

Analyzing of the Conjugated Linoleic Acid Antioxidant Effect in a Model Experiment

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An experiment was conducted using corn grits mixed with ghee to analyse the antioxidant effect of the conjugated linoleic acid.

Corn grits were milled to flour, and butter with increased content of conjugated linoleic acid was added in the amount of 5 %. The mixture was kept on a tray exposed to air on 20 °C for 40 weeks, during which the acid number, the peroxide number, and the composition of fatty acids including the conjugated linoleic acid was determined week by week. The peroxide number and acid number increased from 7 to 50 and from 5 to 10 by the 20th week, respectively. Between the 20th and 40th storage weeks, the peroxide number increased from 50 to 229, and the acid number increased from 10 to 39.

During the first 20 weeks of storage, the conjugated linoleic acid content decreased from 0.30 % to 0.26 %. The linoleic-, oil-, and linolenic acid content hardly changed. Similarly, there was no change in the short-, medium- and long-chain saturated fatty acids. Between the 20th and 40th storage weeks, the CLA content, the linoleic acid content and the linolenic acid content decreased from 0.26% to 0.11%, from 27-28% to 23-24% and from 0.89% to 0.65%, respectively.

We found that out of the polyunsaturated fatty acids the conjugated linoleic acid is the most responsive to oxidation; therefore, its antioxidant effect is the highest. Due to the increased CLA-content, the amount of the linoleic and linolenic acid has hardly changed during the first week of storage, and even after the 20th week the change was insignificant. Consequently, being good antioxidant, butter (ghee) with increased CLA content can protect the components of the food and feed sensitive to oxidation.

A feeding experiment was conducted using this high CLA content feed. The animals were grouped according to the following: Group 1) feeding experimental, ghee-mixed feed for 76 days, Group 2) feeding the same feed, but only for 33 days, Group 3) feeding sunflower-oil-mixed feed for 76 days. The aim of our experiment is to analyse how the high CLA content influences the fatty acid content of pork. As an effect of feeding ghee-enriched feed, the CLA content significantly increased, compared to the control group. However, the linoleic acid and the arachidonic acid content were lower, and the proportion of fatty acids was also lower when feeding control feed.