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Is Willy Wonka's Everlasting Gobstopper truly a never-ending confection, or simply a finite treat?

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Abstract
This paper aims to explore the feasibility of producing a real-life version of Roald Dahl's fictional Everlasting Gobstopper. By identifying the fictional properties of the Everlasting Gobstopper this paper analyses the potential and the challenges of creating such a confection which defies conventional limitations. Through analysis of molecular gastronomy techniques, this study aims to bridge the gap between fiction and reality.

Keywords: *Book; Biology; Molecular Gastronomy; Confectionary; Charlie and the Chocolate Factory*

Introduction

The notorious author Roald Dahl has captivated the minds of children for decades, having sold 300 million copies of his books worldwide [1]. Arguably his most famous novel, 'Charlie and the Chocolate Factory' tells the story of a young boy named Charlie who finds one of Willy Wonka's five golden tickets. Charlie, alongside four other ticket recipients are invited for a once in a lifetime tour of Willy Wonka's chocolate factory. On this tour the four other ticket holders each meet their own unique fate due to their character flaws, leaving Charlie to be the sole survivor of the tour. Charlie is then gifted ownership of the factory as a prize [2]. Throughout the tour of the factory, they encounter many of Wonka's creations, each being more extraordinary than the last! From Fizzy lifting drinks that cause consumers to float in the air, to flavour changing chewing gum that replicates the flavours of a three-course meal [3], the tour is jampacked with whimsical confectionary that has left readers wishing they were one of the lucky five ticket holders able to sample Wonka's creations. The fictional confectionaries of Willy Wonka have captured the imaginations of not only children, but also adults, leaving people wondering about the possibilities of such confections existing beyond the pages of a book. With its promise of an endless taste experience [3], Wonka's Everlasting Gobstopper has left people yearning for a real-life version of the product that mirrors its portrayal in the books. This paper aims to explore the feasibility of creating a real-life Everlasting Gobstopper by bridging the gap between fiction and science.

Feasibility Analysis

In order to evaluate the possibility of creating a real-life Everlasting Gobstopper, we must firstly identify its fictional properties. In chapter 19, Wonka states that "You can put an Everlasting Gobstopper in your mouth and you can suck it and suck it and suck it and suck it and it will never get any smaller!" [3], which informs us that the gobstopper we aim to create must resist physical degradation to ensure it doesn't diminish in size despite prolonged use. As well as this it's reasonable to assume that the ingredients used must be resistant to degradation as well in order to maintain its structural integrity and flavour properties. Finally, it's imperative we verify the gobstopper is safe for human consumption and meets all the regulatory standards for food production. To achieve this, we will integrate scientific approaches from various fields in order to develop an Everlasting Gobstopper that mirrors its fictional properties.

Achieving Everlasting Flavour

The field of molecular gastronomy combines technical, artistic, and social components in the creation of novel food [4] and holds great promise in achieving the everlasting gobstopper. Techniques such as encapsulation can be harnessed to create a real-life rendition, as encapsulation increases flavour

stability and reduces degradation [5]. The process of encapsulation typically requires two steps: the first being the emulsification of a core active material with a dense solution of wall material such as a polysaccharide. The following step involves the drying/cooling of emulsions [6]. Figure 1 shows the scheme of encapsulating a flavour.

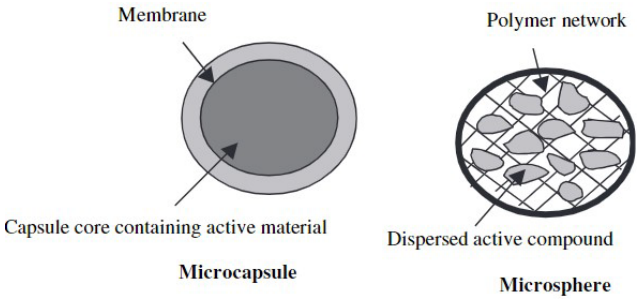

Figure 1 – A schematic diagram depicting flavour encapsulation [6].

Studies have shown that encapsulation is an effective technique in extending flavours shelf life as well as allowing for controlled release [6]. This capacity for controlled release suggests that, in the context of creating the Everlasting Gobstopper, it may be feasible to encapsulate flavours and optimize conditions to ensure continuous flavour release over an extended duration.

Protection from Degradation

As Willy Wonka states that the gobstopper will never get smaller regardless of how long it is in use, careful consideration must be given to the material composition of the gobstopper and its ability to prevent degradation. One approach to this is the use of edible films and coatings which will act as a barrier to environmental factors as well as shielding it from enzymatic digestion. The most abundant enzyme in saliva is α-amylase [7] which aids digestion of carbohydrates. This poses a threat to the longevity of the gobstopper as α-amylase may catalyse the breakdown of materials over time, hence damaging the structural integrity. Edible films/coatings are generally formed from a combination of proteins and polysaccharides which are used alone or blended [8]. The edible films have a thickness less than 0.3 mm [9] and the four main methods of administering the edible films are shown in figure 2.

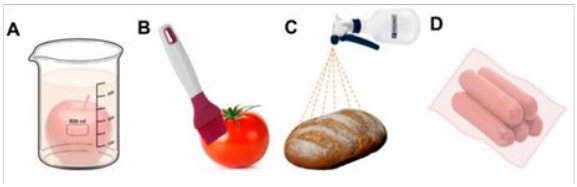

Figure 2 – The four main application techniques of edible films/coatings. (A) Dipped, (B) spread, (C) sprayed, (D) wrapped [6].

By employing edible films and coatings, we have the opportunity to protect the gobstopper against enzymatic degradation and other environmental factors such as moisture, oxygen, and light exposure. This in turn will aid in protection of the gobstopper's structural integrity.

Conclusion

In conclusion, while the prospect of creating a real-life Everlasting Gobstopper which mirrors its portrayal in the books is enticing, current scientific knowledge and technologies poses significant challenges. Although techniques such as encapsulation and the use of edible films/coatings holds promise in extending shelf life and protecting from physical degradation, ultimately the fictional properties of the Everlasting Gobstopper remain unattainable. With the use of encapsulation and edible film coatings we are only able to extend the shelf life of the Gobstopper and protect it from degradation due to environmental factors. This means although we can increase the longevity of the Gobstopper, we cannot make it last forever due to the nature of edible films, as once they are in contact with saliva, α-amylase will begin to hydrolyse the polymer chains, hence the film starts to degrade and the duration of the film's effectiveness is limited. Future research on non-toxic techniques is required – perhaps techniques that preserve chewing gum from mechanical and enzymatic breakdown could be applied to the edible films to prevent them from breaking down. Therefore, although we can prolong the Everlasting Gobstopper's lifespan, the fictional properties to achieving true everlastingness remains beyond our current abilities. More research on preservation techniques and the utilization of nanoparticles in food offer potential avenues for future exploration.

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