

Standard-free method for hoof samples taken from domestic animals such as cow, calf, pony and sheep

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Abstract

A standard-free method for hoof samples taken from cattle such as cow, calf, pony and sheep has been developed in order to estimate the state of health of these animals. The standard-free method developed for human nails was confirmed to be applicable to quantitative analysis of hoof samples since the shape of continuous X-rays is almost the same for nail and hoof taken from these ungulate animals. Accuracy and sensitivity of the present standard method were examined by comparing the results with those obtained by an internal-standard method combined with a chemical-ashing method, and it is confirmed that the method is applicable to hoof samples taken from domestic animals of many species. The method allows us to quantitatively analyze untreated hoof samples and to prepare the targets without complicated preparation technique which often brings ambiguous factors such as elemental loss from the sample and contamination of the sample during preparation procedure. It is also confirmed that halogens, which are important elements for estimating the state of health and are mostly lost during chemical-ashing, can be analyzed without problem by the present method. It is found that elemental concentration of more than twenty elements can be constantly analyzed and it is expected to be quite useful in order to estimate the state of health and to make diagnosis of domestic animals. It is also confirmed that elemental concentration of essential elements in hoof is not so changed depending on the positions in the sliced sample along both horizontal and vertical axis.

Keywords : PIXE, hoof, Standard-free, Cattle, Domestic animals, Untreated, Veterinary medicine, State of health