BUAN6337.005 – PREDICTIVE ANALYTICS FOR DATA SCIENCE

Group21 Project Report

Create data-driven strategies to help Conagra unlock future growth potential in the Tablespreads category

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1. INTRODUCTION

"Apparently, everything is better with butter." This age-old saying gained newfound relevance during the COVID-19 pandemic when the Tiktok #butterboard trend went viral. The trend led to a surge in sales of butter and other table spreads by 49.5% as people took up baking as a hobby and shared their creations on social media platforms. This trend was not limited to Conagra but also benefited other prominent brands like Land O'Lakes'. However, as the pandemic recedes and people return to their usual routines, it remains to be seen if the trend will sustain or taper off. To mitigate the potential decline in sales, it is essential to identify data-driven strategies to unlock future growth potential in the Tablespreads category. In this report, we will analyze market research data, visualize patterns in sales, and recommend a roadmap for next steps to help Conagra stay ahead of the curve and maintain its competitive edge.

1.1 The Company

Conagra Brands, headquartered in Chicago, Illinois, is a leading American consumer packaged goods holding company. With over 100 brands including popular household names such as BirdsEye, Duncan Hines, and Healthy Choice, Conagra products are available in supermarkets, restaurants, and food service establishments. In addition to these established brands, Conagra also features emerging brands like Angie's BOOMCHICKAPOP, Duke's, and Gardein. The company has a rich history of producing high-quality food products and is known for its entrepreneurial spirit and focus on innovation. Based on its 2021 revenue, Conagra ranked 331st on the 2022 Fortune 500 list.

1.2 Table Spread Category

The table spread category encompasses various types of products including Butter, Butter Blends, Margarine, and Spreads. These food items are typically spread onto bread and crackers with a knife, with the aim of enhancing the flavor or texture of the food. Butter and soft cheeses are among the most used spreads within this category.

2. THE MARKET

To better understand the current situation and to help Conagra improve their profitability, our approach has involved a comprehensive analysis of customer feedback, market research, and data analysis.

2.2 Customer Feedback

We conducted a comprehensive survey to gather insights from a diverse group of stakeholders, including students and customers from retail stores like Tom Thumb and Target. Our research found that customers prioritize brand value over product price when making purchases. Other important factors influencing buying decisions included product quantity, expiration date, and flavor preference (such as salted or unsalted). Fat percentage was also considered during the purchasing process. Customers typically consider the number of family members when deciding on the quantity to purchase, opting for larger quantities that have longer expiration dates and are readily available.

2.3 Market Research

The article we referenced[1] is based on research conducted on participants of various genders and ages. Our study found that consumers can be divided into two main groups: those who only consume butter, and those who consume a combination of butter and margarine. Those who regularly consumed margarine often used butter for special occasions or baking, and believed that both should be consumed in moderation. Participants noted that margarine has a distinct odor and deeper yellow color than butter, while a light-yellow color was preferred for butter. Most participants preferred the taste of butter over margarine, but found it more difficult to spread. It is important to note that these findings are qualitative observations from a small number of participants in focus groups.

Item	Butter-only consumers (n=52)	Butter + margarine consumers (n=107)
Gender	42% male	36% male
	58% female	64% female
Age group	22% 18 to 24 yr	36% 18 to 24 yr
	41% 25 to 35 yr	34% 25 to 35 yr
	37% >36 yr	30% >36 yr
Shop for household	86% shop for household	94% shop for household
	14% do not shop for household	6% do not shop for household
Butter use[1]	16% less than once a month	20% less than once a month
	16% 2 to 4 times a month	33% 2 to 4 times a month
	51% more than once a week	41% more than once a week
	17% every day	6% every day

It can be inferred that customers consider different factors while purchasing butter and margarine products. For butter, the primary factor that influences customer purchasing decisions is the flavor profile, specifically the choice between salted versus unsalted options. Conversely, when it comes to margarine, customers appear to prioritize darker colors, stronger flavors, and very soft texture.

3. DATA ANALYSIS

Based on the data we have received we have tried to understand the following aspects:

3.1 Identifying important attributes

After conducting an analysis of Conagra's table spread data, we have identified several attributes available for CAG, including subcategory, count, ounces, form value, form, tier, and others. Our next step is to evaluate each of these attributes' impact on dollar sales and determine which attribute presents the most significant opportunity for CAG.

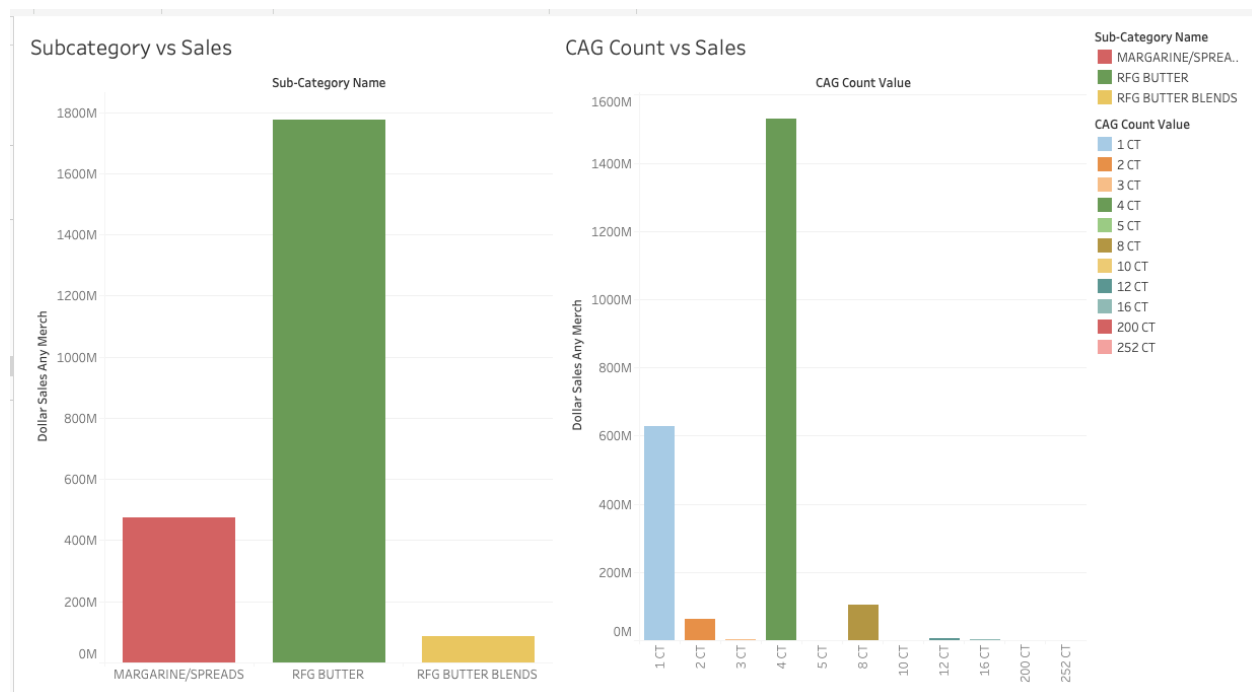The following are plots of various product attributes versus sales:
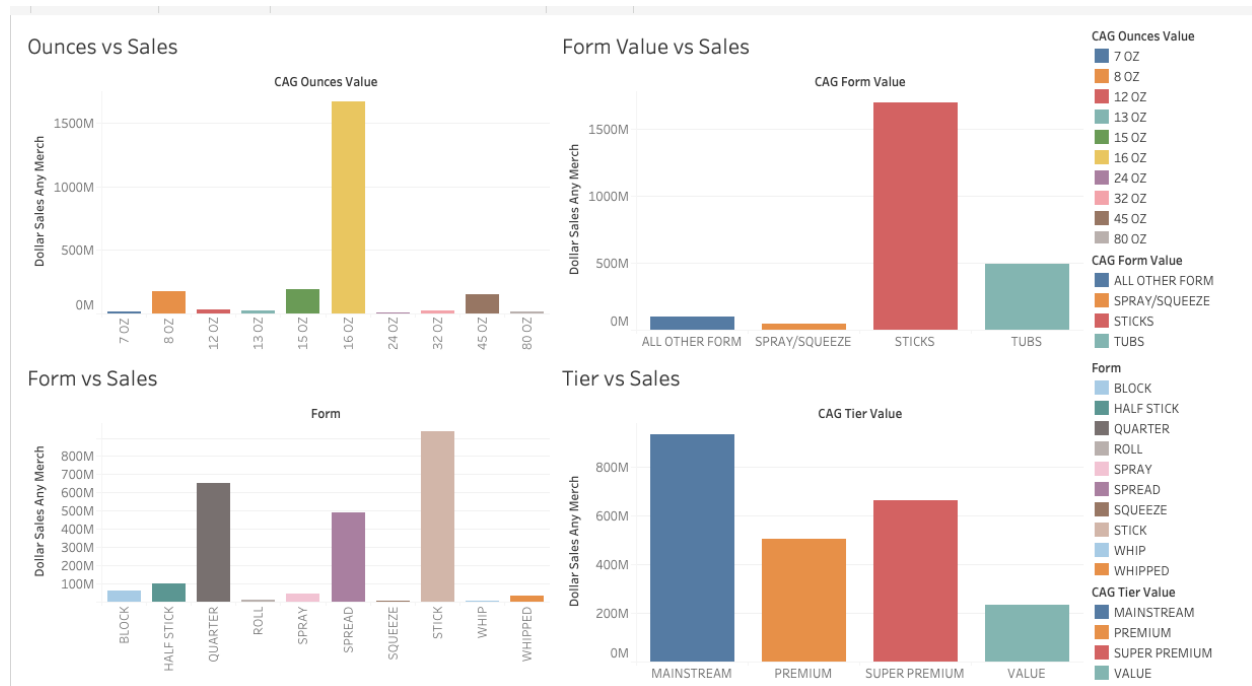

Figure 1:Subcategory and CAG vs Sales

Figure 2: Ounces, Form, Form Value, Tier VS Sales

Based on our analysis of the presented graphs, we have concluded that Form, Tier, and Subcategory have minimal impact on sales growth for CAG. Conversely, Ounce, Form Value, and Count are key attributes that CAG should prioritize when developing product and marketing strategies.

## 3.2 Correlation between price thresholds and impact on sales

For better understanding the Conagra dataset, we selected Earth balance as a sample model. Our analysis focuses on the buyer index, considering various factors that could potentially impact sales and velocities, such as household size, income category, and race.

The quantity of the product purchased is influenced by the number of individuals in a household. Therefore, it is essential to categorize products according to the needs of buyers. For example, individuals living alone may purchase smaller-sized products that last for a shorter period, while households with five or more individuals may require larger quantities of the product that last for a longer period.
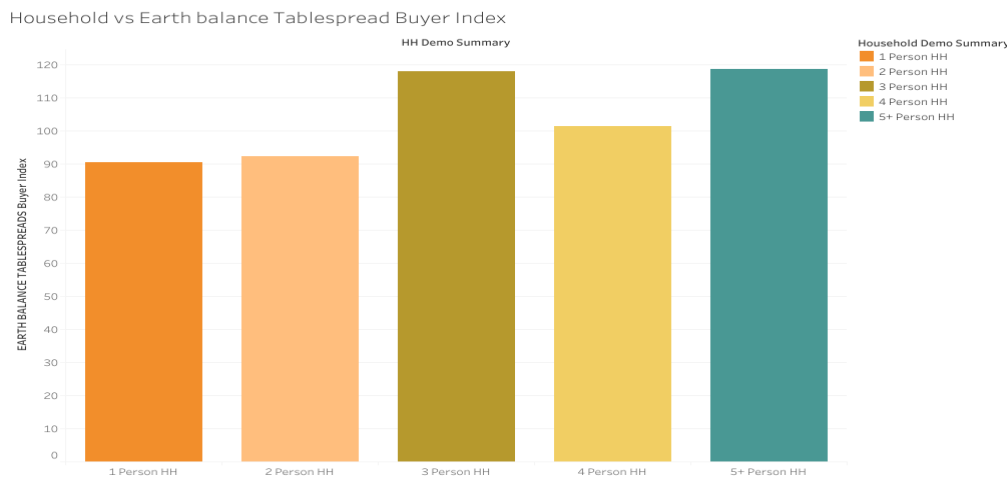

Race also plays a critical role in establishing target consumers and thresholds that may have an unexpected impact on sales and velocities. For example, Asian consumers may not be familiar with table spreads or may perceive them to be more expensive than regular cooking oil. Targeted marketing and attractive pricing strategies can be employed to increase sales in this demographic.

Race vs Earth balance Tablespread Buyer Index
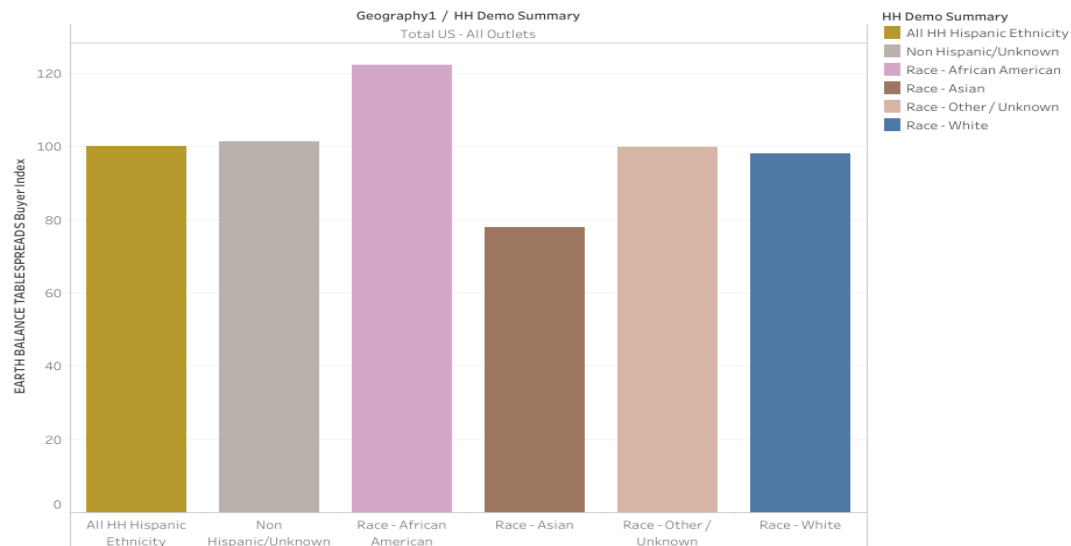
Effective pricing strategies should be employed to ensure the table spread products are accessible to all income categories, thereby expanding market reach.

Income vs Earth balance Tablespread Buyer Index
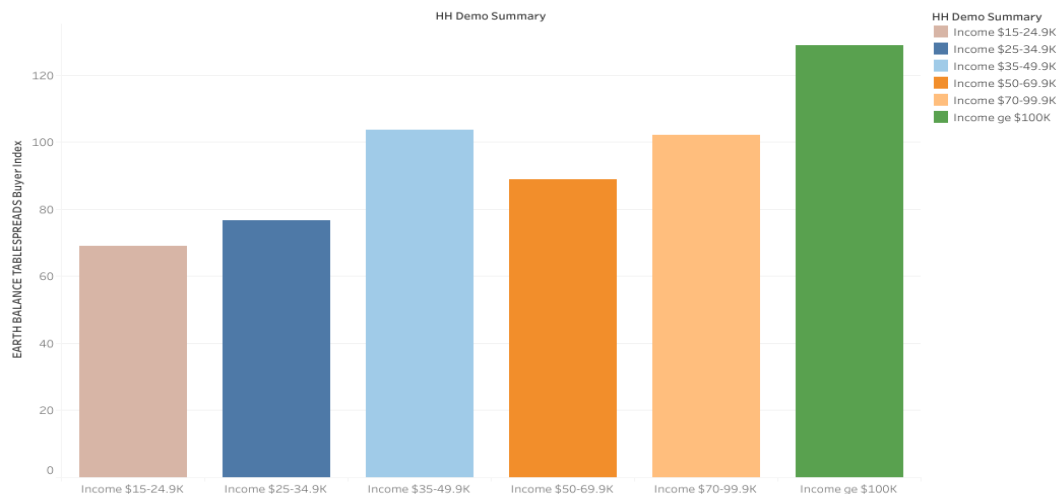
3.3 Interaction Effect Analysis Between Tablespreads, Cooking Oil, and Cooking Spray

We used regression analysis techniques to identify the impact of each of these product categories on revenue, and to identify any interaction effects between them.

Based on our regression analysis, we have identified that there is an interaction effect between Tablespreads, Cooking Oil, and Cooking Spray. This means that the impact of each of these product categories on revenue is not solely based on their individual attributes, but rather, there is a combined effect that needs to be considered when developing strategies to optimize profits.

Further analysis will be conducted to develop a comprehensive strategy for maximizing sales revenue by determining the optimal balance between selling Tablespreads, Cooking Oil, and Cooking Spray. This analysis will help to identify the ideal product mix and pricing strategy to achieve maximum profit for Conagra.
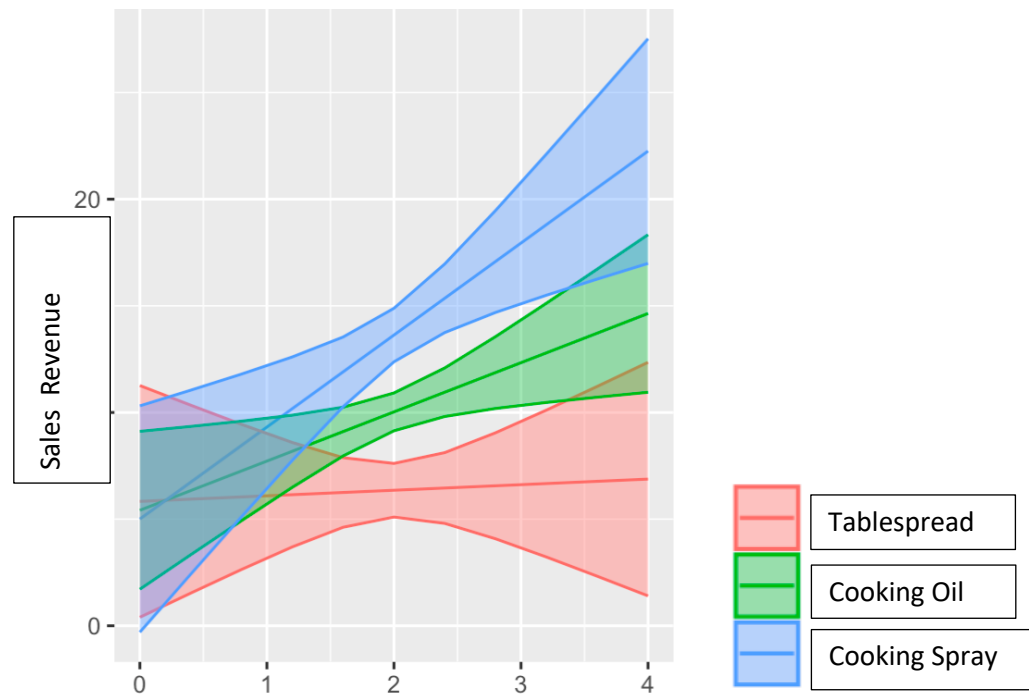

Table 1:Interaction effect of Sales revenue vs Tablespread,Cooking oil ,Cooking Spray

Sales Revenue = b0 + b1(Tablespreads) + b2(Cooking Oil) + b3(Cooking Spray) + error term

3.4 The optimal assortment for Conagra's products in the Tablespreads category

Table 2:The top 10 products which bring in the most revenue for the company.

Consolidated contribution of the top 10 products for Conagra towards sales from 2018-2022
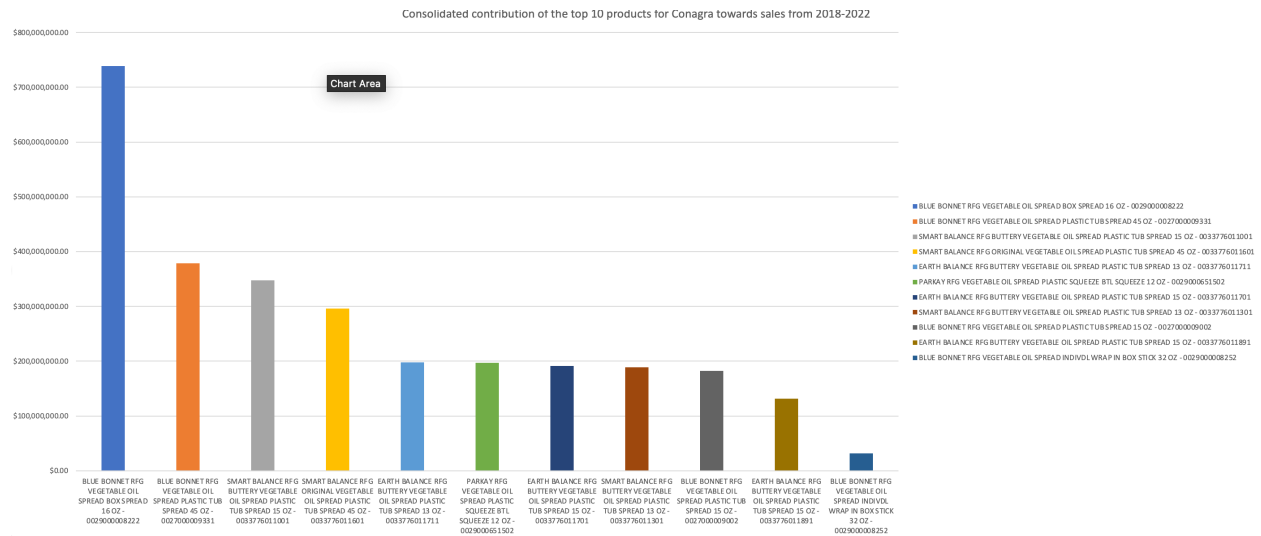
Distribution of table spread form based on CAG ounces value
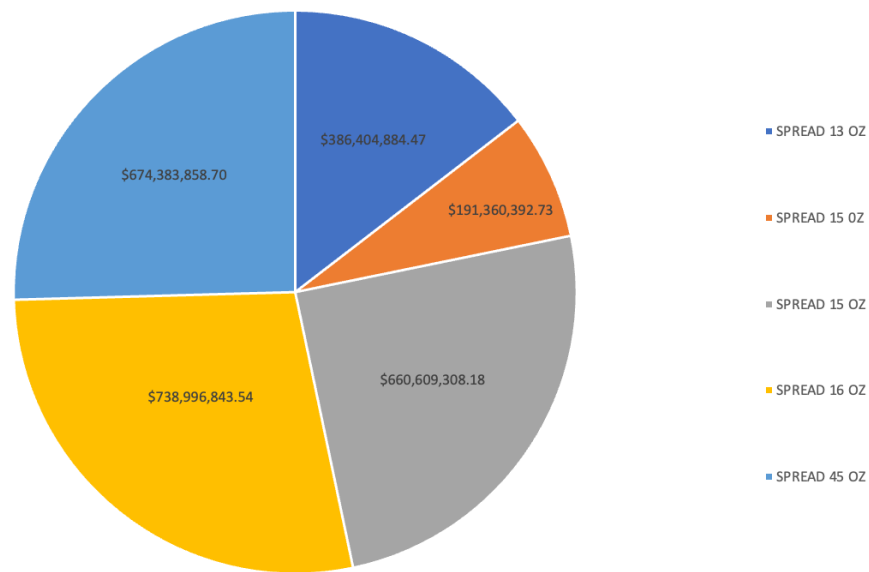
The optimal assortment of the products:

- BLUE BONNET RFG VEGETABLE OIL SPREAD BOX SPREAD 16 OZ - Spread category.
- BLUE BONNET RFG VEGETABLE OIL SPREAD INDIVDL WRAP IN BOX STICK 32 OZ - Stick category
- PARKAY RFG VEGETABLE OIL SPREAD PLASTIC SQUEEZE BTL SQUEEZE 12 OZ - Squeeze/spray category

Based on our analysis, we have found that the standardization of packaging size could potentially improve profitability for the product line. We would further explore if dropping certain packaging sizes and adding new sizes closer to the most popular size could optimize profitability. By making these adjustments, we can potentially reduce production costs and increase sales revenue by offering packaging sizes that better meet the needs of our target market.

4. FUTURE ROADMAP

Apart from the basic analysis that we have done we would like to,

i. further explore the data and find out which product attributes are receiving good number of sales across various geographical locations, across various months and if merchandising is involved.
ii. further come up with a strategy for maximizing sales revenue by determining the optimal balance between selling Tablespreads, Cooking Oil, and Cooking Spray, thereby identify the ideal product mix to achieve maximum profit for Conagra.
iii. investigate whether dropping some packaging sizes and introducing new ones that are similar to the most popular size will improve profitability by reducing production costs and better meet the needs of our target audience.

Work cited

"Identification of the Characteristics That Drive Consumer Liking of Butter." *Journal of Dairy Science*, Elsevier, 20 Feb. 2010, https://www.sciencedirect.com/science/article/pii/S0022030207716995

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