Annex 1: Terms of Reference, members and *modus operandi* of the working group

Terms of Reference for the Working Group on the Development of a Framework for Interrogation of Honey Authenticity Databases
Introduction

The existence of proprietary unpublished databases used to underpin honey authenticity testing was identified as a significant barrier to the acceptance of results generated by NMR by attendees of the UK Honey Seminar. The opacity of the databases makes it difficult to understand how the interpretation was made and how the conclusion reported on the certificate of analysis was reached. It also makes it difficult to assess whether the database is fit for purpose in terms of its representativeness for individual samples.

Databases
The offer from the database owners is to open databases to regulatory authorities / independent bodies only and *only in cases of dispute*, hence the scope of this work is for an expert WG view on how this can be achieved and what database contents and metadata should be disclosed. The WG aim is therefore to develop a practical framework to establish who will do the detailed examination of the composition and representativeness of a database for a particular question / dispute – i.e. who ideally the WG think it should be, whether they would be acceptable to the database owners, and a process for convening this core group of experts, reporting etc. This will shape any subsequent independent scrutiny of proprietary authenticity databases to assess their fitness for purpose on a case-by-case basis.

Outline programme of work
A breakpoint in the work after the first meeting may be triggered if the WG discussions advise that the project is not feasible/achievable, or databases holders will not commit to sharing database details. If the work cannot reasonably continue a short report will be produced and the project will conclude.

If the breakpoint is not triggered the WG will consider in more detail a number of factors including but not limited to:

- Honey authenticity data for example that collated in the literature[1]
- Composition of database
- Representativity of database

- Targeted or non-targeted method used, (e.g. using ^{1}H NMR as an example).
- Demonstration of validation of method used, to cover:
    - In-house validation
    - Second laboratory validation
    - Inter-laboratory validation.
- Uncertainty of the method used.

[1] Walker, M.J., Cowen, S., Gray, K. *et al.* Honey authenticity: the opacity of analytical reports - part 1 defining the problem. npj Sci Food 6, 11 (2022). https://doi.org/10.1038/s41538-022-00126-6

- The validity and utility of a likelihood ratio approach[2] to assessing database representativeness and as a basis for evaluative reporting of the strength of evidence of honey authenticity results.
- Combination of a series of likelihood ratios (independence of the data).

It is anticipated that the Chair and Secretary will draft the framework with expert input from WG members.

The Working Group on the development of a framework for interrogation of honey authenticity databases (hereafter IHAD WG) has been established to fulfil the objectives of a project endorsed and supported by Defra, FSA and FSS and led by the Government Chemist (GC). The work is being jointly funded by Defra and the GC.

Working Group composition

The independent IHAD WG comprises representatives from key stakeholder groups such as the owners of commercial honey authenticity databases, the Technical Adviser to the British Honey Association, the Food Authenticity Centre of Expertise for honey, a Public Analyst, independent expert statistical input (National Measurement Laboratory at LGC), an independent forensic scientist, a statistician experienced in evaluative reporting and representatives from Government departments (observer status). The WG would also benefit from legal input e.g., from a barrister experienced in food law. The WG is chaired by a consultant, former head of the Office of the Government Chemist at LGC, and the Secretary is a consultant, with over 20 years' experience in the analysis of honey for authenticity. The WG will meet up to six times across the seven-month project timeline.

Terms of Reference of the Working Group

The Terms of Reference of the Working Group are to:

- Identify and review existing published works relating to authenticity databases, principally on honey, their composition, representativity, characteristics, including metadata, analytical methods applied and associated processes for assessing sample provenance.
- Agree a breakpoint in the work to decide whether the project is feasible and achievable, or not (e.g. in the event databases holders will not commit to sharing database details).
- If the work cannot reasonably continue agree a short report to conclude the project.
- If the work can reasonably continue agree a framework to allow independent scrutiny of proprietary authenticity databases to assess their fitness for purpose to individual samples.
- Assess the validity and utility of a likelihood ratio approach to assessing database representativeness and as a basis for evaluative reporting of the strength of evidence of honey authenticity results including combination of a series of likelihood ratios (independence of the data).
- Agree published finalised framework document(s).

The Chair of the Working Group will provide effective leadership of the Group, ensuring that all members meet with the desired frequency to fulfil the Terms of Reference and their responsibilities.

The responsibilities of IHAD Working Group Members are to:

[2] Walker, M.J., Cowen, S., Gray, K. *et al.* Honey authenticity: the opacity of analytical reports—part 2, forensic evaluative reporting as a potential solution. *npj Sci Food* **6**, 12 (2022). https://doi.org/10.1038/s41538-022-00127-5

- Declare any direct or indirect conflicts of interest relevant to the WG objectives prior to participation.
- Actively participate in accordance with the Terms of Reference.
- Openly share and discuss any existing publications, guidance documents and scientific papers on the subject.
- Offer expert opinion and advice on the topics discussed.
- Provide constructive input into the WG to facilitate drafting of the required framework documentation.
- Act impartially and independently.
- Treat information discussed in WG meetings in confidence unless Chair/Secretary expressly state that information can be shared.

Members of the working group

To populate the working group the chair, Professor Michael and the Secretariat Dr David Hoyland drew up a list of potential representatives in alignment with the ToR and invitations were sent. Recruited members also suggested experts to supplement the skills required. Major database owners were invited however not all agreed to take part. Observers from the funding organisations were also part of the working group.

The members were:

Working Group for the development of a framework for interrogation of honey authenticity databases (IHAD WG)

List of Members

Expert	Job title	Organisation
Dr Michael Walker (Chair)	Honorary Professor	Institute for Global Food Security, Queens University Belfast
Dr David Hoyland (Secretary)	Independent Technical Expert	The Honey Association
Jay Madden	Technical Manager	Food Authenticity Centre of Expertise for honey – Minerva
Adrian Charlton	Principal Scientist	Fera Science Limited
Alison Johnson	Managing Director	Food Forensics
Nigel Payne	Operations Manager	PASS (Eurofins)
Jane White	President	Association of Public Analysts
Prof. Sheila Willis	Forensic Scientist	Immediate Past President of the Chartered Society of Forensic Sciences and former Director General of Forensic Science Ireland
Dr Alex Biedermann	Associate Professor	Faculty of Law, Criminal Justice and Public Administration, Université de Lausanne
Claire Andrews	Barrister, first tier tribunal judge	Gough Square Chambers, Food Law Group
Simon Cowen	LGC statistician	LGC
Joanne Hubbard	Lead Technical Adviser	Food Forensics
Sandra Meixner	Global Program Manager ATIC Food Authenticity Services	Intertek Germany
Dr Jane van der Meulen	Subject Matter Expert for Authenticity	QSI
Martin Linkogel	Business Unit Manager Bee Products	QSI

Observers:

Michelle Mcquillan	Team Lead, Food Compositional Standards	Defra
Eleanor Smith	Food Authenticity - Food Science Team	Defra
Bhavna Parmar	Senior Scientific Methods Advisor	FSA
Ian Cowie	Senior Investigator	Scottish Food Crime & Incidents Unit, FSS
Lourdes Alvarellos	Head of the Knowledge Centre for Food Fraud and Quality	Joint Research Centre, European Commission

In addition, administrative assistance was provided by Gary Bird, LGC.