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Authenticity research and label control are inevitable parts of proper food and feed safety

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Background

Official controls are carried out to verify compliance with rules on food and feed safety and labelling (Regulation (EC) No 882/2004). Safety requirements in general consist of maximum (residue) levels for specified hazardous substances in specified matrices or products, e.g. residues of veterinary drugs (Regulation (EC) No 37/2010), contaminants in feed (Directive 2002/32/EC). Therefore, establishment of the authenticity and composition of a sample, based on proper method availability [1], form a major part of the fundament of food safety research.

Objective

Authenticity research and label control, conform Regulation (EC) 767/2009 (feed), Directive 2000/13/EC (food) and Directive 2001/110/EC (honey) a.o., are necessary for enforcement of legal limits, and provide guidance for applying the proper detection methods. Consumer protection and information will be facilitated in this way. Three examples will be presented to illustrate this importance.

Enforcement as part of feed and food safety research

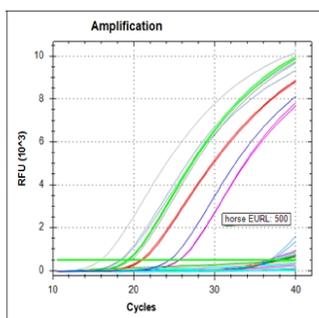| Contaminant monitoring | Authenticity, label control |

Method availability

Example 1: horse meat

Early 2013, large batches of beef were adulterated with horse meat. Besides the issue of economic fraud, products labelled as beef are not tested for veterinary drugs applied for horse treatments, such as phenylbutazone [2]. Approx. 1% of the adulterated samples appeared to contain this medicine. Reliable information on composition is necessary for a proper monitoring.

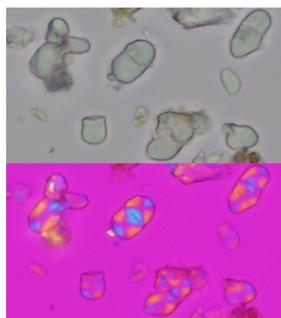

Use of horses as meat source.

PCR identification of horse DNA.

Example 2: marsh mallow

Tea of root cuttings of Marsh mallow is used as a herbal medicine. In the Netherlands a batch of marsh mallow appeared to be adulterated with deadly nightshade. Several consumers were taken into hospital for atropine poisoning [3]. Microscopic research revealed a major share (60-70%) of roots of deadly nightshade. Proper product identification will facilitate product safety.
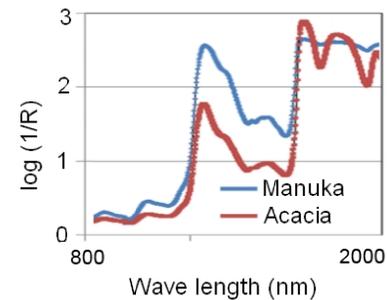
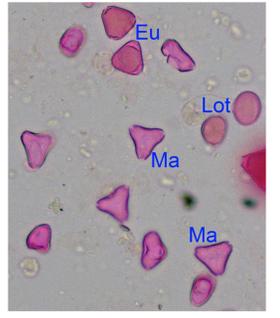

Marshmallow roots used for herbal tea.

Starch grains of Atropa belladonna, without and with polarisation.

Example 3: manuka honey

Manuka honey is consumed for its general health enhancing properties. Near Infrared Spectroscopy and pollen profiling can be used to detect honey batches which are artificially produced to mimic natural manuka honey [4]. Product composition research can be used to test the reliability of the label information and to properly inform consumers.

Spectra of Manuka honey and of Acacia honey, as examples of general honey spectra.

Pollen grains from Manuka honey. Meaning of letters: Ma: manuka, Lot: Lotus, Eu: Eucalyptus.

Conclusions and recommendations

- A range of methods may contribute to the analysis of composition and authenticity, such as DNA analysis, microscopy and profiling methods. Attention is needed for proper method development and availability.

- Authenticity research and label control should have a principal position in the enforcement of food and feed safety.

- An information strategy to stakeholders and consumers can only successfully be applied with sufficient information on identity and authenticity.

References

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Acknowledgements