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Effect of sugar content on fermentation characteristics and *in vitro* digestibility of whole crop wheat silage

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Abstract

The many factors such as sugar content, moisture, type of bacteria which predominate, buffering capacity, packing and sealing are known to be associated with silage fermentation quality. Among the sugar content are particularly important, because effective silage ensiling relies on the fermentation of sugar content to lactic acid by lactic acid bacteria. Sugar content is also known to affect the protein utilization of rumen. This study was conducted to observe the effect of water soluble carbohydrates on fermentation characteristics and *in vitro* digestibility of whole crop wheat silage. This experiment was used standard cultivars (Cheongwoo, *Hordeum balgare L*) and solid breeding line of whole crop wheat. The materials harvested at the 30 after heading day and chopped for making silage, and using this silage carried out *in vitro* digestibility for 6, 12, 24 and 48 hours. For the feed value, crude protein, NDF, ADF contents showed slightly higher than the before ensiling and TDN contents were slightly lower compared to the before ensiling, but did not show the significantly different. For the sugar contents, fructose and glucose contents were decreased in the after ensiling compared to the before ensiling, there were more reduced at the containing high sugar content wheat. The pH value was lower at containing high sugar content wheat. lactic acid content was significantly higher at the containing high sugar content wheat. Therefore, there was profitable to the production of high quality wheat silage at the higher the sugar content. In *in vitro* digestibility test, containing high sugar content HW34line showed significantly higher dry matter digestibility at 6 and 12 hours of incubation and amount of NH₃-N lower other line in all incubation time. Therefore, there was profitable to the production of high quality wheat silage at the higher the sugar content.

Keywords: water soluble carbohydrates, fermentation quality, *in vitro* digestibility,

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