

Effect of application of feeding by norms of lambs from Ile de France breed

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SUMMARY

The aim of this study was to establish the effect of feeding by norms of female breeding lambs from Ile de France breed. The experiment was carried out in the Institute of Animal Science – Kostinbrod. The experimental animals were divided in 2 groups according to their type of birth - single (11 lambs) and twin (10 lambs). The lambs were equal in age (118 ± 0.91). The experiment continued 90 days. Food intake was controlled daily. The composition of ratio and the amount of forages were according to the requirements of the norms by Todorov and Dardjonov, 1995. The chemical analysis of the forage, which was used, was done by adopted methods (Sandev, 1979). The live weight of the lambs was measured individually at the beginning of the experiment and after that monthly. It was calculated the average daily intake of forage, energy (FUG, Food Unit for Growth = 6 MJ NE (net energy) at $q = 0.5$ (q – coefficient for food quality) and protein (PDI) per lamb and their gain efficiency per 1 kg. The obtained information was analyzed by variation-statistical methods.

The obtained results showed, the applied norm feeding ensured reaching of live weight, which respond to the age and type of birth (singles - 50.27 kg, twins – 44.7 kg) of the breeding female lambs from Ile de France breed. The average daily intake of forage, energy and protein was 1.626 kg, 1.625, 123.17 g for the singles, and 1.526 kg, 1.5, 116.9 g for the twins. The gain efficiency per 1 kg for forage, energy and protein was 11.70 kg, 11.69 FUG, 886.14 g for the singles and 10.82 kg, 10.64 FUG and 829.08 g for the twins.

Key words: lambs, Ile de France, feeding by norms

INTRODUCTION

In Bulgaria, the official norms for feeding of sheep from different directions and categories were introduced at end of the last century from Todorov and Dardjonov, 1995.

Iliev et al., 2001 carried out a comparative study on fattening of lambs with rations composed by old (Alexiev and Stoianov, 1984) and new (Todorov and Dardjonov, 1995) norms. The authors paid attention to the importance of

protein digested in the intestine (PDI) and balance of protein in rumen (BPT), with which they explained the significant differences in gain of lambs, but not only to the difference of intake crude protein (CP), as it was in the old norms. Other authors (Shindarska and Dardjonov, 1997) investigated the intake energy expressed in FU by old norms and in FUG by new norms and didn't establish big differences. In respect of PDI it wasn't established difference between real intake and the requisite according to the new norms at fattening of lambs (Shindarska and Dardjonov, 1997; Iliev et al., 2001).

There isn't yet information and published results about application of the Bulgarian norms at breeding lambs. It is of interest to study on the application of new feeding norms of breeding mutton lambs and the realization of their genetic makings for growth. All this has adduced in the present study.

The aim of the present study was to study the effect of application of feeding by norms of female breeding lambs from the Ile de France breed.

MATERIAL AND METHODS

The experiment was carried out in the Institute of Animal Science, Kostinbrod with female breeding lambs from the specialized mutton breed Ile de France. The experimental animals were divided in 2 groups according to their type of birth - single (11 lambs) and twin (10 lambs). The lambs were equal in age (118 ± 0.91). The experiment continued 90 days. The animals had free access to water and salt licks.

During the experiment the food intake was controlled daily. The content of the ration and the quantities of the forages were according to the requirements of the norms by Todorov and Dardjonov, 1995. The scheme of the experiment and the content of the ration were presented in table 1.

Table 1. Scheme of the experiment and ration contents

Type of birth	I group (n=11)				II group (n=10)			
	Singles				Twins			
Experimental days	90				90			
	DM	FUG	PDI	BPR	DM	FUG	PDI	BPR
Norms for I month	1.58	1.54	66	0	1.33	1.30	65	0
Norms for II month	1.60	1.54	71	0	1.58	1.54	66	0
Norms III month	1.64	1.54	71	0	1.60	1.54	71	0
Ration contents	I month	II month	III month	I month	II month	III month		
Meadow hay, %	61.10	61.10	63.10	59.20	60.60	58.80		
Concentrated mix, %	38.90	38.90	36.90	40.80	39.40	41.20		
Corn, %	25.00	25.00	23.70	23.00	21.20	21.40		
Barley, %	11.10	11.10	10.50	13.00	12.10	14.40		
Sunflower meal, %	2.80	2.80	2.70	4.80	6.10	5.40		

*Energy, FUG - Feed Unit for Growth = 6 MJ NE (net energy) at $q = 0.5$ (q - coefficient for feed quality)

The chemical analysis of the forages, that were used, was done by adopted methods (Sandev, 1979) in the department "Feeding and technology of the forage" in the same institute and was presented in table 2.

Table 2. Chemical composition of used forage percent of 1 kg dry matter

Forage	Humidity, %	Crude protein, %	Crude fat, %	Crude fibres, %	Ash, %	NFE, %	Energy, FUG*
Sunflower meal	4.77	34.42	10.19	20.28	7.48	27.46	0.97
Corn	13.14	10.51	3.09	2.90	1.54	81.96	1.33
Barley	9.71	12.59	1.43	4.96	2.79	78.23	1.21
Meadow hay until 25.04	11.58	6.70	1.47	33.92	8.70	49.21	0.76
Meadow hay, as of 25.04	12.98	8.11	0.77	31.52	9.75	49.85	0.98

* The data for energy was calculated for 870 g DM in 1 kg forage

The live weight of the lambs was measured individually at the beginning of the experiment and after that monthly. It was calculated the lambs' gain for every month and for the whole experiment.

It was calculated the average daily intake of forage, energy (FUG) and protein (PDI) per lamb and their gain efficiency per 1 kg.

The obtained information was analyzed by variation-statistical methods. The effect of the type of birth on the weight growth was established with single factor (ANOVA).

RESULTS AND DISCUSSION

The intake of forage, energy and protein was presented in table 3. The obtained results showed that the intake was increased with the age in both experimental groups. In singles, the intake was lower in comparison to twins (16 %, 10% and 13% vs. 26%, 21% and 24%, for forage, energy and protein). For the whole experimental period the average daily intake of the singles was with 6.5%, 8.3% and 5.4% (forage, energy and protein) more than those of the twins. The obtained results from the experiment according to the intake were in agreement to the norms of the corresponding age and daily gain.

In the beginning of the experiment the live weight of the singles (37.7 kg) significantly exceeded the live weight of the twins (31.95 kg) ($P < 0.01$) (Fig.1). During the first and second experimental month the significantly greater live weight of the singles was remained ($P < 0.01$, $P < 0.001$). At the end of the experiment, singles were 209-th-days old and had average weight 50.27 kg, whereas the twins were 206-th-days old and with weight 44.7 kg, as the difference was significant ($P < 0.01$) (Fig.1). The observed significant difference for the live weight was due to the type of birth of the experimental lambs. The obtained values of F-criterion showed a significant influence ($P < 0.01$) of the type of birth on variation of live weight. The obtained results for the live weight

and age were similar to those obtained by Kanchev et al., 1992. The authors reported on the age of 193 days the live weight of female breeding lambs from the same breed was 47.67 kg.

Table 3. Average daily intake of forage, energy and protein per 1 lamb

Indexes	Singles				Twins			
	Month			Daily av., total period	Month			Daily av., total period
	1	2	3		1	2	3	
Feed intake, kg	1.511	1.615	1.753	1.626	1.362	1.500	1.716	1.526
From concentrated mix	0.683	0.695	0.696	0.691	0.616	0.648	0.699	0.654
From meadow hay	0.828	0.920	1.057	0.935	0.746	0.853	1.017	0.872
Energy intake, FUG*	1.552	1.619	1.714	1.625	1.379	1.473	1.656	1.5
From concentrated mix	0.977	0.994	0.995	0.989	0.862	0.894	0.965	0.907
From meadow hay	0.563	0.626	0.719	0.636	0.508	0.580	0.692	0.593
Consumed PDI	116.007	122.631	130.866	123.174	105.258	115.555	130.141	116.9
From concentrated mix	66.740	67.891	67.972	67.530	60.844	64.821	69.624	65.096
From meadow hay	49.266	54.740	62.894	55.643	44.414	50.734	60.517	51.901

*Energy, FUG - Feed Unit for Growth = 6 MJ NE (net energy) at q = 0.5 (q – coefficient for feed quality)

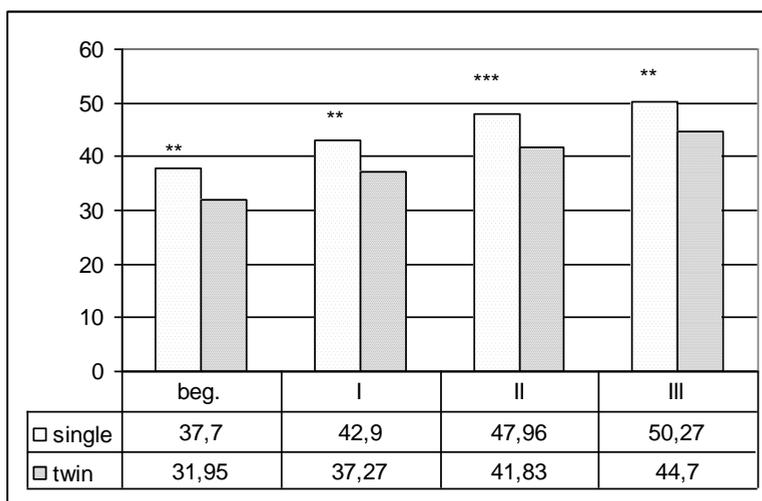


Fig. 1 Live weight of the single and twin lambs

Table 4. Values and significance of F-criteria

Source of variance	DF	Value and significance of F-criteria			
		Live weight, beginning	Live weight, I month	Live weight, II month	Live weight, III month
Between groups	1	9.214 **	9.106 **	12.376 **	9.000 **
Within group	19				
Total	20				

Note: Significant ** at $P < 0.01$

The average daily gain of the lambs was similar - 0.141 kg for twins and 0.139 kg for singles. During the separate months the average daily gain of the lambs for the both groups didn't distinguish significantly and it was between 0.070 kg and 0.176 kg (Fig.2).

The applied feeding by norms ensured similar daily gain of lambs from both groups. The singles increased their live weight with 33% and twins – with 40%. At the beginning of the experiment the differences of the live weight between singles and twins was nearly 18%, but at the end it decreased (12.5%), and it wasn't observed compensation of the live weight of twins. For the whole experimental period, at the same daily gain, the singles had greater intake of forage, energy and protein than twins. The gain efficiency per 1 kg was better for the twins than singles (8%, 9% and 7% for forage, energy and protein) (table 5). The observed better efficiency of twins proposed, that if it was applied norms with higher daily gain, they would compensate their live weight.

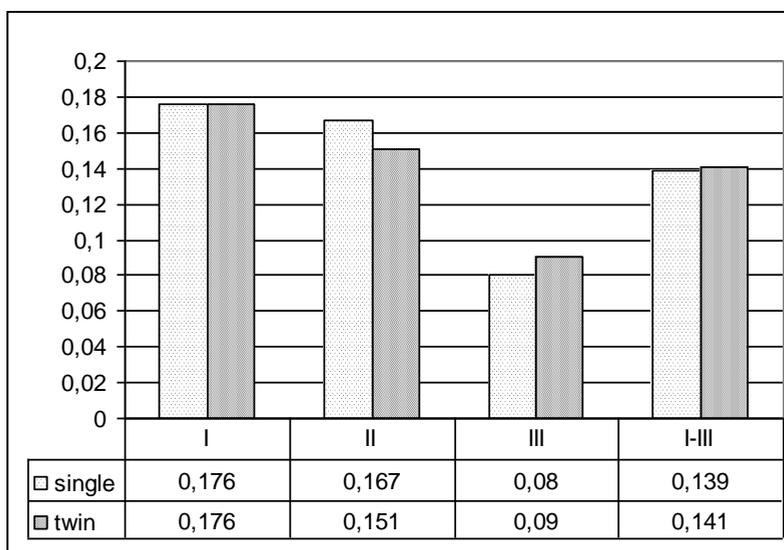


Fig. 2 Average daily gain of lambs single and twins

Table 5. Efficiency per 1 kg gain for forage, energy and protein

Indexes	Singles				Twins			
	I period	II period	III period	Whole period	I period	II period	III period	Whole period
Forage, kg	8.836	9.670	22.766	11.697	8.513	9.933	18.063	10.822
FUG*	9.076	9.695	22.259	11.691	7.784	9.755	17.431	10.638
PDI, g	678.40	734.31	1699.55	886.14	598.05	765.26	1369.90	829.07

*Energy, FUG - Feed Unit for Growth = 6 MJ NE (net energy) at $q = 0.5$ (q – coefficient for feed quality)

CONCLUSIONS

The obtained results showed, the applied norm feeding ensured reaching of live weight, which respond to the age and type of birth of the breeding female lambs from Ile de France breed. The singles reached live weight 50.27 kg and twins - 44.7 kg.

The average daily intake of forage, energy and protein was 1.626 kg, 1.625 FUG, 123.17 g for the singles, and 1.526 kg, 1.5 FUG, 116.9 g for the twins.

The gain efficiency per 1 kg for forage, energy and protein was 11.70 kg, 11.69 FUG, 886.14 g for the singles and 10.82 kg, 10.64 FUG and 829.07 g for the twins.

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