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Control of declared origin of bovine serum, a pilot study

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Bovine serum is the essential culture medium for cell cultures. Therefore it is highly demanded and the quality of the serum, e.g.: absence of bacteria, viruses certain antibodies, etc.., are important criteria. as some cattle diseases are endemic in certain regions, the origin of bovine serum is an important quality measure for its value. Thus the need to control the declared origins is present.
Bovine serum was measured for d2H, d13C, d15N and d34S of proteine (dry residue) and d2H and d18O of the serum water.
The hydrogen and oxygen are mainly depending by the isotopic composition of the water ingested by the cattle, and thus usually influenced by the isotopic signal of the precipitation. The carbon isotope signal is reflecting the diet of the cattle, whether it mainly feed on C3- or C4-plants. The nitrogen and sulphur isotope ratio is transferred from the ground/soil into the plant material and into the animal tissue, with some offset for nitrogen and without any significant offset for sulphur.
Bovine serum samples from Canada, USA, Mexico, Brazil, Australia and New Zealand have been analysed.
Due to the variations in the environmental conditions in different countries and regions which influence the isotope signatures of the serum samples it is possible to discriminate samples of different origin. Main discriminating parameters are d2H and d18O, d13C and d34S.