

Food & Beverage Packaging

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Packaging innovation in the context of circular economy

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Food packaging is a key player in the smorgasbord of actions to prevent food losses and wastes from production up to consumption. Innovative active packaging is able to control food degradation rate and improve food shelf-life, therefore contributing to reduce fresh food losses. The so called “intelligent” packaging is able to monitor the product quality, trace the critical points, and give more complex information throughout the supply chain such as storage conditions. These new functionalities of packaging are contributing to efficiently complement the “use-by date” or “best before” labels. Moreover, packaging materials are becoming more and more environmental friendly by being produced from agricultural or food wastes or by-products, therefore contributing to the development of a circular economy. Examples of the latest research in these fields will be presented and discussed.

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Pasta preference and ability to penetrate through packaging of *Sitophilus zeamais* Motschulsky (Insecta, Coleoptera: Dryophthoridae)

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Results of bioassays of the maize weevil, *Sitophilus zeamais* (Insecta, Coleoptera, Dryophthoridae), on different types of special commercial pasta are reported. The attraction to eight types of pasta was compared: barley and buckwheat, dietetic, egg pasta, gluten-free, spelt and lentils, tricolour pasta (a mixture of semolina, tomato, and spinach), vitamin enriched, and whole wheat semolina. The results obtained demonstrated that adult *S. zeamais* revealed significant preferences for whole wheat semolina and tricolour pasta, followed by vitamin enriched pasta, egg pasta, spelt and lentils pasta, gluten-free pasta, barley and buckwheat pasta, and dietetic pasta. The ability of *S. zeamais* to penetrate through the packages of commercial pasta was also determined using a folded carton box or a plastic pillow pouch with or without gussets. Sixteen types of commercial pasta packages were compared. *S. zeamais* was found inside packages of barley and buckwheat pasta, durum wheat pasta, egg pasta, five cereals pasta, kamut pasta, rice pasta, spelt pasta, spelt and lentil pasta, tricolour pasta, vitamin enriched pasta, and whole wheat pasta. The adults entered into carton boxes and infested the pasta through openings not well sealed by glue. The large or enlarged air vent micro-holes present on polypropylene pasta packages facilitated the entry of adults.

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