

Effect of wheat gluten and extracted soybean meal added to the diet of cows with different kappa-casein genotypes on the composition and physical properties of milk

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Abstract :

The effect of adding wheat gluten or extracted soybean meal (300 g of crude protein/head/day) on milk yield, composition and physical properties, was analysed on 53 Polish Holstein-Friesian cows with different milk kappa-casein genotypes (AA, AB and BB). The addition of wheat gluten to the diet of cows with the AB kappa-casein genotype caused significant increase in fat, crude protein, and casein content of milk, and alpha-casein, beta-casein and kappa-casein yields. It also resulted in an increase in total solids content and total bacteria count (TBC), and decrease in thermostability, alpha-casein content and electrical resistance of milk. In the case of cows with the AA kappa-casein genotype, only significant increase in crude protein, casein content, kappa-casein yield and total solids was observed as a result of wheat gluten addition. Furthermore, a decrease in TBC, and a reduction in the coagulation time were noted. The addition of extracted soybean meal to the diet of cows with the AA and AB kappa-casein genotypes caused significant changes in milk composition and physical properties. These included significant increase in fat, crude protein, casein, and total solids content, and alpha-casein and beta-casein yields, as well as milk acidity and thermostability. Cows with the BB kappa-casein genotype did not reveal any distinct changes in milk composition and its physical properties as a result of supplementation with either wheat gluten or extracted soybean meal. Results of the study show that cows with particular kappa-casein genotypes utilize feed components of the feeding ration in a different manner that may be significant in rationalization of feeding and improvement of milk composition.

Key Word :

milk, kappa-casein, nutrigenomics, protein, soybean meal, wheat gluten

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