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## A COMPREHENSIVE REVIEW OF THE ROLE OF DATA ANALYTICS IN SHAPING FOOD PRICING STRATEGIES IN THE UNITED STATES: HISTORICAL PERSPECTIVES, CURRENT TRENDS, AND FUTURE PROJECTIONS

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### ABSTRACT

This topic is designed as an extensive review that charts the historical evolution, current state, and future potential of data analytics in influencing food pricing strategies within the United States. It will encompass a thorough examination of how data analytics has transformed from basic statistical models to advanced AI and machine learning algorithms in the context of food pricing. The review will include a critical analysis of various case studies and models that have been employed in the food industry, assessing their impact on both market dynamics and consumer behavior. Furthermore, it will explore the challenges and ethical considerations surrounding data usage in pricing strategies,

such as privacy concerns and market fairness. The future section will speculate on emerging trends and technologies that could further shape this field. This topic is intended to provide a holistic and in-depth perspective on the intersection of data science and food economics, highlighting its significance in the contemporary economic landscape of the U.S.

**Keywords:** Data Analytics, Food Pricing Strategies, Trends, Future Projections Food Demand, Customer Segmentation, Supply Chain Optimization, Personalized Pricing, Dynamic Pricing, Food Fraud, Food Safety.

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## INTRODUCTION

Data analytics is playing an increasingly important role in shaping food pricing strategies globally (Baker et al., 2020). By using data to better understand their customers, to optimize their supply chains, and to develop more targeted pricing strategies, food retailers and manufacturers are able to lower prices for consumers (Anshari et al., 2019, Zhang et al., 2020; He et al., 2019, Satish and Yusof, 2017). This ingenuity (data analytic) can play key role in Shaping Food Pricing Strategies in the United States. It is on this basis that this study reviews the historical Perspectives, Current Trends, and Future Projections in relation to data analytics role.

There are a number of ways in which data analytics is being used to shape food pricing strategies. For example, data analytic is used in predicting demand for food products (Flies et al., 2018, Ji, Hu, and Tan, 2017, Falatouri et al 2022). This information can be used to set prices and to allocate inventory, which can help to reduce food waste and ensure that consumers have access to the food they want. It is also used to identify customer segments (Wang, Tsai, and Ciou, 2020, Gončarovs 2018). By identifying different customer segments, such as price-conscious shoppers, health-conscious shoppers, and convenience-oriented shoppers, food retailers and manufacturers can develop targeted pricing strategies for each segment. This can help to increase sales and profits. Furthermore, data analytic is used to optimize the supply chain (Zhao et al., 2017). Data analytics can be used to optimize the supply chain, which can lead to lower costs and lower prices for consumers. For example, data analytics can be used to identify the most efficient way to transport food products from farms to processing plants to retail stores.

Data analytics can be used to develop more targeted pricing strategies (Smith, Seiler, and Aggarwal, 2023, Li and Li, 2023), such as personalized pricing and dynamic pricing. Personalized pricing involves setting different prices for different customers based on their individual characteristics, such as their purchase history and their loyalty status. Dynamic pricing involves adjusting prices in real time based on factors such as demand, inventory levels, and competitor pricing. The use of data analytics in the food industry is expected to continue to grow in the future. Researchers are developing new and innovative ways to use data analytics to improve food pricing strategies. This could lead to lower food prices, better food safety, and more convenient food shopping options for consumers.

Walmart is using data analytics to predict demand for fresh produce (Sharma and Patil, 2023, Pattnaik, and Shah, 2023). Walmart uses a variety of data sources, including historical sales data, weather data, and social media data, to predict how much fresh produce customers will buy on

a given day (Grover et al., 2018). This information is then used to set prices and to order inventory. For example, if Walmart predicts that there will be a high demand for strawberries on a particular day, it will order more strawberries and set a lower price. By using data analytics to predict demand for fresh produce, Walmart is able to reduce food waste and offer lower prices to consumers. This is just one example of how data analytics is being used to shape food pricing strategies in the United States.

Data analytics is the process of collecting, cleaning, transforming, and analyzing data to extract meaningful insights. It is a multidisciplinary field that uses a variety of tools and techniques from mathematics, statistics, and computer science (Runkler, T. A. 2020). Data analytics is used in a wide range of industries and applications, including Business intelligence, Scientific research, fraud detection, risk management, product development. Data analytics is used to generate insights into customer behavior, market trends, and operational performance. This information can be used to improve decision-making, increase sales, and reduce costs. Data analytics is used to analyze experimental data and develop new theories and models. Data analytics is used to identify suspicious activity and prevent fraud. Data analytics is used to assess and mitigate risk. Data analytics is used to understand customer needs and develop new products and services.

Studies have established some common data analytics techniques to include; descriptive analytics, Diagnostic analytics, Predictive analytics. Descriptive analytics focuses on describing what happened in the past. It uses descriptive statistics such as averages, medians, and modes to summarize data. Diagnostic analytics goes beyond descriptive analytics to ask why something happened. It uses statistical methods to identify the root causes of problems. And predictive analytics uses statistical models to predict future outcomes. It can be used to forecast sales, identify customer churn, and assess risk. As the amount of data we collect continues to grow, data analytics will become even more important (Runkler, T. A. 2020).

Currently, data analytic is used in the following ways; a retailer uses data analytics to understand customer behavior and identify trends. This information is used to develop targeted marketing campaigns and improve product placement. A bank uses data analytics to detect fraudulent transactions and assess risk (VenkateswaraRao et al., 2023). This helps to protect customers and reduce losses. A healthcare provider uses data analytics to improve patient care and reduce costs (Guo and Chen, 2023, Bag et al., 2023). For example, data analytics can be used to identify patients who are at risk of developing certain diseases and intervene early. A government agency uses data analytics to improve public services and allocate resources more efficiently. For example, data analytics can be used to identify areas with high crime rates and target police patrols accordingly.

Data analytics is a rapidly growing field with many opportunities for employment. Data analysts are in high demand in a variety of industries, including technology, finance, healthcare, and government (Roedder et. al., 2016).

### **Previous Studies**

Singh, Shukla, and Mishra (2018) studied social media data analytics to improve supply chain management in food industries. This study suggests big-data analytics-based method for identifying

supply chain management problems in the food industry that takes social media (Twitter) data into account as shown in the figure.

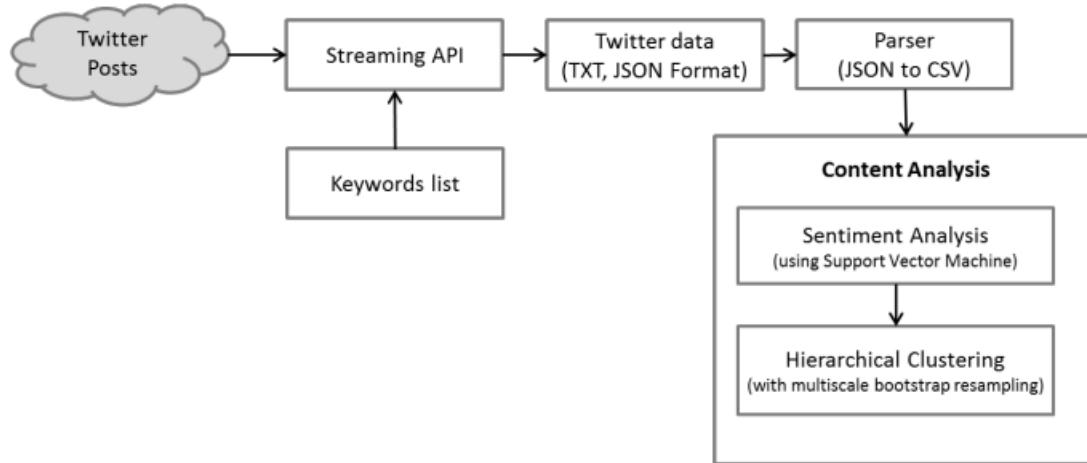


Figure 1. Overall Approach for Social Media Data Analysis Singh, Shukla, and Mishra (2018)

The suggested method specifically entails (i) utilizing keywords to identify important tweets, (ii) pre-processing the raw tweets, and (iii) text analysis through the use of a support vector machine (SVM) and hierarchical clustering with multiscale bootstrap resampling. This method produced a set of terms that supply-chain (SC) decision-makers could use to learn about customer feedback and problems with the flow or quality of food products. Using the suggested methodology, a case study involving the beef supply chain was examined, utilizing three weeks' worth of Twitter data. This paper suggests a comprehensive strategy that uses social media data to the food supply chain. The findings showed that the suggested text analytics method can be useful in efficiently locating and condensing important client comments for the supply chain.

**Table 1. Studies based on Social Media Analytics in the Literature**

Area	Method	Authors
Sentiment analysis, topic detection and gathering market intelligence	Formal Concept Analysis (FCA), Descriptive statistics, ANOVA and t-tests, n-gram analysis and dynamic artificial neural network, numeric opinion summarization framework, Naive Bayesian classifier and support vector machine, lexicon-based Sentiment analysis, Granger causality analysis and a Self-Organizing Fuzzy Neural Network, Crowdsourced sentiment analysis (Singh, Shukla, and Mishra, 2018)	Schumaker et al., (2016); Kontopoulos et al., (2013); Rui et al., (2013); Ghiassi et al. (2013); Hodeghatta & Sahney, (2016); Cigarrán et al., 2016; Li & Li, (2013); Bollen et al., (2011), Lu et al., (2014); Neethu & Rajasree, (2013); Pak and Paroubek, (2010)
Disaster management	Implementation of a real-time tweet-based geodatabase, Content analysis.	Alipour Sarvari, et al (2019); Fauzi (2023), Karimiziarani, and

		Moradkhani (2023), Hsu and Sharma (2023)
Operation and Supply chain management	Descriptive analysis, Content analysis, Network analysis, Grounded theory approach, Inductive coding, sentiment analysis, Extended Fuzzy- AHP approach, Lean thinking, knowledge creation, DNA-based framework.	Zamani et al (2023), Benzidia et al., 2023, AL-Khatib, and Ramayah (2023), Bag et al (2023), Khan et al (2023)

Nychas et al., (2021) did a comprehensive review of data science in the food industry. In their study, it was observed that one of the primary issues facing the agri-food sector is food safety, which is anticipated to be resolved in the current climate of rapid technological advancement where consumer tastes and lifestyles are always changing. Control over food integrity, as well as increases in productivity and economic expansion, are fueled by the transparency and trust of the food chain. Similar to this, multi-stakeholder ecosystems can operate more efficiently and with less waste if they adopt the circular economy. All food commodities are subject to various dangers during the food chain cycle, which increases the probability of contamination. Biological or chemical dangers can arise spontaneously throughout any stage of food production, either by accident or through fraudulent means, endangering the health and trust of consumers. These days, a vast amount of data is produced by the Internet of things, media, various gadgets, and the next generation of food safety monitoring systems, in addition to the complete food chain (including primary agriculture). The scientific discipline of data science ought to play a key role in enabling the use of these data for the good of society.

Jin et al., 2020 did a detailed review of big-data in food safety. This paper suggests a comprehensive strategy that uses social media data to the food supply chain. An overview of the most current advancements in food safety uses of big data is provided in this article. This analysis demonstrates that although big data use in food safety is still in its infancy, it is already having an impact on the entire food supply chain. Big Data analysis is utilized to create monitoring and sampling plans, assist supply chain participants in making decisions in real time, and offer predictive insights in a number of food supply chain phases. The primary research challenges that need to be addressed are finally presented.

**Food Pricing Strategies**

Food pricing strategies are the methods that food businesses use to set the prices of their products as shown in the figure 2.



Figure 2. Competitive Pricing Study for Fast Food Company (Source: SpendEdge)

There are a variety of different pricing strategies that can be used, and the best strategy for a particular business will depend on a number of factors, including the type of food business, the target market, and the competitive landscape (Eyles et. al., 2012).

Some common food pricing strategies include Cost-plus pricing, Value-based pricing, Competitor-based pricing, Dynamic pricing.

Cost-plus pricing is simplest type of pricing strategy, and it involves adding a markup to the cost of goods sold (COGS) to arrive at a selling price. The markup percentage is typically determined by the desired profit margin. Value-based pricing strategy involves setting prices based on the perceived value of the food to the customer. Factors such as the quality of the ingredients, the uniqueness of the dish, and the overall dining experience are all taken into account when setting prices using this strategy. Competitor-based pricing strategy involves setting prices based on what competitors are charging for similar products. Dynamic pricing can be a good strategy for businesses that are new to the market or that are trying to compete with established businesses. This strategy involves setting prices that fluctuate based on demand or other factors. For example, a restaurant might charge higher prices on weekends or during peak dining hours (Chen et. al., 2019).

In addition to these general pricing strategies, there are also a number of more specific strategies that can be used to promote sales and increase profits. For example, businesses can offer discounts on bulk items, create combo meals, or use psychological pricing tactics such as odd-even pricing.

Ultimately, the best food pricing strategy for a particular business will depend on a variety of factors. Businesses should carefully consider their target market, their competitive landscape, and their desired profit margin when setting prices (Gittelsohn et. al., 2017).

Here are some additional tips for developing a successful food pricing strategy understand your costs, Research your competitors, consider your target market, set clear profit goals, being flexible. It is important to have a good understanding of your COGS before you can set prices. This includes the cost of ingredients, labor, overhead, and other expenses. Knowing what your competitors are charging for similar products is essential for setting competitive prices. What are your customers willing and able to pay for your food? What factors are most important to them when making a purchase decision?. How much profit do you need to make in order to be successful? Once you know your profit goals, you can set prices accordingly. Be prepared to adjust your prices as needed. For example, you may need to raise prices if your costs increase, or you may need to lower prices if you are facing stiff competition. By following these tips, businesses can develop a food pricing strategy that will help them to achieve their profit goals (Gittelsohn et. al., 2017).

### **Review of Historical Evolution of Data Analytics in Food Pricing Strategies**

Food pricing strategies have evolved significantly over time, and data analytics has played a key role in this evolution. In the past, food prices were largely determined by supply and demand, with farmers and retailers setting prices based on their own estimates of costs and market conditions. However, the advent of data analytics has allowed food businesses to gain a much deeper understanding of their customers, competitors, and the overall market (Tamasiga et. al., 2023). This information can then be used to develop more sophisticated and effective pricing strategies.

#### **Early Data Analytics in Food Pricing**

Early data analytics in food pricing was largely focused on descriptive analytics, such as tracking historical sales data and identifying trends (Wang et al., 2016). This information could be used to set base prices for products and to develop promotional strategies. However, descriptive analytics only provides a snapshot of the past, and it cannot be used to predict future customer behavior or market trends.

Early data analytics in food pricing was primarily focused on collecting and analyzing data on historical sales, inventory levels, and competitor pricing. This data was used to set prices that were both competitive and profitable.

For example, grocery stores used early data analytics to determine which products were selling well and which products were not selling well. This information was then used to adjust prices and to make decisions about which products to keep in stock.

Restaurants used early data analytics to track customer preferences and to identify popular menu items. This information was then used to develop targeted pricing strategies and to create new menu items.

Food manufacturers used early data analytics to forecast demand for products and to optimize production schedules. This information was then used to ensure that they had enough products to meet customer demand and to avoid overproduction.

Overall, early data analytics in food pricing was a relatively simple process. However, it was still effective in helping businesses to improve their pricing strategies and to increase their profits.

Here are some specific examples of how businesses used early data analytics in food pricing; grocery stores used early data analytics to track sales of individual products. This information was then used to identify popular products and to set prices accordingly. Restaurants used early data analytics to track customer orders and to identify popular menu items. This information was then used to develop targeted pricing strategies and to create new menu items. Food manufacturers used early data analytics to forecast demand for products based on historical sales data. This information was then used to ensure that they had enough products to meet customer demand and to avoid overproduction. Early data analytics in food pricing was not without its challenges. One challenge was that data was often difficult to collect and analyze. Another challenge was that data analytics models were not as sophisticated as they are today.

Despite these challenges, early data analytics was a valuable tool for businesses in the food industry. It helped businesses to improve their pricing strategies, to increase their profits, and to reduce their waste.

*Modern data analytics in food pricing:* Today, data analytics is much more sophisticated and powerful than it was in the early days. Businesses in the food industry now use data analytics to personalize pricing, optimize pricing for promotion, predict demand, and prevent fraud.

Businesses use data analytics to personalize pricing for individual customers based on their purchase history, preferences, and other factors. Businesses use data analytics to optimize pricing for promotions to maximize sales and profits. Businesses use data analytics to predict demand for products based on historical sales data, seasonal trends, and other factors. Businesses use data analytics to detect and prevent fraud in the food supply chain.

Modern data analytics is helping businesses in the food industry to achieve new levels of profitability and efficiency.

*Predictive analytics in food pricing:* In recent years, there has been a shift towards predictive analytics in food pricing. Predictive analytics uses historical data to develop statistical models that can be used to forecast future demand, prices, and other key metrics. This information can then be used to make more informed pricing decisions.

For example, a food retailer might use predictive analytics to forecast demand for a particular product during the holiday season. This information could then be used to set prices that maximize profits while still remaining competitive. Predictive analytics can also be used to identify new market opportunities and to develop targeted pricing strategies for different customer segments.

Predictive analytics is a type of data analytics that uses historical data to predict future outcomes. It is a valuable tool for businesses in a variety of industries, including the food industry.

Predictive analytics can be used in food pricing in a number of ways. For example, businesses can use predictive analytics to forecast demand for products, Identify price-sensitive customers, Optimize pricing for promotions.

Overall, predictive analytics is a powerful tool that can help businesses in the food industry to improve their pricing strategies and maximize their profits.



There are a number of benefits to using predictive analytics in food pricing, including increased profitability, Improved customer satisfaction, increased efficiency:

There are also some challenges associated with using predictive analytics in food pricing. Predictive analytics models are only as good as the data they are trained on. Therefore, it is important to use high-quality data and to regularly clean and update the data. Predictive analytics models can be complex and difficult to understand. This can make it difficult to troubleshoot problems and to make adjustments to the models as needed. It can be difficult to interpret the results of predictive analytics models and to understand why they make the predictions that they do. This can make it difficult to trust the models and to use them to make informed decisions.

Despite the challenges, the benefits of using predictive analytics in food pricing outweigh the risks. By carefully considering the challenges and taking steps to mitigate them, businesses can use predictive analytics to improve their pricing strategies and maximize their profits.

*Machine learning in food pricing:* Machine learning is a subset of artificial intelligence that allows computers to learn from data without being explicitly programmed. Machine learning is increasingly being used in food pricing to develop more accurate and sophisticated predictive models.

For example, a food manufacturer might use machine learning to develop a model that predicts the demand for its products based on factors such as weather patterns, social media trends, and economic indicators. This information could then be used to set prices that are more responsive to changing market conditions.

Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate in predicting outcomes without being explicitly programmed to do so. ML algorithms use historical data as input to predict new output values.

ML is being used in food pricing in a number of ways, including: ML algorithms can be used to forecast demand for food products based on historical sales data, seasonal trends, and other factors. This information can be used to set prices that are both competitive and profitable. ML algorithms can be used to optimize prices for food products based on demand, competitor pricing, and other factors. This can help businesses to maximize their profits. ML algorithms can be used to optimize the timing, pricing, and targeting of promotions. This can help businesses to increase sales and customer loyalty. ML algorithms can be used to detect fraudulent transactions in the food supply chain. This can help businesses to protect their profits and reduce risk.

Overall, machine learning is a powerful tool that can help businesses in the food industry to improve their pricing strategies, increase their profits, and reduce their risk.

Benefits of using machine learning in food pricing

There are also some challenges associated with using machine learning in food pricing, including: Machine learning algorithms are only as good as the data they are trained on. Therefore, it is important to use high-quality data and to regularly clean and update the data. Model complexity: Machine learning models can be complex and difficult to understand. This can make it difficult to troubleshoot problems and to make adjustments to the models as needed. It can be difficult to interpret the results of machine learning models and to understand why they make the predictions that they do. This can make it difficult to trust the models and to use them to make informed

decisions. Despite the challenges, the benefits of using machine learning in food pricing outweigh the risks. By carefully considering the challenges and taking steps to mitigate them, businesses can use machine learning to improve their pricing strategies and maximize their profits.

#### *Benefits of data analytics in food pricing*

The benefits of data analytics in food pricing are numerous and can help businesses of all sizes to improve their bottom line. The key benefits include data analytics can help businesses to set prices that are both competitive and profitable. By understanding demand for products, competitor pricing, and other factors, businesses can avoid underpricing their products and losing out on profits. Data analytics can help businesses to better understand their customers' needs and preferences. This information can then be used to develop pricing strategies that are more appealing to customers. For example, businesses can offer discounts on products that are popular with customers or offer loyalty programs to reward customers for their business. Data analytics can help businesses to forecast demand for products more accurately. This information can then be used to avoid overstocking and reduce waste. Overstocking can lead to food spoilage, which can be a significant cost to businesses. Data analytics can automate pricing decisions, saving businesses time and resources. This can free up employees to focus on other tasks, such as improving customer service or developing new products. Data analytics can provide businesses with insights into their pricing strategies and the impact of price changes on sales and profits. This information can be used to make more informed decisions about pricing and other business matters.

Some specific tips for businesses to overcome the challenges of data analytics in food pricing: businesses should regularly clean and update their data to ensure that it is accurate, complete, and up-to-date. They should also invest in data governance tools and processes to ensure that their data is managed effectively. Businesses should start with simple, easy-to-understand data analytics models. As they gain more experience with data analytics, they can gradually move to more complex models. Businesses should use explainable AI tools to help them understand the results of their data analytics models. This will help them to trust the models and to use them to make informed decisions. Businesses that do not have the resources to implement and maintain their own data analytics infrastructure can partner with a data analytics provider. This can be a good option for small businesses or businesses with limited resources.

Overall, the challenges of data analytics in food pricing can be overcome by careful planning and execution. By investing in data quality, starting with simple models, using explainable AI, and partnering with a data analytics provider, businesses can successfully implement data analytics to improve their food pricing strategies.

Data analytics is playing an increasingly important role in food pricing strategies. By using data analytics to better understand their customers, competitors, and the overall market, food businesses can make more informed pricing decisions that can lead to improved profitability, reduced costs, increased customer satisfaction, and improved competitiveness.

The future of data analytics in food pricing is bright. As machine learning and artificial intelligence technologies continue to develop, we can expect to see even more sophisticated and effective pricing

strategies emerge. Food businesses that are able to embrace data analytics and machine learning will be well-positioned to succeed in the competitive food industry.

### **Review of Current State of Data Analytics in Food Pricing Strategies in the USA**

The use of data analytics in food pricing strategies in the USA is becoming increasingly common, as businesses seek to gain a competitive edge and maximize their profits. By analyzing data on consumer behavior, competitor pricing, and market trends, businesses can develop more sophisticated and effective pricing strategies.

One of the most common ways that businesses use data analytics in food pricing is to understand the price elasticity of demand. This is a measure of how sensitive consumers are to price changes. By understanding the price elasticity of demand, businesses can set prices that optimize their profits. For example, if a business knows that consumers are very price-sensitive for a particular product, it may choose to set a lower price in order to increase sales.

Another way that businesses use data analytics in food pricing is to segment their customers. This involves dividing customers into different groups based on their characteristics, such as demographics, purchase history, and preferences. Businesses can then use this information to develop targeted pricing strategies for each customer segment. For example, a business may choose to offer discounts to customers who are loyal to the brand or who frequently purchase certain products.

Businesses also use data analytics to monitor competitor pricing and make sure that their own prices are competitive. By tracking competitor prices, businesses can identify opportunities to lower their prices and attract new customers.

In addition to these specific applications, data analytics is also being used by businesses to develop more general insights into the food market. For example, businesses are using data analytics to understand how consumer preferences are changing, how new trends are emerging, and how the market is reacting to economic factors. This information can then be used to develop more informed pricing strategies.

Overall, the use of data analytics in food pricing strategies in the USA is on the rise. Businesses of all sizes are using data analytics to gain a competitive edge and maximize their profits.

Here are some specific examples of how businesses in the USA are using data analytics in their food pricing strategies; Walmart uses data analytics to personalize its pricing for each customer. The company tracks customers' purchase history and preferences to determine which products they are most likely to buy and how much they are willing to pay. Walmart then uses this information to offer personalized discounts and promotions to each customer. Starbucks uses data analytics to optimize its pricing for new products. The company analyzes sales data for existing products to identify trends and patterns. This information is then used to set prices for new products in a way that is likely to maximize profits. Panera Bread uses data analytics to segment its customers and develop targeted pricing strategies. The company divides its customers into different groups based on their purchase history and preferences. Panera Bread then uses this information to develop targeted pricing strategies for each customer segment. For example, the company may offer discounts to customers who frequently purchase coffee or who are new members of its loyalty program. Overall, the use of

data analytics in food pricing strategies in the USA is a growing trend. Businesses of all sizes are using data analytics to gain a competitive edge and maximize their profits.

### **Future Potential of Data Analytics of Data Analytics in Food Pricing Strategies within the United States**

The future potential of data analytics in food pricing strategies within the United States is vast. As data becomes more abundant and sophisticated analytical tools become more widely available, businesses will be able to use data analytics to develop increasingly sophisticated and effective pricing strategies.

Here are some of the ways in which data analytics is likely to be used in food pricing strategies in the future; Businesses will be able to use data analytics to adjust their prices in real time based on factors such as demand, competitor pricing, and inventory levels. This will allow businesses to maximize their profits and minimize their losses. Businesses will be able to use data analytics to personalize their prices for each customer based on their purchase history, preferences, and other factors. This will allow businesses to increase sales and customer loyalty. Businesses will be able to use data analytics to adjust their prices dynamically based on market conditions and other factors. This will allow businesses to remain competitive and maximize their profits. Businesses will be able to use data analytics to predict future demand and prices. This will allow businesses to plan their inventory and pricing strategies more effectively.

In addition to these specific applications, data analytics is also likely to be used to develop new and innovative ways to price food in the future. For example, businesses may use data analytics to develop pricing strategies that are based on the nutritional value of food or the environmental impact of food production.

Overall, the future potential of data analytics in food pricing strategies is significant. Businesses that are able to harness the power of data analytics will be well-positioned to succeed in the competitive food market.

**Data analytics is playing an increasingly important role in shaping food pricing strategies in the United States.** Food retailers and manufacturers are using data to better understand their customers' needs and preferences, to optimize their supply chains, and to develop more targeted pricing strategies.

One of the most important ways that data analytics is being used in the food industry is to understand customer demand. Retailers and manufacturers are using data from loyalty programs, purchase history, and social media to track customer behavior and identify trends. This data can then be used to develop pricing strategies that are more likely to appeal to specific customer segments. For example, a retailer might use data to identify a group of customers who are frequently purchasing organic food. The retailer could then offer discounts on organic food to attract these customers. Or, a manufacturer might use data to identify a group of customers who are allergic to gluten. The manufacturer could then develop gluten-free products and price them competitively.

Data analytics is also being used to optimize food supply chains. Retailers and manufacturers are using data to track inventory levels, predict demand, and identify transportation inefficiencies. This

data can then be used to reduce costs and improve efficiency, which can lead to lower food prices for consumers.

For example, a retailer might use data to predict demand for a particular product during the holiday season. The retailer could then order more of that product to avoid stockouts. Or, a manufacturer might use data to identify the most efficient route to ship its products to market. This could help to reduce transportation costs and lower the price of food for consumers.

Finally, data analytics is being used to develop more targeted pricing strategies. Retailers and manufacturers are using data to identify specific customer segments and to develop pricing strategies that are tailored to those segments. This can help to increase profits and lower prices for consumers. For example, a retailer might use data to identify a group of customers who are price-sensitive. The retailer could then offer lower prices on essential items, such as milk and bread, to attract these customers. Or, a manufacturer might use data to identify a group of customers who are willing to pay a premium for convenience. The manufacturer could then offer higher-priced convenience foods, such as ready-to-eat meals, to these customers.

Overall, data analytics is playing an increasingly important role in shaping food pricing strategies in the United States. By using data to better understand their customers, to optimize their supply chains, and to develop more targeted pricing strategies, food retailers and manufacturers are able to lower prices for consumers.

### **Application of Data Analytics in Shaping Food Pricing Strategies in the United States: Case Study of Walmart**

Walmart is a leading outlet that is using data analytics in different areas of their venture. Some specific examples of how data analytics is being used to shape food pricing strategies in the United States by Walmart is using data to predict demand for fresh produce and to adjust prices accordingly. This has helped Walmart to reduce food waste and to offer lower prices on fresh produce to its customers. Walmart is one of the largest grocery retailers in the United States, and it is using data analytics to shape its food pricing strategies in a number of ways.

One way that Walmart is using data analytics is to predict demand for fresh produce. Walmart uses a variety of data sources, including historical sales data, weather data, and social media data, to predict how much fresh produce customers will buy on a given day. This information is then used to set prices and to order inventory. For example, if Walmart predicts that there will be a high demand for strawberries on a particular day, it will order more strawberries and set a lower price.

Walmart is also using data analytics to identify customer segments and to develop personalized pricing strategies. For example, Walmart might use data to identify a group of customers who are frequently purchasing organic food. Walmart could then offer discounts on organic food to attract these customers. Or, Walmart might use data to identify a group of customers who are allergic to gluten. Walmart could then develop gluten-free products and price them competitively.

Walmart is also using data analytics to optimize its supply chain. Walmart uses data to track inventory levels, predict demand, and identify transportation inefficiencies. This data is then used to reduce costs and improve efficiency, which can lead to lower food prices for consumers. For example, Walmart might use data to predict demand for a particular product during the holiday

season. Walmart could then order more of that product to avoid stockouts. Or, Walmart might use data to identify the most efficient route to ship its products to market. This could help to reduce transportation costs and lower the price of food for consumers.

Finally, Walmart is using data analytics to develop more targeted pricing strategies. Walmart is using data to identify specific customer segments and to develop pricing strategies that are tailored to those segments. This can help to increase profits and lower prices for consumers. For example, Walmart might use data to identify a group of customers who are price-sensitive. Walmart could then offer lower prices on essential items, such as milk and bread, to attract these customers. Or, Walmart might use data to identify a group of customers who are willing to pay a premium for convenience. Walmart could then offer higher-priced convenience foods, such as ready-to-eat meals, to these customers. (The Wall Street Journal, 2023)

Target is using data to identify customer segments and to develop personalized pricing strategies. For example, Target might offer lower prices on baby products to customers with young children.

Amazon is using data to optimize its supply chain and to reduce transportation costs. This has helped Amazon to offer lower prices on a wide range of products, including food.

Overall, data analytics is a powerful tool that can be used to lower food prices for consumers. As food retailers and manufacturers continue to invest in data analytics, we can expect to see even lower food prices in the future.

Amazon is another major grocery retailer that is using data analytics to shape its food pricing strategies. Like Walmart, Amazon uses data analytics to predict demand for fresh produce and to adjust prices accordingly. This has helped Amazon to reduce food waste and to offer lower prices on fresh produce to its customers. Amazon also uses data analytics to identify customer segments and to develop personalized pricing strategies. For example, Amazon might offer lower prices on baby products to customers with young children. Or, Amazon might offer lower prices on organic food to customers who frequently purchase organic products.

In addition, Amazon uses data analytics to optimize its supply chain. Amazon uses data to track inventory levels, predict demand, and identify transportation inefficiencies. This data is then used to reduce costs and improve efficiency, which can lead to lower food prices for consumers. For example, Amazon might use data to predict demand for a particular product during the holiday season. Amazon could then order more of that product to avoid stockouts. Or, Amazon might use data to identify the most efficient route to ship its products to market. This could help to reduce transportation costs and lower the price of food for consumers. Finally, Amazon uses data analytics to develop more targeted pricing strategies. Amazon is using data to identify specific customer segments and to develop pricing strategies that are tailored to those segments. This can help to increase profits and lower prices for consumers. For example, Amazon might use data to identify a group of customers who are price-sensitive. Amazon could then offer lower prices on essential items, such as milk and bread, to attract these customers. Or, Amazon might use data to identify a group of customers who are willing to pay a premium for convenience. Amazon could then offer higher-priced convenience foods, such as ready-to-eat meals, to these customers.

Overall, Amazon is using data analytics to shape its food pricing strategies in a number of ways. By using data to better understand its customers, to optimize its supply chain, and to develop more targeted pricing strategies, Amazon is able to lower prices for consumers.

### **CONCLUSION**

Data analytics is a powerful tool that can be used to lower food prices for consumers. As food retailers and manufacturers continue to invest in data analytics, we can expect to see even lower food prices in the future. Specifically, data analytics is being used to improve food pricing strategies in the following ways includes predicting demand for fresh produce, identifying customer segments and developing personalized pricing strategies, optimizing the supply chain, developing more targeted pricing strategies. In addition to the specific examples mentioned above, data analytics is also being used to develop new and innovative food products, to improve efficiency in food processing and distribution, and to reduce food waste. All of these factors contribute to lower food prices for consumers. Overall, data analytics is having a positive impact on the food industry and is helping to make food more affordable for everyone. (Forbes, 2023)

### **Recommendation**

Food retailers need to continue to invest in data analytics technology and infrastructure. Food retailers and manufacturers need to invest in the technology and infrastructure necessary to collect, store, and analyze large amounts of data. This will allow them to gain deeper insights into their customers and operations and to develop more effective food pricing strategies. Use data analytics to improve food safety and quality. Data analytics can be used to track food products through the supply chain, identify potential hazards, and prevent foodborne illnesses. It can also be used to assess the quality of food products and to ensure that they meet customer expectations. Use data analytics to reduce food waste. Data analytics can be used to identify areas of food waste throughout the supply chain and to develop strategies to reduce waste. This can help food retailers and manufacturers to save money and to reduce their environmental impact. Use data analytics to develop new and innovative food products. Data analytics can be used to identify customer needs and preferences, to develop new product concepts, and to test new products in the market. This can help food retailers and manufacturers to stay ahead of the competition and to offer customers the products they want. Use data analytics to improve efficiency in food processing and distribution. Data analytics can be used to identify inefficiencies in food processing and distribution operations. This can help food retailers and manufacturers to reduce costs and to improve their bottom line. Overall, data analytics has the potential to transform the food industry and to make food more affordable, safer, higher quality, and more sustainable for everyone.

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