

**METHOD SPECIFICATION**  
**Faculty of Biosciences, NMBU**

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**Method name: Yttrium**

BIOVIT No.: Msp1073

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**1. Method of analysis / Principle / Main instrument**

Yttrium ( $Y_2O_3$ ) is often used as a marker in digestive studies of fish as Yttrium should not affect the fish's metabolism and it can be added to the feed in relatively low concentrations (0.1 g/kg). It is then important to be able to determine Yttrium in the feed and faeces.

The decomposition of the sample is the most critical part of the analysis as incomplete decomposition can have a great influence on the result. Loss of Yttrium must also be prevented during decomposition. An effective method is to use microwave decomposition with acid as everything takes place in a closed system. The samples are decomposed in a mixture of nitric acid and hydrogen peroxide (5: 1).

Yttrium is determined spectrophotometrically using MP-AES (Microwave Plasma Atomic Emission Spectrometer), which has better sensitivity and is much faster than ordinary flame atomic absorption (AA).

**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.

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<sup>1</sup> Austreng, E. Storebakken, T., Thomassen, M. Refstie, S., Tomassen, Y., 2000, *Aquaculture*, 188, 65-78.

<sup>2</sup> Reis, P., Valente, L., Almeida, M., 2008, *Food Chemistry*, 108: 3, 1094-1098

#### 4. Contact persons:

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**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.

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