Trabajos en Prensa

Chemical composition and in vitro digestibility of annual ryegrass varieties grown in greenhouse conditions

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Ryegrass [1]
water soluble carbohydrates [2]
high sugar forages [3]
nutritional quality [4]

ABSTRACT

Plant breeders have recently focused on increasing the sugar content of grasses as a means to improve their nutritional value. The objective of this study was to compare cyclethe chemical composition of four annual ryegrass varieties (Lolium multiflorum Lam.): two intermediate tetraploids [L. multiflorum var. italicum, Bandito2, (conventional) and Abereve, (high sugar)] and two short cycle diploids [L. multiflorum var. westerwoldicum, Lonestar, (conventional) and Enhancer, (high sugar)] grown in greenhouses. Seeds were planted into plastic pots (16 pots per variety) and clipped three times at six-week intervals. Material was weighed, flash frozen, lyophilized and ground (1 mm). Chemical analyses and digestibility at 24 and 48 h were assessed. In vitro DM (IVDMD), OM (IVOMD) and NDF (IVNDFD) disappearance as well as in vitro true DM disappearance (IVTD) were calculated. Results were compared by preplanned orthogonal contrasts as follows: C1, intermediate tetraploids vs annual diploids, C2, conventional vs high sugar varieties. Intermediate tetraploid varieties had lower DM content, lower OM content, lower NDF and hemicellulose content. They also tended to have higher CP content, but no differences were observed in WSC content or WSC:CP. Conventional and high sugar varieties did not differ except for DM content. Intermediate tetraploid had higher in vitro DM and OM disappearance at 24 and 48 h, and higher in vitro true DM disappearance and NDF disappearance at 24h. Conventional varieties had higher digestibility at 24 h but not at 48 h. No differences in WSC were detected between intermediate tetraploids and annual diploids, or between conventional and high sugar varieties. Differences in forage quality were more important between intermediate tetraploids and annual diploids, but no differences were found between conventional and high sugar varieties. High temperatures at the greenhouse may not have allowed high sugar varieties to accumulate increased levels of WSC.

Keywords: Ryegrass, water soluble carbohydrates, high sugar forages, nutritional quality.

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