

WORK DESCRIPTION
Department of Animal and Aquaculture Sciences, NMBU

Method name: Ash

BIOVIT No.: Arb1038

1. Introduction

The dry matter in a sample consists of two fractions, an organic and an inorganic. When the sample material is burned, the organic part of the sample will be removed. The ash remaining after incineration is therefore a measure of the inorganic fraction of the sample material.

2. Reagents

Nothing

3. Risk assessment

IMPORTANT: Do not open the incinerator at 550 °C. If there is still organic material left, a flame will go out when the door is opened!

Wait until the temperature is around 200 °C or lower.

Use pliers and possibly gloves when taking the samples from the ashtray.

Should you burn yourself; use running cold water for the first few minutes. Then use lukewarm running water so that frost damage does not occur.

Dust mask used when needed.

4. Equipment

- Counting glass or porcelain crucibles (which can withstand over 550 °C)
- Weight (0.0001 g)
- Steel board (to put the samples in)
- Preheating oven (550 °C)

5. Sample material

The method can be used for all types of samples. Sample material with little organic material will contain more ash than sample material that contains a lot of organic material.

Recommended particle size for "dry" material is 1 mm. Smaller particles will give a better combustion and a more correct analytical result.

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Sample amount: 0.5 - 1 g is the standard procedure, but more can be weighed in as needed (see section 6).

6. Special remarks

- If larger sample volumes are weighed, the samples must be pre-ashed for 16 hours.
- Do not have too many trays in the oven at one time for large sample volumes (more smoke)
- Note: Samples that contain little organic material (eg bones) will lose little mass in the case of ashing.

7. Job description

1. Mark the counting glasses / crucibles with the sample number.

NOTE: The numbering disappears during the ashing!

2. Weigh the counting glass and register the weight (**W₀**).
3. Tare the weight and weigh in 0.5 - 1 g sample (**W₁**).
4. Put the samples in the incinerator and close the door
5. To start a program:
 - a) Press button 2 from the left (will now be «program display»)
 - b) Turn the wheel until it says «program start»
 - c) Press the center of the wheel to access stored methods
 - d) Turn the wheel to the desired method (see separate list of programs)
 - e) Activate the program by pressing the wheel
 - f) Press the wheel again when the message "delay start" appears
 - g) Hold down button 1 from the left until a small snap = oven starts
(if you just press the button, the system will pause instead of starting)
 - h) If it is necessary / desirable to cancel a program before it is finished: hold down button 1 until it says «end» on the display.
6. Pre-ashed samples are placed in a desiccator (with active desiccant, silica gel) to cool
7. When the temperature of the samples has become stable (room temperature), the samples are weighed (**W₃**).

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Programs:

- P01 Day 5 30h: day program with 550 °C for 5 ½ hours
- P02 Night 18h: night program with 550 °C for 18h (large sample volumes / difficult samples)
- P03 Night 8h: (standard program) night program with 550 °C for 8h (then down to 130 °C)
- P02 Night 16h: night program with 550 °C for 16h (large sample volumes / difficult samples)

8. Calculation

$$\frac{(W_3 - W_0)}{W_1} \times 1000 = \text{amount of ash stated in g/kg}$$

W₀ = weight counting glass,

W₁ = weight sample before ashing

W₃ = weight sample + counting glass after ashing.

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