

Comparison of hay and maize silage intake by lambs

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Abstract. Use of the ruminant anatomo-physiological characteristic to utilize more roughages decreases the costs of production of animal output. Contribution of suitable forages in the rations for young ruminants is of importance for better development of their rumen and for utilization of more roughages as adult animals. The objective of this study was to compare the intake of hay of lucerne and natural sward with that of maize silage as components of the ration for lambs. Twenty weaned female lambs of the Blackface Pleven breed with initial live weight of 22 kg divided into two groups of 10 animals each were used. The lambs of the two groups received equal quantities of concentrate, 626 g DM head⁻¹ day⁻¹: group 1 received hay of lucerne and natural sward *ad libitum* in 50:50 ratio; group 2 received maize silage. The ration was formulated so as to ensure average daily gain of 250 g by net energy content. The trial lasted for 6 weeks. It was found that the lambs ingested 22.3% greater quantities of dry matter from the hay, 406 g head⁻¹ day⁻¹, as compared to that from the silage, 322 g head⁻¹ day⁻¹ (P<0.05). The conclusion was that the hay of lucerne and natural sward is better than maize silage for feeding weaned lambs.

Key words: hay, maize silage, lambs, intake

1. Introduction

Habituation of the young ruminants to roughage consumption has great importance for development of their rumen and maximum use of their anatomo-physiological characteristic to utilize more roughages as adult animals. The use of less feeds and more roughages in the rations for ruminants makes cheaper the animal output and increases its healthful qualities. During the last decade there was a trend to increase milk and meat production based on greater contribution of herbaceous forages and less concentrated feeds (TISSERAND and KIRILOV, 2004). The forage intake depends on forage quality, animal characteristics and environmental factors.

The objective of this study was to compare the dry matter intake from hay of lucerne and natural sward with that from maize silage as components in the ration for weaned female lambs of the Blackface Pleven breed.

2. Material and methods

The trials were carried out in 2005 with weaned lambs of the Blackface Pleven breed. Twenty female lambs with live weight of 21 kg at the trial start divided into two groups

were used. Each group received equal quantity of concentrated feed: 626 g head⁻¹ day⁻¹, composed of maize grain (178 g), wheat (224 g) and sunflower oil meal (224 g). The ration of group 1 included equal quantities of hay of lucerne and natural sward and that of group 2, maize silage *ad libitum* (10% refuse).

Mixing of the hay of lucerne and natural sward was necessary to balance the crude protein content in the hay and that of the maize silage. The rations were given twice a day and were formulated so as to ensure net energy by table data for 250 g daily gain according to the rates accepted in Bulgaria for lamb feeding (TODOROV and DARDJONOV, 1995). The concentrate was given in different cribs so as to avoid its mixing with the hay or silage. Silage and hay consumption was recorded every day. The results for the hay or silage intake are presented as average values for each trial week. The trial period duration was 6 weeks. The lamb liveweight was controlled every week in the morning before feeding and on two consecutive days at the trial beginning and end. The chemical composition of the forages used in the trial was made by the Weende method.

3. Results and discussion

Crude protein content of the maize silage (90 g kg⁻¹ DM) and the average value of the two hay types (96 g kg⁻¹ DM) were similar, while difference in crude fibre between the two treatments were significant, 226 and 346 g kg⁻¹ DM, respectively. This difference was related to grain presence in the silage and probably also to later harvest stage of lucerne and natural sward.

The dry matter intake from the total ration was higher for the lambs of group 2, than that in group 1 (Table 1 and Fig. 1). The difference was due to greater quantity of ingested dry matter from the hay, as compared to that from the silage that was given *ad libitum* (Fig. 2).

Table 1. Dry matter intake by lambs of Pleven blackface breed

7 – day period	Ingested DM from the roughages (g kg ⁻¹ W ^{0.75})	
	Silage	Hay
1	30.1	37.6
2	27.8	36.1
3	30.5	38.3
4	30.6	35.9
5	30.0	35.5
6	32.2	37.5
Average	30.2	36.8
SD	1.4	1.1

The lamb group fed with hay of lucerne and natural sward ingested more dry matter as compared to that from the maize silage, in spite of the mediocre hay quality. On ave-

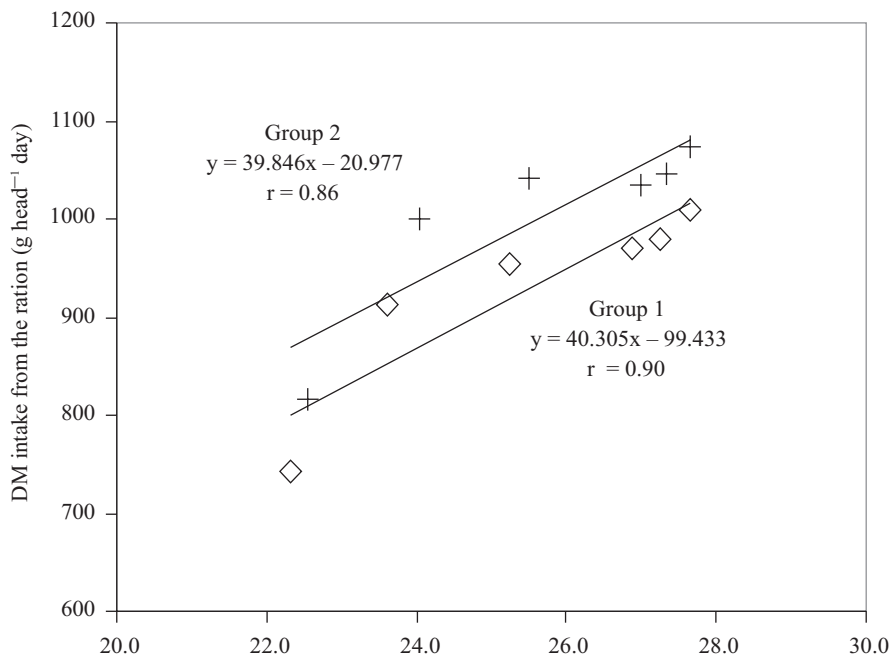


Fig. 1. Relationship between lamb live weight and capacity of free intake of dry matter (DM) from the total ration

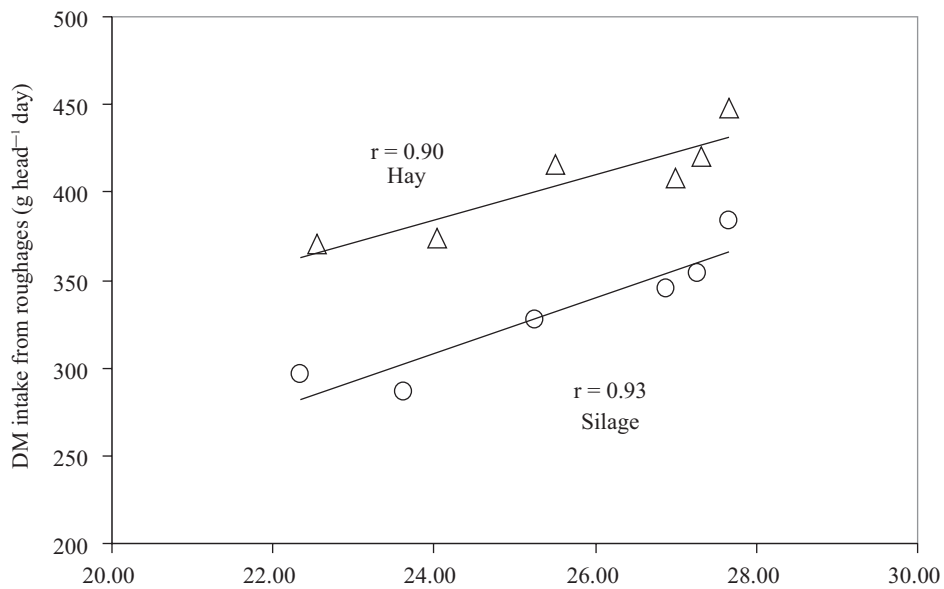


Fig. 2. Intake of the roughages representing a part of the ration by lambs

rage, for the trial period the lambs ingested 406 g day⁻¹ DM from the hay and 322 g day⁻¹ DM from the silage.

The difference was 22.3 % in favour of the hay and varied during the trial period, but the hay intake was always higher than that of the silage. The reasons for the lower maize silage intake were interpreted as caused by: i) lack of habit in the lambs to consume silage because, during the suckling period, they had only hay at their disposal; ii) greater susceptibility of young ruminants to fermentation products from the silage, such as organic acids and ammonia; iii) heterogenous nature of the maize silage where there are leaves, stems, grain and cobs, these being not very suitable for young ruminants. NAYDENOV (1989) found strong relationship between the content of ammonia and organic acids in the silage during lamb fattening which supports our thesis.

4. Conclusion

- As a result of the comparative study, the hay of lucerne and natural sward is better than maize silage for feeding of lambs with live weight between 20 and 30 kg.

References

- KIRILOV A., TISSERAND J. L., 2004. Possibility for regulation of milk production of cows by grass in the 21st century. Bulgarian Journal of Mountain Agriculture.
- NAYDENOV T., 1989. Study and prediction of green and preserved forages. These, Agricultural Academy, Sofia (in Bulgarian).
- TODOROV N., DARDJONOV T., 1995. Nutrient requirements of sheep and goat. Publishing House NIS – UZVM, Stara Zagora, p. 216.

Summary

The objective of this study was to compare the dry matter intake from hay of lucerne and natural sward with that from maize silage as components in the ration for weaned female lambs of the Blackface Plevan breed. The trials were carried out in 2005. Twenty female lambs with live weight of 21 kg at the trial start divided into two groups were used. Each group received equal quantity of concentrated feed: 626 g head⁻¹day⁻¹, composed of maize grain (178 g), wheat (224 g) and sunflower oil meal (224 g). The ration of group 1 included equal quantities of hay of lucerne and natural sward and that of group 2, maize silage *ad libitum* (10% refuse). Mixing of the hay of lucerne and natural sward was necessary to balance the crude protein content in the hay and that of the maize silage. The rations were given twice a day and were formulated so as to ensure net energy by table data for 250 g daily gain according to the rates accepted in Bulgaria for lamb feeding. The concentrate was given in different cribs so as to avoid its mixing with the hay or silage. Silage and hay consumption was recorded every day. The results for the hay or silage intake are presented as average values for each trial week. The trial period duration was 6 weeks. The lamb liveweight was controlled every week in the morning before feeding and on two consecutive days at the trial beginning and end. The chemical composition of the forages used in the

trial was made by the Weende method. The conclusion was that the hay of lucerne and natural sward is better than maize silage for feeding of lambs with live weight between 20 and 30 kg.

Porównanie pobierania przez jagnięta siana i kiszonki z kukurydzy

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Streszczenie

Celem badań było porównanie pobrania suchej masy siana z lucerny i naturalnej łąki z kiszonką z kukurydzy jako komponentów dawki pokarmowej dla odsadzonych jagniąt rasy Black-face Pleven. Doświadczenie przeprowadzono w 2005 roku. W momencie rozpoczęcia doświadczenia podzielono 20 jagniąt płci żeńskiej o masie ciała 21 kg na dwie grupy. Każda grupa otrzymywała taką samą ilość paszy treściwej 626 g w przeliczeniu na sztukę dziennie, złożonej z ziarna kukurydzy (178 g), pszenicy (224 g) i śruty słonecznikowej (224 g). Ponadto dawka była złożona z tych samych ilości w grupie 1 siana z lucerny i naturalnej łąki, a w grupie 2 z kiszonki z kukurydzy *ad libitum* (przy uwzględnieniu 10% niedojadów). Wymieszanie siana z lucerny i naturalnej łąki było konieczne dla zbilansowania zawartości białka ogólnego w sianie o kukurydzy. Pasze były zadawane dwa razy dziennie, zapewniając w dawce energie netto według danych z norm dla uzyskania przyrostów dziennych na poziomie 250 g zgodnie z dawkami akceptowanymi w Bułgarii w tuczu jagniąt. Pasze treściwe były zadawane w odrębnych pojemnikach, co uniemożliwiło ich zmieszanie z sianem i kiszonką. Pobranie kiszonki i siana było określane każdego dnia. Wyniki dla pobrania poszczególnych pasz są prezentowane jako wartości średnie dla każdego tygodnia prowadzenia doświadczenia. Okres badań trwał 6 tygodni. Przyrosty jagniąt były kontrolowane każdego tygodnia rano przed podaniem pasz oraz w dwóch kolejnych dniach rozpoczęcia i zakończenia badań. Skład chemiczny pasz stosowanych w doświadczeniu został oznaczony metodą wendeńską. Reasumując stwierdzono, że siano z lucerny i naturalnej łąki jest lepsze w żywieniu jagniąt o masie od 20 do 30 kg niż kiszonka z kukurydzy.

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