METHOD SPECIFICATION

Faculty of Biosciences, NMBU

Method name: Chromium and ytterbium

BIOVIT No.: Msp1071

1. Method of analysis / Principle / Main instrument

Chromium (Cr) and ytterbium (Yb) are used as markers in metabolic experiments in ruminants. The marker substances are dissolved in water and injected via a peristaltic pump through a plastic tube directly into the rumen of the animal. The concentration of Cr and Yb is determined spectrophotometrically with MP-AES after dilution or decomposition of the samples. The concentration of the injection solution will vary from 1000-1800µg / ml.

Sample decomposition during digestion is the most critical part of the analysis as incomplete decomposition can have a great influence on the result. Loss of Cr/Yb must also be prevented during decomposition. In the microwave-assisted closed system, complete digestion is performed by using concentrated nitric acid (HNO_3) and hydrogen peroxide (H_2O_2). The samples are decomposed in a mixture of nitric acid and hydrogen peroxide (5:1).

The pre-digested samples are analyzed spectrophotometrically with MP-AES (Microwave Plasma Atomic Emission Spectrometer), from Agilent.

Main instrument: MP-AES 4200 (Agilent Technologies).

2. Reference and any modifications

Commission Regulation (EC) No 152/2009. 27 Jan 2009. Laying down the methods of sampling and analysis for the official control of feed. Annex III, P, Official Journal of the European Union L54 / 1 from 26/02/2009.

- METHODS OF ANALYSIS TO CONTROL THE LEVEL OF AUTHORISED ADDITIVES IN FEED (PART: C. DETERMINATION OF THE TRACE ELEMENTS IRON, COPPER, MANGANESE AND ZINC) page 72-76.

- Modifications:

- ➢ For decomposition: Application Note PRO-AG-02; Dried Plant Tissue (Milestone Srl).
- ➢ Instrument: MP-AES 4200 (Agilent Technologies).

3. Requirements for grinding and temperature

Feed / faeces samples- 0.5 mm degree of grinding.

4. Contact persons:

Lab manager: Hanne Kolsrud Hustoft

Responsible for analysis: Milena Bjelanovic / Frank Sundby / Kari Eikanger

5. Additional literature

1) Austreng, E. Storebakken, T., Thomassen, M. Refstie, S., Tomassen, Y., 2000, Aquaculture, 188, 65-78.
2) Reis, P., Valente, L., Almeida, M., 2008, Food Chemistry, 108: 3, 1094-1098.