

Follow up on the EU coordinated control plan “From the hives”

HarmHoney - Harmonisation of Test Methods to determine exogenous sugars in honey

- CDG on Animal Production – Focus on Beekeeping and Sheep & Goat; Hybrid meeting, Lord Jenkins (Charlemagne), Bruxelles, BE, 12 June 2023

Introduction

- The provisions of the EU Honey Directive aim at preserving the purity of honey as an unprocessed raw agricultural product, excluding modifications to its chemical composition.
- The EU Coordinated Control Plan “From the Hives” was organised to gather intelligence on the incidence of non-conforming honey imported into the Union through sampling and analysis that served to target further investigations within the EU.
- Several test methods were used by the JRC to detect markers indicative for the presence of exogenous sugar syrups as current tests are not sufficient to detect such adulteration. However, the applied analytical methods are not yet developed enough at international level.
- Improved, harmonised and generally accepted analytical methods are needed to increase the capability of official control laboratories to detect honey adulterated with sugar syrups.

Objectives

- The JRC will provide technical assistance for the optimisation and harmonisation of appropriate analytical methods to detect adulteration of honey with exogenous sugars.
- This will include the estimation of the performance criteria of the selected analytical methods and their diagnostic capability.

Detection methods for sugar syrup(s) added to honey.

Method principle	Benchmark values / Markers of adulteration
Elemental Analyser/Liquid Chromatography – Isotope Ratio Mass Spectrometry (EA/LC-IRMS)	Benchmark values for differences between $^{13}\text{C}/^{12}\text{C}$ stable carbon isotope ratios of protein and sugar compounds as proposed by Elflein and Raezke ¹
Liquid Chromatography - High Resolution Mass Spectrometry (LC-HRMS)	Oligosaccharides and polysaccharides 2-Acetylfuran-3-glucopyranoside (AFGP) ² Difructose anhydride (DFA) ²
Proton Nuclear Magnetic Resonance (^1H -NMR) Spectroscopy	Mannose ³

[1] L. Elflein, K.-P. Raezke. Apidologie 39 (2008) 574–587.

[2] B. Du, L. Wu, X. Xue, L. Chen, Y. Li, J. Zhao, W. Ca.: J. Agri. Food Chem. 63 (2015) 6614–6623.

[3] J. Missler, T. Wiezorek, G. Beckh. Mannose: a marker for adulteration with syrup or resin treatment of blossom honey.

Proceedings of the XIII International Conference on the Applications of Magnetic Resonance in Food Science, 2016

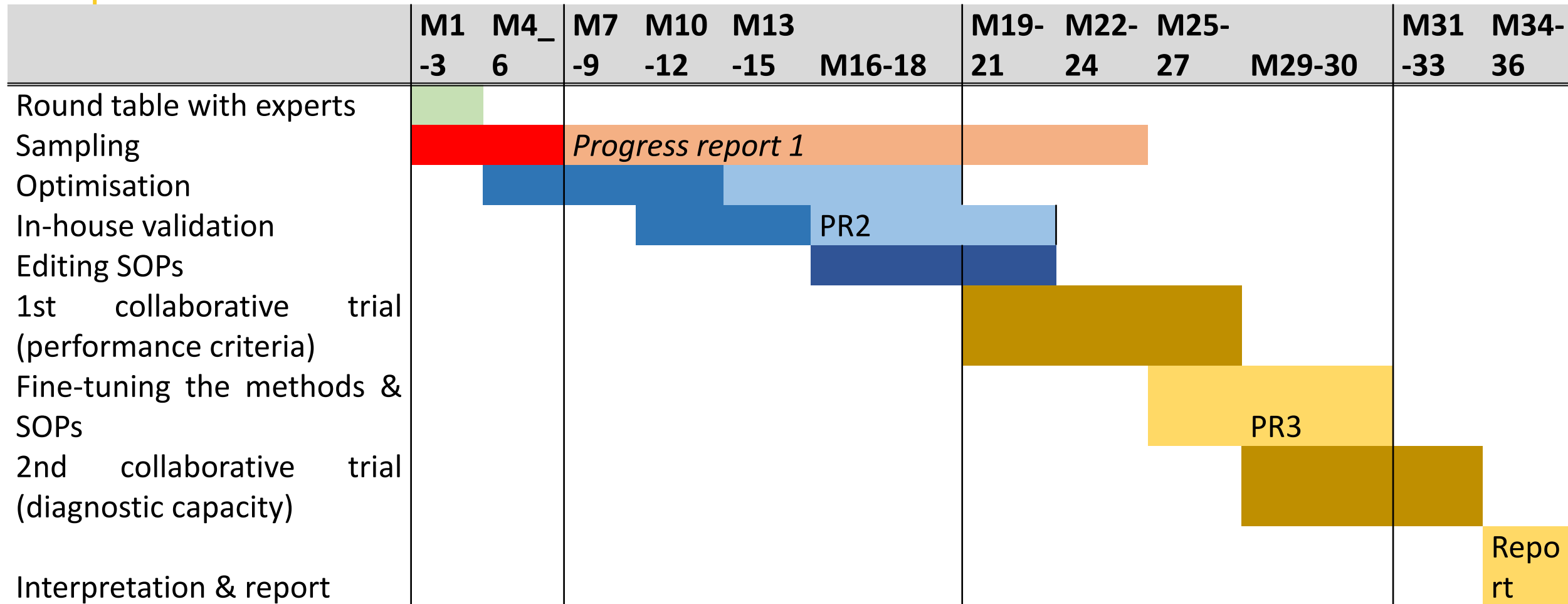
Workflow

1. Round table with technical experts: consensus on markers, analytical methods, sampling, decision rules; collaborations
2. Gathering of samples: representativeness of genuine honeys, adulterants, beekeeping products, tailored made adulterated/contaminated materials
3. Optimisation of analytical methods
4. In-house laboratory validation of analytical methods
5. Drafting standard operating procedures for selected analytical methods

Workflow (Cont'd)

6. 1st collaborative study to validate the fitness-for-purpose of the selected analytical method(s) (including training)
 7. Analysis and interpretation of the results, adjustments of relevant SOPs
 8. 2nd collaborative study to estimate the diagnostic capacity of each selected analytical methods and chemical markers.
 9. Final report on validation of selected analytical methods
- => If method(s) fit-for-purpose then submission to a standardization body.

Gantt chart



Call for samples

- JRC has an **urgent need** of representative samples through the honey supply chain: genuine honeys (incl. honeydews), sugar syrups, beefeeding products, fully traceable tailored made adulterated/contaminated materials (e.g. honeys from beefeeding experiments). Amount per homogenized sample: ≥ 150 g.
- Different geographical origins, botanicals origins, monofloral / polyfloral, blended or not, different years, different seasons, different process, etc.; Different batches / lots
- If interested, please send an e-mail to Olivier.DE-RUDDER@ec.europa.eu mentioning as subject: “**HarmHoney – Sampling contribution**” explaining the types & number of materials and the metadata you can offer. After evaluation, we will provide you the guidelines, sample forms and instructions to dispatch the samples.



Thank you



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