



2nd CIRCUL-A-BILITY CONFERENCE

BOOK OF ABSTRACTS



Ljubljana, 12-14 September 2022

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APPLICATION OF CIRCULARITY MICRO-INDICATORS TO PLASTIC FOOD PACKAGING

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The difficulty in combining sustainable polymeric options with the requirements to guarantee food quality and food safety, has impeded the transition to a more circular economy in the food packaging sector, although efforts have been made in recent years to redesign plastic packaging to consider its sustainability. The limitations imposed by both the legislation and the market also has prevented this transition because several recycled, bio-based, biodegradable, or compostable polymeric materials are not allowed to enter in contact with food and the price of the polymeric sustainable materials allowed are considerably more expensive than alternative virgin polymers. In addition, polymers being one of the most viable solutions for protecting food quality, keeping food fresh, and increasing its shelf life, are lightweight, inexpensive, and have properties that are difficult to replicate with other materials. Therefore, the solution for the transition towards more sustainable food packaging is not to ban the use of polymeric materials or to replace them with less sustainable and less circular materials, but to rethink the way in which they are used and especially how to manage them at the end-of-life, to cause the least possible environmental impact. One of the means to improve the sustainable use of plastics is by looking at their circularity. To assess circularity there is no standard method, and the scientific community has proposed a myriad of tools for this purpose, such as circularity micro-indicators. However, circularity micro-indicators range widely in complexity, philosophy, method of calculation, and type of required information, and most focus only on some aspects of the entire product life cycle.

In this paper, we analyse the different circularity indicators proposed in the literature that could typically be applied to food packaging, in the scope of plastic materials. For each micro-indicator, we discuss and argue its potential

application in this industrial sector, and we highlight the most relevant indicators overall for that sector. This is done obviously in a broad sense, as specific products can sometimes fall outside the typical characteristics and features of food packaging applications. In addition, we analyse other factors that influence the calculation of the micro-indicators identified for food packaging. Finally, we propose a holistic set of micro-indicators that together provide a fair assessment of circularity of plastic food packaging.

Keywords: *circular economy, circularity indicators, sustainability, food packaging*