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Effect of two sous-vide cooking methods on physicochemical characteristics of Longissimus thoracis muscle from pigs fed with or without extruded linseed

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Meat is recognised as a highly nutritive food. With cooking, the meat enhances its nutritional value and becomes more digestible. However, high cooking temperatures lead to several chemical modifications in meat. Therefore, there is an increasing interest in sous-vide cooking. The aim of this research was to study the influence of two sous-vide cooking methods on physicochemical characteristics of *Longissimus thoracis* (LT) muscle from 24 pigs fed with two different diets: control group (C) had a basal barley/soybean diet; in the linseed group (L), 5% of extruded linseed replaced the same amount of barley. At 24 h *post mortem*, LT muscles were sliced, vacuum sealed and stored at −18 °C until analysis. Samples were cooked in water bath at two different combinations of temperature and time: 'A' 80 °C of the bath water as long as the core temperature of the pork reached 70 °C; 'B' 60 °C for 15 h. After the cooking process, the samples were kept under refrigeration (2 °C) for 24 h. The day after, cooking loss, colour, pH, microbial growth and tenderness were determined. Microbial growth was analysed also in the raw meat. Statistical analysis was performed by means of ANOVA, using the GLM procedure of SAS. Dietary treatment (C vs. L) and cooking condition (A vs. B) were used as independent variables. Dietary treatments did not produce significant differences in pH, colour, cooking loss and tenderness. Colour parameters were affected by cooking method: a* values of the internal part of the sample and b* values of the external part were higher for the samples cooked at 60 °C (a* 4.74 vs. 3.97 for B and A, respectively, $p<.05$; b* 17.79 vs. 15.84,

$p<.01$). The A cooking method led to higher ($p<.01$) shear force values (5.03 vs. 3.30 kg). The microbial load in the raw meat was significantly different ($p<.05$) between dietary treatments: C group showed higher total viable count (4.56 vs. 4.14 $\log_{10}$) and *Enterobacteriaceae* (2.65 vs. 1.94 $\log_{10}$) respect to L group. Low microbial growth was detected for both cooking methods. Total viable count was 0.50 $\log_{10}$ for A cooking method and 0.64 $\log_{10}$ for B, without significant differences among them. No *Enterobacteriaceae* growth was detected. Also, no differences were found for pH and cooking loss between A and B. Both cooking methods generated a meat safe from contamination. The B method: low temperature for long time also, generated tender meat.

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