

CONCENTRATIONS OF COPPER, IRON, AND ZINC IN LIVERS AND KIDNEYS OF CALVES IN SWITZERLAND

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Background

Although the consumption of calf liver and calf kidney is not very important in Switzerland, we were interested in knowing more about the situation of contamination with regard to the metals mentioned above. We were advised that especially residues of copper are said to play a major role. It is well known that the liver generally acts as an accumulating organ for various compounds. Typical concentrations reported in the literature in calf-liver are: Cu 53 ppm, Fe 76 ppm, Zn 82 ppm. In calf kidney are found on an average: Cu 3ppb, Fe 100 ppm, Zn 16 ppm [1]. The bioavailability of these metals in man is not exactly known, but is estimated not to exceed some 20 per cent.

Objectives

To gain an overall view concerning copper-, iron-, and zinc-residues in liver and kidney from Swiss calves (100 samples from each organ).

Method

The samples are homogenised; then their contents of water are determined by incineration. The concentrations of Cu, Fe, and Zn are measured by AAS after treatment at 150°C in a mixture of HNO₃, H₂O₂, and water during 1 hour.

Results and discussion

Liver: The most important contaminant is Cu. About 20 per cent of the samples exhibit concentrations of 200 ppm or higher. Zn appears in a lower range from 50 to 150 ppm. Fe does not exceed 80 ppm.

Kidney: The concentrations of Cu and Zn are distinctly lower, whereas Fe lies between 50 to 120 ppm.

Conclusions

The higher concentrations (200 ppm and more) of Cu in livers of calves are supposed to be caused by administration through feed. Administration of copper may lead to anemia and so-called "white meat", which is preferred by many consumers.

Litterature

[1] S. W. Souci, W. Fachmann and H. Kraut, Food composition and nutrition tables 1986/87, Wissenschaftliche Verlagsgesellschaft mbH Stuttgart 1986