

Evidence Proforma
Food Authenticity Centres of Expertise

Nottingham Trent University

What is your organisations particular area(s) of expertise in food authenticity testing?
Use of immunoassays and other proteomic methods, notably mass spectrometry, to monitor marker proteins of relevance to food authenticity.
Please highlight your organisations key skills and capabilities in this area and provide a justification as to why you feel it should be regarded as a Centre of Expertise? In particular you should focus on highlighting your key analytical skills and capabilities and any accreditation and how you ensure fitness for purpose testing. (250 words max)
<p>Key staff are qualified to PhD level, are experts in protein biochemistry and have worked on food authenticity problems for several years (minimum of 8 years). Over the last 25 years the team leader, Professor Ellen Billett, has become a recognised expert in meat authenticity.</p> <p>We are experts in antibody production, immunoassay development & optimisation and use of mass spectrometry for the analysis and identification of proteins. We have experience of a wide range of analytical methods for proteins including 1D- and 2D-gel electrophoresis, immunoassays (including ELISAs, dot blotting & Western blotting) and the use of mass spectrometry for protein identification. We are experts in the development and use of a suite of methods for the detection, identification and semi-quantification of protein biomarkers.</p> <p>To date we have concentrated on the detection and semi-quantification of specific offals (heart, liver, kidney and lung) and added serum in meat products. SOPs are used for the latter analyses which include internal positive and negative controls and/or standards in all cases. We have provided a service for a number of companies in the meat product supply chain.</p> <p>The team is based at Nottingham Trent University and has access to a wide range of facilities including cutting edge equipment for proteomic methodologies.</p> <p>Work conducted by the team is used as an exemplar in Defra's Independent Response to the Elliott report (March 2015; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/409253/amwg-elliott-response.pdf) under recommendations on the availability of fit for purpose laboratory services.</p>
Briefly highlight your experience in method validation, data interpretation and



evaluation and the reporting of analytical results? (150 words max)

Methods have been validated by the use of in-house blind samples including analysis of accuracy, repeatability of precision, robustness and applicability.

In-house reference materials have been prepared and used to determine experimental limit of detection (LOD) for various offals and added serum. In reference materials the methods have 100% specificity above the LOD.

Further validation of added offal has been achieved using commercial samples.

Please provide brief details where possible, of your experience in dealing with complex technical authenticity challenges and evidence of your ability to provide solutions. (150 words max)

We have worked with companies and Public Analysts to produce solutions to specific problems. We have assisted to identify which part of supply chain is responsible for the introduction of a defect in authenticity compliance. We have provided expert advice/statements to a Public Analyst for use at a court hearing.

We have experience of using proteomic approaches to address problems where solutions are not currently available; conducting research and development to tackle authenticity issues.

Our proteomic methods complement the DNA approaches and can be used to validate meat speciation. They can be used to ensure the species of the actual meat tissues; this is not possible using DNA-based methods.

Our proteomic methods are capable of revealing 'rogue' proteins in a sample (proteins that are unexpected in a sample), and may lead to the identification of new authenticity issues.

Are you willing to provide advice on your areas of expertise and assist others through partnership working and sharing of information? Outline briefly your experience in collaborative working and how you could contribute to enhancing the UK's standing in the field of authenticity testing. (150 words max)

We value collaborative work and believe that honesty is required to gain the confidence of regulatory authorities, industry and the general public. We have experience of working with Public Analysts and the Food Standards Agency to solve authenticity issues. For example, in the past we determined if added serum had been added to chicken breasts (for the FSA) and in beef patties (for a Public Analyst).

We provide a trustworthy, reliable service which fills a gap in the field of authenticity testing; and hence contribute to enhancing the UK's standing in the field of authenticity testing.

Please provide a brief statement of your capabilities to be included on the virtual food

authenticity network portal (50 words max)

Robust proteomic methods developed in house are used to

- Identify undeclared offals (heart, liver, kidney, lung)
- Determine the species of origin of an offal
- Semi-quantify the levels of individual offals
- Monitor undeclared blood proteins in meat products
- Conduct customised R&D, and identify/address new authenticity problems via the analysis of proteins.

UK Centres of Expertise in food authenticity testing¹

a) **Academic or other Research organisation carrying out authenticity research in a particular field**

Ellen.billett@ntu.ac.uk Tel: 01158486356

We are experts in antibody production, immunoassay development & optimisation and use of mass spectrometry for the analysis and identification of proteins. We have experience of a wide range of analytical methods for proteins including 1D- and 2D-gel electrophoresis, immunoassays (including ELISAs, dot blotting & Western blotting) and the use of mass spectrometry for protein identification. We are experts in the development and use of a suite of methods for the detection, identification and semi-quantification of protein biomarkers.

We conduct customised R&D, and identify/address new authenticity problems via the analysis of proteins.

b) **Organisations having a general proficiency in authenticity testing across a range of techniques and commodities**

1. XXX - Contact email & Tel No

Supporting statement i.e. Expertise in XYZ across a range of xyz commodities

c) **Organisations with a specific expertise in a particular authenticity technique(s)**

Ellen.billett@ntu.ac.uk Tel: 01158486356

We are experts in antibody production, immunoassay development & optimisation and use of mass spectrometry for the analysis and identification of proteins. We have experience of a wide range of analytical methods for proteins including 1D- and 2D-gel electrophoresis, immunoassays (including ELISAs, dot blotting & Western blotting) and the use of mass spectrometry for protein identification. We are experts in the development and use of a suite of methods for the detection, identification and semi-quantification of protein biomarkers. In particular we have developed methods to:

- Identify undeclared offals (heart, liver, kidney, lung)
- Determine the species of origin of an offal
- Semi-quantify the levels of individual offals
- Monitor undeclared blood proteins in meat products

¹ These Organisations above have completed a self-assessment demonstrating their ability to meet criteria expected of a food authenticity Centre of Expertise, agreed by the Authenticity Methods Working Group (link to AMWG criteria).

d) Organisations with an in depth knowledge of authenticity testing for a particular commodity

1. XXX - Contact email & Tel No

Supporting statement i.e. Expertise in X and Y techniques for food authentication

Other organisations who wish to be recognised as a 'Centre of Expertise' in food authenticity testing in the UK should complete a proforma (link) submitting evidence as to how they meet the AMWG criteria to foodauthenticity@defra.gsi.gov.uk A brief statement of expertise can also be included.

This portal takes no responsibility for any commercial decisions made on the basis of the information provided above.