

Development and Testing of a New Edible Dough Product for the Cannabis Industry

Preston Parsons, Henry Sanders, Ainsley Guerrero,
Lucas Aube, Grady Lilley, Renat Urazgildiiev

November 25, 2024

Abstract

This report explores the development and testing of a new edible dough product for commercial use in the cannabis industry. The product is designed to be both safe for consumption without cooking and moldable. This report outlines the methods, results, and conclusions drawn from the trials conducted with the dough.

1 Introduction

The edible cannabis industry has seen a steady rise in popularity due to consumer demand for safer-than-inhaled cannabis products. Edible dough offers a simple solution for both the avid stoner and the casual enjoyer, eliminating the need for baking and reducing preparation time. Edible Dough Co. seeks to pioneer this sector by developing a new, innovative dough formula that can completely replace the need to smoke that green!

The primary aim of this project was to develop a dough that can be molded and formed but can be safely consumed without any further preparation. The dough needs to meet several criteria, including taste, texture, shelf life, and cannabinoid composition. This report presents an analysis of the product development process, from initial formulation to final testing, and highlights the performance of the dough during various trials.

2 Methods

In coordination with Ainsley, the technical director, and Preston, the chief research officer, we have developed a formula that meets our research criteria while still being edible and capable of effectively holding the THC oil. The edible dough mixture is similar to popular dough brands in that it contains water, salt, and flour, but experimentation with various other ingredients led to several formulas being developed, labeled A-F.

2.1 Formulations

- **Formula A:** Cornstarch, Flour, Water, Cane Sugar, Cannabis Extracts, Salt, Glycerin, Turmeric (color), Hemp Extract
- **Formula B:** Flour, Ground Oats, Cornstarch, Pasteurized Egg Yolks, THC Oil, Coconut Fiber, Chocolate (Cocoa Powder, Butter, Sugar)

- **Formula C:** Flour, Cornstarch, Baking Soda, Tears (non-vegan), THC Oil, Hemp Oil, Olive Fiber
- **Formula D:** Cream of Wheat, Chili Powder, Pseudoephedrine, Red Phosphorus, Cannabis Extract, Red #3, Sugar, Thickening Agent
- **Formula E:** Rice Flour, Potato Starch, Xanthan Gum, Beet Powder (for color), Peach Skin, Stevia, THC Oil
- **Formula F:** All-purpose Flour, Cane Sugar, Molasses, Coconut Oil, THC Oil, Natural Almond Flavor

2.2 Evaluation Criteria

Our grading criteria for each formula included texture, flavor, potency, malleability, and appearance. Focus groups consisting of 20 randomly selected participants from our previously identified target audiences evaluated each formula on a scale of 1-10 on each of the above criteria. Having taken user feedback, it was determined that Formula C met most of our criteria and was most successful with our target audience.

3 Results

The five formulations were labeled as Formula A, Formula B, Formula C, Formula D, Formula E, and Formula F, with each showing varying degrees of success in different categories (flavor, texture, malleability, appearance, and potency).

- **Formula A:** Exhibited the best flavor but had a salty taste and crumbly texture that many participants found unappealing. Cannabis ‘high’ achieved after 1.75 hours on average.
- **Formula B:** Had a smooth texture but was too sweet for some participants, leading to mixed results for flavor.
- **Formula D:** Was the most malleable of all the formulas. Participants felt it was the most satisfying to play with, but after a week at room temperature, it started to oxidize, and the color darkened while the consistency of the top layer changed. Refrigeration improved texture retention.
- **Formula E:** Had the best appearance, with the nicest-looking texture right out of the container and the most vibrant colors, but stiffened immediately after use. Its flavor was unappealing.
- **Formula F:** Was extremely potent. However, flavor concentrates amplified its intensity, making the taste overwhelming.

Formula D, when stored in a refrigerated environment, showed the best results in terms of malleability, freshness, and texture retention over time. Freezing the dough caused it to lose its smoothness, while room temperature storage led to early texture breakdown and slight fermentation after two weeks.

4 Discussion

Formula C ended up being the most successful formula across our evaluation criteria. Participants tended to favor it due to its superior taste and consistency, making it very satisfying to eat and mold. In addition, it had a good ability to hold THC oil without compromising the integrity of the product, making it a suitable candidate for both lines of edible dough.

Being our first tests of this product, the flavors used were generally generic. In the future, we may perform more marketing research on what flavors to use as the face of Edible Dough Co. through polls at our public stands and stores. Additionally, further experimentation on how to increase shelf life and texture stability is necessary. As it stands, the dough can be safely eaten for a good amount of time after being put on the shelf; however, the texture greatly changes after the first week. If we can develop a formula that maintains the classic edible dough texture for longer using natural stabilization methods, we could significantly extend the product's usability.

5 Conclusion

The development of Edible Dough Co.'s new product has shown promising results, with Formula C emerging as the most viable option for commercial production. The dough was well-received in terms of texture and flavor, although improvements are needed in its shelf life. Future research should focus on refining the dough's ingredients and testing different preservation methods to enhance the product's stability.

Overall, this project marks a significant step toward introducing a new, convenient food product to the market, and further testing will be crucial for optimizing its recipe and production process.

Team Member Contributions

- **Preston Parsons:** Developed the formulation for Formula C and conducted sensory evaluations.
- **Henry Sanders:** Conducted the shelf life testing and storage trials.
- **Ainsley Guerrero:** Led the data analysis and interpretation of the results.
- **Lucas Aube:** Managed the initial formulation and flavor testing.
- **Grady Lilley:** Proposed future testing improvements based on results.
- **Renat Urazgildiiev:** Donated his body to science after consuming 600 containers of the dough in one hour and is now a lab rat.