

The feeding value of silage made from peas grown alone or in mixture with cereals

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Introduction The interest in pea as a forage crop rich in protein does not decrease. In areas frequent summer drought pea (*Pisum sativum*) as a whole plant for forage gives assured yield and may be used for zero grazing, hay or silage. The winter varieties use winter-spring soil moisture better and give higher yield than the spring varieties, but they lodge, so it is necessary to sow them with supporting cereal crops to increase lodging resistance. The objective of the study was to compare the intake, digestibility, energy value and quality index of two wilted silage made from winter pea, variety Pleven 10, and from pea-cereal crop mixture.

Materials and methods The trials were carried out at the Institute of Forage Crops, Pleven. Silages were made from peas grown alone and from a pea-cereal (wheat and rye) mixture in a 25:75 ratio. The crops were harvested at the stage of early wax ripeness of the first pods of pea and cereal components and they were wilted before ensiling. The silages both had very good fermentation characteristics: dry matter (DM) content 50.3 and 53.9%, lactic acid 9.6 and 8.4% of DM, acetic acid 0.91 and 0.71, respectively. Both silages had pH of 4.7 and no butyric acid. Six fine-wool wethers of average live weight of 58 kg were placed in cages for balance trials at two feeding levels, *ad libitum* (allowing 10% refusal) and restricted feeding to determine intake and digestibility. The forage quantity ingested, the refusal at *ad libitum* feeding and the faeces were recorded every day during the 8-day trial period. The net energy content was calculated as feed units for growth (FUG) (Todorov, 1995) (1 FUG = 6 MJ net energy for growth) from nutrients ingested and excreted in faeces. Using the results of DM intake during *ad libitum* feeding and FUG content, the forage quality index (QI) was calculated according to Kirilov (2000) ($QI = DM \text{ intake} \times FUG / FUG \text{ for maintenance}$) with the maintenance requirement taken as 0.039 FUG/kg $W^{0.75}$ (Todorov & Dardjonov, 1995).

Results The intake and digestibility of pea silage were higher than those of the silage made from pea-cereal mixture (Table 1). This is probably due not only to the better palatability of the wilted pea silage, but also to the advanced developmental stage of cereals and their great presence in the mixture which caused an additional decrease in palatability. The lower digestibility resulted in a lower energy value of the silage of pea-cereal mixture 0.76 (4.56 MJ net energy for growth) vs. 0.83 FUG (4.98 MJ). During *ad libitum* feeding, the digestibility and energy values decreased a little, as compared to the limited feeding.

The lower intake and digestibility combined to give a lower forage quality index for the pea-cereal mixture compared to pea - with net energy intake 1.21 vs. 1.62 times maintenance requirement for the two silages.

Table 1 Intake, digestibility, energy value and quality index of silage from pea and pea-cereal mixture

Silage	Feeding	CP, g / kg DM	DM intake, g / kg $W^{0.75}$ *	OM digestibility, % **	FUG, per kg DM	Quality Index
Pea	limited	154.8	42.3	64.30 ^a ± 1.45	0.86	
	<i>ad libitum</i>	154.8	76.0 ^a ± 0.6	63.30 ^a ± 1.65	0.83	1.62 ^a
Pea:cereals	limited	113.0	42.2	58.14 ^b ± 2.01	0.81	
	<i>ad libitum</i>	113.0	62.3 ^b ± 4.8	57.15 ^b ± 2.88	0.76	1.21 ^b

*The means followed by different letters differ statistically significant; ** Mean ± Standard deviation

Conclusion The results of this study demonstrate the higher digestibility and intake, higher net energy content and higher forage quality index of pea silage as compared to the silage made of pea-cereal crop mixture at the stage of wax ripeness and with a cereal content of 75%.

References

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