = 10). The sex ratio was equal in each breed. Lambing was from February 20th to March 28th in the stable. Winter ewe feed ratio content lucern hay (*ad libitum*), corn sillage (1 kg/ewe/day) and barley groats (0,15 kg/ewe/day). Minerals was free disposal. Lambs except mathers milk consume lucern hay and barley groats too. From April 16th to the end of the study were all animals on clover-grass pasture very good quality.

Lambs weight was evaluated directly after parturition (LW 0) and in two week intervals. After linear interpolation were live weights recount on average age 30 (LW 30), 70 (LW 70) and 100 days (LW 100). From LW were count lambs daily gains (DG) in intervals: from parturition to 30 days (DG 0–30), from 30 to 70 days (DG 30–70), from parturition to 70 days (DG 0–70), from 70 to 100 days (DG 70–100), from 30 to 100 days (DP 30–100) and from parturition to 100 days (DP 0–100). From 70th day of live were lambs ultrasound measured (UM) on meatiness and fattiness. Depth of *musculus longissimus lumborum et thoracis* (Dm.l.l.t.) and fat thickness (FT) was carried out between last pectoral and first lumbar vertebrae after tease out of wool, by ultrasound Aloka SSD 500 with 5 MHz linear probe. Results of UM were recount on age of lambs 70 and 100 days (Dm.l.l.t. 70 and 100, FT 70 and FT 100). Results were statistically analysed by STATISTICA 8.0.

Results and discussion

As follows from the *Table 1 and 2*, in evaluated intervals the breed of lambs has no effect on LW and DG too. The LW 0 was in evaluated breeds from 3,23 kg to 3,93 kg. This weights are simillar with results, which presents in their studies *Dobes et al* (2007), *Larsgard a Olesen* (1998), *Cloete et al* (2007) and *Maxa et al* (2007).

Very high DG were in all breeds in interval DG 0 - 30, the best DG 0 - 30 was in charollais breed (CH 0,429 kg). Very high DG were in all breeds find out in interval DG 30–70 too, in our opinion, this is thanks very good mothers milkiness in both intervals. On the other hand, lowest DG were registered in the interval DG 70–100. Nevertheless, DG in the interval DG 0 – 100 were in all breeds relatively high, this is well visible on relativly high absolute weights in 100 days of live LW 100.byly u všech sledovaných plemen poměrně vysoké, což se projevilo i na poměrně vysokých ŽH 100 (*Table 1 and 2*).

The sex of lambs had significant effect only on LW 100, respectively on DG 30–70, DG 30–100 and DG 0–100. As follows from *Table 1*, LW 0 of ewe lambs was higher about 0,11 kg than in rams. In all follows intervals was LW higher in rams. LW 100 in rams was 36,04 kg, when DG 0 – 100 (*Table 2*.) was in this interval 0,325 kg. DG 0–100 in ewe lambs was 0,286 kg. This slightly lower DG in ewe lambs had impact on significantly lower LW 100 (32,23 kg) in total group of ewe lambs.

How is visible from *Table 3*, breed had significant effect only on Dm.l.l.t. 100 and FT 70. Results of Dm.l.l.t. from our study are comparative with results, which presents *Fernandez et al* (1997) and *Larsgard a Olesen* (1998). The significant effect of sex on Dm.l.l.t was observed in any group of study. However, significant effect was observed on FT 70, which agree with results of *Fernandez et al*. (1997) and *Gutierrez et al* (2005). We must say, that in rams was visible trend for increasing of FT, depending on increasing of LW. In ewe lambs was trend oposite, which result is not comparative with results of other authors.

***Table 1*: L.S.M. and S.E.M. of live weight (LW) of lamb**

Parameter		LW 0 (kg)			LW 30 (kg)			LW 70 (kg)			LW 100 (kg)		
	n	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.
Breed													
Suffolk (A)	8	3,83	0,37		13,95	1,00		26,33	1,57		34,74	2,00	
Merinolandschaf (B)	10	3,93	0,30		14,80	0,56		27,77	1,23		33,23	1,22	
Oxford Down (C)	6	3,63	0,13		13,56	1,56		26,42	0,84		34,05	1,31	
Charollais (D)	6	3,23	0,18		16,11	1,14		26,85	1,53		34,38	1,78	
Sex													*
Rams (A)	15	3,51	0,20		15,54	0,75		28,22	1,04		36,04	1,06	b
Ewe lambs (B)	15	3,62	0,19		14,53	0,92		25,58	1,08		32,23	1,31	a

A, B – * * – P ≤ 0,01; a, b – * – P ≤ 0,05

***Table 2*: L.S.M. and S.E.M. of daily gains (DG) of lambs**

Parameter		DG 0 – 30 (g)			DG 30 – 70 (g)			DG 0 – 70 (g)			DG 30 –100 (g)			DG 70 - 100 (g)			DG 0 – 100 (g)		
	n	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.
Breed																			
Suffolk (A)	8	0,337	0,02		0,310	0,03		0,321	0,02		0,297	0,03		0,280	0,03		0,309	0,02	
Merinolandchaf (B)	10	0,362	0,01		0,324	0,02		0,341	0,02		0,263	0,02		0,182	0,05		0,293	0,01	
Oxford Down (C)	6	0,331	0,05		0,324	0,03		0,326	0,01		0,263	0,01		0,182	0,03		0,304	0,01	
Charollais (D)	6	0,429	0,03		0,268	0,03		0,337	0,02		0,261	0,02		0,251	0,03		0,311	0,02	
Sex							*						*						*
Rams (A)	15	0,400	0,03		0,317	0,03	b	0,353	0,01		0,293	0,03	b	0,261	0,03		0,325	0,01	b
Ewe lambs (B)	15	0,363	0,02		0,276	0,01	a	0,314	0,01		0,253	0,02	a	0,221	0,01		0,286	0,01	a

A, B – * * – P ≤ 0,01; a, b – * – P ≤ 0,.05

***Table 3*: L.S.M. a S.E.M of depth of muscle (Dm.l.l.t., cm) and fat thickness (FT, cm)**

Parameter		Dm.l.l.t. 70			Dm.l.l.t. 100			FT 70			FT 100		
	n	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.	L.S.M.	S.E.M.	Sign.
Breed							*			*			
Suffolk (A)	8	2,11	0,13		2,00	0,11	c	0,23	0,02		0,25	0,02	
Merinolandschaf (B)	10	2,12	0,13		2,22	0,10		0,25	0,02	d	0,24	0,02	
Oxford Down (C)	6	1,82	0,18		2,45	0,15	a	0,24	0,02		0,25	0,03	
Charollais (D)	6	1,90	0,12		2,22	0,09		0,20	0,01	b	0,22	0,02	
Sex										*			
Rams (A)	15	2,03	0,09		2,18	0,08		0,22	0,01	b	0,25	0,01	
Ewe lambs (B)	15	1,96	0,10		2,27	0,08		0,25	0,01	a	0,23	0,01	

A, B, C – * * – P ≤ 0,01; a, b, c, d – * – P ≤ 0,05

Conclusions

From our evaluation follows, that breed of lambs had significant effect on any growth parameter under study. However, the sex of lambs had significant effect on LW 100 and DG 30–70, DG 30–100 and DG 0–100. The ultrasound measurements shown, that breed had significant effect on Dm.l.l.t 100 and FT 70, the factor of sex had effect only on FT 70.

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