PRODUCTION CHARACTERISTICS OF MUTTON SHEEP BREED CHAROLLAIS AS DEPENDED ON THE NUTRITION LEVEL AND DAMS' WEIGHT

M. Shaker Momani[1], I. Šáda[1], F. Vohradský[1], J. Oplt[2], D. Večeřová[3]

[1] *Czech University of Agriculture, Institute of Tropical and Subtropical Agriculture, Prague, Czech Republic*
[2] *Ministry of Agriculture of the Czech Republic, Prague, Czech Republic*
[3] *Research Institute of Animal Production, Prague-Uhříněves, Czech Republic*

The aim of our study was to evaluate production characterstics of the Charollais mutton sheep breed as depended on live weight of dams and on the level of nutrition. In addition, the effect of genotype of tupping ram, age of dams, sex of lambs, litter size per live weight and average daily weight gain of lambs from birth to 130 days of age were considered. In the whole flock the following rates were attained: the conception rate 91.1%, fertility rate per ewe of the foundation stock 175.4%, fertility rate per lambed ewe 192.6% and rate of postparturition mortality of lambs 10.6%. Age of dams affected significantly fertility rate per ewe of the foundation stock in the given set ($P \leq 0.01$). Live weight of dams affected significantly rate of fertility per pregnant ewe ($P \leq 0.01$). Average live weight of lambs at birth was 4.10 kg and at the age of 30, 70 and 130 days it was 12.81 kg, 24.23 and 35.07 kg, respectively. In evaluation by *F*-test significant to highly significant effect of dam's age on average daily weight gain and live weight of lambs at birth and 30 days of age has been found. Observation of the effect of sex on live weight at birth showed that the differences between ewe lambs and ram lambs were not statistically significant, but the differences in live weight and weight gain between ewe lambs and ram lambs at the age of 30, 70 and 130 days were significant to highly significant. The litter size affects weight gain and live weight at birth and at the age of 30, 70 and 130 days very significantly ($P \leq 0.001$). The effect of nutrition three weeks before lambing on the live weight of lambs at birth was statistically significant ($P \leq 0.01$).

sheep; Charollais breed; fertility; growth; effects of internal conformation; nutrition

INTRODUCTION

Meat production in sheep-raising, particularly lamb becomes more and more important. In sheep this depends on fertility (which plays a decisive role in view of production and economics of breeding) and growth abilities of lambs. Growth intensity of lambs which is a breeding trait enables a fast achievement of slaughter weight and affects indices of fattening capacity.

Growth ability of lambs is marked by relatively great variability caused either by genetic (tupping ram's genotype, dam's genotype and lamb's genotype) or non-genetic factors (effect of year, nutrition, dam's age, dam's weight, sex of lamb and litter size).

Křížek et al. (1983) reports that older as well as heavier dams have also heavier lambs at birth since the development of foetus depends above all on interior of dam's body.

According to the result of their study, Mavrogenis et al. (1980) assume the dependence between the level of nutrition and dairy production of sheep.

Correct growth and development of lambs in the period after birth is a prerequisite for satisfactory efficiency in further phases of rearing and breeding (Korn, Horstman, 1987; Momani et al., 1994, 1995). These authors present that the development of weight of lambs during the period of rearing is affected mainly by sex of lamb, litters size and age of dams.

MATERIAL AND METHODS

Investigation was performed on the farm ZD Nečtiny (flock Plachtín) situated in western Bohemia with an area of 1 800 ha at an altitude of 480–690 m. Average annual temperature is about 6.3 °C and 537 mm annual sum of precipitation.

The aim of our study was evaluation of production characteristics of mutton sheep breed Charollais as depended on live weight of dams and the level of nutrition.

The experiment was carried out in 1995 with 137 ewes of Charollais breed which were classified into five groups according to their live weight:

Group 1: ewes of weight 55 to 65 kg (n = 21 ewes)
Group 2: ewes of weight 65 to 75 kg (n = 36 ewes)
Group 3: ewes of weight 75 to 85 kg (n = 47 ewes)
Group 4: ewes of weight 85 to 95 kg (n = 25 ewes)
Group 5: ewes of weight 95 to 105 kg (n = 8 ewes)

All groups were once used for tupping. The tested ewes were imported from France. Their average age at tupping was 4.2 years.

Harem type of tupping was used to tup the ewes. Tupping was performed from 21 September 1994 to 24 October 1994 and six tupping rams was used in tupping.

Lambing was carried out in sheep fold from 14 February to 24 April 1995.

Live weight was taken in 128 lambs at birth and then each fortnight by weighing on the digital scales with accuracy of 0.1 kg.

Based on the data found the conversion of live weight to age 30, 70 and 130 days was done by the method of linear interpolation.

Furthermore, selected reproduction indices were assessed along with evaluation of growth capacity of lambs from birth to the age of 130 days. In evaluation of live weight and weight gain of lambs the following factors were taken into account: tupping rams' genotype, age of dams, live weight of dams, sex of lambs, litter size and level of nutrition.

The data found were processed by mathematic-statistical program (SAS) according to the model equations with stable effects by the method of least squares.

$$Y_{hijklm} = \mu + O_h + V_i + H_j + P_k + C_l + K_m + e_{hijklm}$$

where: Y_{hijklm} – live weight at birth, at the age of 30, 70 and 130 days
μ – average of population
O_h – tupping rams' genotype
V_i – age of dams
H_j – weight of dams
P_k – sex
C_l – litter size
K_m – feed ratio
e_{hijklm} – residue

Reproduction indices were evaluated by the method of analysis of variance (Scheffe's test was used to determine the significance of differences) using the program PC STATGRAPHIC.

In the time of gestation (winter season) ewes were housed in sheep pens on deep litter where they were fed quality hay *ad libitum*, concentrate mixture 150 g per sheep and day, feeding salt and water.

Three weeks prior to parturition ewes were randomly divided into three groups and each group had been fed in advance the concentrate mixture (group I = 46 ewes, group II = 46 ewes, group III = 45 ewes) which was added by 300 g concentrate mixture per ewe and day.

The first mixture consisted of molasses-enriched feed 33%, cereal mixture 67%, the second mixture consisted of molasses-enriched feed 33%, cereal mixture 22%, wheat bran 45 % and the third mixture was composed of barley

31%, oat 10%, wheat 15%, bran 16%, soybean coarse meal 13.8%, rape oil cake 10%, salt 1.2% and aminovitamin 3%.

Lambs after birth had ewe milk supply, quality hay and concentrate mixture *ad libitum*. On 10 May 1995 ewes with their lambs were placed in paddocks with a quality pasture and water without concentrate supplement. Besides, ewes and lambs had access to sheep-fold with hay available (*ad libitum*).

RESULTS AND DISCUSSION

Tab. I presents the investigated reproduction parameters as depended on live weight and age of dams.

The evaluation of reproduction characteristics of ewes was based on the following factors: conception rate, fertility rate per ewe of the foundation stock, fertility rate per lambed ewe and mortality of lambs (up to 5 days from birth) – Tab. I.

Conception rate of 91.1 was achieved in the whole flock, fertility rate per ewe of foundation stock 175.4%, fertility rate per lambed ewe 192.6% and postparturition mortality of lambs 10.6%.

Tab. I shows that the age of ewes affected significantly fertility rate per ewe of the foundation stock in the given set ($P \leq 0.01$) what coincides with the data of other authors (Slaná et al., 1987; Mikuš, Fľak, 1987; Momani et al., 1994).

An increase in the values of all reproductions parameters with growing age of ewes, except the ewes three years old, is evident from the results. We suppose that this result was likely affected by a low number of ewes in this age category.

The greatest fertility rate per ewe of the foundation stock and fertility rate per lambed ewe were achieved in ewes at the age of five years (193.3%, 193.3%) and the lowest in three years old ewes (116.7%, 175.0%).

The results achieved by us are lower than those presented by Pinďák (1994) in ewes of the Charollais breed involved in the performance control, but are higher than those reported by Momani et al. (1994) who evaluated in 1994 the data on fertility of 159 ewes of the Charollais breed in the same flock of the farm ZD Nečtiny.

Investigation of the effect of live weight of dams on reproduction indices has shown that live weight of dams affected fertility rate per lambed ewe ($P \leq 0.01$) very significantly. The result found by us is in congruency with the data of Křížek et al. (1981, 1983), but inconsistent with Mohammed et al. (1987) who did not find in their experiment a significant effect of live weight of dams on fertility indices.

I. Reproduction traits as depended on ewe live weight and age in 1995

Indicators	Actual number	Prematurely culled	Not pregnant	Abortus	Number of parturitions	Conception rate (%)	Number of lambs	Fertility rate per ewe (%)	Fertility rate per pregnant ewe (%)	Postpartur. mortality of lambs	Postparturition mortality rate of lambs (%)
Total	137	3	12	–	122	91.1	235	175.4	192.6	25	10.6
Age of dams											
2 years^{A}	46	1	2	–	43	95.6	80	177.8^{++B}	186.1	7	8.8
3 years^{B}	6	–	2	–	4	66.7	7	116.7^{++ACD}	175.0	1	14.3
4 years^{C}	69	1	8	–	60	88.2	119	175.0^{++B}	198.3	13	10.9
5 years^{D}	16	1	–	–	15	100.0	29	193.3^{++B}	193.3	4	13.8
Live weight of dams											
55 to 65 kg^{A}	21	1	2	–	18	90.0	35	175.0	194.4^{++BE}	4	11.4
65 to 75 kg^{B}	36	–	4	–	32	88.9	58	161.1	181.2^{++ACDE}	6	10.3
75 to 85 kg^{C}	47	1	3	–	43	93.5	87	189.1	202.3^{++BE}	11	12.6
85 to 95 kg^{D}	25	–	3	–	22	88.0	43	172.0	195.5^{++BE}	3	7.0
95 to 105 kg^{E}	8	1	–	–	7	100.0	12	171.4	171.4^{++ABCD}	1	8.3

$^{+}P \pm 0.05$; $^{++}P \pm 0.01$

The highest fertility rate per lambed ewe 202.3% was gained in ewes of live weight 75–85 kg and lowest 171.4% in ewes of live weight 95–105 kg (Tab. I).

There were no significant differences in evaluation of mortality rate of lambs as depended on live weight and age of dams. The lowest mortality rate of lambs was in two years old ewes (8.8%) and highest in three years old ewes (14.3%).

The highest mortality rate of lambs (12.6%) was found in ewes with live weight of 75–85 kg and the lowest in ewes with live weight 85–95 kg (7.0%) – Tab. I.

Tabs. II and III show average daily weight gain and live weight at birth, at the age of 30, 70 and 130 days of lamb age as depended on dam's age, live weight of dams, sex, litter size, level of nutrition and genotype of tupping ram.

Average live weight of lambs at birth was 4.10 kg and at the age of 30, 70 and 130 days 12.81 kg, 24.23 kg and 35.07 kg, respectively.

Average daily weight gain up to 30, 70 and 130 days of age of lambs were 290 g, 288 g and 238 g, respectively.

There was a significant to highly significant effect found in evaluation of dam's age on average daily gain and live weight of lambs at birth and 30 days old.

The lowest live weight (10.82 kg) had lambs up to 30 days of age from ewes two years old and the highest (15.45 kg) from three years old ewes. The difference was statistically significant. This result is inconsistent with the data of Kassab (1975); on the contrary, Sidwell and Miller (1971) proved in their analysis of effects acting on live weight of lambs at birth that an age of dams and litter size have a significant effect on this weight.

Live weight of lambs at the age of 70 and 130 days and average daily weight gain up to 70 and 130 days of age were not affected by dam's age. Wright et al. (1975), Al-Rawi et al. (1982) and Abdul-Rahman et al. (1986) report that in their experiments age of dams did not affect the course of the growth of lambs up to weaning. However, Křížek et al. (1983) give that age of dams affected significantly live weight and average weight gain of lambs at birth, and at the age of 30, 60 and 120 days. In addition, they present that the growth of lambs up to 6 weeks of age is affected significantly by milk production of dams.

Sidwell, Miller (1971), Korn, Horstman (1987) and Horák et al. (1987) report that weight gain of lambs after birth are markedly affected by milk production of dams.

The effect of live weight of dam's on live weight of lambs at birth and up to 130 days of age was not confirmed. According to Křížek et al. (1983),

live weight of dams affected significantly live weight and average daily gain of lambs at birth and at the age of 30 and 60 days. Another important criterion which affects live weight and intensity of lamb's growth is the sex. Many authors have confirmed that sex has an important effect on the growth (Horák et al., 1987; Korn, Horstman, 1987; Fantová et al., 1988).

Investigation of the effect of sex on live weight at birth showed that the differences between ewe lambs and ram lambs were not statistically significant, but differences in live weight and daily weight gain between ewe lambs and ram lambs at the age of 30, 70 and 130 days were significant up to highly significant.

Live weight of ram lambs at birth was higher by 2.92% than live weight of ewe lambs and at the age of 130 days, the difference was as much as 13.48%.

This result is consistent with the data of Abdul-Rahman et al. (1986) who report that the differences between ewe lambs and ram lambs of the Awassi breed were at birth small and insignificant but in the sixth week of age the values were higher in ram lambs and the differences at weaning were highly significant ($P \leq 0.01$). Al-Rawi et al. (1982) report that in lambs of the Awassi breed ram lambs had significantly higher weight at birth and at weaning, and significantly higher gain. Fantová et al. (1988) also report that ram lambs weight at birth is higher by 7% than ewe lambs and this difference increases to 10% at the age of 24 weeks.

Another important criterion which affects live weight and growth intensity of lambs is the litter size that affected significantly ($P \leq 0.001$) live weight of lambs at birth and at the age of 30, 70 and 130 days as well.

When comparing the average daily weight gain as depended on the litter size, the differences are also significant between single lambs and lambs from more numerous litters. Live weight of lambs at birth was in single lambs higher by 11.96% than in twins and by 27.55% than in triplets. Live weight of lambs at the age of 130 days was in single lambs 39.10 kg, 34.44 kg in twins and 31.66 kg in triplets, the differences were statistically significant ($P \leq 0.001$).

These results well correspond with the data reported by Abdul-Rahman et al. (1986) that in lambs of the Awassi breed single lambs had higher live weight at birth by 0.44 kg than twins and this difference increased at weaning to 3.98 kg in favour of single lambs. Mohammed et al. (1987) report that in lambs of the Karadi breed single lambs had significantly higher weight at birth than twins, but significant differences in further course of growth were not found. Fantová et al. (1988) state that the weight of single lambs at birth is by 19% higher than that of twins and at the age of 24 weeks

II. Average daily weight gain and live weight of lambs at birth and at the age of 30 days as depended on different effects

Indicators		*n*	Live weight at birth		Live weight at 30 days of age		Weigth gain until 30 days of age	
			Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants
Average		128	4.10	4.10	12.81	12.81	290	290
Standard deviation			1.01		4.77		136.06	
Age of dam								
F value			4.88^{++}		3.49^{+}		2.47	
2 years	a	40	–0.39 bcd	3.71	–1.99 bc	10.82	–54 b	237
3 years	b	3	0.29 a	4.38	2.65 ac	15.45	79 ac	369
4 years	c	75	0.07 a	4.17	–0.39 ab	12.42	–16 b	275
5 years	d	10	0.03 a	4.13	–0.27	12.54	–10	280
Weight of dams								
F value			1.08		1.26		1.31	
55–65 kg	a	11	–0.02	4.08	–0.76	12.05	–25	265
65–75 kg	b	37	–0.02	4.08	–1.38 c	11.43	–45	245
75–85 kg	c	51	–0.04	4.06	0.10 b	12.81	1	292
85–95 kg	d	26	–0.20	3.90	0.24	13.05	15	305
95–105 kg	e	3	0.27	4.37	1.89	14.70	53	344
Sex								
F value			2.01		5.46^{++}		4.62^{+}	
Ram lambs	a	71	0.06	4.15	0.57 b	13.37	17 b	307
Lamb hoggs	b	57	–0.06	4.04	–0.57 a	12.24	–17 a	273

Continuation of Tab. II

Indicators		*n*	Live weight at birth		Live weight at 30 days of age		Weigth gain until 30 days of age	
			Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants
Number of litters								
F value			22.49^{+++}		5.02^{++}		3.63^{+}	
Single lambs	a	13	0.49 bc	4.59	1.61 bc	14.41	37 b	327
Twins	b	86	0.00 ac	4.10	–0.95 a	11.86	–32 a	258
Triplets	c	29	–0.50 ab	3.60	0.66 a	12.15	–06	284
Nutrition								
F value			3.18^{+}		0.05		0.30	
Group I	a	48	0.12 bc	4.23	–0.10	12.71	–08	282
Group II	b	41	–0.06 a	4.04	0.03	12.83	3	293
Group III	c	39	–0.08 a	4.01	0.07	12.88	5	295
Number of tupping rams								
F value			0.20		0.98		0.98	
1	a	37	0.03	4.12	–0.28	12.53	–10	280
2	b	40	0.04	4.13	0.28	13.09	08	298
3	c	1	–0.24	3.86	0.45	13.26	23	313
4	d	13	0.14	4.23	0.33	13.14	6	296
5	e	37	0.03	4.13	–0.79	12.02	–27	263

$^{+}P \pm 0.05$; $^{++}P \pm 0.01$; $^{+++}P \pm 0.001$

III. Average daily weight gain and live weight of lambs at birth and at the age of 70 and 130 days as depended on different effects

Indicators	n	Live weight at 70 days of age		Weigth gain until 70 days of age		Live weight at 130 days of age		Weigth gain until 130 days of age	
		Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants
Average	128	24.23	24.23	288	288	35.07	35.07	238	238
Standard deviation		10.49		138.97		10.87		77.81	
Age of dam									
F value		1.67		1.27		2.51		2.01	
2 years a	40	–2.59	21.65	–31	256	–3.51 c	31.56	–24 c	214
3 years b	3	2.65	26.88	34	321	1.24	36.31	7	246
4 years c	75	0.70	24.93	9	296	0.86 a	35.93	6 a	244
5 years d	10	–0.76	23.47	–11	277	1.41	36.47	11	249
Weight of dams						0.18		0.17	
F value		1.43		1.51		0.85	35.91	7	245
55–65 kg a	11	–0.91	23.32	–13	275	0.06	35.12	10	239
65–75 kg b	37	–3.08 d	21.15	–44 d	244	–0.82	34.25	–6	232
75–85 kg c	51	–1.09	23.14	–15	273	–0.64	34.43	–3	235
85–95 kg d	26	1.66 b	25.89	26 b	314	0.55	35.62	2	241
95–105 kg e	3	3.42	27.65	45	333				
Sex						19.01^{++}		18.30^{++}	
F value		6.91^{++}		6.41^{++}		2.21 b	37.28	17 b	255
Ram lambs a	71	1.42 b	25.66	20 b	307	–2.21 a	32.85	–17 a	222
Lamb hoggs b	57	–1.42 a	22.81	–20 a	268				

Continuation of Tab. III

Indicators	n	Live weight at 70 days of age		Weigth gain until 70 days of age		Live weight at 130 days of age		Weigth gain until 130 days of age	
		Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants	Deviations from average	Corrected constants
Number of litters									
F value		6.28^{++}		4.99^{++}		7.95^{+++}		6.03^{++}	
Single lambs a	13	4.16 bc	28.40	52 bc	340	4.03 bc	39.10	27 bc	265
Twins b	86	–1.89 a	22.35	–27 a	261	–0.63 a	34.44	–05 a	233
Triplets c	29	–2.28 a	21.95	–25 a	262	–3.41 a	31.66	–22 a	216
Nutrition									
F value		0.43		0.48		0.32		0.28	
Group I a	48	–0.02	24.21	–02	285	0.19	35.25	1	239
Group II b	41	–0.62	23.61	–08	280	0.39	35.45	3	242
Group III c	39	0.65	24.88	10	298	–0.57	34.49	–4	234
Number of tupping rams									
F value		0.91		0.90		1.80		1.73	
1 a	37	0.41	24.65	5	293	0.86	35.93	6	245
2 b	40	1.49	25.72	21	308	2.12 c	37.18	16 c	254
3 c	1	–1.62	22.61	–19	268	–9.33 bde	25.74	–70 bd	168
4 d	13	0.63	24.86	7	295	4.79 c	39.86	36 c	274
5 e	37	0.91	23.32	–14	274	1.56 c	36.63	12	250

$^{+}P \pm 0.05$; $^{++}P \pm 0.01$; $^{+++}P \pm 0.001$

the difference between average weight of single lambs and twins is up to 21% higher in favour of single lambs.

The effect of nutrition three weeks before lambing on live weight of lambs at birth was statistically significant in favour of group I. The differences in live weight and average daily weight gain of lambs at the age of 30, 70 and 130 days as a result of nutrition were not found. Many authors report that live weight of lambs at birth and initial level of milk production are in close correlation with nutrition in last periods of pregnancy (Křížek et al., 1983; Gajdošík, Polách, 1984).

It follows from literature that the level of ewes feeding during last three weeks prior to lambing has an impact on milk production as well as on predicted growth capacity of their progeny (Mavrogenis et al., 1980; Korn, Horstman, 1987).

In evaluation by *F*-test there was no effect of genotype of rams on the parameters of lambs growth at birth and further, up to 130 days of age. The result found by us is consistent with the data of Momani et al. (1995).

References

ABDUL-RAHMAN, F. Y. – SALIH, A. M. – AL-BANNA, K. A.: Milk production in Awassi ewes and its relationship with growth of lambs. Iraqi J. Agric. Sci., *4*, 1986: 55–65.

AL-RAWI, A. A. – BADAWI, F. S. – SAID, S. I. – FARAG, M. S.: Genetic and phenotypic parameter estimates for growth traits in Awassi sheep. Indian J. Anim. Sci., *52*, 1982: 897–900.

FANTOVÁ, M. – LOUDA, F. – ŠTOLC, L.: Pastevní výkrm jehňat s využitím laktace bahnic (Outdoor fattening of lambs using ewe lactation). Praha, VŠZ 1988. 113 p.

GAJDOŠÍK, M. – POLÁCH, A.: Chov oviec (Sheep-raising). 1st ed. Bratislava, Príroda, Praha, SZN 1984. 360 p.

HORÁK, F. – BEŇUŠKA, M. – INGR, I. – JELÍNEK, F. – KŘÍŽEK, J. – SLANÁ, O. – ZELENKA, J.: Produkce jehněčího masa (Lamb production). Praha, SZN 1987. 185 p.

KASSAB, S. A.: Some environmental factors affecting birth weight in Awassi sheep. Agr. Pakistan, *26*, 1975: 207–212.

KORN, S. – HORSTMAN, N.: Gewichtsentwicklung von Lämmern während der Aufzucht. Dtsch. Schafzucht, *79*, 1987: 288–290.

KŘÍŽEK, J. – LOUDA, F. – JAKUBEC, V. – ŘEHÁČEK, E.: Genetické a negenetické faktory ovlivňující mateřské vlastnosti ovcí (The genetic and nongenetic factors affecting the maternal properties of ewes). Živoč. Výr., *28*, 1983: 63–68.

KŘÍŽEK, J. et al.: Vliv genetických a negenetických faktorů na reprodukci ovcí zušlechtěná valaška a jejich kříženek s plodnými a masnými plemeny (Effect of genetic and non-genetic factors on reproduction of Improved Wallachian sheep and their crosses with fertile and meat breeds). Praha-Uhříněves, VÚŽV 1981: 25–29.

MAVROGENIS, A. P. – HANCOCK, J. – LOUCA, A.: The effect of body weight changes during pregnancy and lactation on the performance of three breeds of sheep. J. Agric. Sci., *95*, 1980: 357–363.

MIKUŠ, F. – FĽAK, P.: Výskyt jedináčkov a dvojičiek a ich podiel podľa pohlavia s ohľadom na vek bahníc (The occurrence of single-born and twin lambs and their sex ratios with respect to the age of ewes). Živoč. Výr., *32*, 1987: 393–409.

MOHAMMED, A. K. – MURAD, O. N. – SHUKOR, E. W.: Effect of age and weight of dam on lambing performance and lambs growth in Karadi sheep. Iraqi J. Agric. Sci., *5*, 1987: 65–72 (Suppl.).

MOMANI SHAKER, M. – ŠÁDA, I. – ŠTOLC, L.: Reprodukční vlastnosti a intenzita růstu jehňat plemene charollais v České republice (Reproductive characteristics and growth rate in lambs of Charollais breed in the Czech Republic). Živoč. Výr., *39*, 1994: 1021–1026.

MOMANI SHAKER, M. – ŠÁDA, I. – ŠTOLC, L. – VOHRADSKÝ, F. – VEČEŘOVÁ, D.: Vliv vnitřních a vnějších činitelů na růst jehňat u plemene charollais (The effects of internal and external factors on lamb growth in Charollais breed). Živoč. Výr., *40*, 1995: 149–153.

PINĎÁK, A.: Šlechtitelský program v chovu ovcí (Breeding program in sheep rearing). Proc. Conf. Nové aspekty chovu ovcí a koz v podmínkách tržního hospodářství ČR (New trends in sheep and goat breeding under conditions of markets economies of the Czech Republic), VŠZ Brno, 1994: 31–35.

SIDWELL, G. M. – MILLER, L. R.: Production in some pure breeds of sheep and their crosses. I. Reproductive efficiency in ewe. J. Anim. Sci., *32*, 1971: 1084–1089.

SLANÁ, O. – VYHNÁLEK, J. – POKORNÝ, M.: Porovnání užitkovosti několika genotypů merinových plemen ovcí v podmínkách jednoho stáda (Comparison of efficiency of some genotypes of Merino sheep under conditions of one flock). Praha-Uhříněves, VÚŽV 1987. 56 p.

WRIGHT, J. – ANNE, LU – THRIFT, F. A. – DUFT, R. H.: Influence of ewe age on productive characters of South-Down sheep. J. Anim. Sci., *41*, 1975: 517–521.

Received for publication on February 9, 1996

MOMANI, SHAKER M. – ŠÁDA, I. – VOHRADSKÝ, F. – OPLT, J. – VEČEŘOVÁ, D. (Česká zemědělská univerzita, Institut tropického a subtropického zemědělství, Praha; Ministerstvo zemědělství České republiky, Praha; Výzkumný ústav živočišné výroby, Praha-Uhříněves, Česká republika):

Produkční vlastnosti masného plemene ovcí charollais v závislosti na úrovni výživy a hmotnosti matek.

Scientia Agric. Bohem., *27*, 1996 (2): 147–160.

Cílem práce bylo vyhodnocení produkčních vlastností ovcí masného plemene charollais v závislosti na živé hmotnosti matek a úrovni výživy.

Dále byl sledován vliv genotypu otce, věku matek, pohlaví jehňat a četnosti vrhu na živou hmotnost a průměrné denní přírůstky jehňat od narození do 130 dnů věku.

K pokusu bylo použito celkem 137 bahnic plemene charollais v ZD Nečtiny, které byly v závislosti na živé hmotnosti rozděleny do pěti skupin.

U 128 jehňat byla při narození a dále pak každých 14 dnů zjišťována živá hmotnost. Na základě zjištěných údajů byl metodou lineární interpolace proveden přepočet živé hmotnosti na věk 30, 70 a 130 dnů.

Na podkladě získaných údajů byly zhodnoceny vybrané reprodukční ukazatele metodou analýzy rozptylu při použití programu PC STATGRAPHICS. Růstová schopnost jehňat byla vyhodnocena matematicko-statistickým programem SAS, metodou nejmenších čtverců, podle modelových rovnic s pevnými efekty.

Tři týdny před porodem byly bahnice náhodně rozděleny do tří skupin. Každá skupina dostávala předem určenou dávku jadrné směsi, doplněnou 300 g jadrné směsi na kus a den.

U celého stáda bylo zjištěno procento oplodnění 91,1 %, procento plodnosti na bahnici základního stáda 175,4 %, procento plodnosti na obahněnou bahnici 192,6 % a procento poporodní úmrtnosti jehňat 10,6 %.

Věk matek ovlivnil průkazně procento plodnosti na bahnici základního stáda v daném souboru ($P \leq 0{,}01$).

Živá hmotnost matek velmi významně ovlivnila procento plodnosti na obahněnou bahnici ($P \leq 0{,}01$).

Průměrná živá hmotnost jehňat při narození byla 4,10 kg a ve 30, 70 a 130 dnech věku 12,81 kg, 24,23 kg, resp. 35,07 kg.

Na základě hodnocení F-testem byl zjištěn významný až vysoce významný vliv věku matky na průměrný denní přírůstek a živou hmotnost jehňat při narození a ve 30 dnech věku.

Sledování vlivu pohlaví na živou hmotnost při narození ukázalo, že rozdíly mezi jehničkami a beránky nebyly statisticky významné, avšak rozdíly v živé hmotnosti a v přírůstcích mezi jehničkami a beránky ve 30, 70 a 130 dnech věku byly významné až vysoce významné.

Velmi významně ovlivňuje přírůstky a živou hmotnost při narození a ve 30, 70, a 130 dnech věku jehňat četnost vrhu ($P \leq 0{,}001$).

Vliv výživy v době tří týdnů před obahněním na živou hmotnost jehňat při narození byl statisticky významný, a to ve prospěch skupiny I ($P \leq 0{,}01$). Rozdíly v živé hmotnosti a průměrném denním přírůstku jehňat v 30, 70 a 130 dnech věku způsobené rozdílnou úrovní výživy matek nebyly zjištěny.

Živá hmotnost a průměrný denní přírůstek jehňat při narození a dále do 130 dnů věku nebyly ovlivněny genotypem otce a živou hmotností matek.

ovce; charollais; plodnost; růst; vlivy vnitřního prostředí; výživa.

Contact Address:

Dr. Ing. Mohamed Shaker M o m a n i , Česká zemědělská univerzita, Institut tropického a subtropického zemědělství, 165 21 Praha 6-Suchdol, Česká republika, tel.: 02/338 21 80, fax: 02/39 35 07