Consumer insights on strawberry fruit on the bottom Greek yogurt using qualitative multivariate analysis

DEL TORO-GIPSON, R.S., SIPPLE, L.R., CADWALLADER, D.C., DRAKE, M.A.
Southeast Dairy Foods Research Center
Dept. of Food, Bioprocessing and Nutrition Sciences, North Carolina State Univ., Raleigh, NC. 27695-7624

Abstract

This study established consumer desires for strawberry fruit on the bottom (FOB) Greek yogurt using qualitative multivariate analysis (QMA). Eight commercial strawberry FOB Greek yogurts were selected. Yogurt consumers (n=14) were provided with two single serve commercial cups of each product every 5 days across a 4-week period. Consumers recorded their experience with each yogurt, including likes, dislikes and photos, using an online diary. At the end of the 4-week period, consumers participated in a 2.5 h downloading session and projective mapping (PM) exercise. Brand was not a key attribute for consumer liking. Yogurt appearance attributes such as syneresis, dull fruit color, and breakage of the fruit through the yogurt gel prior to stirring were undesirable. After stirring the yogurt prior to consumption, consumers preferred yogurts that appeared smooth and homogenous and were not visibly grainy or lumpy. Consumers noted difficulty with stirring when there was excessive syneresis. A balanced sweetness to tartness and a high strawberry jam flavor with minimal aftertaste were preferred. Consumers were concerned about the size of fruit pieces and proportion of fruit to yogurt. Specifically, not enough fruit compared to the amount of yogurt was disliked. Fruit that was too soft was also undesirable. This study demonstrates that the appearance of FOB Greek yogurt prior to stirring and the process of stirring impacts the consumer experience and overall satisfaction with the product along with traditional flavor and texture properties.

Introduction

Greek Yogurt

- Greek yogurt is a fermented, semi-solid product derived from yogurt by draining away part of its water and water-soluble components.
- The increased health awareness associated with diets rich in protein has fueled the consumption of Greek Yogurt (Jaoude et al., 2010).
- In 2013, the US Greek yogurt recorded year-on-year growth of 41%, and this growth included traditional fruit on the bottom (FOB) as well as blended yogurt flavors and other new inclusion flavors.

Fruit on the Bottom (FOB) Greek Yogurt

- Fruit on the Bottom (FOB) yogurt was first introduced by Dannon in 1942.
- At the time, U.S. Food Safety standards for dairy production required that dairy products not be mixed with other ingredients in it. By placing fruit below the cultured milk, it was safe to package due to the low pH caused by acid generated during fermentation.
-

Quantitative Multivariate Analysis (QMA)

- QMA consists of many steps, including a home usage test, a group discussion, and projective mapping with a small number of consumers (10-15); QMA incorporates all these steps purposefully to uncover different aspects of consumer insights (Beckley et al., 2012).
- The approach of utilizing a home usage test, a focus group and projective mapping aims to help researchers understand the entirety of the consumer experience with Greek fruit on the bottom yogurt.

Justification

Previously, consumer tests on FOB have focused on flavor and texture, but this study aimed to understand the entire consumer experience from opening the package to consumption, with a specific focus on the attributes of FOB Greek yogurt that impact consumer liking and satisfaction.

Objective

The objective of this study was to characterize the consumer experience with FOB Greek yogurt through the use of a qualitative multivariate analysis approach.

Materials and Methods

Qualitative Multivariate Analysis

- Qualitative multivariate analysis (QMA) is a composite methodology that combines multiple techniques, including a Home Usage Test, Projective Mapping, and Focus Group, to capture insights related to consumer needs, values, behaviors, experiences, and perceptions for a particular product.

QMA part 1: Home Usage Test (HUT)

- An online survey was designed (Sawtooth Software Inc.) to recruit frequent strawberry FOB Greek yogurt consumers.
- Eight commercial FOB Greek yogurts were selected for the study. The yogurts selected represented a range of brand, fat content, sweetening systems, and label claims (e.g. organic vs conventional).
- Fourteen strawberry Greek yogurt consumers (7 female, 7 male) were selected to participate.
  - Participants evaluated the yogurts across a 4-week period. Two commercial single-serving cups of each yogurt were provided for evaluation (2 samples/week).
  - Participants were provided with written instructions as well as a link to an online diary (Compusense Cloud, Guelph, Canada). The online diaries contained colored pictures of each product along with the product price.
  - Participants were instructed to consume each yogurt in a manner that they usually consumed yogurt, evaluate each sample at least once (with the option to evaluate each sample twice), and to write a few sentences describing their experience.
  - Participants were asked to score overall liking for each product on a 9-point hedonic scale and to upload 3 photos of the yogurt: 1) unstirred after opening package, 2) stirred before consumption, and 3) sample cup after consumption.
- At the end of the 4-week period, data from consumer diaries was collected and compiled.

QMA *Part 2: Projective Mapping (PM)*

- Following the HUT, each participant completed a Projective Mapping (PM) exercise with the 8 different yogurts. Participants had access to their completed diaries and were provided with an empty cup of each commercial yogurt for the PM exercise.
- PM was conducted using Compusense Cloud (Guelph, Canada). Consumers were asked to place the yogurts on a 2-D map based on degree of similarity.
  - Similar products were placed near one another and different products were placed far apart.
  - Consumers "tagged" each sample with descriptors that were characteristic of that sample (e.g. appearance, flavor, texture, performance attributes).

QMA Part 3: Downloading Session

- One 2.5 h focus group was conducted to summarize and collect participant thoughts, perceptions, and insights about their experiences with FOB Greek Yogurt.
  - Key focus areas of discussion were: 1) FOB Yogurt Purchasing Factors, 2) Packaging, 3) Ingredients and Nutrition, and 4) Label Claims.
  - Each commercial yogurt was also discussed. A sample of each yogurt was available for participants to taste.
- Participants were provided with a copy of their online diary entries including pictures of the products, price, comments, and uploaded photos for each sample.
- Focus group materials included a moderator guide, video recorder, and 3 note takers.

Statistical Analysis

- HUT results were analyzed by frequency of responses recorded in online diaries.
- Projective Mapping results were analyzed using Multiple Factor Analysis (MFA).
  - Frequencies of descriptor tags on samples from the Mapping Exercise were run as supplementary MFA variables.
- A Journey Map was constructed based on the consumer responses from the downloading session.

Results

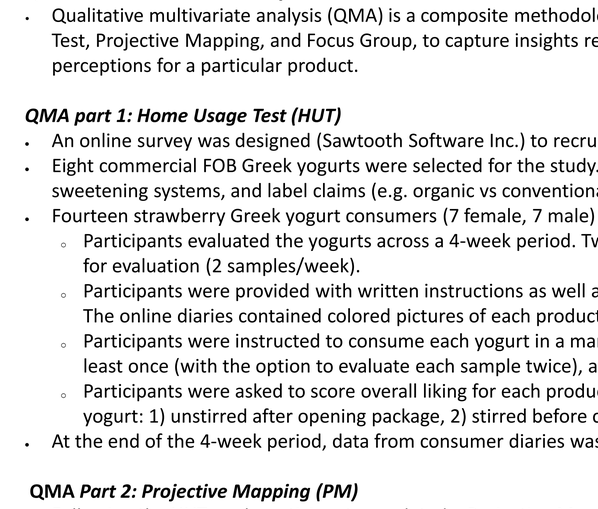

Figure 1. Projective map generated by consumers

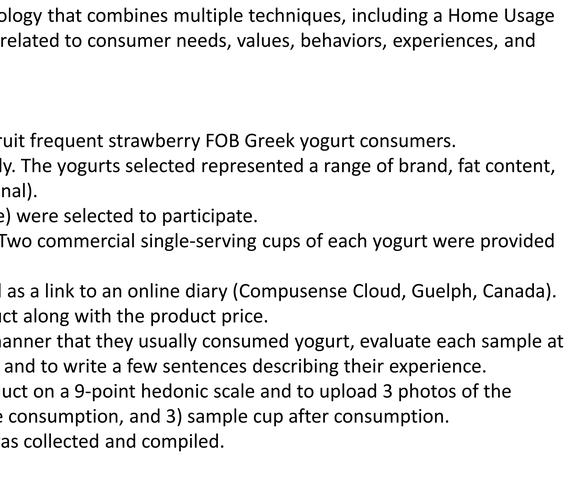

Figure 2. Product descriptors correlated with the projective map; red circle denotes area with highest overall liking scores by panelists

Results

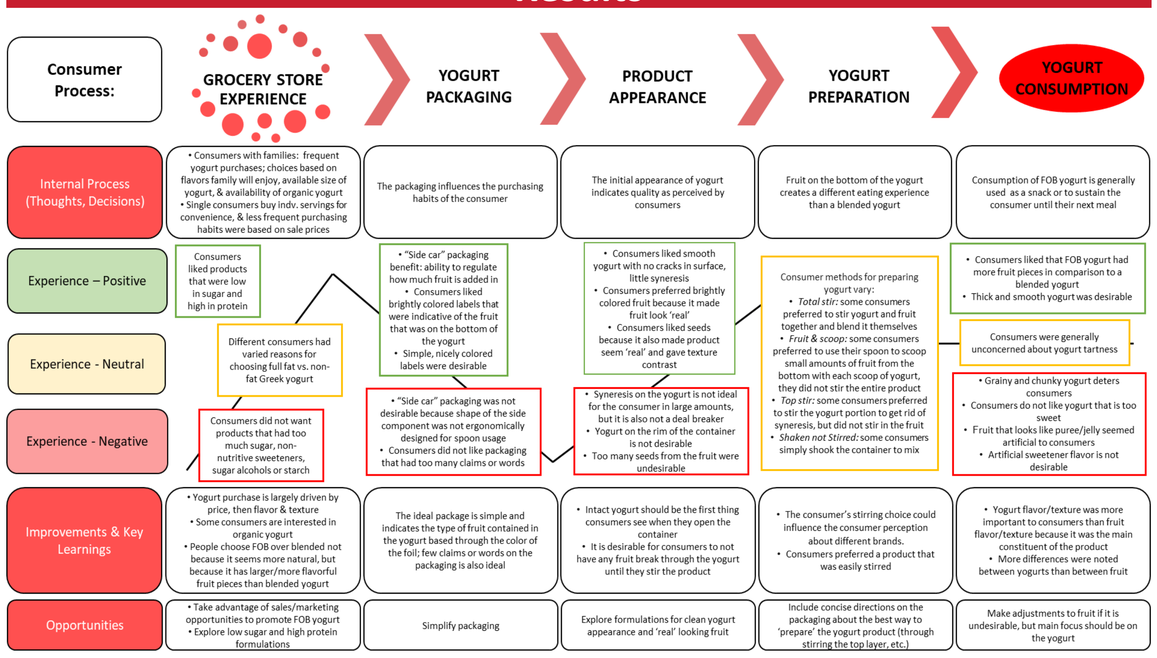

Figure 3. Journey map explaining the 'journey' that consumers experience from the initial step of purchasing the fruit on the bottom Greek yogurt, to the consumption of the product

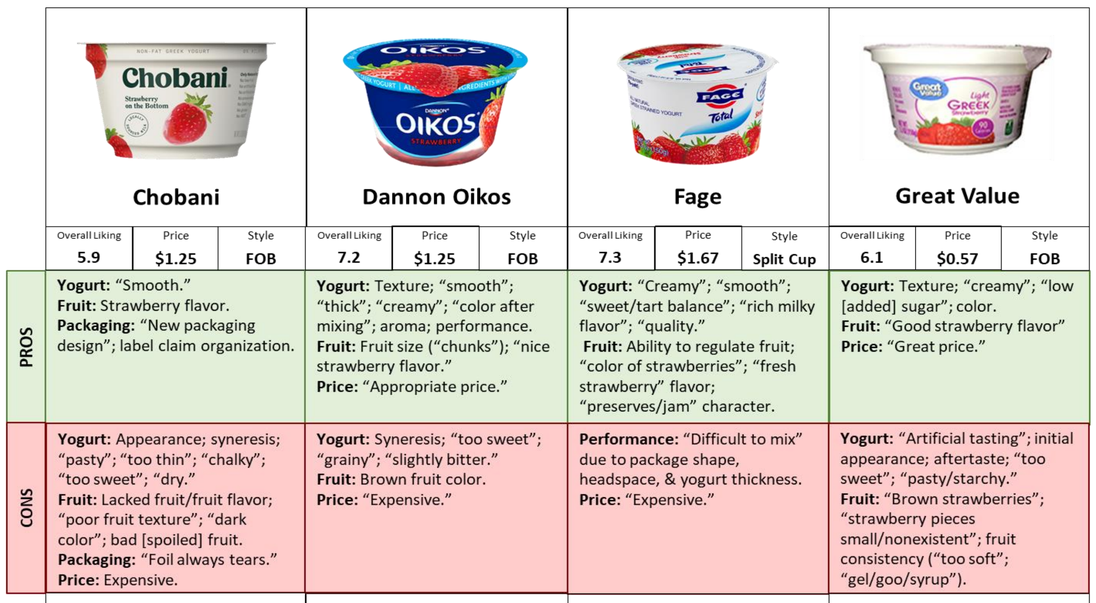

Figure 4. Pictures and comments from panelists (n=14) home usage diaries coupled with overall liking scores

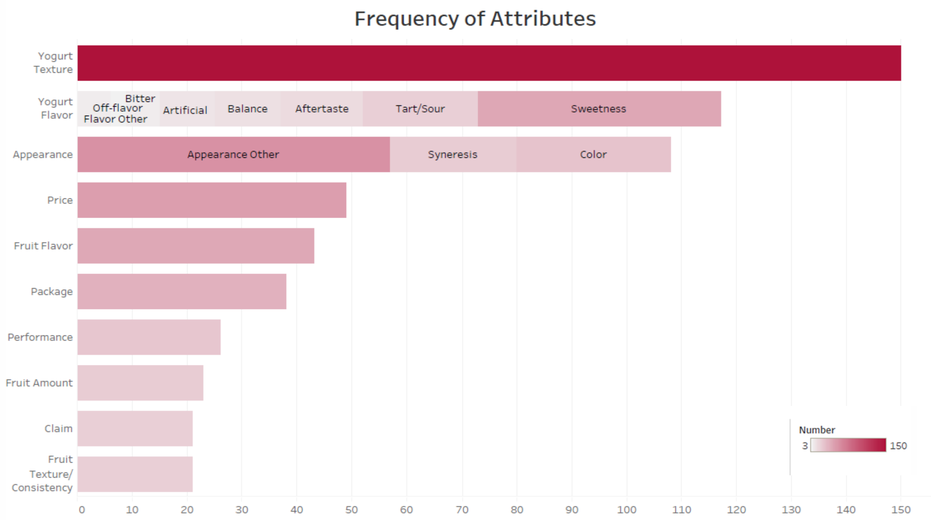

Figure 5. Frequency of consumer attribute comments from the home usage diaries. Sum of number for each overall yogurt flavor; color shows sum of number. The marks are labeled by attribute. Details are shown for attribute and overall yogurt flavor.

Conclusions

- The attributes of yogurt texture and flavor (specifically sweetness) are more important to consumers than fruit flavor and texture in FOB Greek yogurts.
- Consumers use a variety of methods to mix yogurts, which can impact their overall experience with the yogurt and its performance.
- Price is a key driver for yogurt purchase decisions.
- While consumers were concerned about specific appearance attributes (e.g. syneresis and color), these factors were not necessarily deal breakers.

Acknowledgements

Compusense®
Sensory Service Center