

Use of inductively coupled plasma mass spectroscopy and chemometrics tools for traceability of Brazilian meat

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Meat is important for nutrition due to the high bioavailability of its protein and minerals. Considering the increasingly intern and extern demand, quality control of meat and its subproducts is mandatory. A traceability program helps to increase the knowledge about the relation between the geographic region, genetics and quality of the product. In this context, inductively coupled plasma mass spectrometry (ICP-MS) and chemometrics tools were used to study the traceability of Brazilian meat. Different samples (*Longissimus dorsi*) from different cattle breeds, crosses and Brazilian geographic regions were obtained from Bifequali Network. This program has the purpose to turn the meat chain, under responsibility of Embrapa Cattle-Southeast, more productive and competitive. These samples were freezing dried and milled in a cryogenic mill. For optimization of metals extraction, a fractional factorial design 2^{7-3} , with a total of sixteen experiments was performed with the use of NIST 1577 - Bovine Liver CRM. The following variables were evaluated: sample mass; type of acid; volume of acid; acid concentration; time of extraction; shacking (with and without) and heating. The best condition was obtained using 0.1 g of sample + 7.5 mL of HNO_3 (0.5 mol L^{-1}) + shacked and heating (80° C) during 45 min. The recovery of Mn, As, Mo, Cd, Pb, Zn, Se, Co and V was carried out by using ICP-MS and Ca, Cu, Fe, K, Mg, Na, P and S was carried out by using ICP OES. Spectral scans of samples (2-257 m/z) were performed with analytical blank and samples, using internal standards (Sc, Y e Rh). The obtained spectra were used as the basis to propose a chemometric model for forecast of samples of unknown geographic origin and breed or cross, by using principal components analysis. The sample preparation methodology has proved to be adequate for the proposed objective, which employ a huge number of samples and it was possible observed a separation according to cattle breeds or crossing.

Acknowledgments: FAPESP (2006/59083-9), CNPq and CAPES.