VERSITA

ORIGINAL PAPER

Effect of animal age and gender on fatty acid and elemental composition in Austrian beef applicable for authentication purposes[‡]

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The main aim of the present study was to find differences in the content of fatty acids and variations in elemental composition in beef samples of longissimus dorsi muscle related to cattle age and gender. A further goal was to describe interrelations among the selected variables (descriptors) characterising the samples. For this purpose, an extensive data table was compiled, which contains chemical descriptors specifying forty-six beef samples originating from four well-known Austrian grassland-based beef labels. The following descriptors were investigated: (a) concentrations of 33 fatty acids, (b) concentrations of 19 elements, (c) contents of dry-mass, protein, intramuscular fat, and ash, (d) total content of saturated fatty acids (SFA), mono-unsaturated fatty acids (MUFA), and poly-unsaturated fatty acids (PUFA), (e) total contents of *omega*-3 (*n*-3) and *omega*-6 (*n*-6) PUFA and their ratio. The correlation analysis provided a number of statistically significant correlations among the descriptors, which were concordant with the results of the principal component analysis and cluster analysis. Furthermore, the effect of age and gender of cattle (both acting as target factors) on the fatty acid content and elemental composition of beef was examined by analysis of variance (ANOVA) and appropriate non-parametric tests. Several important interrelations among the beef characteristics investigated were also discovered. Finally, the most relevant beef descriptors were utilised in linear discrimination analysis (LDA) for predicting the slaughter age of the cattle for beef authentication.
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Introduction

Nutritional value is a very important feature of beef quality which, among other things, is associated with efforts to improve the beef composition with regard to fatty acids (FA) content. A dietary intake of unsaturated FA has been shown to reduce the risk of cardiovascular diseases and possibly also the incidence of some kinds of cancer, asthma and diabetes (Simopoulos, 2004). *Omega*-3 (*n*-3) poly-unsaturated fatty acids (PUFA) have to form a direct part of the diet, as they cannot be synthesised by verte-