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The Effect of Inclusion of Dietary Tuna Oil in Diets of Growing-finishing Pigs on Slaughter Weight and Backfat Characteristics

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Abstract

This study was evaluated the effect of inclusion of tuna oil in diets of growing-finishing pigs (barrows and gilts) on backfat characteristics when slaughtered at different weights. Four hundred and eighty crossbred pigs averaging 30 kg were assigned to 12 treatment combinations (40 $^{\text{pigs}}/_{\text{treatment}}$ combination) in a $2 \times 2 \times 3$ factorial arrangement. The treatments were: dietary (0 and 2 % tuna oil); sex (barrows and gilts); and slaughter weight (90, 100 and 110 kg). As pigs reached their slaughter weight, they were randomly selected (8 $^{\text{pigs}}/_{\text{treatment}}$ combination; 96 pigs in total) and slaughtered. Backfat colour, hardness, melting point and fatty acid profile were assessed. There was no significant difference in colour among treatments. Backfat of tuna oil group and of gilts was softer than those of the control group ($p < 0.001$) and barrows ($p < 0.05$), respectively. This could have resulted in the low melting point of fat. Moreover, the thiobarbituric acid reactive substances (TBA) values of fat from tuna oil group stored for 3 days was higher ($p < 0.001$) than that of the control group. The cholesterol and triglyceride levels were not affected by diet and sex but the triglyceride level increased with increasing slaughter weight ($p < 0.01$). The tuna oil group had higher polyunsaturated fatty acid (PUFA) content, ratio of PUFA: saturated fatty acid (SFA) and total n^{-3} fatty acids but lower n6:n3 fatty acid than those of the control group ($p < 0.01$). Gilts had higher PUFA in backfat than barrows ($p < 0.05$). The backfat from both 90 and 100 kg slaughter weight had a lower ratio of n6:n3 fatty acid than that of 110 kg group ($p < 0.05$). Therefore, feeding growing-finishing swine with 2 % tuna oil increases omega^{-3} fatty acid in backfat. The PUFA:SFA was increased and n6:n3 ratios approached the recommended levels for healthy eating in human beings. However, due to oxidative susceptibility barrows should not be slaughtered at more than 100 kg to be acceptable to consumers.

Keywords: Backfat, fatty acid, pig, tuna oil

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