

Nutritive value of *Alopecurus pratensis*, *Festuca rubra*, *Arrhenatherum elatius* and *Lolium perenne* grown in the South of Belgium

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Introduction In Europe, recent strategies have aimed at encouraging farmers to use production techniques more efficient in preserving the environment and maintaining natural areas. Those strategies have encouraged the use of secondary grass species in forage production systems. However, the nutritive value of those grasses is not well known. Therefore, the aim of the present study was to evaluate the energy and nitrogen values of *Alopecurus pratensis* (ALPR), *Festuca rubra* (FERU) and *Arrhenatherum elatius* (AREL) under moderate rates of nitrogen (N) application (60 kg N/ha per cut) and a hay-cutting regime (2 cuts/year: 25 May and 9 July). *Lolium perenne* cv. Bastion (LOPE) was used as a control. The first cut of ALPR was a mixture of 18 April and 25 May cuts.

Materials and methods For each cut, organic matter digestibility (OMD) was measured with 4 Texel crossbred male sheep (35 ± 5 kg), according to a Latin square (4 x 4) experimental design. Maintained in digestion crates, the sheep were fed each grass hay in 2 daily equal meals (restricted feeding level: 40 g DM/kg LW^{0.75}/d) for 21 days (a 13-d adaptation period followed by an 8-d period of total faeces collection). Effective degradability of crude protein (Deg CP) was also evaluated (outflow rate k = 0.02/h) on sheep: an *in sacco* procedure was performed on 3 other Texel crossbred male sheep (91 ± 7 kg) fitted with a rumen canula. Observed degradability data were then fitted to the lagged exponential model. Finally, nutritive value was expressed in terms of net energy (UF) and intestinally digestible protein (PDI) according to the French feeding system. Only digestibility data could be submitted to a variance analysis. Dry matter, organic matter, crude protein (CP) and neutral detergent fibre (NDF) contents were determined following classical procedures.

Results With the exception of ALPR (1st cut only), OMD ($P < 0.05$) and UF values of secondary grasses were lower than those of LOPE, reflecting differences in CP and NDF contents (Table 1). The Deg CP was similar for AREL and LOPE, while it was either higher (1st cut) or lower (2nd cut) for ALPR and FERU than for LOPE ($P < 0.05$). Nevertheless, reflecting variations in CP content, PDI values of secondary grasses were similar to or even higher than those of LOPE. Overall, based on DM yields, the calculation of total UF and PDI production (2 cuts) showed that the studied secondary grasses provided lower (ALPR) or higher (FERU, AREL) UF yield and higher PDI yield than LOPE.

Table 1 Nutritive value of secondary grasses

Grasses	DM Yield (t/ha)*	CP (g/kg DM)	NDF (g/kg DM)	OMD (g/g)	Deg CP (g/g)	UFL (/kg DM)	UFV (/kg DM)	PDIE (g/kg DM)	PDIN (g/kg DM)
First cut									
ALPR	4.05	177	601	.680 ^a	.573 ^a	0.77	0.70	103	110
FERU	6.13	93	697	.595 ^c	.438 ^b	0.66	0.57	91	66
AREL	7.86	72	714	.599 ^c	.391 ^c	0.66	0.57	90	58
LOPE	5.36	80	635	.648 ^b	.404 ^c	0.73	0.65	91	58
Second cut									
ALPR	1.56	217	745	.659 ^b	.445 ^c	0.76	0.67	127	133
FERU	2.72	171	715	.644 ^b	.522 ^b	0.72	0.64	98	101
AREL	2.74	154	721	.645 ^b	.563 ^{ab}	0.73	0.64	91	91
LOPE	0.83	156	656	.701 ^a	.594 ^a	0.81	0.74	91	89

*Average data previously reported by Peeters A. (2004)

Conclusions Because of their relatively valuable nutritive value as compared to that of *Lolium perenne*, the studied secondary grasses, particularly *F. rubra*, could be recommended for forage production systems related to preserving the environment.

Reference

Peeters, A. (2004). Wild and sown grasses. Profiles of temperate species selection: ecology, biodiversity and use. FAO and Blackwell Publishing, Rome, 311p.