

Plasticor: Smarting Food Packages

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Abstract

Food waste that occurs at different stages from food production to transportation and in homes is an economic, social and environmental problem. These food scraps are largely responsible for the generation of greenhouse gases (GHG). In addition, many of these foods are sold in non-biodegradable plastic packaging that results in the accumulation of plastic in the environment, directly and/or indirectly affecting the lives of animals and humans. In order to bring about a possibility of reducing food waste and the accumulation of long-lasting plastics in nature, Plasticor was developed, a biodegradable and sustainable polymer used in the packaging of foods that use biosensors to test the viability for human consumption of food. A smart packaging that involves food and has its color changed when the product is no longer fit for consumption, indicating the presence of harmful microorganisms. Thus, avoiding the early disposal of food in good condition and consequently its impact on the environment, in addition to postponing the consumption of new products, Plasticor contributes to a more sustainable world.

Keywords: Biodegradable; Compostable; Smart plastic package; biosensor; Food waste prevention.

Introduction

Among the problems present in our modern world are the issue of world hunger and pollution. Every year millions of tons of food are wasted when thrown away, in addition to the issue of hunger, these remains, when rotting, release gases that contribute to the increase in the greenhouse effect (GHG). Also per year, tons of non-biodegradable and compostable plastics are disposed of in the wrong way, contaminating the environment and affecting the fauna and

flora of the places where they end up. To solve such problems, the idea for the Plasticor product came up, a biodegradable and compostable polymer that can identify whether or not a food is suitable for consumption.

Food Waste and Hungry

Food waste is indicated as a major source of greenhouse gases, such as methane, and the reduction of this source is one of the points that has attracted the attention of

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the industry, which in the face of a consumer market increasingly aware of the environmental impacts caused by the human being, has been looking for solutions. Among the many reasons for food waste is the failure to assess the consumer's assessment of whether the food is consumable. When considered unsuitable for consumption due to aspects such as appearance, consistency, and/or taste, as well as other factors such as leftover meals, food is discarded both in homes and in restaurants and markets. However, this quality finding does not always represent the reality of the food and it is thrown away in the wrong way [1]. If such a product is still suitable for consumption and is used, it would result in a reduction of waste and therefore that of high consumption, which in turn would reduce the production of pollutants in the environment. Likewise, this food in good condition can be used for social purposes, such as fighting hunger [1].

The concern about synthetic plastic

Plastics began to emerge around the first decades of the 20th century and have since become one of the main constituent materials of many modern products, replacing many technologies that previously used other materials such as metals or ceramics. As an example of this, we have the plastic packaging that today is the most used for the protection and transport of various goods [2]. Many are based on non-renewable and also non-biodegradable fossil sources, such as PE, PP, and PET, among others, which, despite their great utility that enabled great advances in several areas, also presents a setback when they end in dumps or in oceans resulting in the generation of

microplastics that contaminate the food chain from its base to the top of the chain and that can last for years in these ecosystems, resulting in problems ranging from human contamination through fishing as well as the death and extinction of several species. The substitution of these types of plastics for plastics of natural origin and that do not harm the environment as in the case of biodegradable and compostable plastics but that serve as a substitute for plastics of synthetic origin is a practical and profitable solution that allows us to produce in a way that attacks the planet less [2].

Plasticor Solution

To seek an answer to such questions, Plasticor was created and developed during the Hackathon event: Biopolymer, biodegradable, compostable, and intelligent created at the Federal University of Rio de Janeiro, Brazil, in the year 2017. A nanotechnological package that uses capable biosensors to detect spoiled food. Being able to help both at home and in the operational sector. The bioplastic changes color as the food releases volatile compounds, which indicate the quality of the food, whether it is spoiled or not. With this feature, the consumer would have greater reliability of certainty about the quality of the product before discarding it. With the lowest disposal of products that are still consumable, it is possible to use them for food. Isolated regions that have long transportation routes in which the product is at risk of spoiling and being discarded, would be one of the beneficiaries of this reduction in the early disposal of food. Because it is biodegradable it causes less environmental impact compared to conventional plastics

and its composability allows its use as fertilizer for plants [2].

Conclusion

The Plasticor product comes to innovate the packaging market with a sustainable and functional product that benefits the consumer and the planet by reducing waste, increasing the reliability of the food product and reducing the environmental impact that current plastic packaging will cause if it continues to be used in the right

way as if it is being used today. All of this based on its biodegradable and compostable biopolymer technology that uses nanotechnology and biosensors to detect compounds resulting from decomposition.

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References

1. Matzembacher DE, Brancoli P, Maia LM, Eriksson M. Consumer's food waste in different restaurants configuration: A comparison between different levels of incentive and interaction. *Waste Manag.* 2020 Aug 1;114:263-73.
2. Tavill G. Industry Challenges and Approaches to Food Waste. *Physiol Behav.* 2020; 223:112993.