

Effect of g.9476869G>A myeloperoxidase (MPO) gene polymorphism on the antioxidant activity of milk from Polish Holstein-Friesian cows of the Black-and-White variety (HO)

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Shortened version of the title: Polymorphism of MPO and milk antioxidant activity

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Summary

Myeloperoxidase (MPO) is an important enzyme, which is one of the components of the antibacterial system in neutrophils and monocytes. MPO participates in the inflammatory response in multiple locations in the body, e.g. in the mammary glands. As a result of the activity of MPO, many of oxidizing compounds as well as reactive oxygen species are generated. It seems that the myeloperoxidase may be a marker linking inflammation processes and oxidative stress. So far, there are no literature data on the association between the MPO gene polymorphism and the antioxidant properties of milk. The aim of the study was to analyze the effect of g.9476869G> A polymorphism of myeloperoxidase (MPO) gene and age of cows on the antioxidant activity of milk and other milk traits in Polish Holstein-Friesian cows. Polymorphism of MPO gene was identified by the PCR-RFLP method using the HphI endonuclease. The total antioxidant capacity of milk samples was measured by the

Trolox Equivalent Antioxidant Capacity (TEAC) method. It was found that the GG genotype was the most frequent (0.606). The genotype at the tested MPO locus and the age of the animals affected the antioxidant activity of milk. Milk from cows with the GA genotype was characterised by a significantly higher antioxidant activity than milk from cows with the GG genotype ($P < 0.0001$). The analysis of interaction showed that cows with the GA genotype and older than 6.5 years produced milk with a significantly higher antioxidant activity compared with younger cows with the same genotype ($P < 0.0001$), as well as cows with the GG genotype of all ages ($P < 0.0001$).