

Project Group 3



“BUAN 6337.004 - Predictive Analytics for Data Science - S23”

Naveen Jindal School of Management, UT-Dallas

Professor: B.P.S.Murthi

Submitted By:

- Harshini Parepally (HXP220004)
- Keerthana Panyala (KXP220025)
- Mohanish Pradeep (MXP210040)
- Aaditya S (AXS210464)
- Vishal Kanna (VXN220000)
- Kushagra Rastogi (KXR220031)

CONTENTS

Introduction	3
Overview	3
Objectives	3
Adversities	4
Findings	4
Conclusion	24

Introduction:

Headquartered in Chicago, Illinois, Conagra Brands, Inc. is a holding company focused on consumer packaged goods. Under a variety of brand names, Conagra manufactures and markets products that are sold in supermarkets, restaurants, and other food service establishments.

Conagra has always been committed to upholding its timeless values of integrity and open-mindedness, which is reflected in its focus on diversity and inclusion. Conagra leverages its deep understanding of consumer preferences to create delicious food options that seamlessly combine authentic flavors with modern attributes, across both its well-known and up-and-coming brands.

The company's unwavering dedication to ethical practices, appreciation for diverse perspectives, and promotion of collaboration are all testament to this commitment.

Overview:

The goal of this project is to develop data-driven solutions to assist Conagra in unlocking growth potential in the Tablespreads category. Conagra Brands is devoted to driving innovation and growth in its product portfolio as one of the leading packaged food companies in the United States. Conagra's Tablespreads category, which includes butter, margarine, and spreads, is a significant focus area for the corporation, and the company is trying to optimize its existing brands and discover new development potential within this category.

To accomplish this goal, our team performed a thorough examination of market trends, customer behavior, and the competitive environment in the Tablespreads category. To acquire insights into the factors that drive the Tablespreads market and discover new growth prospects, we will leverage a combination of data sources, including IRI's Point of Sales and Panel data and NPD's National Eating Trends data. Advanced analytics approaches, such as predictive modeling will also be used to forecast future demand and establish focused marketing and product development plans.

Objective:

The project's findings will assist Conagra in developing a data-driven strategy that will aid product development, pricing, and marketing in the Tablespreads sector. Conagra will be able to optimize its existing portfolio of Tablespreads brands and explore new product development options that fit consumers' shifting demands and preferences by harnessing consumer insights and market trends. Finally, the success of this project will allow Conagra to acquire a larger portion of the Tablespreads market and drive long-term sustainable growth.

This project's major goal is to offer Conagra with a thorough understanding of the Tablespreads category, including consumer preferences, competitive dynamics, and market trends. Our ultimate goal is to assist Conagra in realizing their full growth potential and increasing their market share in the highly competitive and continually expanding Tablespreads area.

Adversities:

To remain competitive in the dynamic and rapidly changing business environment of today, companies encounter a plethora of obstacles, including the need to constantly adjust to evolving consumer demands, stay abreast of technological innovations, and outperform rivals. In this report we have analyzed by calculating market shares, comparisons with competitors and so on.

Findings

Table Spreads Category (Analysis by Sales)

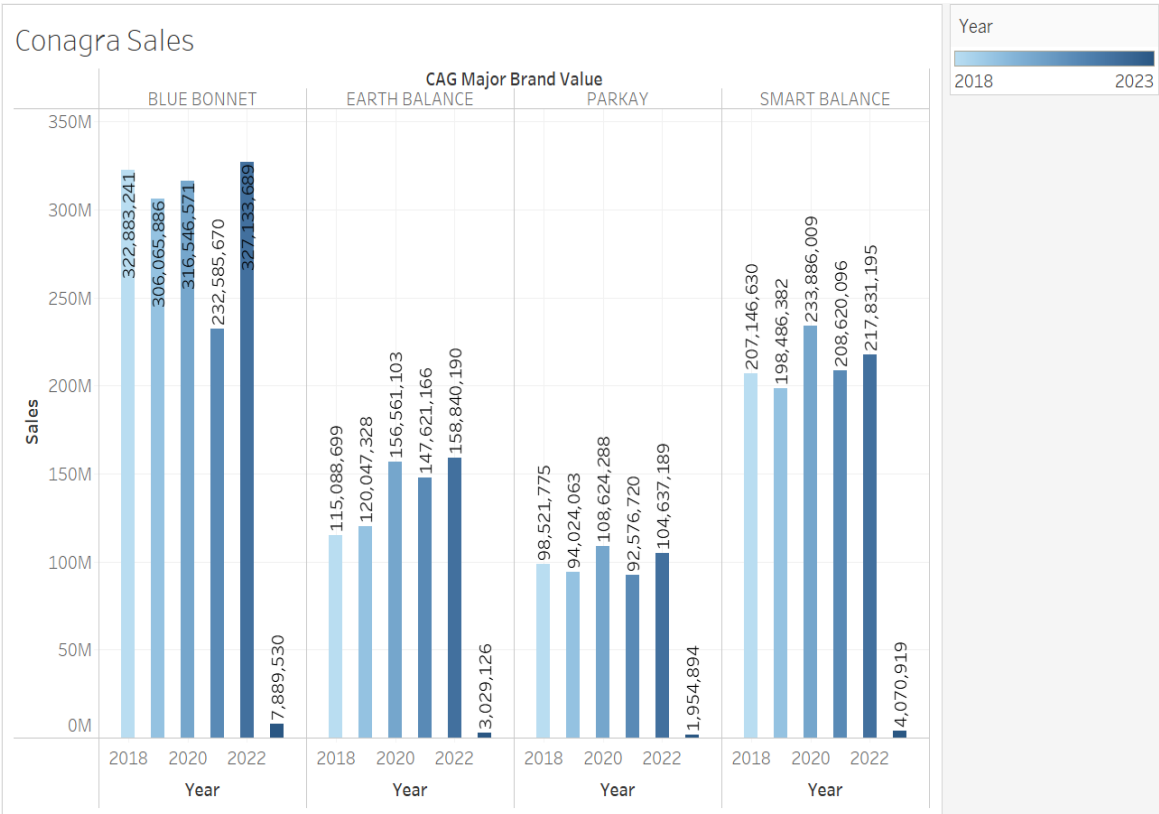


Fig. 1: Conagra brand sales across years

Figure 1 represents Conagra brand sales over the years. Blue bonnet had the highest combined sales for butter and margarine, followed by smart balance. Parkay contributed the least to the overall sales distribution of Conagra brands. Intuitively, pricing promotions and discounts can also be used strategically to drive sales during peak periods or to clear out excess inventory. Effective marketing campaigns can help raise awareness of a brand and its products, as well as generate demand among target consumers. These approaches can be used in combination to create a holistic strategy for improving sales for the specific brand.

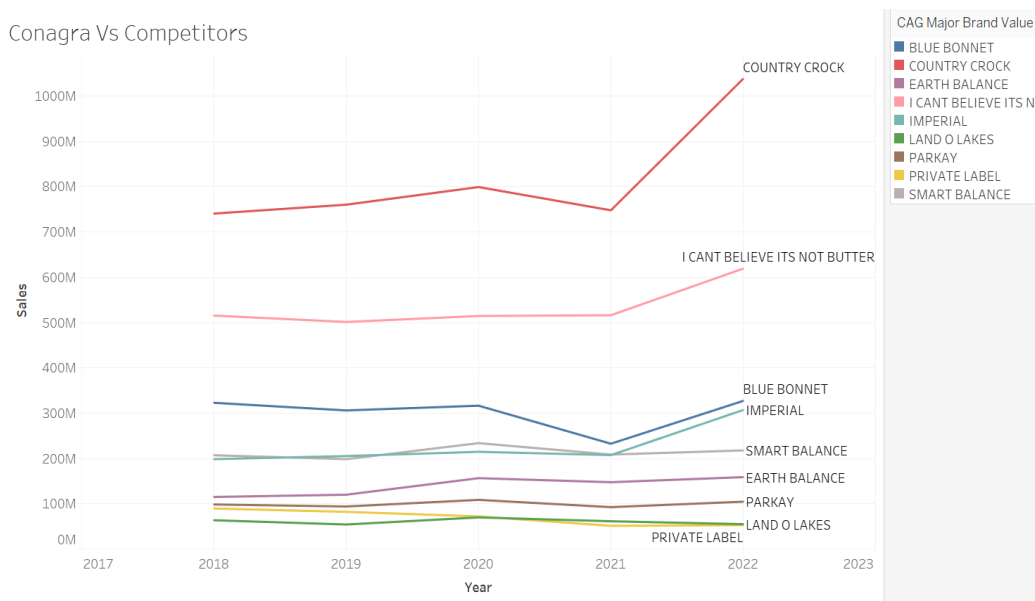


Fig. 2: Conagra Sales vs Competitors

Figure 2 represents Conagra and the competitor brand sales respectively. We observed that 'Country Crock' was consistently on the top followed by 'I can't believe it's not butter'. Strikingly, there was a close competition between Imperial and Smart Balance. Improving major brand value takes a long-term commitment to developing a strong, distinct brand that resonates with people and delivers on its brand promise. It necessitates a thorough awareness of customer behavior as well as a desire to innovate and adapt.

Figure 3 (below) depicts the sales value based on form- tubs, sticks, and all other types. Land O Lakes is the market leader when it comes to the form- Sticks and Country Crock for the form type- Tubs. None of the conagra brands featured in the top 4 contributors. However, Blue Bonnet holds a significant percentage of the total sales when other form types are taken into consideration.

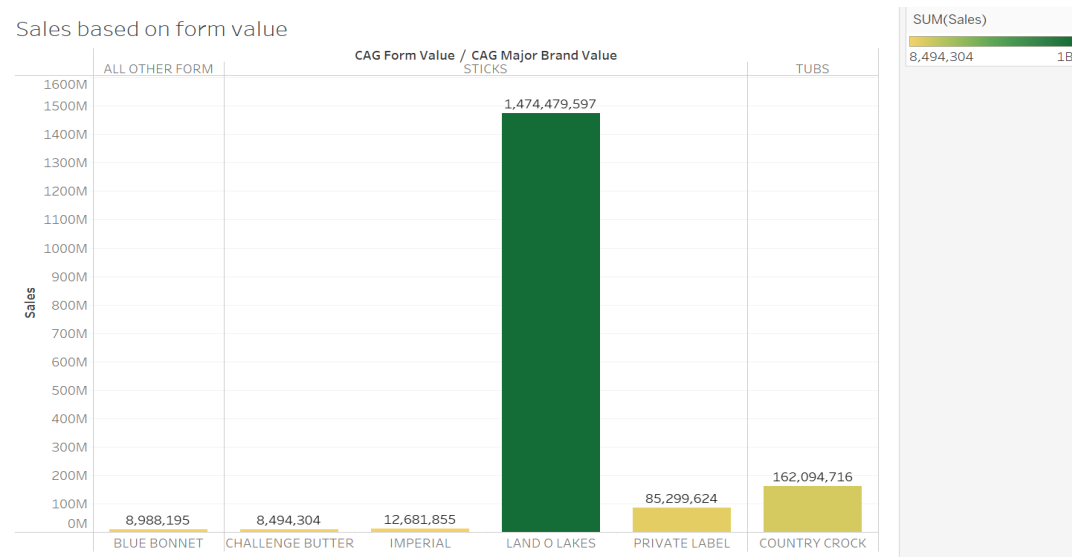


Fig. 3: Sales based on form value

Table Spreads Category (Analysis by Market Share)

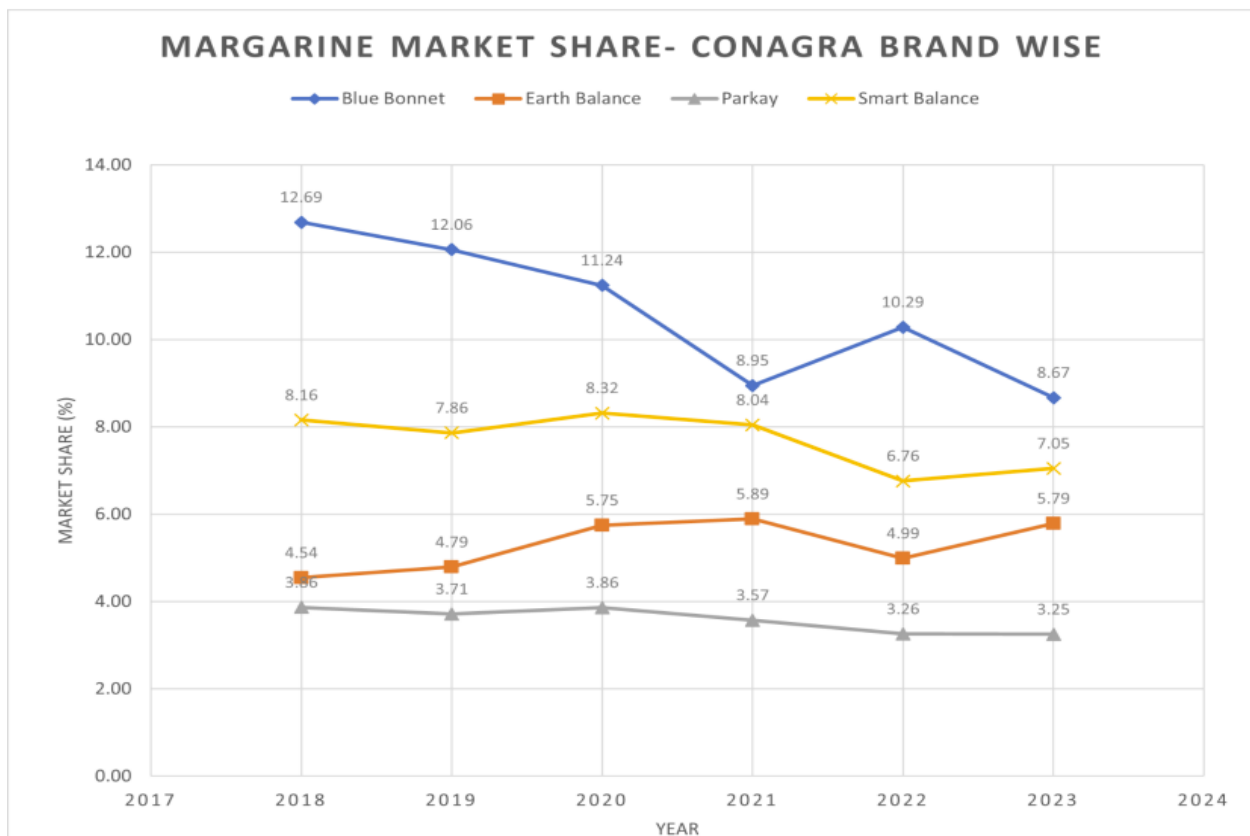


Fig. 4: Year Wise distribution of conagra brand market share

Figure 4 represents the year wise distribution of market shares for all the conagra brands. Evidently, Blue Bonnet was the forerunner when compared to all the other alternatives.

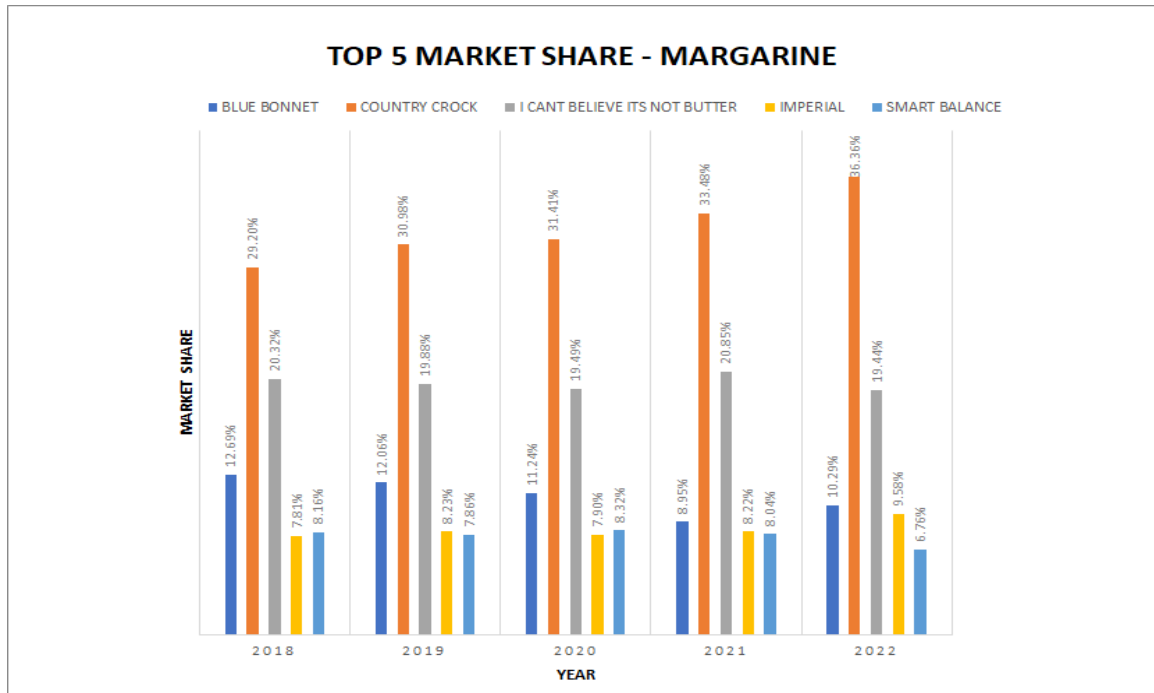


Fig. 5: Top 5 Market Share for margarine

Figure 5 emphasized the top 5 Market Shares for Margarine over the last 5 years. Country crock was the clear kingpin for margarine across regions. Blue Bonnet occupies the third position. For the period between 2018-2021, there is a decline in market share for Blue Bonnet and however there is a slight increase in 2022.

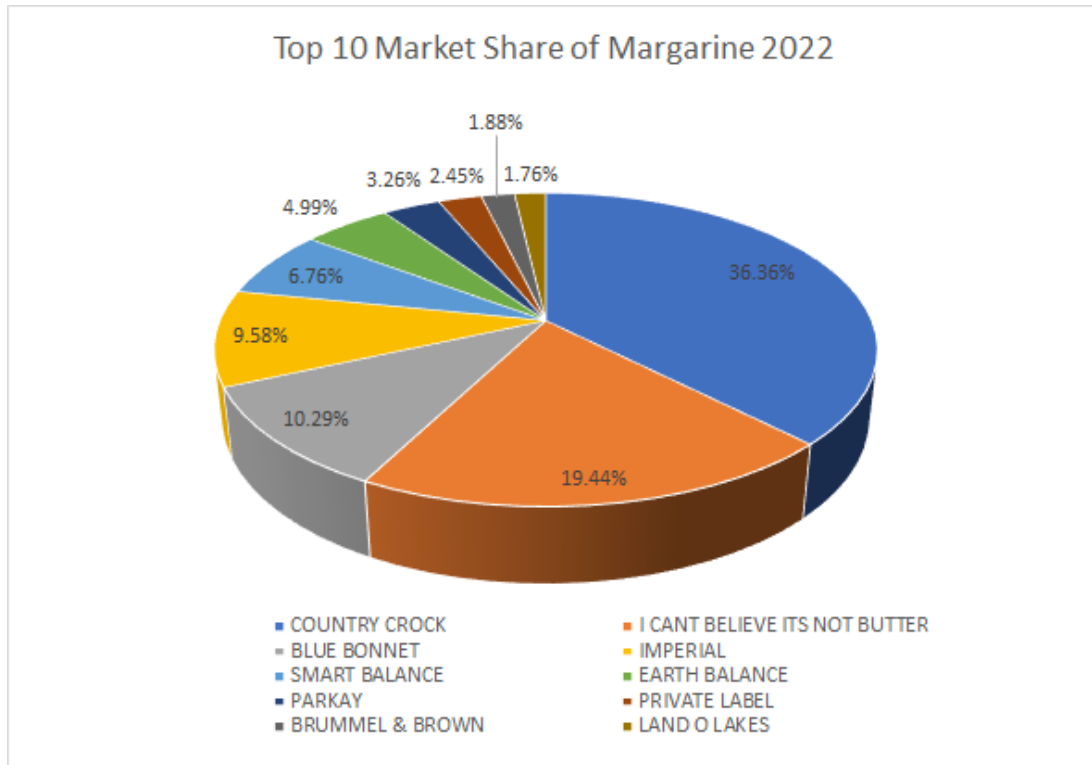


Fig. 6: Top 10 Market Share for margarine - 2022

Taking a deeper look into the year 2022, two of the Conagra Brands were in the top 5 in terms of market share for Margarine. Blue Bonnet had a share of 10.29% Smart Balance had a share of 6.76 %.

Table Spreads Category (Analysis by Geography)

A. PLAINS REGION

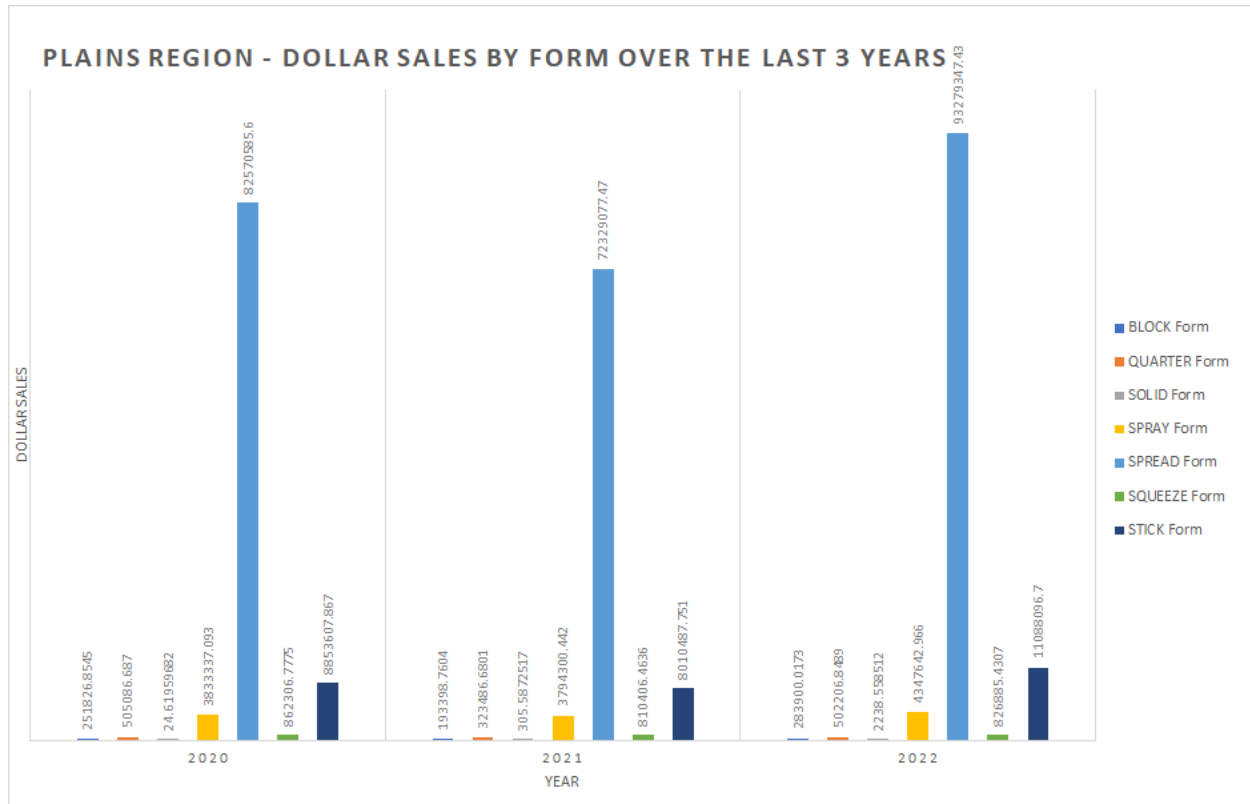


Fig. 7: Dollar Sales over last 3 years - Plains

The above graph gives us following insights,

1. The spread form sells the most among table spreads, keeping up with trends of the overall market.
2. The total dollar sales saw a dip in the year 2021 but it has recovered to better levels than 2020 in the year 2022.
3. The above insights hold good even for the second most preferred form (Stick form).

B. SOUTH EAST

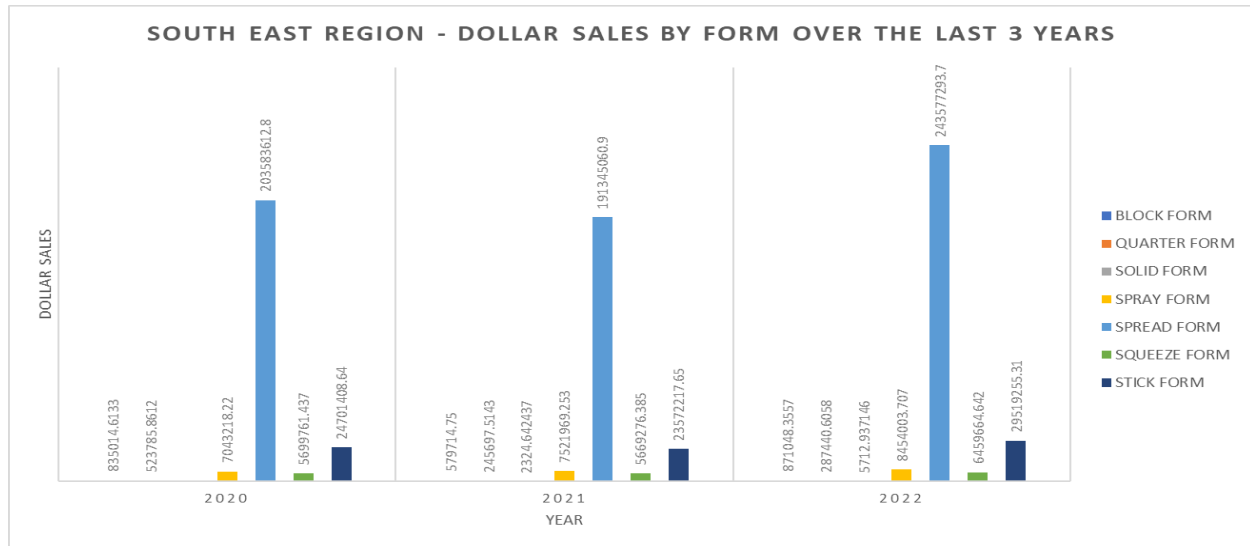


Fig. 8: Dollar Sales over last 3 years - South East

The above graph gives us following insights,

1. The spread form sells the most among table spreads, keeping up with trends of the overall market.
2. The total dollar sales saw a dip in the year 2021 for all forms but it has recovered to better levels than 2020 which was the peak (due to increased consumption) in the year 2022.
3. The above insights hold good even for the second most preferred form (Stick form).

C. MID SOUTH

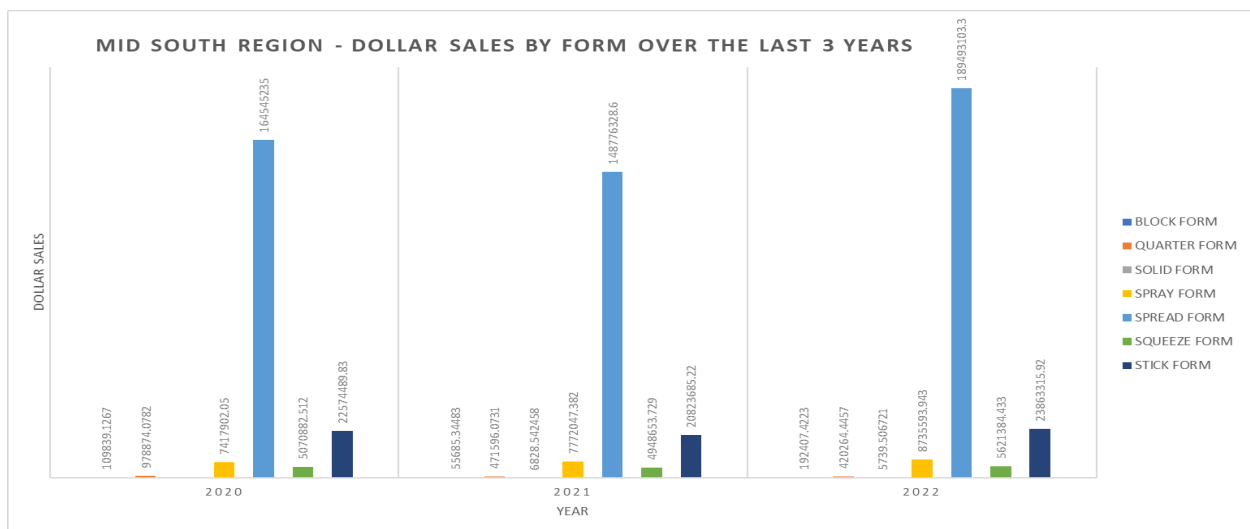


Fig. 9: Dollar Sales over last 3 years - Mid South

The above graph gives us following insights,

1. The spread form sells the most among table spreads, keeping up with trends of the overall market.
2. The total dollar sales saw a dip in the year 2021 for all forms but it has recovered to better levels than 2020 which was the peak (due to increased consumption) in the year 2022.
3. The above insights hold good even for the second most preferred form (Stick form).

Table Spreads Category (Analysis based on Demographics)

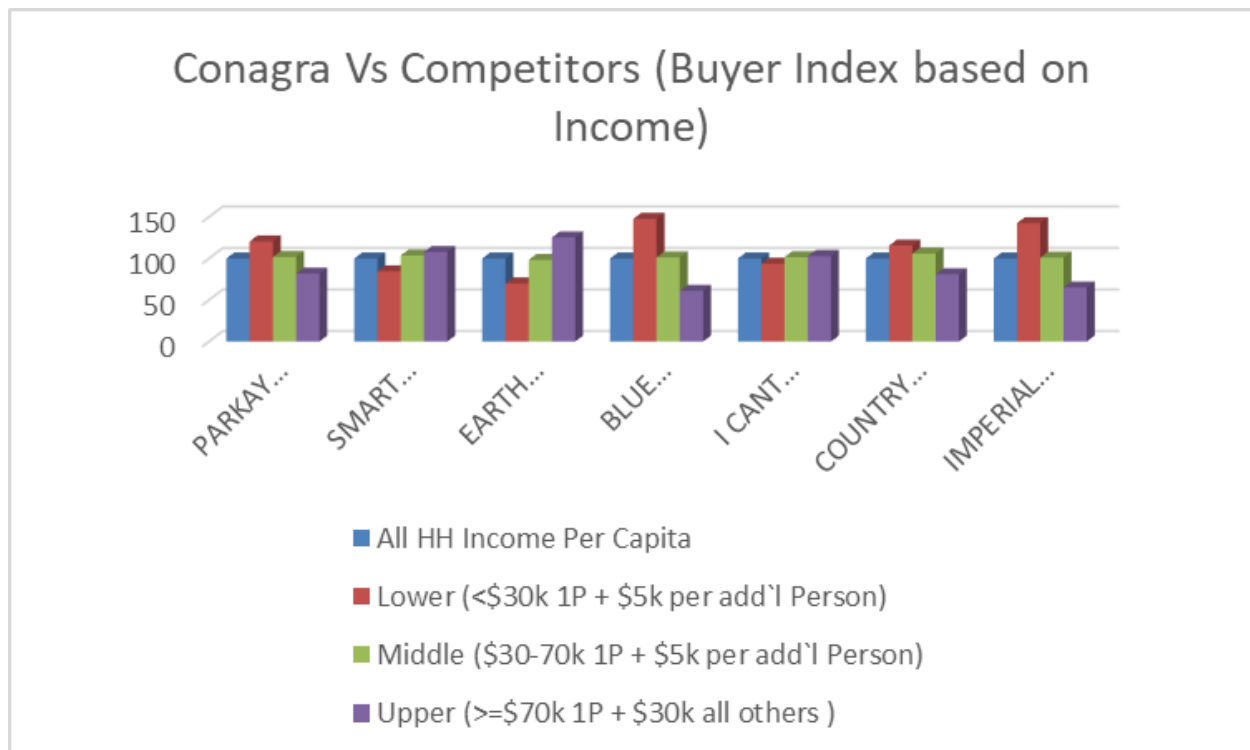


Fig. 9: Buyer Index based on Income

From the above figure, we observe that Low income groups prefer Parkay and Blue Bonnet from the list of Conagra Brands. The competitor for Conagra Brands when low group income groups are considered is Imperial. The middle income groups prefer Smart Balance. Country Crock is the competitor for Conagra brands when middle income groups are considered. The high income groups prefer Earth Balance and Smart Balance.

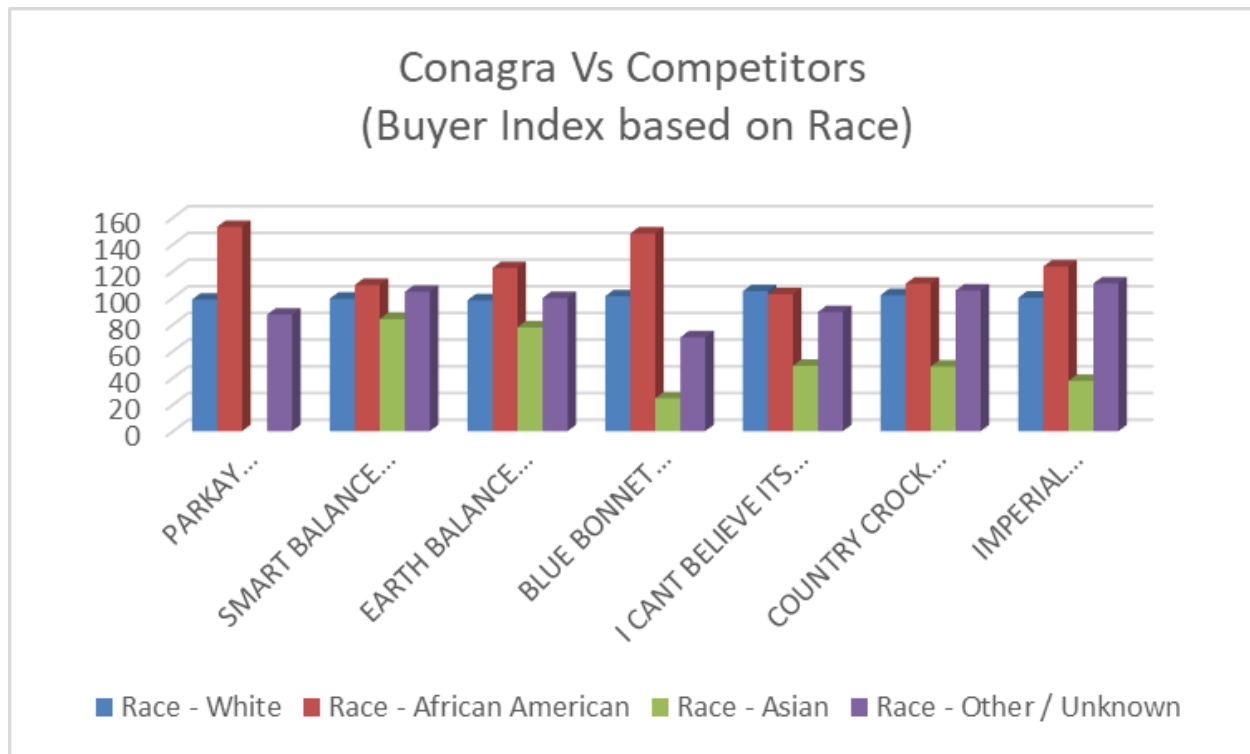


Fig. 10: Buyer Index based on Race

From the above figure, we observe that African Americans purchase table spreads the most and they prefer Parkay and BlueBonnet. There is not much competition for Conagra Brands when race is considered.

Cooking and Salad Oil

OVERVIEW OF THE MARKET

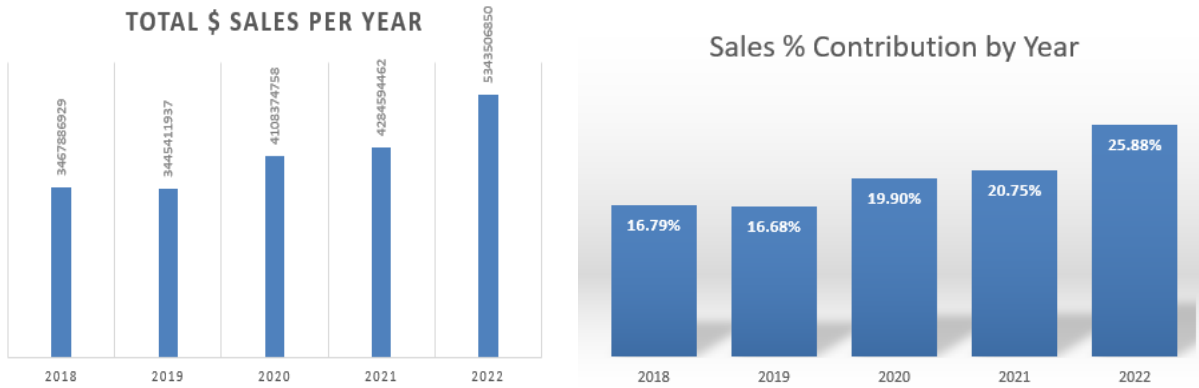


Fig. 11: Total Sales

The market for cooking oil looks as shown above, In terms of total dollar sales the market has grown over the years with 2019 being an exception with marginal reduction in sales. Year 2022 has been the most promising one with a significant increase from all the previous years.

Year	2018	2019	2020	2021	2022
Total Volume sales (Total volume sales)	3355373660	3388230937	3964883977	3619856606	3382798666

In terms of the total volume sales Year 2020 has been the most promising one possibly due to the impact of COVID-19 and people choosing to stay indoors and cook at home.

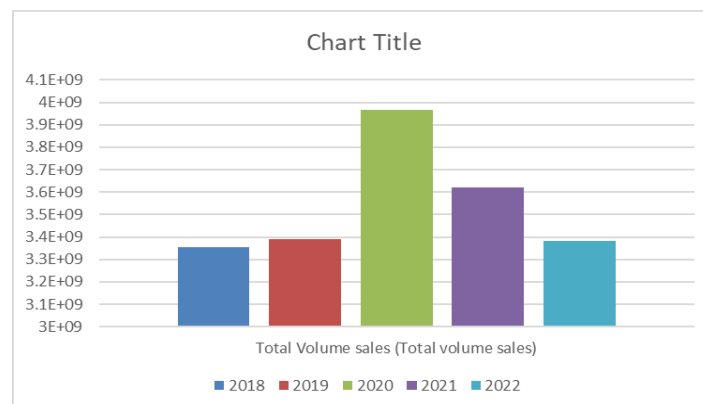


Fig. 12: Total Volume Sales

TOP PLAYERS IN THE SALAD AND COOKING OIL MARKET

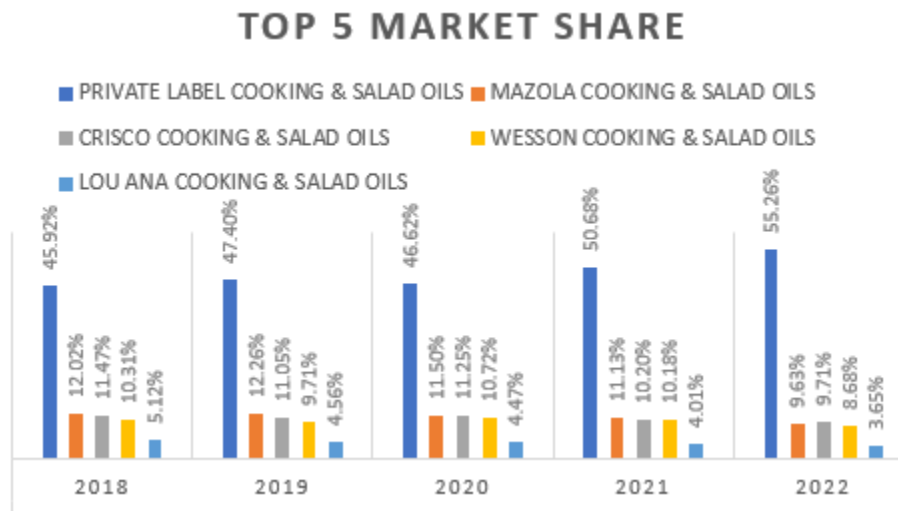


Fig. 13: Top 5 Market Share

The above graph shows the Top companies with highest market share (based on Total Dollar Sales) - Private label have dominated the market with over 45 percent of market share consistently and it has grown significantly in the past couple of years (2021 onwards) to over 55 percent market share currently.

We can also observe it is taking away the market share from its nearest competitors as they have all shrunk in their shares significantly.

CONAGRA MARKET SHARE IN THE COOKING AND SALAD OIL SEGMENT

Conagra Market share Per year

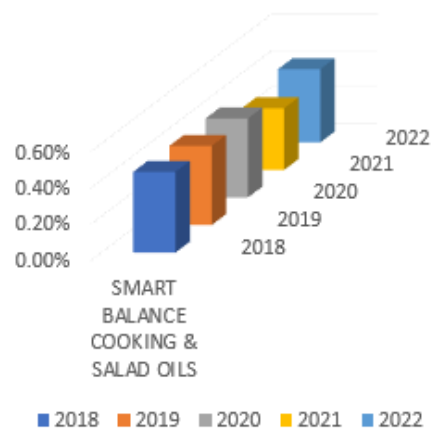


Fig. 14: Conagra Market share per year

The above graph shows how the Smart Balance brand of Conagra has performed over the years across all the regions. It has remained stable over the years with year 2021 being an exception but has done well to recover in the year 2022 to earlier levels.

CONTRIBUTION OF DIFFERENT REGIONS IN CONAGRA'S TOTAL MARKET SHARE:

Regions	2018	2019	2020	2021	2022
Total US - Multi Outlet + Conv	50.00%	50.00%	50.00%	50.00%	50.00%
Southeast - IRI Standard - Multi Outlet + Conv	8.88%	10.15%	10.00%	10.29%	11.33%
Northeast - IRI Standard - Multi Outlet + Conv	9.75%	8.88%	8.85%	8.47%	7.28%
Mid-South - IRI Standard - Multi Outlet + Conv	6.29%	6.45%	6.49%	6.93%	7.66%
South Central - IRI Standard - Multi Outlet + Conv	6.02%	6.49%	6.20%	5.70%	6.02%
Great Lakes - IRI Standard - Multi Outlet + Conv	6.03%	5.45%	5.36%	5.92%	5.26%
West - IRI Standard - Multi Outlet + Conv	4.92%	4.73%	4.80%	5.04%	5.23%
California - IRI Standard - Multi Outlet + Conv	5.07%	4.78%	5.22%	4.90%	4.62%
Plains - IRI Standard - Multi Outlet + Conv	3.04%	3.07%	3.07%	2.74%	2.60%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%

The above table shows the contribution of each region in the total sale (Total Dollar Sales) across the years. Total US-Multi Outlet +Conv contributes for 50 percent of all sales. It is closely followed by Southeast, Northeast and Mid south regions.

Southeast remains the most promising region, as it has the highest growth from 8.88% to 11.33% followed by the Mid-South region. The other regions have more or less remained stable in terms of their contribution for total sales. Although they have remained stable, the remaining regions must be looked at carefully as their contributions have been either marginally receding or not improving significantly.

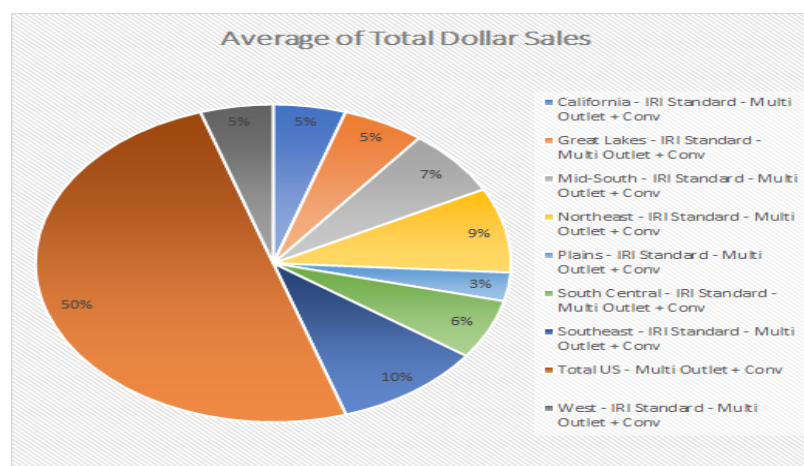


Fig. 15: Average Total Dollar Sales

The shares of regions have been averaged (over the years) for the sake of simplicity to put it into a pie chart shown above.

REGION WISE LOOK AT COMPETITORS:

Total US - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
BETTERBODY FOODS COOKING & SALAD OILS	0.78%	0.77%	0.78%	0.83%	0.72%
IBERIA COOKING & SALAD OILS	0.61%	0.55%	0.57%	0.56%	0.48%
SMART BALANCE COOKING & SALAD OILS	0.44%	0.44%	0.44%	0.34%	0.40%
LA TOURANGELLE COOKING & SALAD OILS	0.42%	0.46%	0.52%	0.49%	0.34%
NUTIVA COOKING & SALAD OILS	0.40%	0.40%	0.44%	0.39%	0.34%
Southeast - IRI Standard - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
OLIVARI COOKING & SALAD OILS	0.40%	0.54%	0.87%	0.93%	0.84%
BETTERBODY FOODS COOKING & SALAD OILS	0.57%	0.60%	0.60%	0.68%	0.63%
CARRINGTON FARMS COOKING & SALAD OILS	0.59%	0.55%	0.53%	0.51%	0.42%
SMART BALANCE COOKING & SALAD OILS	0.42%	0.46%	0.45%	0.35%	0.45%
AHUACATLAN COOKING & SALAD OILS	0.34%	0.40%	0.30%	0.31%	0.24%
Northeast - IRI Standard - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
CHOSEN FOODS COOKING & SALAD OILS	0.66%	0.78%	0.93%	0.93%	1.06%
GOYA COOKING & SALAD OILS	0.43%	0.48%	0.64%	0.48%	0.56%
BETTERBODY FOODS COOKING & SALAD OILS	0.54%	0.48%	0.40%	0.46%	0.34%
SMART BALANCE COOKING & SALAD OILS	0.50%	0.46%	0.45%	0.35%	0.36%
LA TOURANGELLE COOKING & SALAD OILS	0.32%	0.38%	0.43%	0.38%	0.30%

The above table shows the purported competitors (purely on the basis of market shares), we can take away couple of insights on this:

1. Betterbody foods cooking and salad oils remain the most active competitor across all the regions with a better market in all of them. Additionally, looking at the buyer Distribution we can conclude both these brands have conflicting customer bases (Similar Demographics).
2. Smart balance's market share in the all US - Multi outlet region has come down by 0.45 percent to 0.40 percent, this is a concern as it accounts for 50 percent of all sales of the company.
3. The company has done well to hold on to its market share in the Southeast region despite tough competition.
4. Northeast remains to be an area of concern as the market share has come down from 0.5 percent in 2018 to 0.36 percent in 2022.

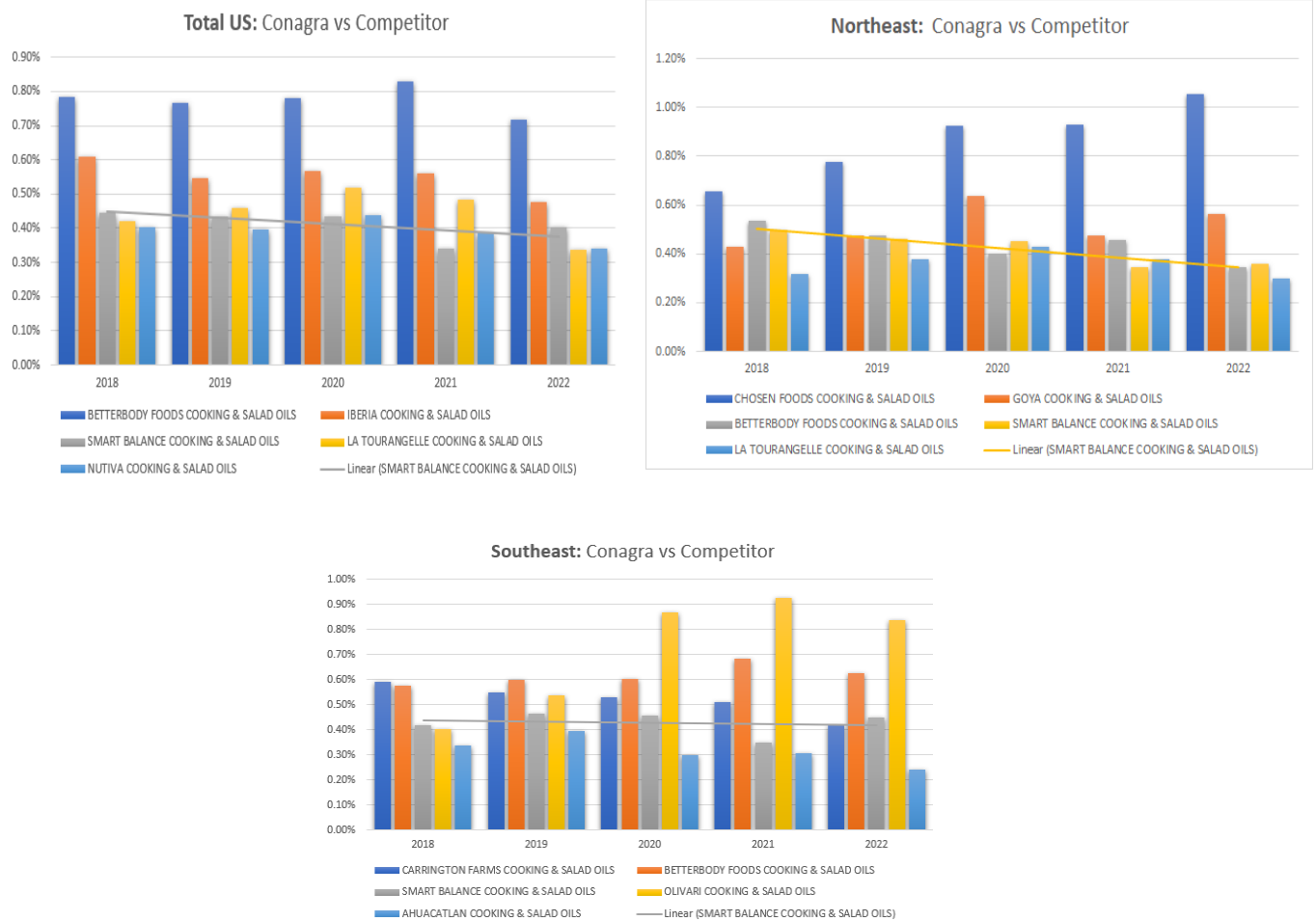
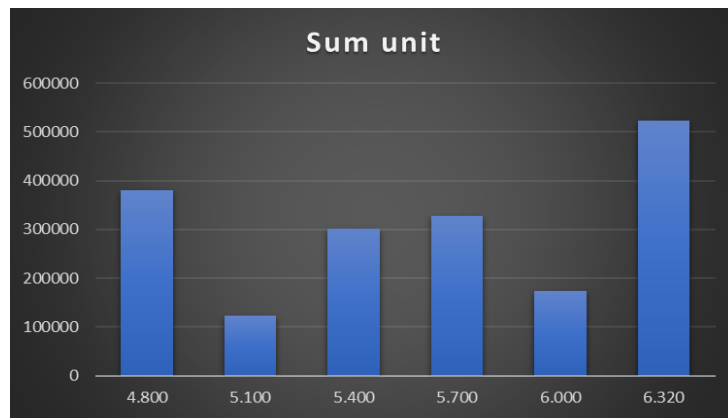


Fig. 16: Region wise look at the competitors

By looking at the trend line for the smart balance product in the above graphs we can conclude that it is either remaining flat or receding in all the 3 regions which contribute the most for total dollar sales.

NOTE: However this may not be a complete indication of average performance as other metrics such as units sold and price per unit has to be considered. It may be the case where units of higher profitability could have been sold more leading to better profits despite sales being more or less stagnant.

Sample analysis of Price per unit (No merch) Vs Sum unit sales (No merch) for Total US-Multi Outlet + Conv region for the year 2022 for SMART BALANCE



Price LL	price UL	Sum unit
4.500	4.800	379915
4.810	5.100	123563
5.110	5.400	301648
5.410	5.700	327871
5.710	6.000	173977
6.010	6.320	522710

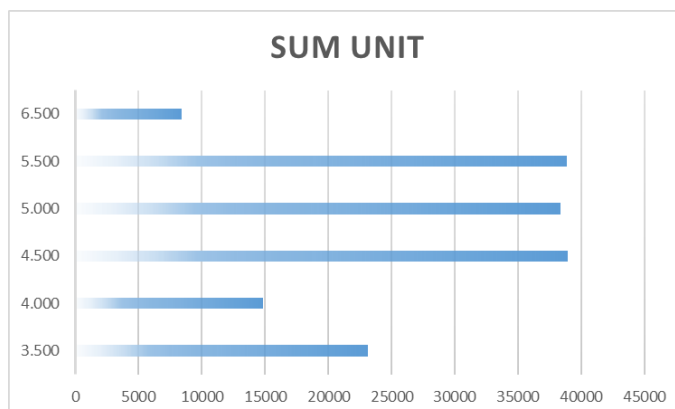
Fig. 16: Sample analysis of Price per unit

The above Graph shows the distribution of Units sold vs Price per unit when no merchandise (no Offer on the product) in the Total US region.

There are couple of takeaways:

1. Units between 6\$ to 6.32\$ had the highest sale for the year 2022. This can mean **units of higher quantity were sold most** implying higher cost per unit.
2. This can be the case as units of higher quantity mean more savings for customers as there were no promotional offers.
3. There are also significant purchases for units of lower cost (<4.8\$) which can imply that the customers bought lower quantities, possibly expecting an offer on their return purchase.

Sample analysis of Price per unit (any merch) Vs Sum unit sales (any merch) for Total US-Multi Outlet + Conv region for the year 2022 for SMART BALANCE



Price LL	price UL	Sum unit
3.000	3.500	23106
3.510	4.000	14808
4.010	4.500	38899
4.510	5.000	38371
5.010	5.500	38839
5.510	6.500	8435

Fig. 17: Sample analysis of Price per unit

There are couple of takeaways from the above graph,

1. Most of the units sold were in between 4.5\$ to 5.5\$ when promotional offers were available for customers, this could mean either the company promoted those products specifically or these categories are most appealing for customers.

Additional insights:

1. A similar analysis can be carried out for other regions to know what sells most and come out with common offers across all regions at the same time.
2. A deeper analysis of 'Top selling' brands in all regions on the similar lines would provide us insights on what the customer base looks like (High quantity (Large families) or Low quantity (Small families)) helping conagra to focus more on what kind of customers to target for.

Cooking Spray

OVERVIEW OF THE MARKET:

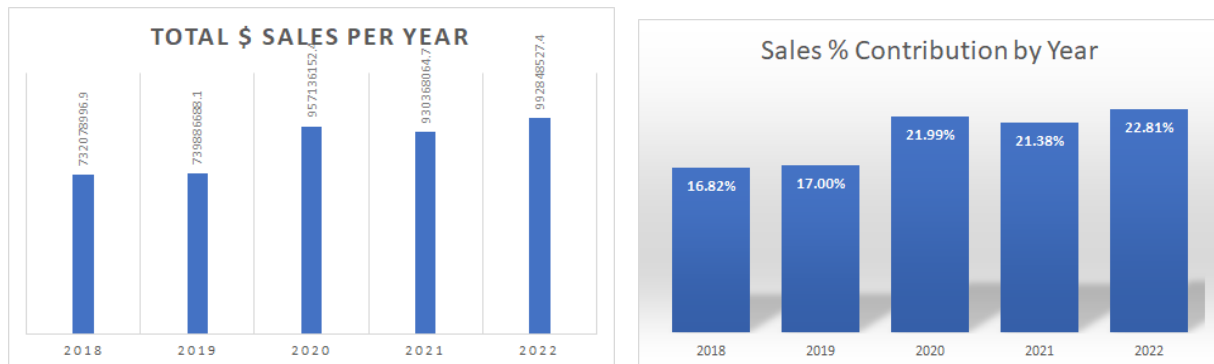


Fig. 18: Total Sales

By looking at the above graph we get following takeaways:

1. There is a significant increase in the sales amounting to rise in Total dollar sales across all regions in the year 2020. This is possible as people stayed indoors and cooked for themselves rather than eating out due to the pandemic.
2. The market has remained stable after that owing to the fact that oil sprays are healthier options when compared to the salad and cooking oils.

Market Analysis for cooking sprays

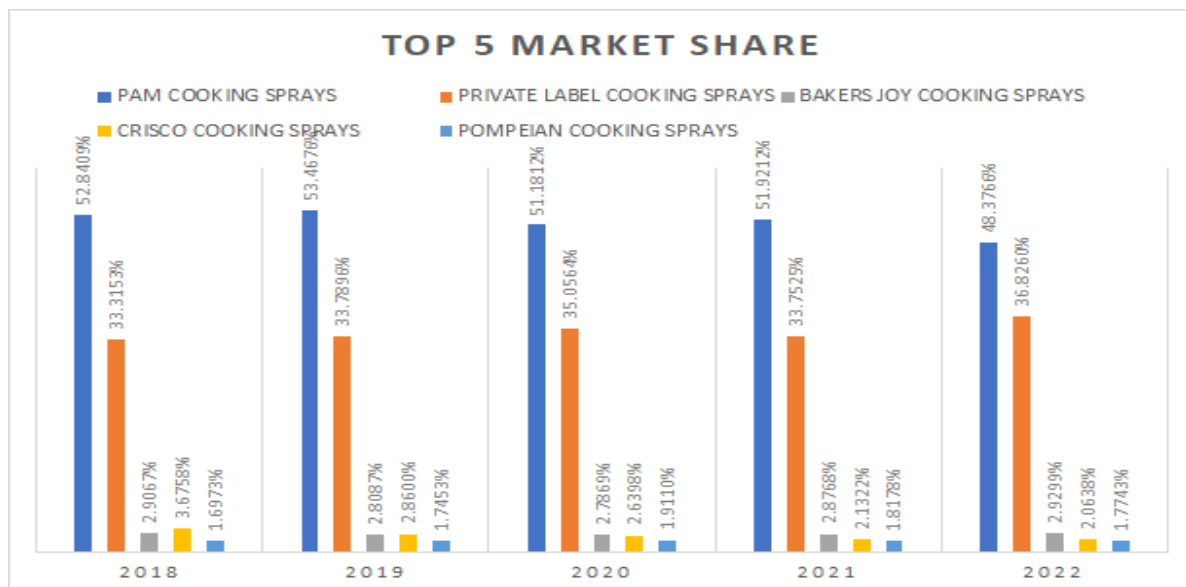


Fig. 19: Top 5 Market Share

The PAM COOKING SPRAYS by CONAGRA BRANDS is the market leader with over 50% market share over the years. **Year 2022 hasn't specifically been a good year** as it seems to have lost significant share of the market possibly to the number 2 brand (PRIVATE LABEL COOKING SPRAYS) this needs to be considered carefully as any further drop will narrow the gap leading to tough competition.

Analysis of CONAGRA BRANDS

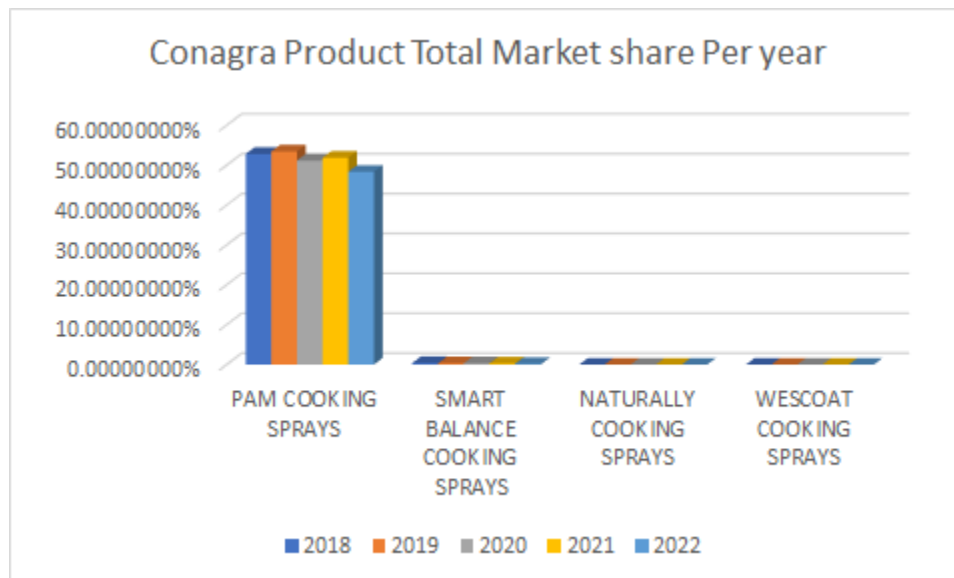


Fig. 20: Conagra Market Share per year

The PAM COOKING SPRAYS remains the most selling brand followed by SMART BALANCE COOKING SPRAYS with an average of 0.3%. The NATURAL COOKING SPRAYS AND WESTCOAT COOKING SPRAYS are almost negligible in terms of market share.

As a result of above findings we are restricting our analysis to the SMART BALANCE COOKING SPRAYS. The PAM COOKING SPRAYS is already a leader in this segment while the other 2 brands have almost negligible presence in the market.

CONTRIBUTION OF REGIONS IN SMART BALANCE COOKING SPRAYS MARKET SHARE

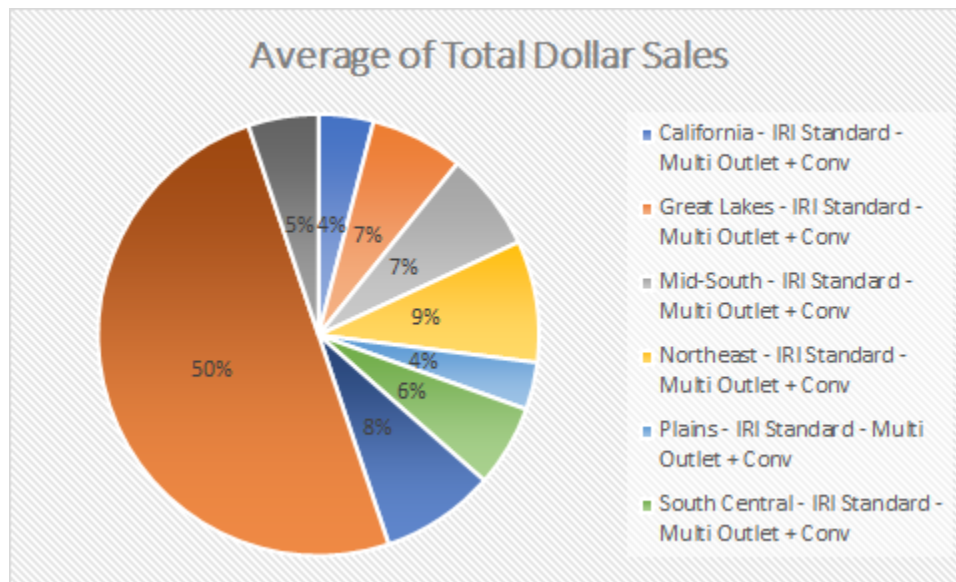


Fig. 21: Average of Total dollar sales

Regions	2018	2019	2020	2021	2022
Total US - Multi Outlet + Conv	50.00%	50.00%	50.00%	50.00%	50.00%
Northeast - IRI Standard - Multi Outlet + Conv	9.03%	9.05%	9.13%	8.87%	8.55%
Southeast - IRI Standard - Multi Outlet + Conv	8.04%	8.23%	8.06%	8.46%	8.95%
Mid-South - IRI Standard - Multi Outlet + Conv	7.17%	7.16%	7.16%	7.32%	7.33%
Great Lakes - IRI Standard - Multi Outlet + Conv	6.96%	6.85%	6.85%	6.82%	6.71%
South Central - IRI Standard - Multi Outlet + Conv	6.10%	6.09%	5.88%	5.97%	6.03%
West - IRI Standard - Multi Outlet + Conv	5.11%	5.10%	5.25%	5.16%	5.13%
California - IRI Standard - Multi Outlet + Conv	3.97%	3.92%	4.18%	4.05%	3.96%
Plains - IRI Standard - Multi Outlet + Conv	3.62%	3.61%	3.48%	3.35%	3.33%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%

By looking at the above graph we can understand that similar to the oil category, **the Multi Outlet + Conv** has the highest share followed by Northeast and Southeast regions.

SMART BALANCE VS CLOSEST COMPETITORS IN ALL REGIONS

Total US - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
SPECTRUM COOKING SPRAYS	0.61%	0.39%	0.48%	0.44%	0.31%
LODGE COOKING SPRAYS	0.44%	0.40%	0.48%	0.51%	0.32%
SMART BALANCE COOKING SPRAYS	0.44%	0.34%	0.38%	0.28%	0.20%
MAZOLA COOKING SPRAYS	0.49%	0.34%	0.27%	0.29%	0.18%
PRIMAL KITCHEN COOKING SPRAYS	0.01%	0.06%	0.26%	0.40%	0.54%
Southeast - IRI Standard - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
WINONA PURE COOKING SPRAYS	0.22%	0.29%	0.36%	0.62%	0.63%
LODGE COOKING SPRAYS	0.31%	0.28%	0.32%	0.32%	0.22%
SMART BALANCE COOKING SPRAYS	0.31%	0.25%	0.28%	0.23%	0.13%
LA TOURANGELLE COOKING SPRAYS	0.03%	0.03%	0.09%	0.31%	0.36%
MAZOLA COOKING SPRAYS	0.39%	0.17%	0.04%	0.06%	0.02%
Northeast - IRI Standard - Multi Outlet + Conv					
Product	2018	2019	2020	2021	2022
SPECTRUM COOKING SPRAYS	0.75%	0.57%	0.81%	0.92%	0.67%
MAZOLA COOKING SPRAYS	0.72%	0.66%	0.67%	0.74%	0.55%
SMART BALANCE COOKING SPRAYS	0.76%	0.60%	0.67%	0.43%	0.36%
FRATELLI MANTOVA COOKING SPRAYS	0.23%	0.20%	0.27%	0.34%	0.41%
LODGE COOKING SPRAYS	0.33%	0.27%	0.32%	0.33%	0.17%

By looking at the above graph we can clearly understand that SMART BALANCE is losing out on its sales significantly in the regions.

If proper steps aren't taken there is a serious threat of extinction from the market. We can correlate this with overall market share which is also at an all time low of 0.2% in 2022 (Indicating almost 40 percent decline from 0.28% in 2021).

TIME SERIES REGRESSION FOR MARGARINE

We predicted the market shares for Margarine for the year 2023 using the Linear trend time series model. Below are the prediction results for the year 2023 for Conagra Brands

Brand	Market Share Prediction 2023
Blue Bonnet	8.87%
Smart Balance	7.2%
Earth Balance	5.63%
Parkay	3.3%

Conclusion

Finally, the data-driven methods created in this project have the potential to enable Conagra Brands to flourish in the dairy product sector. We uncovered critical patterns and insights that might inform product development, marketing, and sales strategies by using data from many sources and employing advanced analytics approaches. Building a strong brand identity, creating consistent brand experiences, exploiting customer insights, fostering brand advocacy, and forming partnerships and collaborations are among the offered strategies. These tactics can assist Conagra Brands in remaining competitive in a dynamic and changing market, as well as driving long-term growth and profitability. It is vital to remember, however, that applying these techniques would necessitate a sustained effort as well as a commitment to ongoing development and innovation.