METHOD SPECIFICATION
Faculty of Biosciences, NMBU

Method name: Calorimetry (energy determination)
BIOVIT nr.: Msp1015

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1. Method of analysis / Principle / Main instrument

Calorimetry is defined as the measurement of released or absorbed heat and involves the experimental measurement of the released or absorbed energy from a reactive system, such as a combustion or chemical reaction.

At BIOVIT, calorimetry is mainly used to determine negotiable energy in feed, intestine and faeces samples, but energy in other materials and liquids can also be determined.

The samples are completely incinerated in a closed system with excess of oxygen (bomb calorimeter). During combustion, the chemical bonds between the atoms change and when all the material has been burned, all the organic molecules will be converted to mainly CO_2 and H_2O, cf. combustion of methane in excess oxygen.

$$CH_4 + 2O_2 = CO_2 + 2H_2O$$

In addition, there will be an inorganic residue that is not incinerated.

Main instrument: 6400 Bomb Calorimeter (Parr Instrument Company, Illinois, USA)

2. Reference and any modifications

ISO 9831, Animal feeding stuffs, animal products, and faeces or urine - Determination of gross calorific value - Bomb calorimeter method

3. Requirements for the grinding and storage

Approximately 1 g of dry sample per analysis, but smaller sample volume down to 0.2 g is accepted.

Dry samples are stored in refrigerated rooms, while liquid samples must be frozen.

4. Contact persons

Lab manager: Hanne K. Hustoft
Responsible for analysis: Kari Eikanger/Frank Sundby

5. Additional literature

1. ISO 6497, Animal feeding stuffs - Sampling
2. ISO 6498, Animal feeding stuffs - Preparation of test samples