http://www.pjbs.org

PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 8 (2): 194-197, 2005
ISSN 1028-8880

The Effect of Different Ration Protein Levels on the Fattening Performance in the Türkgeldi Lambs

Levent Coskuntuna and Sabahattin Öğün
Department of Animal Science, Faculty of Agriculture, Trakya University, 59030 Tekirdağ, Turkey

Abstract: In this trial the effects of the crude protein contents of the fattening concentrates on the fattening performance in the Türkgeldi lambs were investigated. Twentyseven Türkgeldi male lambs (weaned 2-2.5 mounts of age) were allotted randomly by weight in the three groups at the beginning of the trial. Animals in each trial groups were fed individually with trial concentrates (G1; 13.34% CP, 2510 kcal ME kg^{-1}, G2; 14.56% CP, 2530 kcal ME kg^{-1}, G3; 15.85% CP, 2560 kcal ME kg^{-1}) and the concentrates were given *ad libutum* levels for a 56 days. Also 100 g/day sun crude hays were given per animal during the fattening period. Concentrates were given three times a day and any food remaining in the troughs were removed and weighted before the morning feeding. Live weights of the animals were recorded every two weeks interval. Average live weights at the end of the trial, average daily gains, average feed intake and feed efficience ratio of the trial groups were founds as 40.40±1.586, 38.73±0.877, 38.14±1.757 kg; 344.31±15.224, 319.69±12.959, 306.56±15.411 g; 1.46±0.015, 1.45±0.010, 1.41±0.013 kg and 4.44±0.214, 4.83±0.231, 4.98±0.302 kg for the groups of G1, G2 and G3, respectively. There were no significant differences between the groups with respect to live weights, daily gains and feed efficience ratios, although the differences about daily feed intake values between trials were found significantly ($p<0.05$).

Key words: Türkgeldi lambs, crude protein, fattening performance

INTRODUCTION

The primary principle of the intensive lamb fattening process is concerned with use of intensive feed ingredients in order to benefit the high rate of development in the lambs early ages. In terms of economic issues, to get the live weight as high as possible in a certain period of time in feeding is significant. By this way, during the fattening period, decrease in the rate of survival in the total necessity of feed ingredients and the best use of the fattening intake, in other words an economic production are supposed[1,2].

In the stockbreeding aiming to utilize high rate of growth and fattening in the early ages of life and to produce meat under economic circumstances, in the occurrence of genotype and its limited potential, the correlation between environmental factors and feeding is very effective. In this sense, the definition of different genotypes in fattening performance is initial step.

When the general features of digestion physiology and metabolic changes on ruminants are investigated it is understood that the need of protein are formed by two basis that are the need related to staying animal and Rumen microorganisms. Under some circumstances the level of protein synthesized by Rumen microorganisms is enough for the need of staying animal.

However, when this resource is insufficient, it is supposed that the rations are supported by proteins and certain piece of this support must be by pass characterized. Because of the microbial divisions taking place in Rumen, protein at rations, especially when the physiologic period in which the speed of metabolism is higher, are important in terms of not only their quantitative features but also their qualifications[2-4].

With this trial, the effects of quantity of the crude protein contents of the fattening concentrates on the parameters related to fattening performance are intended to investigate through the basis of Türkgeldi genotypes.

MATERIALS AND METHODS

The material of this investigation is twenty seven Türkgeldi male lambs that were weaned 2-2.5 months of age. The lambs were divided into 3 groups consisting of nine lambs each. The lambs were fed with fattening concentrates at *ad libutum* level and 100 g day sun crude hays.

During the research, the live weights of the animals were recorded at the beginning, in the end and fourteen-day periods (totally five times) While controlling, the delicate scales for 20 g were used before feeding in the mornings.

Corresponding Author: Dr. Levent Coskuntuna, Assistant Professor, Department of Animal Science, Agricultural Faculty, Trakya University, 59030 Tekirdağ, Turkey E-mail: lcoskuntuna@tu.tzf.edu.tr

Both fattening concentrates related to groups and the consuming rate of sun crude hays were searched not only daily but also individually. For this reason, during the investigation the individual feedboxes were cleaned every morning and food remaining was recorded and through the quantities between given and remaining feed, the daily feed intake was determined. The delicate scale for 5 g was used. The intensive fattening contents used in this trial were given in Table 1.

In the table, the values of Ca and P are calculated with the help of Cullison and Lowrey's[5] research and other values about crude contents are found through chemical analysis.

In this trial, the analysis of crude contents of fattening concentrates on the trial groups was made through Weende analysis method[6].

In order to display the effects of these applications, the data was evaluated according to the variant analysis technique and when the differences within applications became obvious, Duncan test was utilized[7].

Table 1: The features of the intensive fattening contents used in this trial

	The forms of fattening concentrates (%)		
Raw material of feeding	I. Group	II. Group	III. Group
Barley	37.25	37.35	37.45
Wheat	15.00	15.00	15.00
Bran	31.00	21.00	11.00
Cotton seed	10.00	20.00	30.00
Dust of marble	5.00	5.00	5.00
DCP	1.30	1.20	1.10
Vit-Min. mix	0.25	0.25	0.25
Salt	0.20	0.20	0.20
Total	100.00	100.00	100.00
	Feed ingredients		
Dry matter (%)	89.73	89.78	90.68
Crude protein (%)	13.34	14.56	15.85
Crude cellülose (%)	6.40	8.40	9.70
Crude fat (%)	4.26	4.01	5.07
Crude ash (%)	9.01	9.07	8.93
Energy (kcal ME kg^{-1})	2510.00	2530.00	2560.00
Ca (%)	2.11	2.09	2.07
P (%)	0.80	0.80	0.80
Ca/P	2.63	2.61	2.58

RESULTS

For 56-day Fattening, according to control periods, the results on live weight, live weight gains, feed intake and feed efficience ratio parameters are given below together with the statistics.

In the trial, the groups started in the equal conditions in terms of their live weights, the live weights at the end of the fattening for the 1st, 2nd and 3rd groups, respectively were recorded as 40.40+1.586, 38.73+0.877 and 38.14+1.757 kg. As it is shown in the Table 2, for all the controlling periods, the differences between groups interms of live weights were not considered as significant for statistics. During the fattening performance this situation formed by live weights is the result of live weight changes occurring in the basic groups. When the values related to groups live weight changes are examined, it is clear that there are no significant differences between values of control periods and beginning-end of fattening process (Table 2).

Increase in live weights in feeding, when 1st period is taken as the basis, the value of 3rd Group was higher than 1st and 2nd. groups for numerical sense. In this group, for the coming periods of fattening the speed of live weight gains became slower and with respect to values of beginning-end of fattening process (306.56±15.411 g/day) it was at a lower level than I. (344.31±15.224 g/day) and II. (319.69±12.959 g/day) groups (Table 2).

When the ratios in average daily live weight gains during the fattening process were regarded, intenus of the related parameter, it is passible to say that there are no sharp differences within the values of ration crude protein.

As it is seen in the Table 3, average daily fattening concentrate intake tends to increase in correlation with the time in all the groups. Here, the most prominent thing is that aport from 1st period, when its compared to other groups in 3rd group whose fattening concentrate intake enriched with crude protein was higher than others, its average daily fattening concentrate intake was at lower levels. However, in terms of average daily fattening concentrate; 3rd group had higher values ($p>0.01$) When compared with others on the basis of 1st period but this tendency changed after. 2nd period and as a result of daily intake occurring in 2nd, 3rd and 4th. Periods, for the beginning. End of fattening, the average daily fattening intake in the three groups was 1.46±0.015, 1.45±0.010 and 1.41±0.013 kg, respectively. Although the differences ($p>0.05$) between 1st and 2nd groups were not considered as important in term of general fattening, it is understood that fattening concentrate intake in 3rd group was significantly lower than others ($p>0.05$).

On the basis of control periods during the fattening performance, the differences among the groups were not significant ($p>0.05$). Feed efficiency rates the tendencies bringing about as the consequence of the ratios of fattening concentrate were not parallel with live weight gains and fattening concentrate intake. For the beginning. End of fattening performance, the best result was gained in 1st group (4.44±0.214), 2nd group came secondarily (4.83±0.231) and 3rd group was the last one (4.98±0.302) (Table 3).

Table 2: Mean±SE of Live weight (kg) and daily live weight gains (g)

	I. Group		II. Group		III. Group		
Periods	Mean	SE	Mean	SE	Mean	SE	P[1]
Live weight (kg)							
I.	21.12	0.856	21.16	0.809	20.97	0.913	NS
II.	25.99	1.115	25.76	0.714	26.05	1.185	NS
III.	32.28	0.417	29.54	0.751	29.72	1.308	NS
IV.	35.90	0.317	34.22	0.724	34.05	1.487	NS
V.	40.40	1.586	38.73	0.877	38.14	1.757	NS
Daily live weight gains (g)							
I.	348.34	30.345	328.25	26.835	362.85	29.132	NS
II.	347.30	13.877	270.36	21.399	261.60	29.170	NS
III.	359.99	15.464	357.93	26.162	309.82	33.284	NS
IV.	321.62	30.780	321.60	23.151	291.96	25.029	NS
V.	344.31	15.224	319.69	12.959	306.56	15.411	NS

[1] NS = Not signification

Table 3: Mean±SE of fattening concentrate intake (kg d^{-1}) and feed efficiency rate

	I. Group		II. Group		III. Group		
Periods	Mean	SE	Mean	SE	Mean	SE	P[1]
Fattening concentrate intake (kg d^{-1})							
I.	1.22	0.023a	1.24	0.014a	1.30	0.021b	**
II.	1.39	0.025	1.38	0.015	1.34	0.024	NS
III.	1.66	0.110a	1.53	0.016a	1.41	0.029b	*
IV.	1.66	0.033a	1.68	0.018b	1.60	0.024a	*
V.	1.46	0.015a	1.45	0.010a	1.41	0.013b	*
Feed efficiency rate							
I.	3.65	0.259	3.98	0.333	3.63	0.188	NS
II.	4.36	0.497	5.48	0.574	5.71	0.859	NS
III.	4.36	0.230	4.48	0.357	4.95	0.574	NS
IV.	5.33	0.455	5.42	0.386	5.64	0.340	NS
V.	4.44	0.214	4.83	0.231	4.98	0.302	NS

[1] NS = Not signification, *p<0.05, **p<0.01

DISCUSSION

To compensate the need of any fattening concentrate in organism one of the most important features taking role in determining the density of rations was the level of fattening concentrate intake that was supposed to be. Most of the researchers emphasize that the necessity of the high leveled protein at rations after weaning period was the result of not only the need for this nourishment but also of the lower capacity of intake in this period[8,9]. On the other hand, it must be emphasized that this kind of approach is significant in terms of having guarantee for the minimum fattening concentrate intake in order to reach desired growth and it must also be considered that there are lots of effects of different factors that may be effective on the application of fattening concentrate intake.

When the protein contents are at normal levels in fattening concentrate intake, free intake (level is not affected by protein contents. On the other hand, the rations whose protein density is too high or too low may cause pressure upon intake levels. It is possible to define the lowest and critic ration level for animal product for any species as the quantity causing decrease at the intake levels[10].

As Swanson[11] stated, the practices to raise the ration protein contents in order to raise the intake level in milking cows in the early periods of lactation are generally explained in a correlation with being delicious, however most of the researchers try to explain the relation between the increase of protein level and fattening concentrate intake through digestiblity[12,13]. But the positive effects of the increase of ration protein level on fattening concentrate intake are limited. Forbes[10] states that this situation can be explained as the result of protein's metabolic effects creating fullness at higher levels when compared with carbohydrate and fat.

Ivesi, in one of his fattening performances with male lambs and Görgülü[14] in his study about the correlation between the level of protein and energy of rations and protein resources and their effects on fattening performance, state that for all the energy levels fattening concentrate intake raise in a parallelism with the increase of ration protein level and for the lambs taking the rations which are lack of protein and energy and the lambs taking rations enriched of energy but lacking of protein, the fattening concentrate intake is lower than other lambs taking other application combinations.

In this trial, to get the desired protein levels, increasing rate of cotton bagasse was used for the groups intake as fattening concentrate (Table 1). Therefore, although there are no certain evidence for the consumption of ration protein, in terms of teorical sense

it con be admitted that the features of protein consumption may vary according to mixes, However, the rate of consumption of barley and wheat which are the energy resource for microbial fermentation showed a little changes (in order to keep the balance between energy levels) in fattening concentrate mixes (Table 1).

Consequently, it is found that the level of ration crude protein was effective only on fattening concentrate intake but it was not effective on other nourishing parameters.

REFERENCES

1. Hart, S.P. and H.A. Glimp, 1991. Effect of diet compsition and feed intake level on die digestibility and ruminal metabplism in growing lambs. J. Anim. Sci., 69: 13636-1644.
2. Chestnutt, D.M.B., 1984. Effect of lamb growth and growth pattern on carcass fat levels. Anim. Production, 58: 77-85.
3. Lewis, D., 1961. Digestive physiology and nutrition of the ruminant. Butterworths-London.
4. Black, J.L., W.F. Calebrook, 1976. Biological value of protein in ruminants. Proc. Aust. Soc. Anim. Prod. V., 11: 421-424.
5. Cullison, A.E. and S. Lowrey, 1987. Feeds and Feeding. Fourth Edition. A Reaston Book. Prentice Hall, Englewood Cliffs, New Jersey. pp: 645.
6. Akyildiz, A.R., 1984. Laboratory guide for feeding. Ankara Universty, Agriculture Faculty. Publications, No: 895. Ankara.
7. Soysal, M.I., 1993. Principles of biometer course (Notes of Statistics I and II) Publication No. of Agriculture Faculty of Thrace University : 95. Course Note : 64 Tekirdağ.
8. Theriez, M., C. Costrill and Y. Villette, 1982. Influence of Metobizable Energy Contentof Diet and of Feeding Level on Lamb Performances. II. Utiilazition of Metabolizable Energy for Growth and Fattening. Livestock Production Sci., 9: 487-500.
9. Webster, G.M. and G.M. Povey, 1990. Nutrition of Finishing Lamb. In New Development In Sheep Production. Occasional Publication No. 14. British Society of Animal Production. Edited by C.F.R. Slade T.L.J: Lawrance.
10. Forbes, J.M., 1995. Voluntary Food Intake and Selection in Farm Animals. Cambrige, pp: 520.
11. Swanson, L.V., 1989. Discussion-interactions of nutrition and reproduction. J. Dairy Sci., 72: 805-814.
12. Owens, F.N and W.G. Bergen, 1983. Nitrogen metabolism of ruminant animals. Historical perspective, Current understanding and Future Implication. J. Anim. Sci., 57: 498-518.
13. Hassan, S.A and M.J. Bryant, 1986. The response of store lambs to dietary suplements of fish meal. 2. Effects of Level Feeding. Anim. Prod., pp: 42: 223-232.
14. Görgülü, M., H.R. Kutlu, E. Demir, O. Öztürkcan and J.M. Forbes, 1996. Nutritional consequence of free-choice among feed ingridiets by awassi lambs. Small Rum. Res., 20: 23-29.