

## **Analysis of inorganic migrants from new alternatives for plastic food contact materials: a reason for concern?**

H. Demaegdt<sup>1</sup>, D. Morales<sup>1</sup>, S. Ciano<sup>2</sup>, E. Van Hoeck<sup>2</sup> and K. Cheyns<sup>1</sup>

<sup>1</sup>*Sciensano, Service of trace elements and nanomaterials, od chemical and physical health risks, Belgium*

<sup>2</sup>*Sciensano, Service of organic contaminants and additives, od chemical and physical health risks, Brussels, Belgium*

Due to constant pressure from consumers and authorities to reduce fossil-based plastic, the food contact materials (FCM) industry is forced to develop alternative materials. While these alternative materials need to be environmentally friendly, they must also be safe for consumers. In this study, we aim to determine if and to what extent trace elements could be released from these alternative materials.

In this study, 100 samples representing different materials were collected: paper analogues (bagasse, wheat), wood analogues (bamboo, palm leaves, coconut, straw, wheat), bioplastics, recycled plastics, silicones and textiles. Migration experiments were performed according to the EURL kitchenware guideline (JRC, 2021) using 3% acetic acid. Total trace element concentrations (Ag, Ti, Zn, Cu, As, Cd and Pb) in the simulant were measured with ICP-MS/MS (Agilent 8800). Additionally, a semi-quantitative scan was performed to detect other elements. The wood analogues like coconut, straw and wheat showed very little to no release of any of the seven target trace elements. The same is true for the samples made of recycled plastics, bioplastics and silicone.

On the other hand, FCM made from bagasse, bamboo, or palm leaves did show the release of As, Cd or Pb, with Pb being the most recurring trace element. Almost all samples made from bagasse released Pb but still below the limit mentioned in Annex II of Regulation (EU) No. 10/2011. Four out of 12 samples made from bamboo showed the release of Pb, with one sample exceeding the 10 µg/kg limit.

The interpretation of the scans and textile FCM is currently ongoing.

The use of alternative FCMs made from coconut, straw and wheat, bioplastics, recycled plastics and silicone does not raise any safety concerns regarding the targeted trace elements as they are unlikely to contaminate foodstuffs that come in contact with them. On the other hand, for FCM like bagasse, bamboo and palm leaves, the release of As, Cd or Pb was detected, with Pb release exceeding the limit of Regulation (EU) No. 10/2011 in one sample.

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\* E-mail: [Heidi.Demaegdt@sciensano.be](mailto:Heidi.Demaegdt@sciensano.be)

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