

P.47.- Determination of animal constituents in feedingstuff: Evaluation of diverse methods and their results

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Two methods for the determination of animal ingredients in feedingstuff were compared in the following study. Classical microscopy was done according to the EU guideline 98/88/EC that was provided by the IAG feedstuff analysis section feedstuff microscopy. PCR-analysis was done according to the VDLUFA-method „Molecular biological determination of animal ingredients - PCR-method“. A set of 13 feed samples with artificially added animal meals of different composition was investigated to check abilities and limits of the methods. The results presented were confirmed by laboratories of the IAG feedstuff microscopy and the PCR-AG of VDLUFA in ring tests. The microscopical method allowed the detection of all added animal ingredients (0,1%, 0,5% and 2%) with morphological structures (bone particles, cartilage and/or muscle fibres). The limit of detection was dependent on the content of morphological structures in the animal meals. Besides the presence or absence of animal constituents a differentiation between fish and terrestrial animals as well as reliable quantitative results were obtained in presence of morphological structures of animals in the feed samples. These aspects confirm the suitability of the microscopical method in the official control of feedingstuffs. With the PCR-method all samples containing terrestrial animal meal (0,1%, 0,5% und 2%) were determined positively - even samples with animal meal having nearly no morphological detectable structures. Two different modules of the PCR-method (species-specific PCR and RFLP-analyses) allowed to distinguish between animal groups and to identify diverse animal species. Herring was not detected sufficiently with the tested screening primerpairs. The results showed that microscopy and PCR analyses complement each other: The microscopical approach allows a reproducible, high sensitive and quantitative determination of animal ingredients with morphological detectable structures in feed with a differentiation between fish and terrestrial animals in presence of bone fragments. The PCR-analysis allows the detection of animal ingredients in feed even in absence of morphological detectable structures. This method enables to differentiate between animal groups and species and to identify diverse species. When combining both methods it is necessary to interpret the obtained data in consideration of the different targets of both methods: Microscopy provides reliable results also in highly processed feed matrices with well-preserved morphological animal structures even when the genetic material is highly degraded. The PCR-method tested provides results in feed samples with preserved genetic animal material even after the separation of morphological structures. These specialties have to be considered with respect to the choice of a suitable determination method for animal ingredients in feedingstuff as well as for the evaluation of the results obtained from these investigations in highly processed feed matrices.

Keywords

Meat and Bone Meals (MBM), Feedingstuffs, classical microscopy, DNA technology (PCR), comparison of methods and results