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From Waste to Worth:

Revolutionizing Food Packaging with Edible, Eco-Friendly Solutions

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Plastics has been an increasingly global concern for everyone due to a plethora of reasons. The term "pliable," which means "easily shaped," is where the word "plastic" came from since it can be easily altered into various shapes depending on the purpose of the production. For example, it can be shaped into tube to create PVC in construction used or turned into spoon for food industry. Plastics are also familiarised to the world as “polymers” or “long chain monomers” as these subunits are joined together to form polymers. Natural sources of polymers include cellulose, which serves as the building block of plant cell walls and enables cells to adjust how they operate (Evode et al., 2021).

The most common biochemical processes that are involved in producing plastics are polycondensation and polymerisation. Most plastics would end up in landfilled or being mismanaged rather than being recycle. This would lead to accumulations of plastics in the environment which can be detrimental as these plastics would release hazardous chemicals to the soil which able to disrupt the nutrients of the soil itself aside from being hazardous towards the animal especially aquatic animals as these mismanaged plastics would be found floating above the sea or rivers.

Previous study reported by Semple et al. (2022) revealed that around 56% of the plastics production was from packaging industry which mainly focuses on food packaging. Figure 1 shows in 2018 which has production rate of food packaging worth $56.8 billion, 40% of these food packaging was made using plastics. However, since the usage of paper as food packaging would also use plastic laminate as another protective layers, it can be said that plastics usage in food packaging is well over 40%. The households in the European Union (EU) have spent more than €600 billion on "catering services" in 2018, which includes cafés, restaurants, canteens, catered events, and similar establishments. It should be noted that during the summer months, there are a sharp rise in the mass consumption of disposable plastic tableware, particularly during the food truck and barbecue festivals and picnics. Other industry including civil aviation sector also shows a massive need for food packaging supplies and would utilise single used plasticware (Dybka-Stępień et al., 2021). As a result, the usage of single-used and disposable plasticware has become a norm in daily life and one of the major contributors towards plastic accumulation.

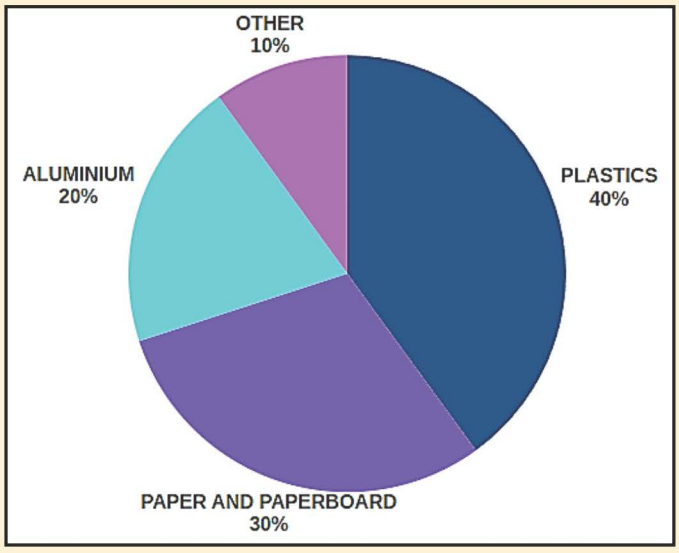

Figure 1: Composition of material used to make food packaging in 2018. Source: Semple et al. (2022)

In order to avoid worst scenario, vital action needs to be executed and one of the methods is by utilising agriculture waste as plastics replacer especially on edible cutlery (Shabaana et al., 2021). It has been discovered that waste from a variety of food sources contains useful ingredients that can be used to make food packaging with better quality or that is more sustainable. Research has also been done on agricultural waste components such as additives and monomers. The latter have frequently been investigated as antioxidants, antimicrobials, sensors/indicators, and plastic fillers (Duguma et al., 2023). As plastics play a pivotal role in the food packaging industry, it is crucial to tackle these issues by providing edible and eco-friendly cutlery to the masses. Thus, agriculture waste-based cutlery represents a sustainable alternative to traditional plastic utensils which are abundant in waste streams from food processing industries.

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