



Method for the Determination of *Ambrosia* (*Ambrosia artemisiifolia* L.) in non-pelleted Animal Feedingstuff, IAG-Method A5



International Association of Feedingstuff Analysis
Section Feedingstuff Microscopy



1. Objective and field of application

The method is used for both qualitative and quantitative determination of whole *Ambrosia artemisiifolia* L. fruits and seeds in non-pelleted animal feedingstuffs.

2. Principle

Ambrosia is determined by the visual identification of the fruits and seeds. Quantification is done by weighing and counting the amount of identified whole fruits and seeds in the sieved fractions of the sample.

3. Reagents

not needed

4. Equipment and accessories

4.1 Optical equipment

4.1.1 Stereo microscope (up to 70X magnification)

4.1.2 Magnifier (up to 10X magnification)

4.2 Analytical balance (accuracy 0,001 g)

4.3 Additional laboratory equipment is listed in supporting document (9)

4.4 Reference material

5. Procedure

5.1 Preparation of the laboratory sample

The non-pelleted laboratory sample (at least 500g) is weighed (4.2) and sieved. The sieve fractions between 1,5 – 4,0 mm have to be analysed. The weight of each fraction is recorded.

5.2 Identification

Ambrosia fruits and seeds are identified based on their characteristic features. The identification of fruits and seeds may be facilitated by comparison to reference material (4.4) and existing descriptions (10).

Ambrosia fruits / seeds are 2-4 mm long, and are coloured dark-brown to black. Due to deformed spathe they have spiny tops which fit terminally.

5.3 Quantification

The quantification of whole *Ambrosia* seeds / fruits performed using the sieve fractions between 1,5-4,0 mm.



Material identified as *Ambrosia* seeds / fruits is separated from the sample and weighed. An aliquot of the sieved fractions may be used if necessary.

6. Calculation and report

6.1 Calculation

The amount of *Ambrosia* seeds / fruits in mg/kg (ppm) feedingstuff (original sample) is calculated using the following formula:

$$C = \frac{BC \times 1000}{E} \text{ [mg/kg]}$$

C = amount of component in mg/kg feedingstuff (ppm)

BC = selected fragments of component in the laboratory sample or an aliquot of it [mg]

E = total weight of the laboratory sample or an examined aliquot of the laboratory sample [g]

6.2 Report

6.2.1 Negative result:

As far as was discernible using a microscope, *Ambrosia* seeds / fruits were not found in the submitted sample.

6.2.2 Positive result:

6.2.2.1 Counted *Ambrosia* seeds / fruits

As far as was discernible using a microscope x *Ambrosia* seeds / fruits were counted in x g of feedingstuff in the submitted sample.

6.2.2.2 Weighed *Ambrosia* seeds / fruits

As far as was discernible using a microscope x mg *Ambrosia* seeds/fruits/kg feedingstuff were found in the submitted sample.

For quantification *Ambrosia* seeds / fruits have been determined using the sieve fractions between 1,5-4,0 mm.

7. Validation

Inapplicable



8. Remarks

- 8.1 The seeds and fruits of *Ambrosia artemisiifolia* L. mainly occur as impurity in bird feed. *Ambrosia* causes a high health risk because of its pollen possessing a high allergenic potential.
- 8.2 Fragments of *Ambrosia* seeds / fruits are not determined, because they are unable of further spreading.
- 8.3 This method also is suitable for the examination of raw material and food.
- 8.4 This method has been developed by the International Association of Feedingstuff Analysis (IAG) – Section Feedingstuff Microscopy.

9. Supporting document

Sample Preparation for the Macroscopic and Microscopic Analysis, IAG-Method A1

10. Literature

- FREUND, H. (ed.), 1976: Handbuch der Mikroskopie in der Technik. Band VIII: Mikroskopie der Nahrungs- und Futtermittel, der Drogen und Genußmittel. Umschau-Verlag, Frankfurt/ Main
- GASSNER, G.; Hohmann, B. und Deutschmann, F., 1989: Mikroskopische Untersuchung pflanzlicher Lebensmittel. 5. Auflage, Gustav Fischer-Verlag, Stuttgart, New York, 66-70
- HAHN, H. und Michaelsen, L., 1996: Mikroskopische Diagnostik pflanzlicher Nahrungs-, Genuß- und Futtermittel, einschließlich Gewürze. Springer-Verlag, Berlin, Heidelberg, New York
- MALKOMESIUS, E.; Nehring, K.; Claus, G. und Kummer, H., 1951: Die Untersuchung von Futtermitteln. In: Handbuch der landwirtschaftlichen Versuchs- und Untersuchungsmethodik (Methodenbuch, Band III, 2. Auflage, Hrsg. R. Herrmann), Neumann-Verlag, Radebeul und Berlin
- MEZAROS, L. UND DEUTSCHMANN, F., 1975: Atlas für die Mikroskopie von Nahrungsgrundstoffen und Futtermitteln. Teil I: Ölsaaten und deren Verarbeitungsrückstände. In: Handbuch der landwirtschaftlichen Versuchs- und Untersuchungsmethodik (VDLUFA-Methodenbuch, Bd. XI, Hrsg. L. Schmitt), Verlag Neumann-Neudamm, Melsungen
- RÖZSE, E., 2005: Atlas of Feed Microscopy. Part II: The Examination of Non-desired Materials in Feed. National Institute for Agricultural Quality Control, Budapest
- VÖHRINGER, H., 1997: Leitfaden für die Futtermittel-Qualitätskontrolle durch Mikroskopie. Hoffmann-La Roche, 3. Fassung, Wien



- *AMBROSIA ARTEMISIIFOLIA* in der Schweiz – eine herbologische Annäherung, Christian Bohren et. Al, AGRARForschung 12(2): 71-78, 2005.
- Schädliche Unkraut- und Grassamen, Dr.-Ing: J.Wolff, Die Mühle + Mischfüttertechnik Heft 48 Nov. 1987, Verlag Moritz Schäfer
- Die Unkrautsamen der Klee- und Grassaaten mit besonderer Berücksichtigung ihrer Herkunft, Burchard, O., Verlagsbuchhandlung Paul Parey
- Ackerunkräuter und Ackergräser – Ihre Verbreitung, Gefährdung und Wissenschaftliche Bedeutung. – Mitteilungen für den Landbau 1/85 BASF, Limburgerhof