

MOSH/MOAH Research at the LCI

Mineral oils are in use almost everywhere around us. Their components can migrate into vegetable foods and foods of animal origin in very different ways.

In terms of their chemical structure these are essentially mineral oil saturated hydrocarbons (MOSH) and to a lesser degree mineral oil aromatic hydrocarbons (MOAH). Both are easily absorbed by the human body from foods and can accumulate in the body's fat cells and in several organs. Animal tests form the basis of toxicological assessments since there are currently no studies on their effects on humans. According to the Federal Institute for Risk Assessment (BfR), MOAH intake should be totally avoided since it cannot be ruled out that this fraction also contains carcinogenic compounds. The main source of migration of mineral oil components into foodstuffs is not the food manufacturers themselves. Given the ubiquitous presence of mineral oil, the many different routes of MOSH and MOAH migration into food, the sophisticated analytic methods required, and the many stakeholders involved, the topic is considered extremely complex.

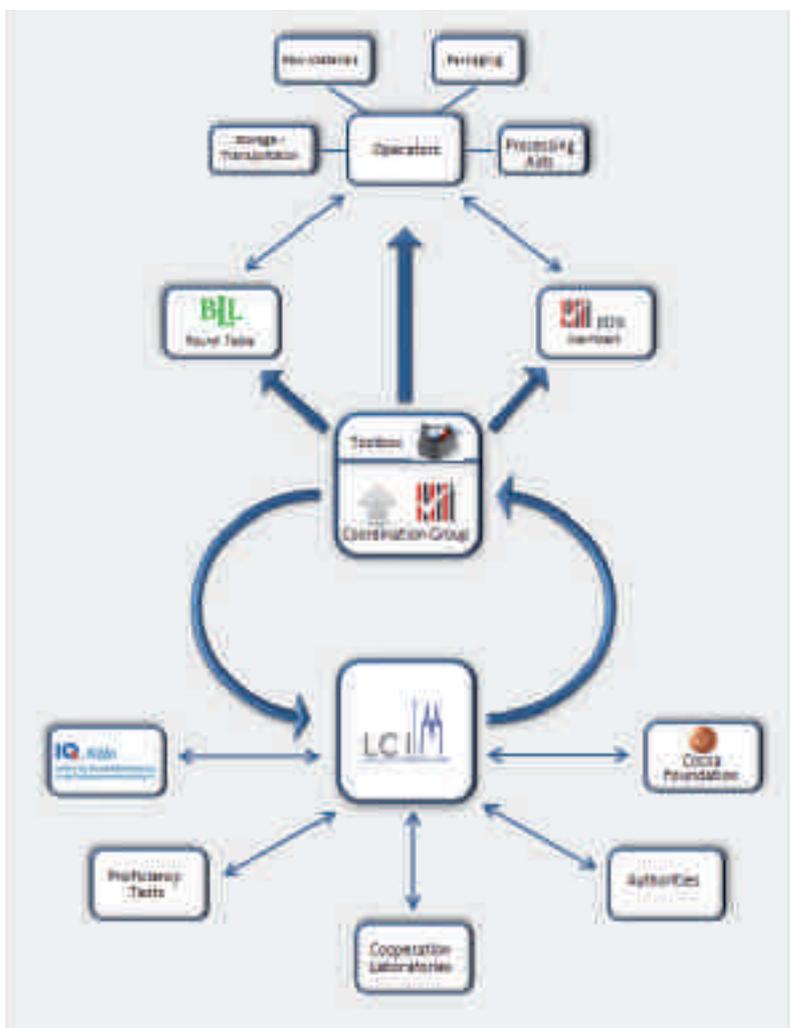
LCI Research in the context of the BDSI Minimisation Concept

The possible migration of mineral oil components into foods is not an issue that concerns the confectionery sector alone; it is faced by the food industry as a whole. On 1 July 2013, within the scope of its preventive consumer health protection efforts, the Association of the German Confectionery Industry (BDSI) initiated a three-year research project focused on the aspects of analytical methods, sources of migration, and prevention strategies. The LCI's research

objective is to prevent MOAH migration into confectionery and snack products and to minimise MOSH migration as far as possible. Equipped with state-of-the-art equipment for online coupled liquid chromatography-gas chromatography-flame ionisation detection (LC-GC-FID) and comprehensive two-dimensional gas chromatography with time-of-flight mass spectrometry (GCxGC-TOF-MS), the LCI's research is particularly focused on the following aspects:

- minimising migration;
- establishment of a database that also makes it possible to trace the migration of mineral oil components and migration sources;
- identification of various factors influencing the migration of mineral oil components into foodstuffs.

Coordination Groups / Cooperation with Stakeholders



In support of this project, the BDSI set up its own coordination group made up of experts from its member companies. Since this issue affects, or may affect, all foodstuffs, both the BDSI and the LCI, in addition to the efforts of the coordination group, are in close contact with all foodprocessing chain stakeholders. The LCI participates in round robin tests and cooperates with other laboratories (cf. diagram) for the purpose of establishing suitable analytical methods for quantifying MOSH/MOAH.

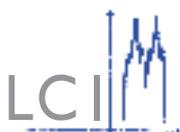
Conclusion

On behalf of its member companies, the LCI is conducting an extensive and very successfully initiated MOSH/MOAH

minimisation and prevention project that is particularly focused on analytical methods, migration sources – and hence a broadening of the knowledge base – as well as promising and practicable prevention strategies for companies. The results of this work are also reported outside the confectionery sector for discussion with all foodprocessing chain stakeholders. BSI

- development and establishment of analysis methods;
- examination of samples of raw materials, packaging materials, and foodstuffs at all stages of processing and storage for the targeted detection of sources of MOSH and MOAH migration;
- development of a toolbox for

minimisation and prevention project that is particularly focused on analytical methods, migration sources – and hence a broadening of the knowledge base – as well as promising and practicable prevention strategies for companies. The results of this work are also reported outside the confectionery sector for discussion with all foodprocessing chain stakeholders. BSI



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