N-3 *vs* n-6 PUFA Dietary Intervention - Effects on Fatty Acid- and Micronutrient Profiles of Beef and Beef Products

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The study investigated the dietary impact of ALA (α-linolenic acid) vs LA (linoleic acid) on fatty acid- and micronutrient composition of beef tissues and the extent of diet- and processing-induced changes by lipid- and micronutrient composition of beef products made thereof [German Corned beef (GCB), tea sausage spread (TSS), scalded sausage]. Beef and beef products were obtained from German Holstein bulls (n=29) which either received a control diet consisting of maize silage and concentrate with soybean meal (41%), (n=15), or an experimental diet of grass silage and concentrate plus rapeseed cake (12%) and linseed oil (3%), (n=14). The study revealed that upon an ALA vs LA intervention the sum of saturated fatty acids in beef (longissimus muscle) decreased by approximately 25%, whereas the amounts of ALA (by 2.6 times), EPA (by 2.3 times) and Σn-3 LC-PUFA (by 1.7 times) were significantly elevated. The amount of CLAcis-9,trans-11 in beef did not differ between feeding groups, whereas the n-6/n-3 FA ratio was significantly lower in beef of ALA (2.3±0.1) than LA (5.8±0.1) fed animals. Trace element (Fe, Cu, Zn, Se) concentrations were not affected by the diet. Experimental diet significantly increased ß-carotene contents, and the g-tocopherol contents were decreased. During beef processing, n-3 FA (ALA, EPA, Σn-3 FA) from beef were found to be product-specifically transferred into the corresponding beef products. ALA and Σn-3 LC-PUFA contents were found be by 1.4 and 1.5 times higher in GCB from ALA than LA fed animals. The n-6/n-3 FA ratio was significantly lower in GCB produced from ALA (4.0±0.4) than LA fed animals (5.9±0.4). The trace elements contents were not affected by the diet; however g-tocopherol contents were decreased by experimental diet. Scalded sausage was the only beef product for which no significant effect of a dietary FA intervention of beef bulls was obtained.