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Animal Feeding Stuffs – Determination of Crude Ash

(ISO 5984:2002, IDT)

饲料中粗灰分的测定

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Animal Feeding Stuffs – Determination of Crude Ash

1 Scope

This Standard specifies a method for the determination of crude ash of animal feeding stuffs.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 14699.1 Feeding Stuffs – Sampling (GB/T 14699.1-2005, ISO 6497:2002, IDT)

GB/T 20195 Animal Feeding Stuffs - Preparation of Test Samples (GB/T 20195-2006, ISO 6498:1998, IDT)

3 Term and Definition

For the purposes of this Standard, the following term and definition applies.

3.1 Crude ash

Residue obtained after incineration at 550 °C under the conditions specified in this Standard.

4 Principle

The organic matter in a test portion is decomposed by incineration, then the ash obtained is weighed.

NOTE: the ash is expressed by the mass fraction.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Analytical balance, capable of weighing to the nearest 0.001 g.

5.2 Muffle furnace, electrically heated, thermostatically controlled, and provided with a pyrometer. The furnace, when set at 550 °C, shall be capable of being controlled in such a way that the temperature in the places where the incineration dishes will be placed will not differ by more than 20 °C from this set temperature.

5.3 Drying oven, capable of being controlled at (103 ± 2) °C.

5.4 Hot-plate or gas burner

5.5 Incineration dish, of platinum or platinum-gold alloy (e.g., 10 % Pt, 90 % Au) or of other material unaffected by the conditions of the test, preferably rectangular with a surface area of about 20 cm² and a height of about 2.5 cm. For samples that are inclined to swell on carbonization, use dishes with a surface area of about 30 cm² and a height of about 3 cm.

5.6 Desiccator, provided with an effective desiccant.

6 Sampling

It is important that the laboratory receive a sample which is truly representative and has not been damaged or changed during transport or storage.

Store the sample in such a way that deterioration and change in composition are prevented.

A recommended sampling method is given in GB/T 14699.1.

7 Procedure

7.1 Preparation of test sample

Prepare the test sample in accordance with GB/T 20195.

7.2 Test portion

Weigh, to the nearest 0.001 g, about 5 g of the test sample (7.1) into the incineration dish (5.5), previously heated for at least 30 min in the muffle furnace (5.2) set at 550 °C, cooled in the desiccator (5.6) and weighed to the nearest 0.001 g.

7.3 Determination

Place the incineration dish containing the test portion (7.2) on a hot plate or over a gas burner (5.4) and heat progressively until the test portion has carbonized. Transfer the dish to the muffle furnace (5.2), previously heated to 550 °C, and leave it for 3 h. Inspect visually whether the ash is free from carbonaceous particles. If it is not, replace the dish in the furnace and heat for another 1 h. If carbonaceous particles are still visible, or if there is doubt as to whether they are present, allow the ash to cool, moisten with distilled water, evaporate carefully to dryness in the oven (5.3), set at (103±2) °C. Then replace the dish in the furnace and heat for another 1 h. Allow the dish to cool in the desiccator to room temperature then weigh rapidly to the nearest 0.001 g.

NOTE: The crude ash obtained by the above procedure may be used subsequently for the determination of ash insoluble in hydrochloric acid (see ISO 5985).

Carry out two determinations on test portions from the same test sample.

8 Expression of Results

The crude ash, W , expressed as a mass fraction in percent of the test sample, it shall be calculated as per Formula (1):

$$W = \frac{m_2 - m_0}{m_1 - m_0} \times 100 \quad \dots\dots\dots (1)$$

Where:

m_2 - is the mass, in grams, of the dish and the crude ash.

m_0 - is the mass, in grams, of the empty dish;

m_1 - is the mass, in grams, of the dish containing the test portion.

Take as the result the arithmetic mean of the two determinations, provided that the requirement for repeatability (see 9.2) is satisfied. Report the result to the nearest 0.1 % (mass fraction).

9 Precision

9.1 Interlaboratory tests

Details of interlaboratory tests on the precision of the method are given in Annex A. The values derived from these tests may not be applicable to concentration ranges and matrices other than those given.

9.2 Repeatability

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