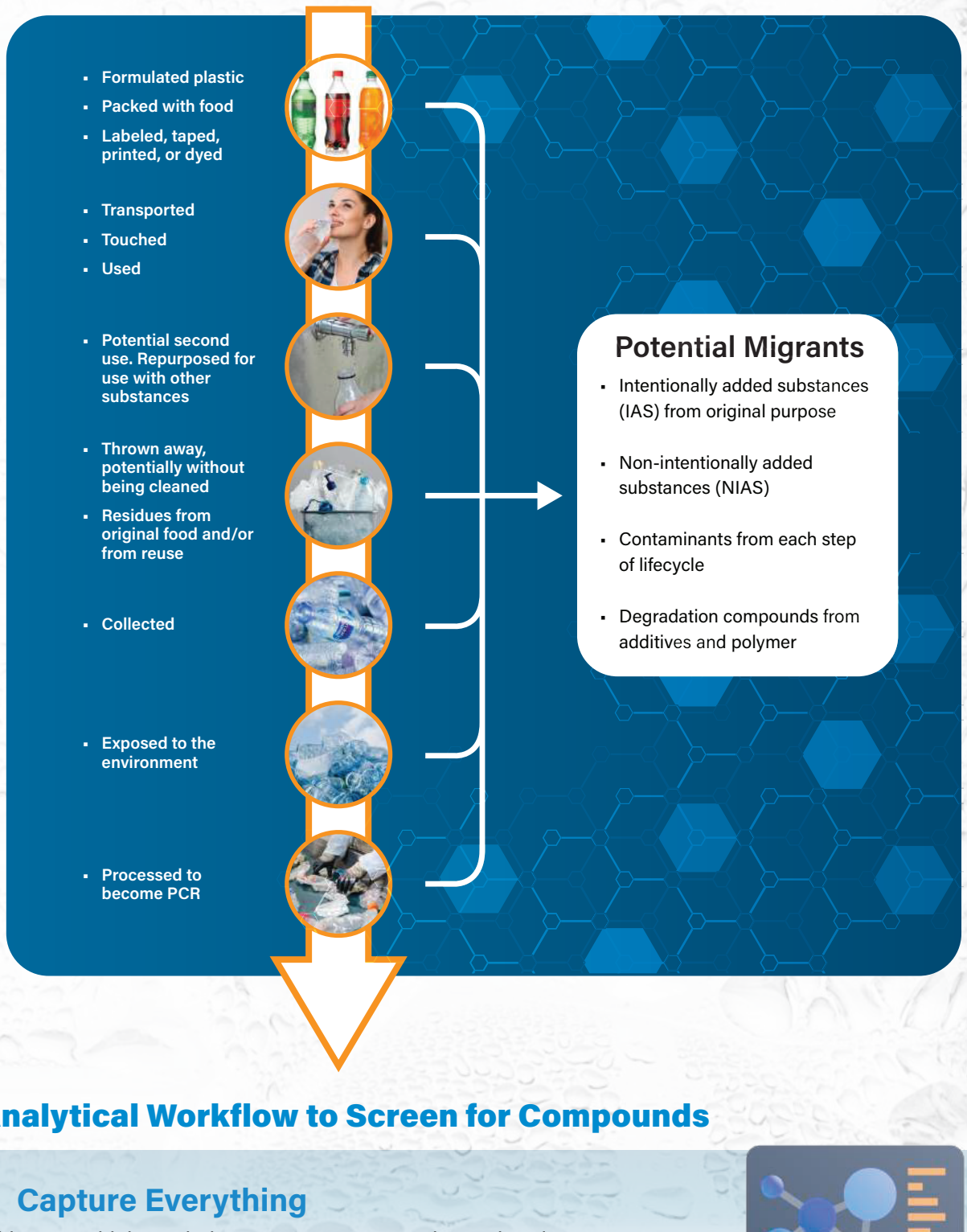
SCREENING FOR SAFETY: Assessing Recycled Plastic Intended for Food Packaging Use

Targets are being set for the incorporation of recycled plastic into Food Contact Material (FCM). Those that can't comply face a competitive disadvantage through both financial penalties & consumer-rejection. The principal concern of using so-called Post-Consumer Resin (PCR) is safety. The challenge is that materials have already had a life with many routes for potential contaminants. To directly address this challenge a screening workflow has been developed using high-resolution mass spectrometry (HRMS) with curated, enriched libraries specific for plastic FCM, facilitating an assessment of any migrants present.

The Life of a FCM: Sources of Unexpected Compounds



Analytical Workflow to Screen for Compounds

1. Capture Everything

With Waters high resolution mass spectrometry (HRMS) and UNIFI™ Scientific Information System, you have all the data all the time to look for known and unknowns. The raw data is always accessible and can be interrogated later for new or reassessed contaminants.

2. Screen for Most Likely Compounds

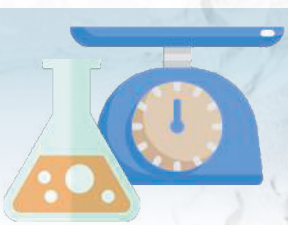
UNIFI uses a well characterized empirical library of over **600 compounds** commonly found in Food Contact Materials. Retention time, precursor and fragment ion accurate mass data is used to identify compounds with a high degree of confidence. Identified compounds can also be quantified without having to re-process the raw data or change software platform. New compounds can easily be added to the library.

3. Screen for Compounds Related to Plastic FCM

UNIFI automatically derives the elemental composition of the remaining unknown compounds and searches against specially curated UNIFI libraries containing over **10,000 compounds** associated with Plastic Food Contact Materials. This step is prior to accessing on-line libraries which would return too many hits to be of practical use. Predicted fragment ions from these libraries are automatically compared to detected ions to further aid the identification of unknown compounds.

4. Elucidation of Remaining Unknowns

Remaining unassigned peaks, which could include unknown degradants for example, can be elucidated using the tools within UNIFI to enable toxicological evaluation.



Addressing Chemicals of Concern

High-risk potential contaminants are specifically targeted with sensitive quantitative tandem quad mass spectrometers (TQ-MS) to confirm absence (to detectable limits) or quantitate any present for regulatory approval. This will include substances such as BPA, PAAs and phthalates for instance.

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