

Fatty acid profile, oxidative stability and sensory properties of breast meat from turkeys fed diets with a different n-6/n-3 PUFA ratio

Jakub Naczmański¹, Jan Jankowski¹, Zenon Zdunczyk², Dariusz Mikulski¹, Jerzy Juskiwicz², Janusz F. Pomianowski³ and Przemysław Zdunczyk²

¹University of Warmia and Mazury in Olsztyn, Department of Poultry Science, Oczapowskiego 5, 10-718 Olsztyn, Poland

²Institute of Animal Reproduction and Food Research, Polish Academy of Sciences, 10 Tuwima Str., 10-747 Olsztyn, Poland

³University of Warmia and Mazury in Olsztyn, Department of Commodity Science and Food Research, Plac Cieszyński 1, 10-718 Olsztyn, Poland

The objective of this study was to determine the effect of diets with a different n-6/n-3 polyunsaturated fatty acids (PUFAs) ratio (7.31, 4.43 and 0.99), resulting from the addition of different dietary oils: soybean, rapeseed and linseed (diets S, R and L, respectively), on the fatty acid profile, oxidative status and sensory properties of turkey breast meat. After 15 weeks of feeding, breast meat yield and chemical properties of the meat were similar in all groups. Raw breast meat of R turkeys had a significantly higher content of all-*trans*-retinol and α -tocopherol, compared with S and L. The physicochemical properties of breast meat, including pH, color, drip loss and cooking loss, did not differ significantly. Cooked meat samples differed significantly with respect to the concentrations of oleic acid, linoleic acid (S and R > L) and linolenic acid (S and R < L). Compared with S and R, breast meat of L turkeys was characterized by higher concentrations of total PUFAs (35.1 vs. 30.1 and 29.3%), a significantly lower n-6/n-3 PUFAs ratio (1.51 vs. 5.43 and 5.07%) and a higher thiobarbituric acid reactive substances content (TBARS; 31.9 vs. 26.4 and 26.7 nmol/g). After four months of deep-freeze storage the n-6/n-3 PUFAs ratio did not deteriorate. It may be concluded that replacing soybean oil with linseed oil, but not with rapeseed oil, increased the proportion of PUFAs in the total fatty acids pool and improved the n-6/n-3 PUFAs ratio, yet it also adversely affected the sensory properties and oxidative stability of meat. Both raw and stored breast meat from L turkeys was susceptible to oxidative changes, as manifested by the significantly higher TBARS concentrations (17.07 and 81.06) compared with those of the S group (10.91 and 53.00 nmol/g, respectively).