Session 24

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Reproductive, meat and milk performance traits of Charolaise sheep raised in the region of Warmia and Mazury

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The aim of the present study was to determine the reproductive traits and the milk yield and meat performance of Charolaise sheep. The study was conducted on a breeding flock of Charolaise sheep, in the region of Warmia and Mazury. The analysis included: reproductive traits over the years 2002 - 2006, i.e. fertility, fecundity, lamb survival rate and reproductive performance; meat performance traits, i.e. body weight at the age of 2 and 70 days, 4, 8 and 12 months, daily gains over the periods of 2 - 70 days, 70 days - 4 months, 4 - 8 months and 8 - 12 months, live (USG) measurements of *musculus longissimus* cross-section and fat thickness over the loin “eye” at the age of 70 days, 4, 8 and 12 months; milk performance traits, i.e. daily milk yield, milk production over a 70-day lactation period, composition of milk, i.e. fat, protein, lactose and dry matter, and somatic cell count (SCC) in milk. Milk yield was controlled at 28 and 70 days of lactation. One udder-half of a ewe was hand-milked after the intramuscular injection of 5 i.u. oxytocin. The ewes were isolated from the lambs for 12 hours before milking. The quantity of milk was multiplied by four. M. l. d. and fat thickness were measured at the last rib using a SSD 500 Aloka ultrasound system with a 7.5 MHz linear transducer.

The results were verified statistically using Statistica 6.0 software. Statistical significance of differences between groups was estimated by Student’s -test.

It was found that Charolaise sheep raised in the region of Warmia and Mazury are showed high fecundity - 173,08% (fig.1), compared to a mean of 153,38% over a five-year period. However, significant lamb losses, both perinatal (stillbirths) and post-natal, considerably decreased the overall reproductive performance of the herd, which was at an average level of 107,65%. Charolaise sheep are generally sensitive and require greater care, particularly in the perinatal period.

This sheep together are characterized by very good meat production traits, reflected in a fast growth rate and muscle development of ewes and rams both before and after weaning (Tab. 1). Over all analyzed periods ewes lambs were significantly lighter than rams lambs,

and at the age of 4, 8 and 12 months these differences were found to be highly statistically significant (P≤ 0.01). From month 4 to 8 and 8 to 12 the growth rate of ram lambs was significantly higher (P≤ 0.01), compared to ewes. At the age of 12 months the values of m. l. d. depth and area of loin “eye” were significantly higher (P≤ 0.01) in ram lambs.

Good production results were greatly dependent on high milk performance. Mean daily milk yield was 2031,43 ml and 1185,71 ml at 28 and 70 days of lactation, respectively, while total milk production over a 70-day lactation period was 128,92 kg. Ewes nursing twin lambs produced more milk, compared to ewes nursing singles, which was confirmed by a statistical analysis on day 28, 70 of lactation (Tab.2). As a result, also mean daily milk yield and total milk production were significantly higher in this group (P≤ 0.05).

Fig. 1. Reproductive performance indices of ewes

Indices	Years				
	2002	2003	2004	2005	2006
Fertility (%)	75,00 ^{A}	89,66 ^{B}	89,19 ^{B}	90,48 ^{B}	75,00 ^{A}
Fecundity (%)	133,33 ^{Aa}	173,08 ^{B}	136,36 ^{Aa}	165,79 ^{B}	158,33 ^{b}
Lamb survival rate (%)	100,00 ^{A}	88,10 ^{B}	94,59	88,69 ^{B}	94,34
Reproductive performance (%)	100,00 ^{A}	127,59 ^{Ba}	94,59 ^{Ab}	111,90 ^{a}	104,17 ^{a}

a, b - $p \leq 0,05$; A, B - $p \leq 0,01$

Tab. 1. Traits of meat performance ($\bar{x} \pm s$)

Specification	Ewes	Rams
Body weight (kg) at the age:		
2 days	4,65 ± 0,77	5,11 ± 0,82
70 days	23,15 ± 3,33	25,60 ± 3,97
4 months	36,18 ± 3,75 ^{A}	40,35 ± 2,73 ^{B}
8 months	51,82 ± 4,93 ^{A}	60,55 ± 3,68 ^{B}
12 months	66,43 ± 5,60 ^{A}	80,24 ± 3,57 ^{B}
Daily gains (g) in the period:		
2-70 days	272,06 ± 40,68	301,32 ± 48,12
70 days-4 months	260,67 ±3 0,17 ^{a}	295,00 ± 31,71 ^{b}
4-8 months	130,28 ± 19,37 ^{A}	168,33 ± 13,35 ^{B}
8-12 months	116,93 ± 19,77 ^{A}	157,52 ± 16,19 ^{B}
M. L. D. USG scanning - area (cm^2) at the age of:		
70 days	8,41 ± 1,53	9,69 ± 2,33
4 months	11,75 ± 1,14	12,86 ± 2,17
8 months	15,66 ± 1,78	16,80 ± 1,25
12 months	19,64± 1,79 ^{A}	22,55 ± 2,81 ^{B}
Fat thickness (mm) at the age of:		
70 days	0,15 ± 0,03	0,16 ± 0,02
4 months	0,24 ± 0,04	0,26 ± 0,03
8 months	0,31 ± 0,04	0,33 ± 0,05
12 months	0,41 ± 0,04	0,42 ± 0,07

a, b - $p \leq 0,05$; A, B - $p \leq 0,01$

Tab. 2. Traits of milk performance and composition of milk ($\overline{x} \pm s$)

Specification	Ewes nursing singles	Ewes nursing twins
Daily milk yield (ml):		
28th day of lactation	1914,29 ± 179,52 [a]	2148,57 ± 188,63 [b]
70th day of lactation	1094,29 ± 124,74 [a]	1277,14 ± 109,20 [b]
Milk production per lactation (kg)	121,11 ± 10,95 [a]	136,73 ± 11,29 [b]
Composition of milk (%):		
fat	5,20 ± 0,86	5,34 ± 0,96
protien	4,37 ± 0,21	4,70 ± 0,44
lactose	4,98 ± 0,18	4,88 ± 0,29
dry matter	15,10 ± 0,85	15,37 ± 0,97
SCC (tys./ml)	233,57 ± 128,48	139,14 ± 115,82
Ln SCC	12,16 ± 0,78	11,65 ± 0,59

a, b - $p \leq 0,05$