Influence of the species and conservation additives on the content of nutrients and grass forage safety

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Introduction Winter feed ration is based on the conserved fodder from the first cut of grassland. As compared with haymaking, ensiling represents a much lower weather risk, which reflects favourably in working costs and low conservation losses (Achilles et al., 2002). Honig and Pahlow (1986) claim that the application of ensiling inoculants to partly wilted grasses with the DM content higher than 26% and lower than 45% improves the course of the fermentation process and decreases the total loss of nutrients. Prerequisite for high-quality silage is a clean and healthy phytomass (Holubek et al., 2007). Development of microscopic fungi may lead to the formation of mycotoxins (Opitz von Boberfeld et al., 2006). These metabolites can cause economic losses in animal production and decrease meat quality (Opitz von Boberfeld, 1996). There are considerable differences among species. Interspecific hybrids of *Festulolium* ssp. combine the resistance of the *Festuca* sp. family with the high quality of the *Lolium* sp. family (Casler et al., 2002).

Material and methods The experiment was carried out in triplicates. The harvesting of grasses *Lolium perenne* (cv. Kentaur), *Festulolium braunii* (cv. Perseus) and *Festulolium pabulare* (cv. Felina) was on begin of June (stage of end earing). The plots (1.5 x 10 m) were harvested by a self-propelled mowing machine. Stubble height was 0.07 m. The assessed grasses were wilted 30 hours. Use preservatives were organic acids (43 % formic acid, 10 % propionic acid, 30 % ammonium formate, 2,0 % benzoic acid), (4 l t^{-1}) and probioenzymatic inoculant (*Enterococcus faecium*, *Lactobacillus plantarum*, *Pediococcus acidilactici*, *Lactobacillus salivarius*, cellulase, hemicellulase, and amylase), ($1x10^{11}$ CFU; 10 g t^{-1}). Biomass was ensiled in micro experimental silos. Silages sampled 60 days after the beginning of conservation were assessed for digestibility of organic matter (DOM) via pepsin-cellulase method, contents of crude protein (CP), crude fiber (CF) and net energy lactation (NEL). ELISA method was applied to estimate the content of mycotoxins zearalenone (ZEA), fumonisin (FUM).

Results and Discussion While the surveyed fodder species differed in the digestibility of organic matter ($P < 0.05$), the application of conservative additives did not affect the content of organic nutrients (Table 1). *Festulolium pabulare* apparently exhibited a higher content ($P<0.05$) of crude fiber (CF) and lower contents ($P<0.05$) of net energy of lactation (NEL). The lower quality of *Festulolium pabulare* as compared with *Lolium perenne* and *Festulolium braunii* is documented also by other works. Interesting is the look at the occurrence of mycotoxins. There was zearalenone detected in the silages (Table 1). Fumonisin was detected in *Festulolium braunii*. None of the studied factors had an influence on the zearalenone content but a tendency to the higher occurrence of zearalenone apparently existed in *Lolium perenne*. As to the preservatives, lower zearalenone content in the silage was apparently found with the use of the biological inoculant or organic acids. Statistical significance was not demonstrated namely with respect to a higher standard error of the mean.

Conclusion *Festulolium pabulare* (*Festuca arundinacea* x *Lolium multiflorum*) unlike *Festulolium braunii* (*Lolium multiflorum* x *Festuca pratensis*) and *Lolium perenne* had lower

quality of forage. However had higher forage safety which was demonstrated with lower content of zearalenone.

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Table 1. Effect of species (SP) and preservative (PR) digestibility of organic matter (DOM), crude protein (CP), crude fiber (CF), net energy lactation (NEL), fumonisin (FUM) and zearalenone (ZEA)

Factor	DOM % DM	CP % DM	CF % DM	NEL MJ kg^{-1} DM	FUM ppb	ZEA ppb
Species (SP)						
Lolium perenne	83.8[a]	10.96	27.70[a]	5.97a	<LOQ	66.07
Festulolium braunii	82.0[a]	10.07	30.08[ab]	5.79[ab]	6.07	46.34
Festulolium pabulare	74.6[b]	9.73	32.56[b]	5.34[b]	<LOQ	47.92
Preservatives (PR)						
Control	79.9	9.95	30.52	5.68	<LOQ	62.92
Organic acids	78.9	10.33	30.45	5.72	6.07	48.52
Probioenzymatic	81.6	10.48	29.37	5.69	<LOQ	48.89
SPxPR	0.2512	0.9999	0.9986	0.990	0.4349	0.4177

The study was conducted within the framework of Grant QH71041 ´The influence of pathogenic microorganisms and secondary metabolites on the quality and hygienic character of fodders´, funded by the National Agency for Agricultural Research (NAZV) and from Grant MSM6215648905 ´Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change´, funded by the Ministry of Education, Youth and Sports of the Czech Republic.