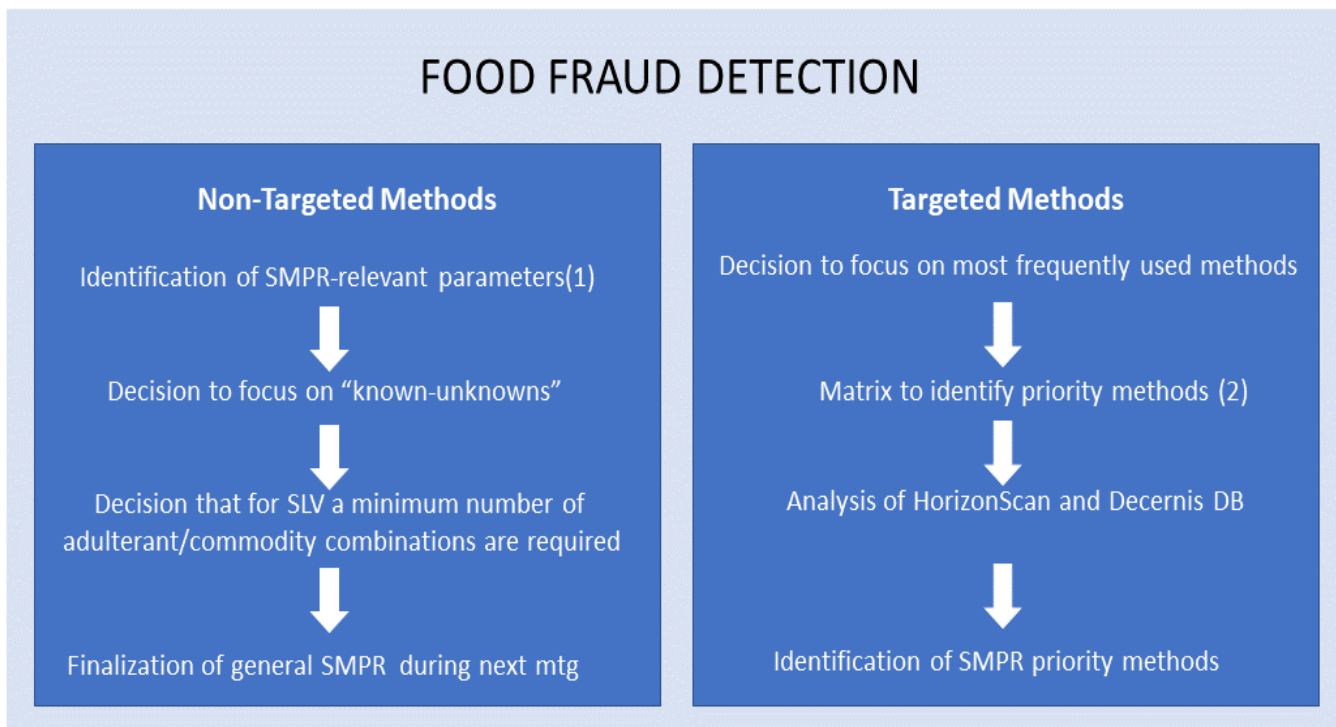# FOOD AUTHENTICITY

July 2, 2019

The staff at AOAC INTENATIONAL would like to provide you with a quarterly update on the progress being made by the Targeted Testing (TT) and Non-targeted Testing (NTT) Working Groups.

Since our last correspondence, we've welcomed a new member to the Food Authenticity Management Team at AOAC INTENATIONAL. Dr. Bert Pöpping has graciously accepted our invitation to serve as a Scientific Advisor to the Food Authenticity and Fraud Program. As a recognized authority and key opinion leader in food authenticity and food fraud, Dr. Pöpping now joins Drs. Joe Boison, John Szpylka, and Samuel Godefroy in round out our team of volunteer experts who will collectively ensure effective strategies to execute the annual program workplan and advise on strategies for engaging ongoing program efforts.

GENERAL OVERVIEW OF PROGRAM DIRECTION AND WORKING APPROACHES
The Targeted Testing (TT) and Non-targeted Testing (NTT) Working Groups are tasked to develop SMPRs for three commodity groups: olive oil, milk (liquid and powder) and honey.

The following chart depicts the different approaches that are being taken:

FOOD FRAUD DETECTION

Non-Targeted Methods

Identification of SMPR-relevant parameters(1)

⬇

Decision to focus on "known-unknowns"

⬇

Decision that for SLV a minimum number of adulterant/commodity combinations are required

⬇

Finalization of general SMPR during next mtg

Targeted Methods

Decision to focus on most frequently used methods

⬇

Matrix to identify priority methods (2)

⬇

Analysis of HorizonScan and Decernis DB

⬇

Identification of SMPR priority methods

WORKING GROUP UPDATES FROM THE CHAIRS

I. The Targeted Testing Working Group (Dr Joe Boison):

- The definition of targeted testing was agreed upon to mean – a known compound or group of known compounds typically correlated with adulteration for economic gain,
- 3 sub-working groups were established based on the priority matrices: olive oils (virgin and extra virgin), honey and milk (liquid and powdered),
- Database searches were conducted to identify the analytical techniques for targeted food authenticity analysis that had been published thus far. Based on database access limitations, leads for this activity were identified and information from the Decernis and Horizon Scan databases were mined and sorted,
- Data is currently being recompiled in 2-Dimension (2D) rubric tables (method technique versus olive oil, method technique versus honey and method technique versus milk and milk products) to include a estimate of the frequency of use for each paired commodity and technique. Techniques include but will not be limited to:

LC-MS/MS	NMR
GC-MS/MS	FAME
NIR	Raman/SERS
FT-IR	Microscopy
PCR	UV
ELISA/LFD	Wet Chemistry

- NEXT Steps and timeline:
  - Sub-group participants will next conduct literature searches (Pubmed, Scopus, etc) for targeted analysis methods published under each of the identified techniques above with a list of authors, year of publication, journal name, etc., and then collate all of these methods.
  - Those methods which are supported by some level of validation for routine laboratory or field use will be identified.
  - An interim draft report to summarize the current state of targeted testing and identify gaps (if any) that may have been uncovered in the process will be prepared. (By 31July 2019)
  - The report will be posted for public comment (comments dur by 31August 2019)
  - Public comments will be reconciled, and Chair of the Working Group will prepare a presentation to AP/Stakeholders, etc. at the Annual Meeting.

II. The Non-targeted Testing Working Group (Dr. John Szpylka):

- Key generic differences were identified between SMPRs for non-target testing and traditional targeted testing SMPRs,

- Key elements within the current USP Food Fraud Guidelines were identified and leveraged for inclusion in NTT SMPR development. These included:
  - Modelling properties on the authentic material not the properties of the adulterant
  - Developing applicability statements
  - Developing reference sets of authentic materials and test sets of typical and atypical samples
  - Defining technologies and mathematical assessments
- Categories for general NTT SMPRs were finalized (identified in green in the accompanying illustration):


Working group has also begun considerations on metrics to properly evaluate methods designed to test for unknown adulterants. A two-stage approach was proposed and endorsed. The SMPR will provide recipes of known adulterant/commodity samples for use in a single lab validation (SLV) exercise. Methods progressing to a multi-lab validation (MLV) will include blind test samples created by a third-party group.

- NEXT Steps:
  - Draft and finalize a generic SMPR containing the categories defined above,
  - Establishment of SLV and MLV operational parameters to include %Selectivity and %Specificity,
  - Create commodity-targeted sub-working groups to
    - Identify adulterant types for the corresponding commodity
    - Determine the %adulteration range expected for EMAs

CONCLUDING REMARKS

The following timeline is an estimation of anticipated progress prior to our next scheduled face-to-face session on Food Authenticity. This will be held during AOAC INTERNATIONAL's Annual Meeting in Denver, CO on **Friday, September 6, 2019** from 8:00am-5:00pm MDT.
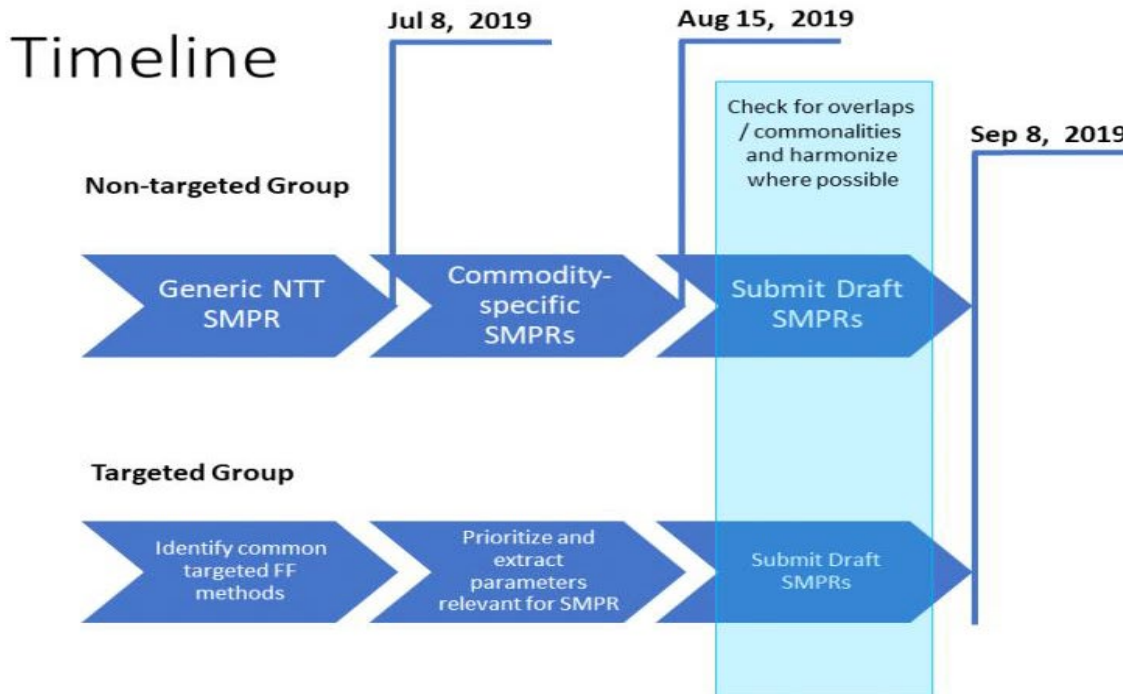
The agenda is currently under development. In the unlikely event that draft SMPRs are not completed prior to the Annual Meeting, completion of these documents will be the principal focus of the meeting.

We hope you're making make plans to attend and look forward to seeing you in Denver.