

# Consumer Satisfaction With Gluten-Free Yeast-Raised Doughnuts for Commercial Production

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## Abstract

The demand for gluten-free baked goods has been growing. Currently the baking industry has been unable to produce a yeast-raised gluten-free doughnut to meet this demand. This study tested one formula, and sought to discover the feasibility. Research into gluten-free baked goods offers celiac suffers more versatility in their diet.

## Problem

The diagnosis of celiac disease is on the rise, as are the number of consumers choosing a gluten-free diet. Despite these trends, the baking industry as of 2012 has not addressed the need for a gluten-free yeast-raised doughnut.

## Purpose

The purpose of this quantitative, quasi-experimental study was to examine the possibility of producing gluten-free yeast-raised doughnuts commercially that satisfy consumer demands.

## Limitations

This study was limited by a convenience sample, rather than a random sample. The convenience sample consisted of individuals who were already shopping for doughnuts or visiting a local college campus. Consequently, the results of the study cannot be applied to a larger population. They can only be suggestive.

## Research Question

The research question was designed to determine if consumers found the doughnuts made with gluten-free flour to be at least as good as traditional doughnuts.

1. Will consumers find significant difference between doughnuts made with gluten-free flour and traditional doughnuts?

## Procedures

### Data Collection

Data collection was accomplished by asking 50 adults to rate their level of satisfaction, based on the survey discussed below, with two different kinds of doughnuts, those that were gluten free and those made with wheat flour.

### Survey Instrument

Four survey questions were posed, based on a 5-point Likert scale: 1=very dissatisfied, 2=dissatisfied, 3=neutral, 4=satisfied, and 5=very satisfied.

1. How satisfied were you with the visual appearance of the doughnut?
2. How satisfied were you with the texture of the doughnut?
3. How satisfied were you with the taste of the doughnut?
4. Considering the total doughnut, including appearance, taste, and texture, how satisfied were you with the doughnut?

## Data Analysis

Data were analyzed using a one way ANOVA. The independent variable was doughnut type (categorical), and the dependent variable was the survey responses (continuous).

## Findings

Three separate one-way ANOVA s showed a significant difference between participants expectations of gluten-free doughnuts and traditional doughnuts, with scores on the gluten-free doughnuts showing significantly lower scores on taste, texture, and appearance. These findings suggest that the gluten-free doughnut did not meet participants' expectations.

Q1:  $F(1,98) = 22.02, p=.000$

Q2:  $F(1,98) = 59.84, p=.000$

Q3:  $F(1,98) = 46.04, p=.000$

Q1:  $F(1,98) = 74.04, p=.000$



## Relevant Literature

### Expectation-confirmation theory

Bhattacharjee (2001)  
Oliver (1977)  
Lee (2010)  
Kim, Ferring, and Roa (2009)

### Sensory quality

Rai, Kaur, and Singh (2011)  
Rai, Kaur, Singh, and Minhas (2012)  
Brites, Trigo, Santos, Collar, and Rosell (2010)  
Melito (2009)  
Alvarez-Jubete, Auty, Arendt, and Gallagher (2010)

## Conclusions

The demand for gluten-free baked goods continues to grow as more people are committed to a gluten-free diet, and this trend appears to be much more than just a passing fad. The baking industry has yet to produce a gluten-free, yeast-raised doughnut. While the millet blend of flour used in the study was not a solution to the problem because it did not meet the expectations of customers, it does suggest that a millet blend may indeed be the answer; however, more research is warranted to address this increasing demand for gluten-free baking products, including a gluten-free, yeast-raised doughnut.

## Social Change Implications

This study may have significant positive social change implications because it could help narrow the gap between the demand for more gluten-free baked goods and the ability of bakeries to produce these goods. Bringing more gluten-free baked goods to the market place could create a positive social change by allowing celiac suffers more freedom in their restricted diets. While I did not find in this study a viable solution to meet this growing need, I did eliminate one flour blend as a possible solution. Obviously further research is needed to find a gluten-free, yeast-raised doughnut that meets the expectations of consumers on a gluten-free diet.