Explaining Consumers’ Purchasing Behavior Before and After COVID-19

Conagra Brands
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TEAM 7:

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BUSINESS OVERVIEW

Conagra Brands have been making and selling products under various brand names for over 100 years. Their products are available in supermarkets, restaurants, and food service establishments.

~16,500
Employees

~$11 bn
Revenue

Chicago
Headquarters

~50
Facilities in US

PROJECT OVERVIEW

1. **FROZEN MEALS** – Important notes/ Sales pattern/ Price elasticity/ Flavor & Nutrition preference / Regional factor / Supporting Analysis
2. **FROZEN VEGGIES**– Key findings
3. **POPCORN** – Key findings
4. Marketing Strategy – Recommendations

FROZEN MEALS

IMPORTANT NOTES

1

YEAR:

- We perform our analysis based on monthly basic. Therefore, we eliminated all data points in Dec 2017 due to the lack of information
- Further, all data between Jan 2018 and Feb 2019 is considered as the “Pre-COVID” period, and all data thereafter as “During COVID”

2

PRODUCT TYPE:

- The FROZEN MEALS master data set consists of 74 product types that we further categorize into 18 core product groups based on the same characters of each product types. Please refer to APPENDIX 1 for the details.
- Of the 18 product groups, the top 5 account for over 95% of the sales. These 5 groups have been the primary focus of our analyses

3

NUTRITION:

- In order to examine if consumer behavior can be explained by the nutritional value of products, we add a new variable, nutrition level to the dataset. This variable was considered specifically catering to Conagra’s emphasis on nutritious food options
- Each product type was assigned to one of 4 Nutrition groups. For the detail, please refer to APPENDIX 2.

4

PRIVATE LABEL/NATIONAL BRAND:

- We acknowledge there are differences between NATIONAL BRAND and PRIVATE LEVEL in many aspects, therefore we present our analysis in two different groups accordingly, except for Nutrition level preference.

5

PARENT, FLAVOR/SCENT & PACKAGING GROUP:

- While we respect Conagra’s commitment to the UN SDGs with packaging, we have eliminated this variable along with Parent and Flavor/Scent to offer more meaningful and targeted marketing insights

SALES PATTERN

1 **National brands** account for 93% of total units sold from 2018 through 2020

2 In terms of **revenue (Dollars)**, the **top 5 product groups** under both National brands and Private label account for **over 95% of total revenue**. Hereafter all analyses focus on these 5 groups for the two brands.

3 While **demand prior to COVID was stationary** (+/-20%), we observe a sudden **increase in demand** (+/-40%) after February 2020, right **after COVID** hit the US

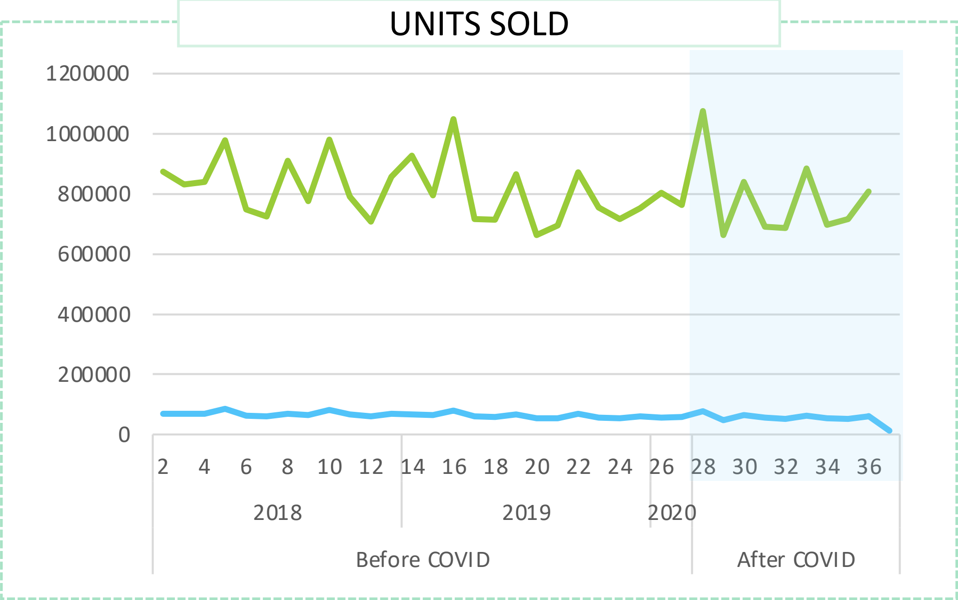
TOP 5 PRODUCT GROUPS

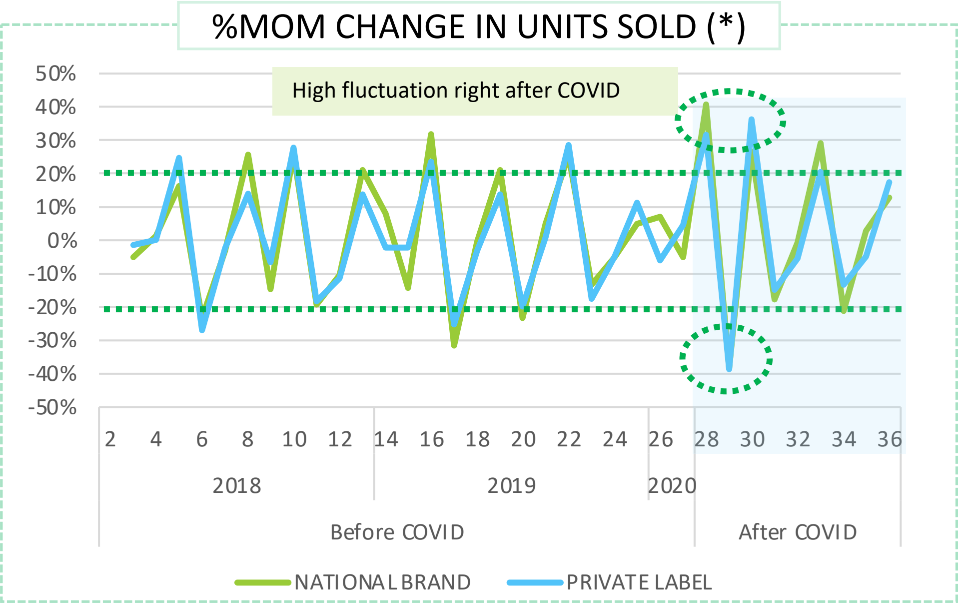
NATIONAL BRAND	Units	%	Dollars	%
1 MEALS	22,472,443	78.0%	67,669,355	75.6%
2 MEXICAN	2,543,800	8.8%	5,954,811	6.6%
3 POCKET FOOD	1,761,605	6.1%	6,920,484	7.7%
4 SANDWICH	670,530	2.3%	2,253,112	2.5%
5 BURGERNV	571,186	2.0%	2,733,366	3.1%

PRIVATE LABEL	Units	%	Dollars	%
1 MEALS	1,548,519	68%	6,273,625	75.5%
2 SANDWICH	229,467	10%	607,101	7.3%
3 BURGERNV	186,263	8%	563,505	6.8%
4 MEXICAN	166,453	7%	416,407	5.0%
5 HOT DOG	97,083	4%	302,567	3.6%

MEALS include 4 product types: ENTRÉE/DINNER/ DINNER OR ENTRÉE/MEAL KIT.

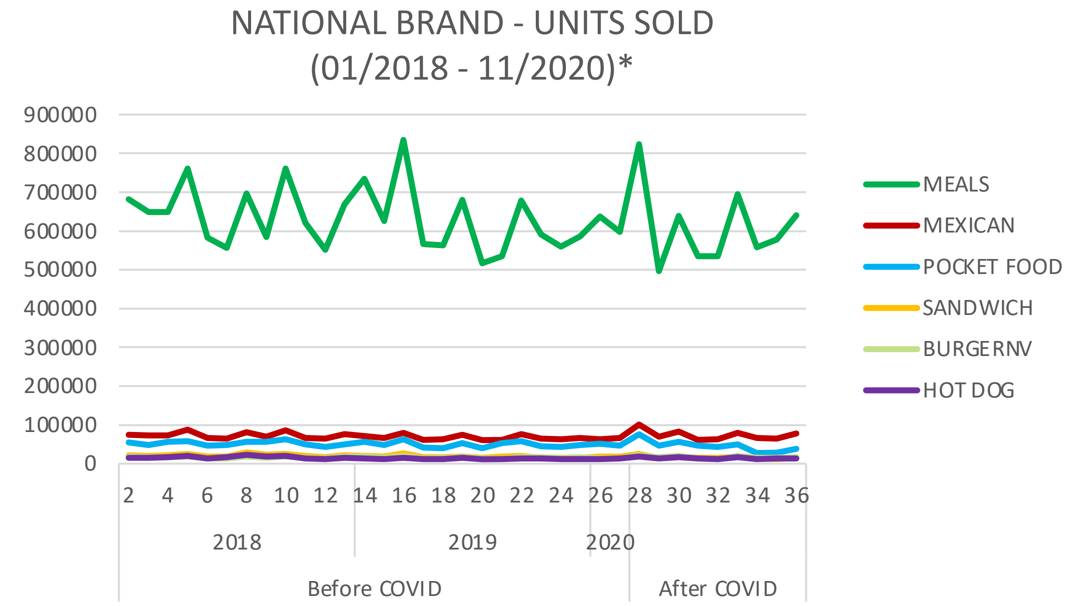
It's noted that product type ENTRÉE alone account for ac.70% of total units sold in both brands..

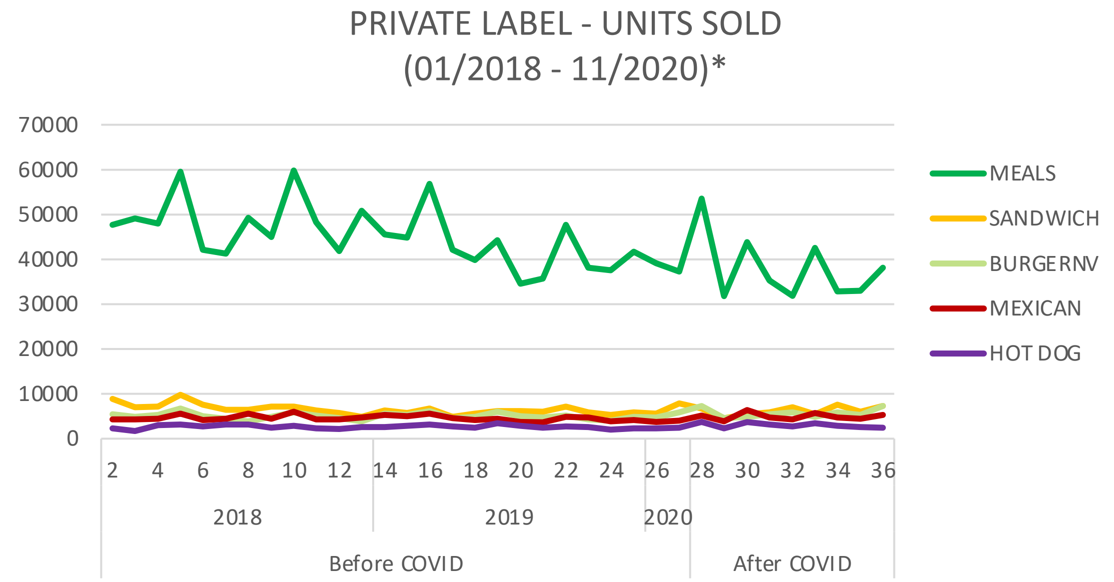


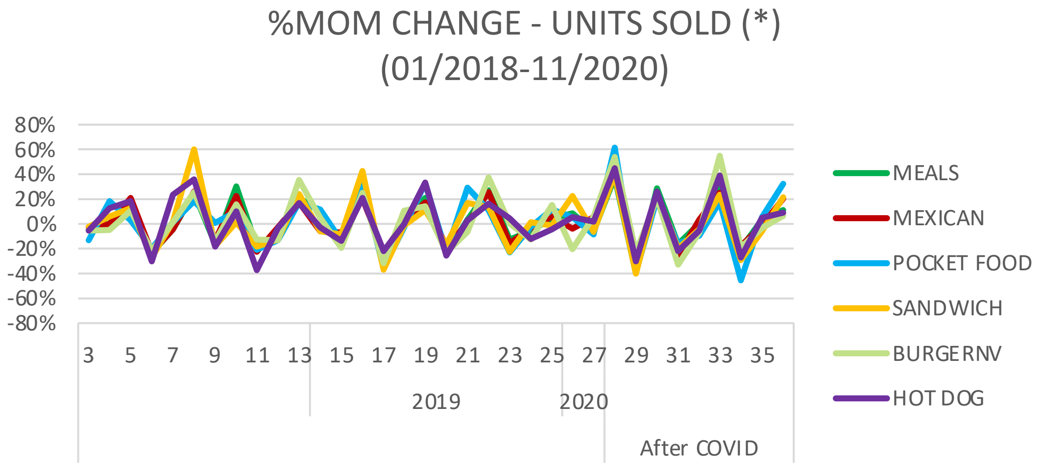


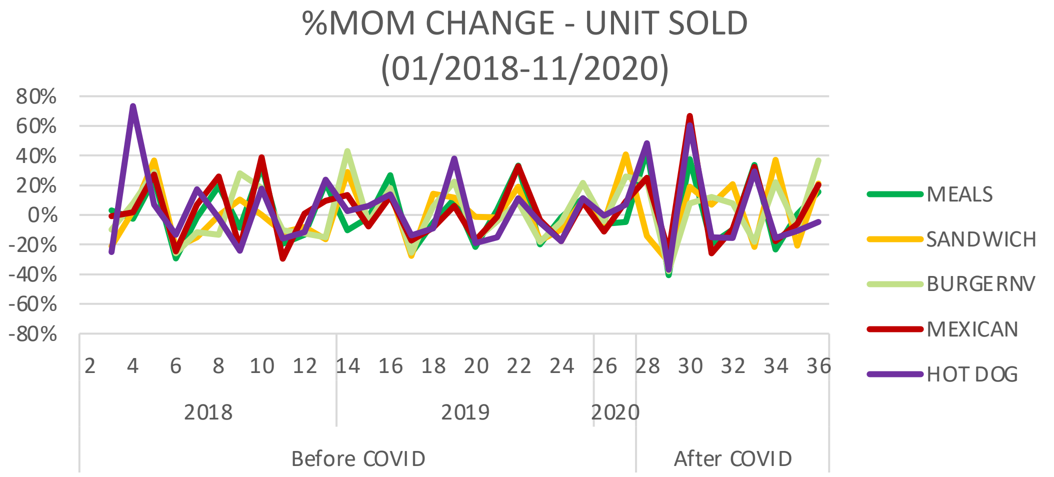
(*) %MOM: percentage change month over month

UNITS SOLD



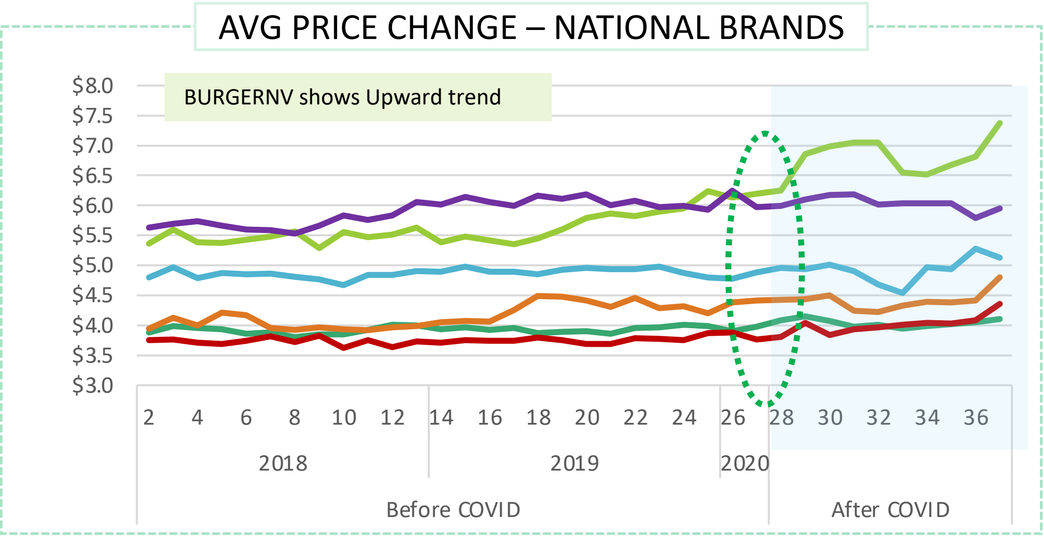


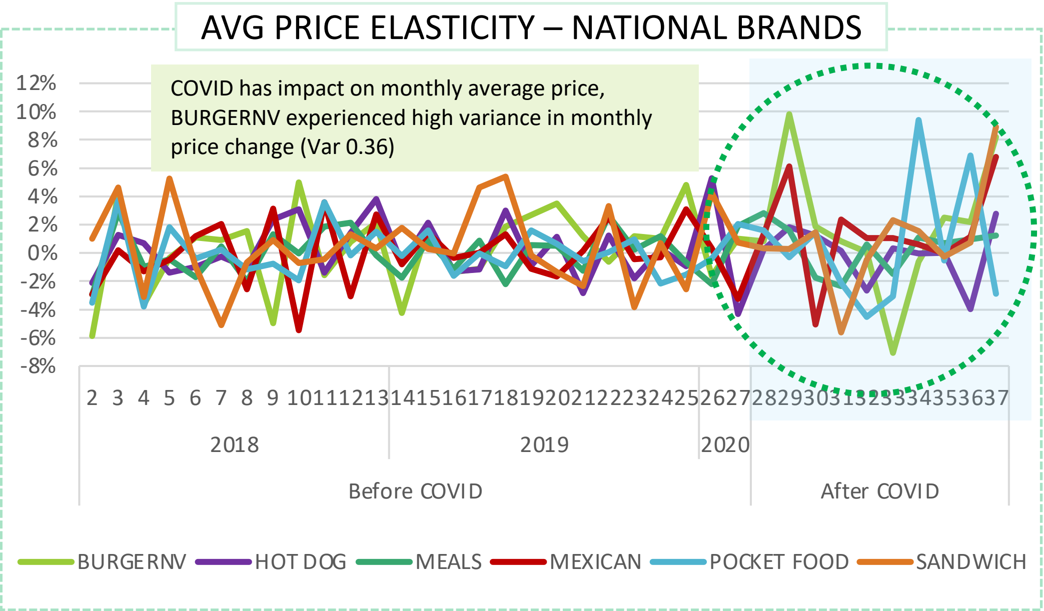


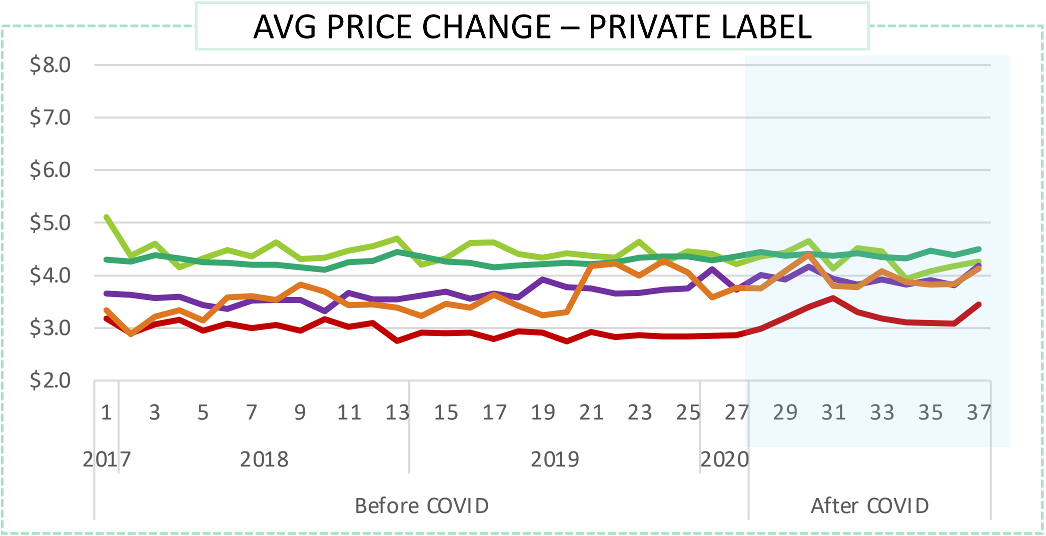


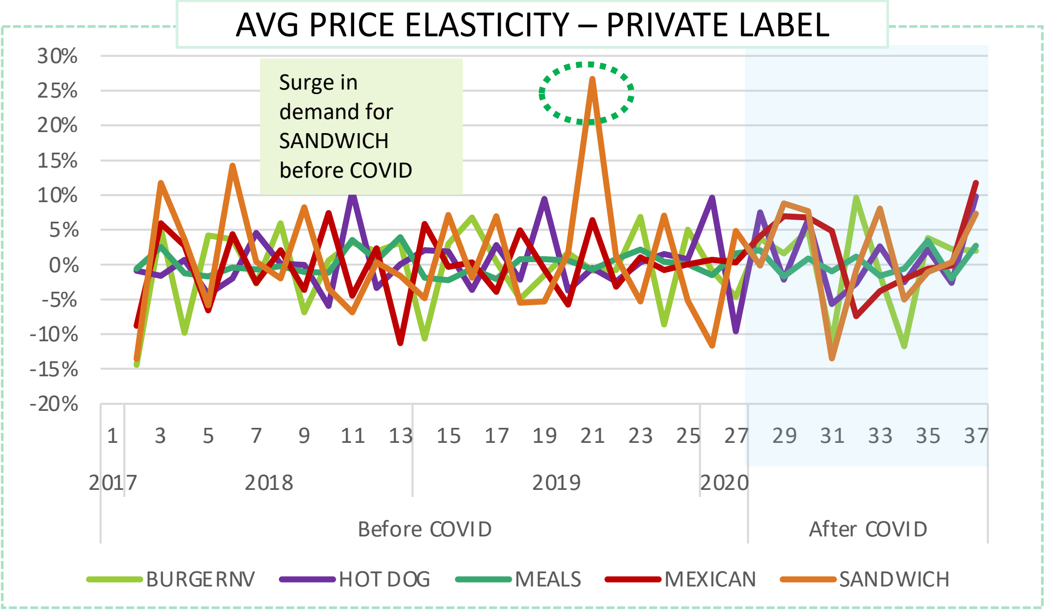
(*) %MOM: percentage change month over month

PRICE ELASTICITY

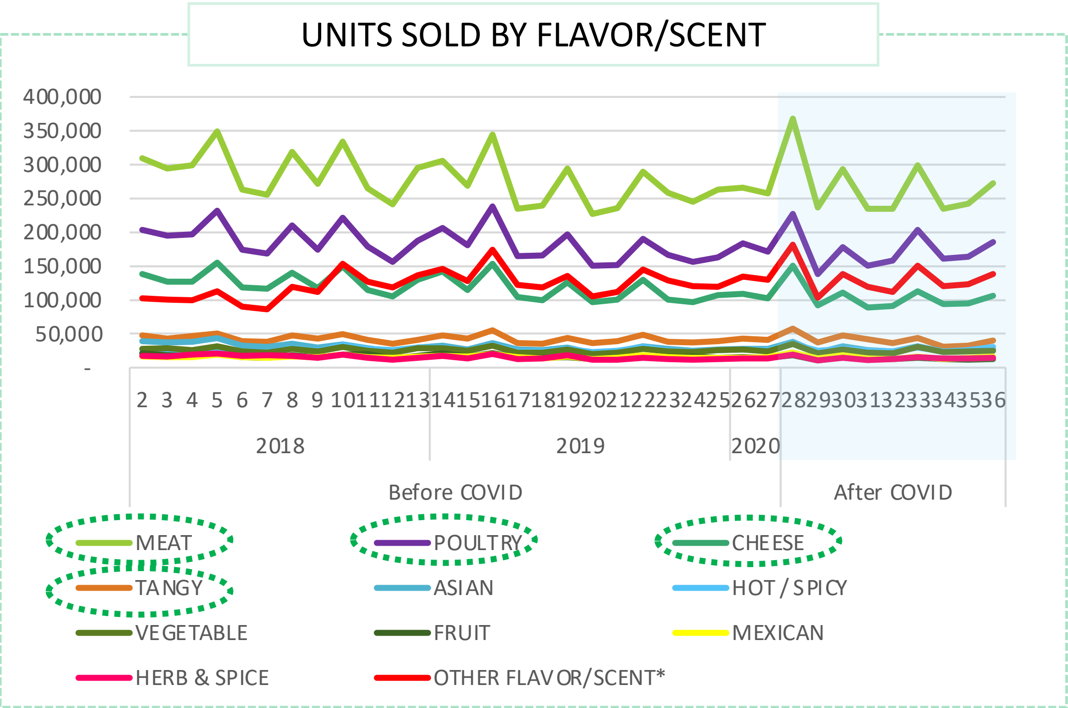


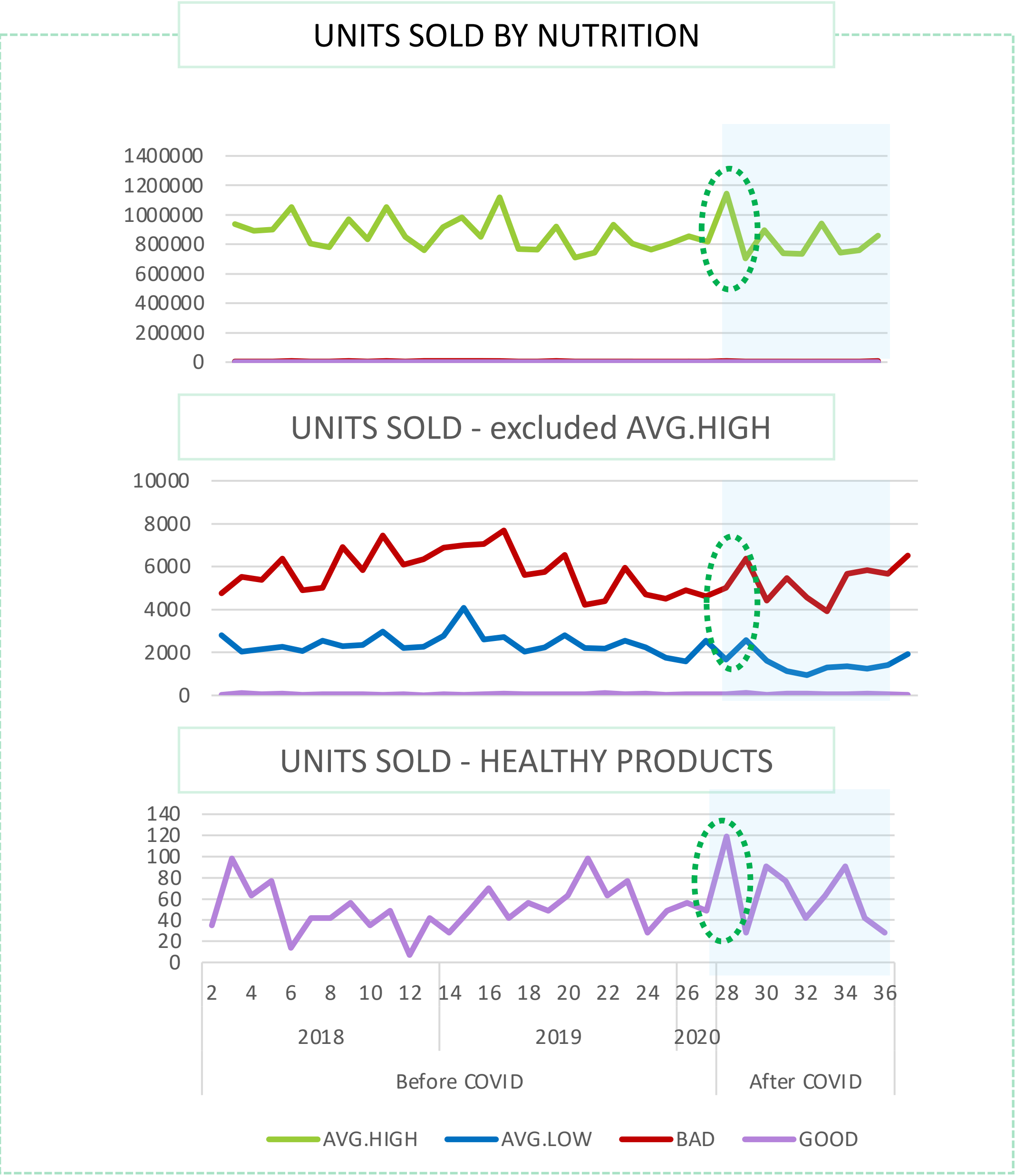






FLAVOR PREFERENCE & NUTRITION





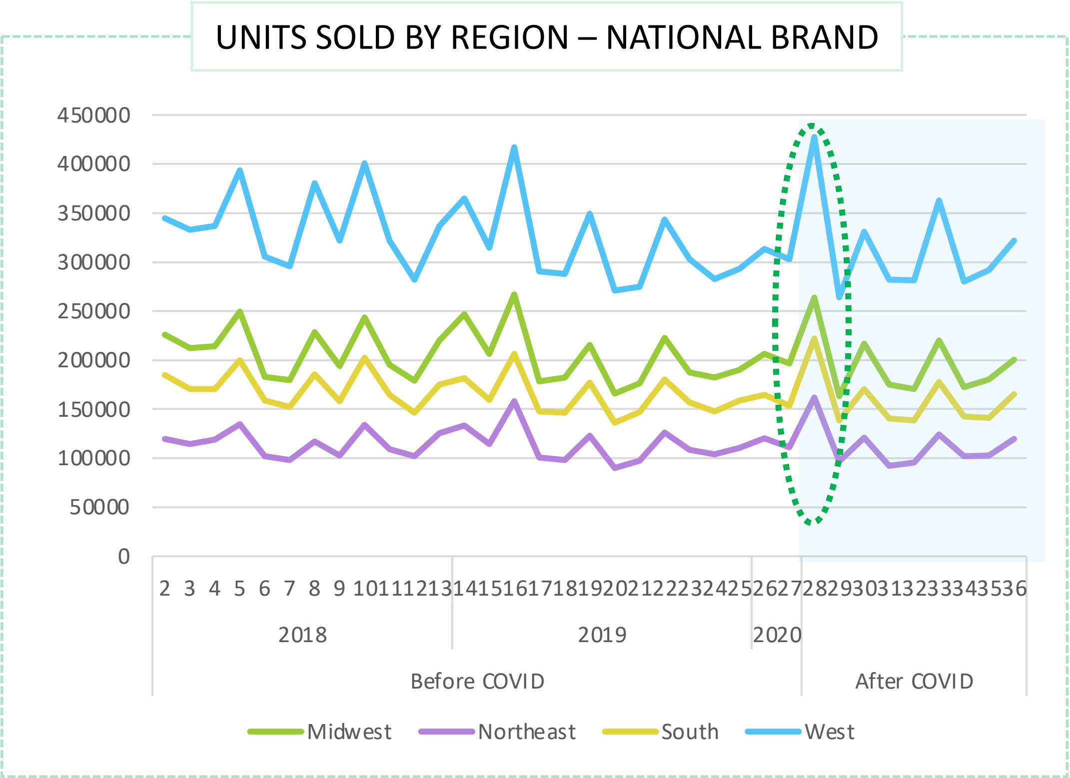
1

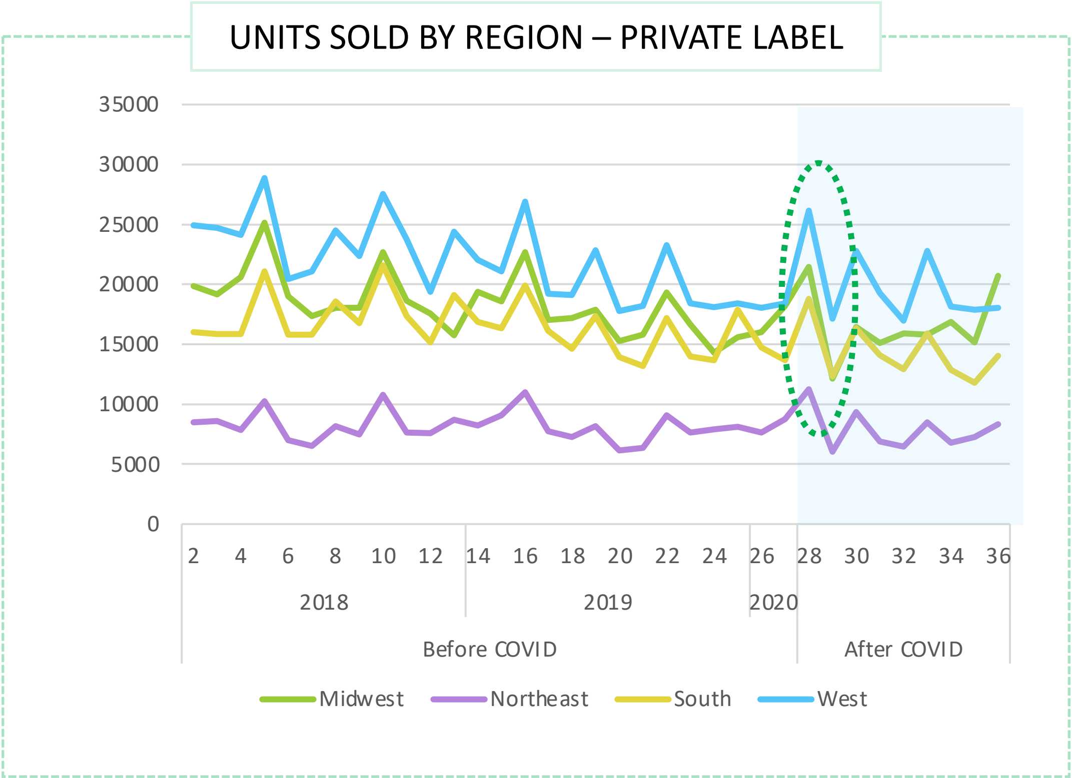
TOP 5 Flavors based on units sold include: **Meat, Poultry, Cheese, Tangy and Other Flavors.** We don't observe a significant change in Flavor/Scent **preference** before and after COVID

2

While we observe a sudden spike across products of nutritional levels after COVID, there are still **no significant trends**. The AVG.HIGH products (High calories, >5% DV, and High protein, >20% DV) are still dominating the portfolio. We especially notice that **GOOD** products (Low calories, High protein) have **very few units sold** compared to others.

REGIONAL FACTOR





1

NATIONAL BRAND: We observe a **short-term** HIGH DEMAND from all four regions in Mar/2020, then, a sharp DECREASE in the following month. There is **similar pattern** in all four markets.

2

PRIVATE LABEL: We observe a high demand at all four regions after COVID, then, a sharp decline in demand.

- In general, we observe slight downward trends in **MIDWEST/ WEST/ SOUTH** from 2018 to 2020
- We observe a significant increase in demand in **MIDWEST** in Nov/2020

3

WEST is the best market for both NATIONAL BRAND and PRIVATE LABEL. The demand shows a stationary pattern on monthly basic under the study period. The monthly changes are likely associated with changes to (1) pricing strategy or (2) product packages rather than the COVID outbreak over the study period.

SUPPORTING ANALYSES – SUMMARY

OVERALL

- There does not seem to be a very significant difference in demand overall before and after COVID
- West, followed by Midwest regions offered significantly higher sales than Northeast and South. This trend continued during COVID as well
- There is a strong demand for National Brands among product group across regions compared to private brands
- Mexican food, followed by Meals significantly effect increase in sales
- There is no significant impact of all nutrition levels on sales

NATIONAL BRAND

- There has not been significant change in demand for National brands before and after COVID
- Like the overall results, West and Midwest have a significantly larger demand for national brands before and after COVID
- Within national brands, meals with Avg low and Avg high nutrition value enjoy the most demand before and after COVID
- Additionally, in the West, consumers significantly prefer meals with Avg low nutritional level

PRIVATE LABEL

- There is no statistically significant effect of the pandemic on demand for private label frozen meals
- Midwest is potentially the only strong market for Private Labels, with a strong preference for meals with Avg high and Avg low nutrition value. While the West prefers meals with a Bad nutritional value.

FROZEN VEGETABLES

DATA PROCESSING OF FROZEN VEGETABLES

1

UPC, PRODUCT DESCRIPTION,MANUFACTURER, MAJOR BRAND, BRAND :

- We removed all these columns from the data. These columns are very similar in nature and parameters such as 'UPC' had a lot of unique variables which would have hampered the analysis.

2

YEAR:

- Dates preceding March 2020 were labeled as 'PRE COVID' and following March 2020 were labeled as 'POST COVID'

3

PACKAGING:

- Since the Bag variable under packaging column have more than 95% of the total Sales, the data was categorized into two groups; i.e 'Bag' & 'Others'.

4

PARENT:

- PARENT columns had 4 categories that contains more 90% of the total sales amount, we split the data into 5 groups, namely- PRIVATE LABEL, PARENT 1,2, and 3 and others.

5

PRODUCT

- Regarding the product like top 10 product like MIXED VEGETABLE, BROCCOLI, BEANS etc., contained 92% of total sales. Hence, the data was categorized into 11 categories i.e., top 10 sales vegetable and others as one category

OVERVIEW – UNITS & REVENUE

1

National brands account for 61% of total units sold from 2018 through 2020 unlike the 93% we see within the Frozen Meals observation

2

We see a cyclic fluctuation from 2017 to January 2020 which would be the expected path for the following year. Once COVID begins, we see a 38% increase in sales and a 20% increase in expected sales

3

In terms of **revenue**, the **top 5 product groups** under National brands and Private label account for **over 77% of the total units sold** and **over 75% of the total revenue**.

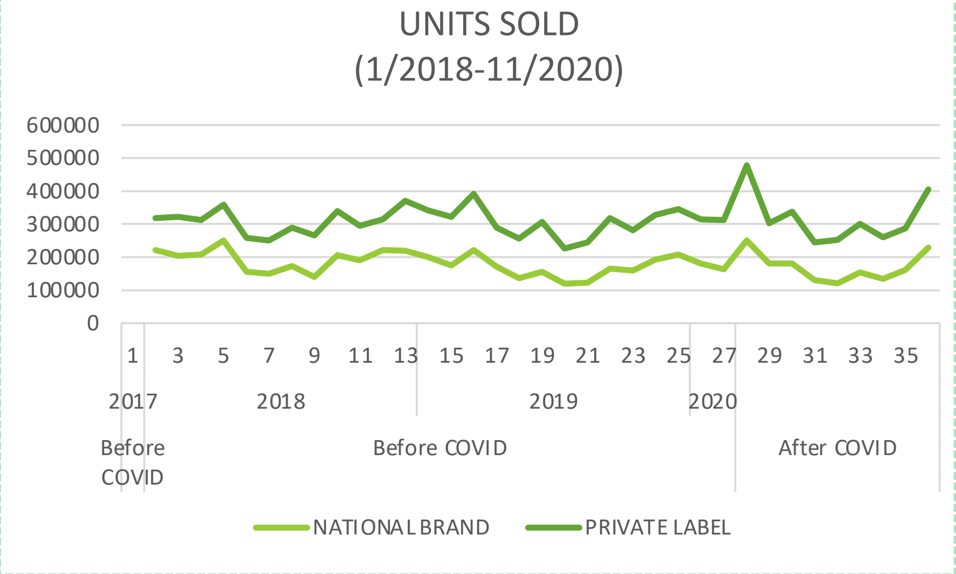
TOP 5 PRODUCT GROUPS

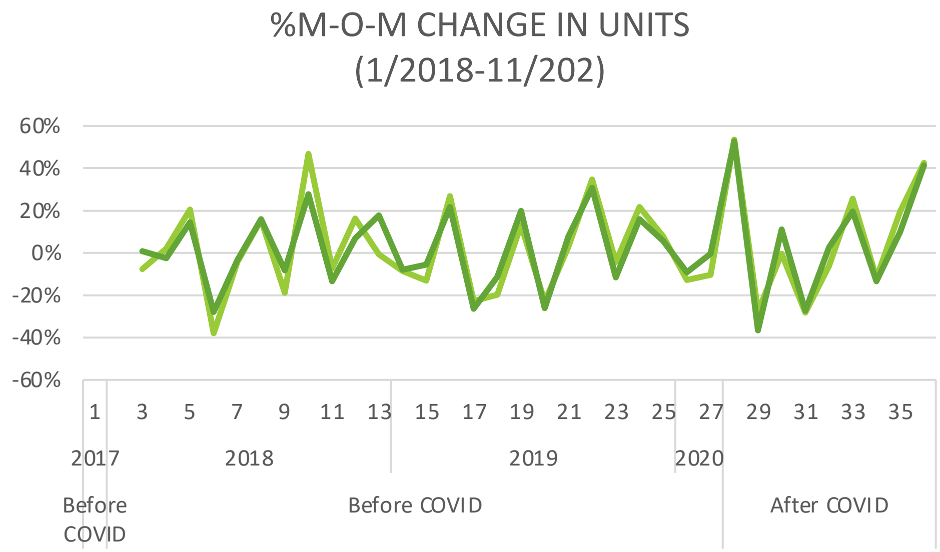
NATIONAL BRAND (12/2017-12/2020)

	UNITS	%	DOLLARS	%	AVG.PRICE
1 MIXED VEGETABLE	1,971,837	31%	4,008,863	30%	2.03
2 BROCCOLI	924,105	14%	2,085,188	16%	2.26
3 CORN	803,145	12%	1,260,416	9%	1.57
4 BEAN	691,705	11%	1,333,319	10%	1.93
5 PEAS	607,803	9%	1,011,318	8%	1.66

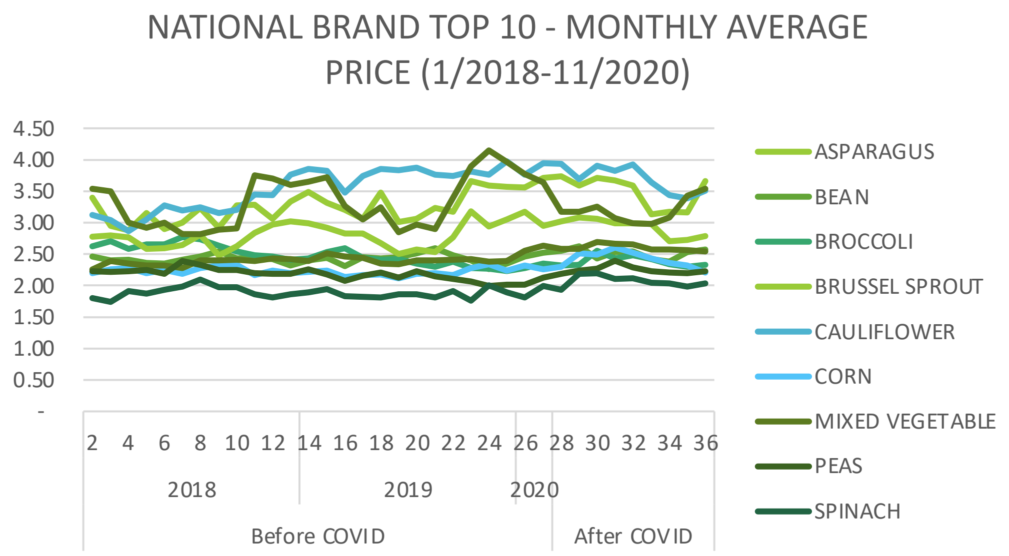
PRIVATE LABEL

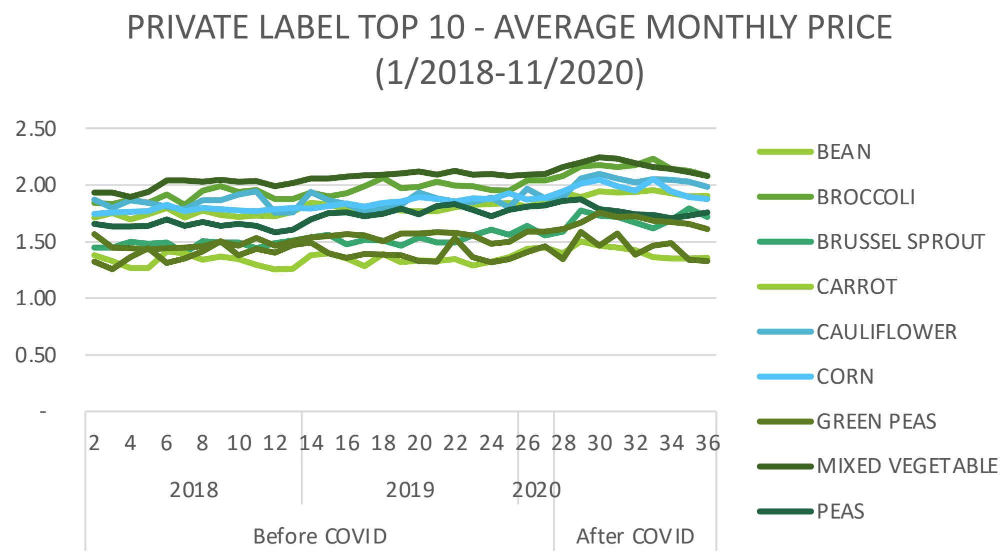
	UNITS	%	DOLLARS	%	AVG.PRICE
1 MIXED VEGETABLE	3,090,052	28%	4,939,236	31%	1.60
2 BROCCOLI	1,832,019	16%	2,798,829	17%	1.53
3 BEAN	1,440,523	13%	1,989,629	12%	1.38
4 CORN	1,195,369	11%	1,601,846	10%	1.34
5 PEAS	975,625	9%	1,325,181	8%	1.36

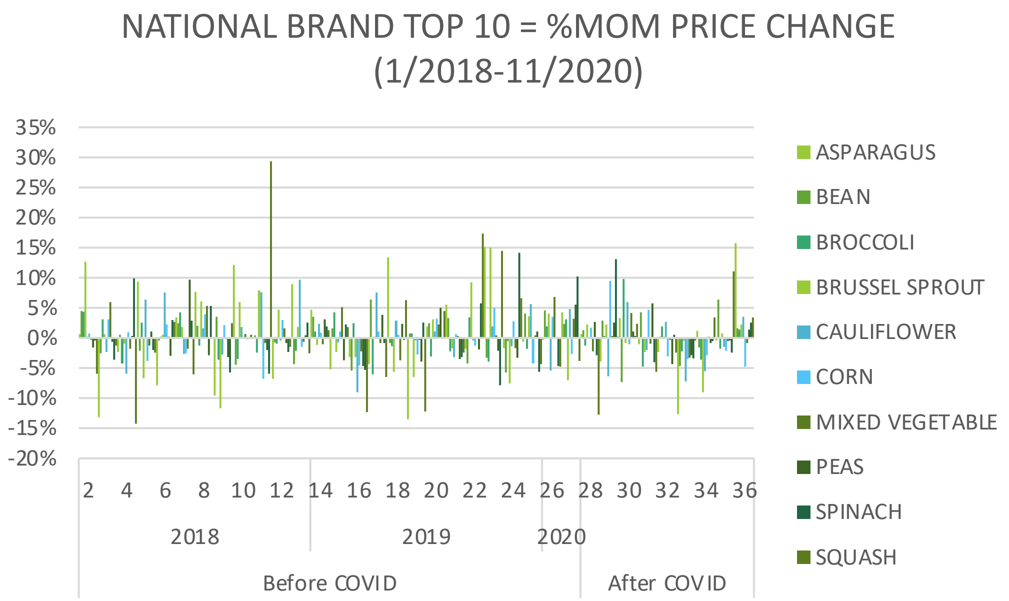


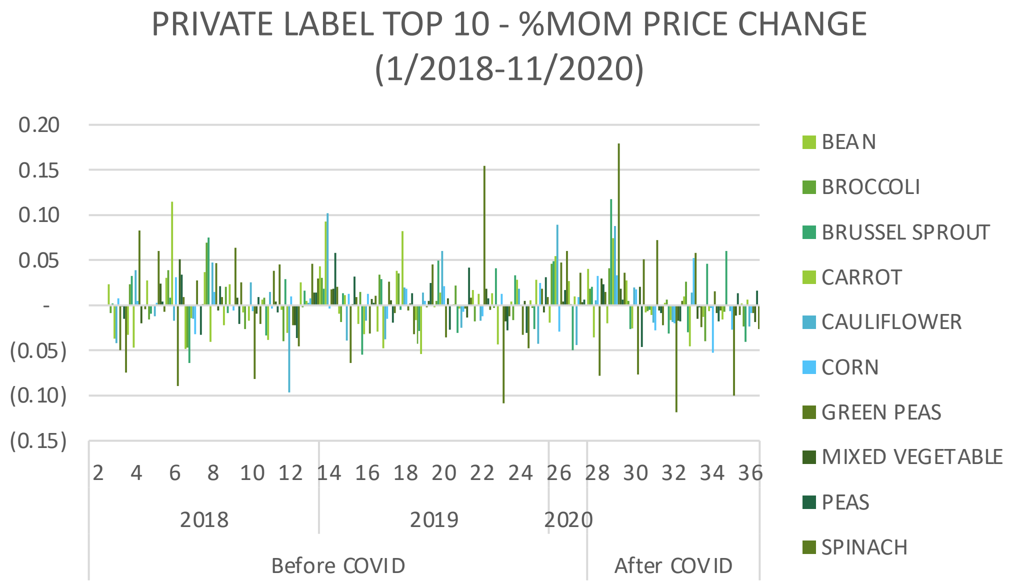


PRICE ELASTICITY

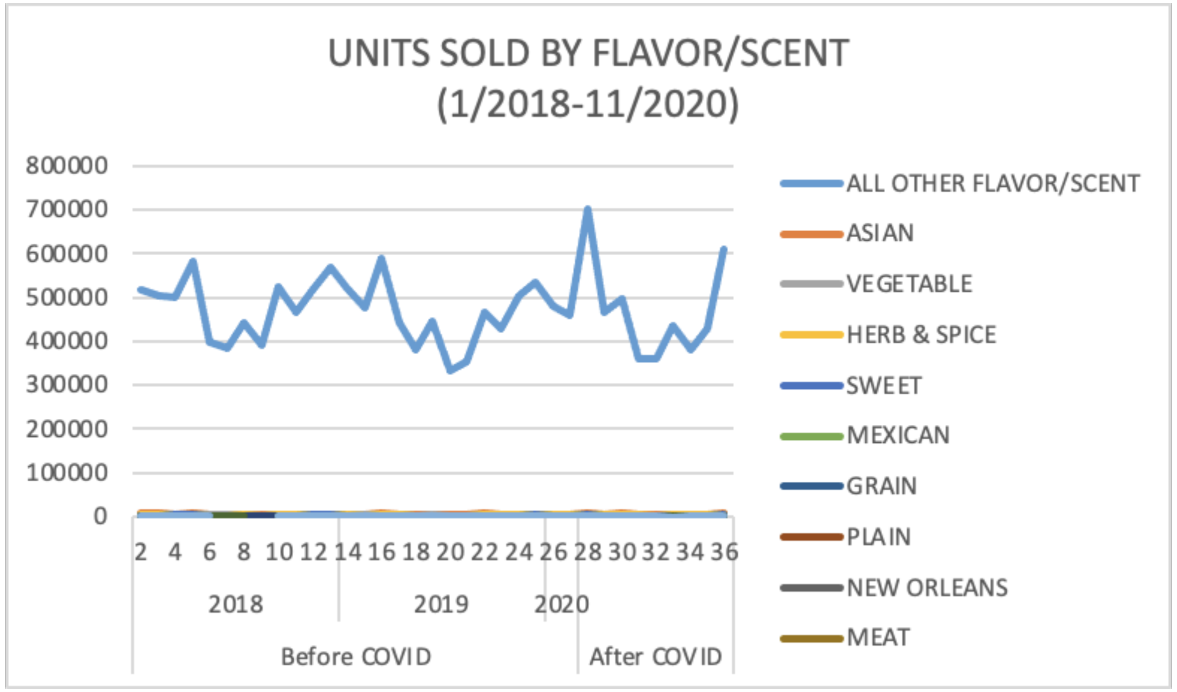


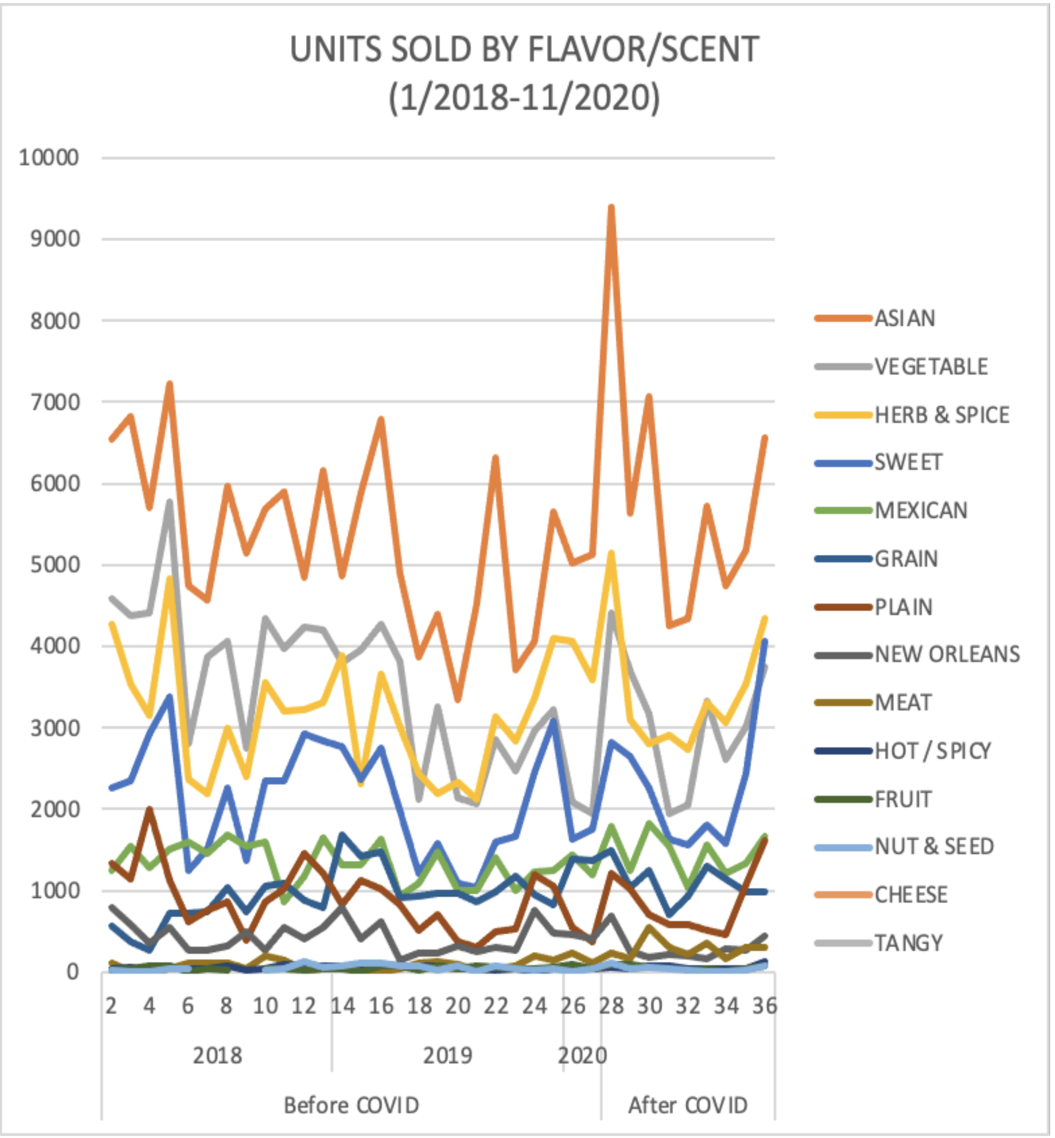






FLAVOR PREFERENCE





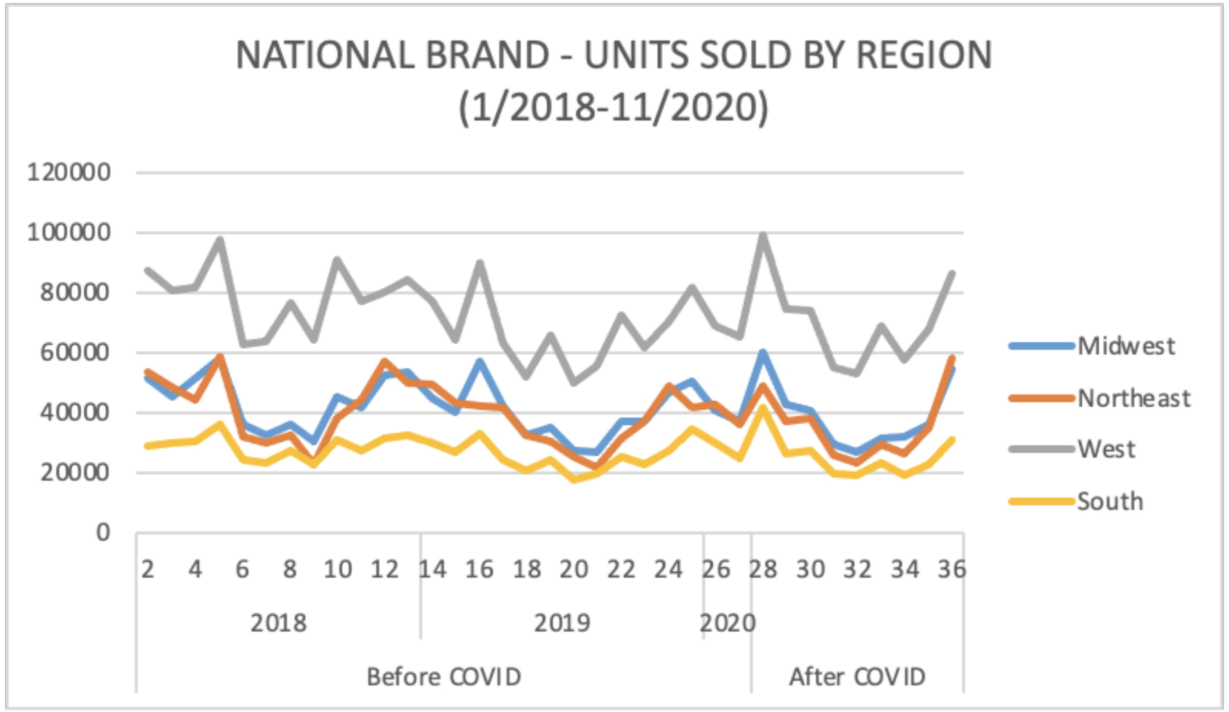
1

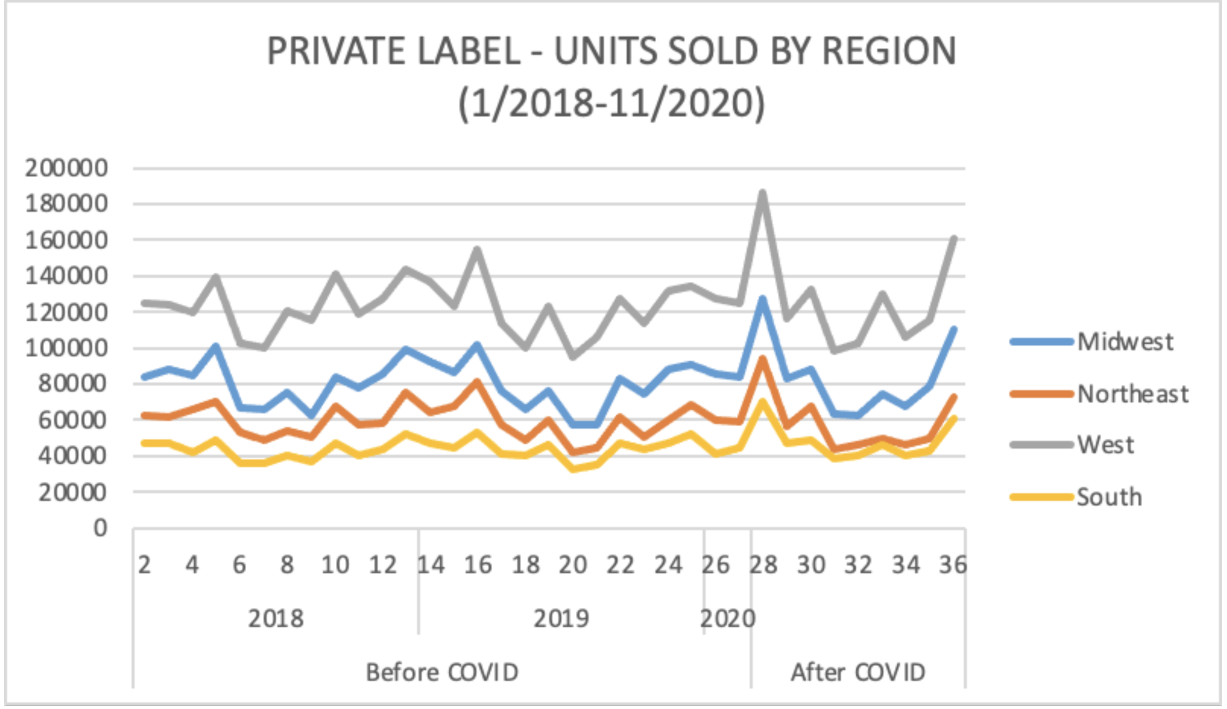
TOP 5 Flavors based on units sold include (excluding All Other Flavors & Scents):
1. Asian
2. Vegetable
3. Herb & Spice
4. Sweet
5. Mexican

2

The secondary figure excludes the field 'All Other Flavors and Scents', we see similar trends among most product flavor/scents, however a high emphasis on nutritional products spikes immediately followed by a sharp decline. Ref. Slide 9 on nutritional trends to examine similar results.

REGION





1

NATIONAL BRAND: We observe a HIGH DEMAND from all four regions after COVID; in terms of % change, within National Brands, the change is highest for the Midwest and West regions. As expected, there is a decrease in all 4 regions, however it is the most observable in West relatively.

2

PRIVATE LABEL: We observe a high demand at all four regions after COVID, then, a sharp decline in demand just as with the National Brand.

- West Region experienced a sharp peak followed by a 45% decrease in the unit sales
- Midwest follows the same sharp peak followed by a 47% decrease in unit sales
- The differences are significant to observe when comparing Private vs. National Brands in Midwest, Northeast, & South "After-COVID". The fluctuations in regional sales outside of COVID's impact in specific regions can be due to pricing strategies.

SUPPORTING ANALYSES – UNITS

COVID

- **OVERALL :** There does not seem to be a very significant difference in demand overall before and after COVID. With COVID, the UNIT sales went up and we see the COVID variable having positive impact in the UNITS sales at a significant level
- **NATIONAL & PRIVATE BRANDS:** Both brand types had similar directions in terms of fluctuations during COVID, with more dynamic changes with Private Labels, however this does not constitute COVID's impact on Private vs National Brand sales

REGION

- **OVERALL:** On an average Northeast and Southhave relatively less unit sales whereas West seemed to have high average sales.
- **COVID IMPACT:** We observe increase in demand for all the region because of COVID except for in Northeast specifically for the National Brand
- **NATIONAL & PRIVATE BRANDS:** However, although COVID might not have had an impact overall, it might have had an impact in Northeast due to pricing or marketing

PARENT

- **OVERALL:** Parent 2 and 3 have significantly high number of Sales on an average. However, 5 and 7 seems to have less than the average sales unit.
- **COVID IMPACT:** Although Parent 2 and 3 were selling in signifciant higher no. than other brands, because of COVID its average sales unit decreased compared to other Parents. Also, parent 5 and 7 have a relatively negative impact of COVID.

PRODUCT TYPE

- **OVERALL:** Frozen Vegetables on an average product like Broccoli, Sprout, Cauliflower, Corn, Mixed Vegetables, and Others have significant higher UNIT sales whereas Okra have significant lower unit sales.
- **COVID IMPACT:** Although the only product that seems to have been impacted was Zucchini

FLAVOR

- **OVERALL:** It is observed that Flavor/Scent factors follow the same direction as factors explored previously. The beginning of COVD had a short-term impact, but in the long term these all Flavor/Scent items restabilized overall
- **COVID IMPACT:** COVID had varying short-term impacts on various Flavor/Scent items. The highest grossing categories followed the overall direction while more miniscule categories had differing fluctuations causing the overall regression to be significant for the parameter overall

POPCORN


SOURCE
1
2
3
4
5
6
7
8
9
0
PRE-CH
TTX/MIX
MUTE
VOL
CH
CH LIST
MEDIA.P
MENU
INFO
TOOLS
EXIT
RETURN
A
B
C
D

DATA OVERVIEW

1 **PARENT GROUP:**

- The master data set consists of 118 product types that were further categorized into 7 core product types based on their corresponding food group

2 **PRODUCT TYPE:**

- The master data set was classified into 4 groups and were factorized

3 **PRIVATE LABEL/NATIONAL BRAND:**

- In addition to a more general analysis of the data, to better understand market trends for the two brands (private/national), data was divided accordingly and analyzed

4 **PRODUCT DESCRIPTION, MAJOR BRAND, MANUFACTURER, UPC & CATEGORY:**

- We removed the above variables to offer more meaningful and targeted marketing insights

5 **FACTORIZATION OF CATEGORICAL VARIABLES:**

- Variables such as Packaging type, region, product type, etc. were factorized to perform regression analysis on the data.

SALES PATTERN

1. **National brands** account for 74% of total units sold from 2018 through 2020

2. While **demand prior to COVID was** (+/-47%), we observe a slight **increase in demand** (+/-53%) after February 2020, right **after COVID** hit the US

3. In terms of **revenue**, out of 4 product groups**, Microwaveable popcorn** has the **highest market share (81%) in National brand** and **79%** for **Private label.**

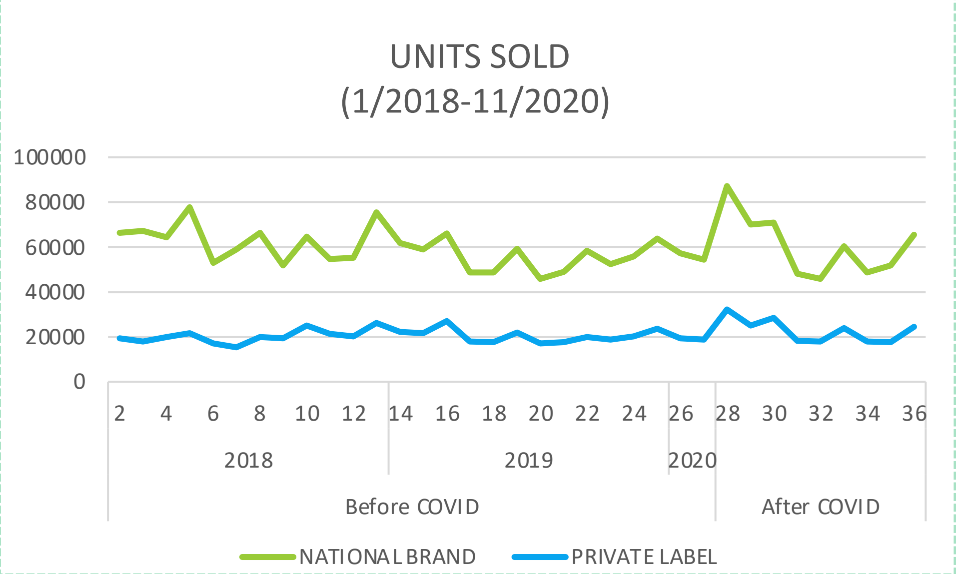
TOP 5 PRODUCT GROUPS

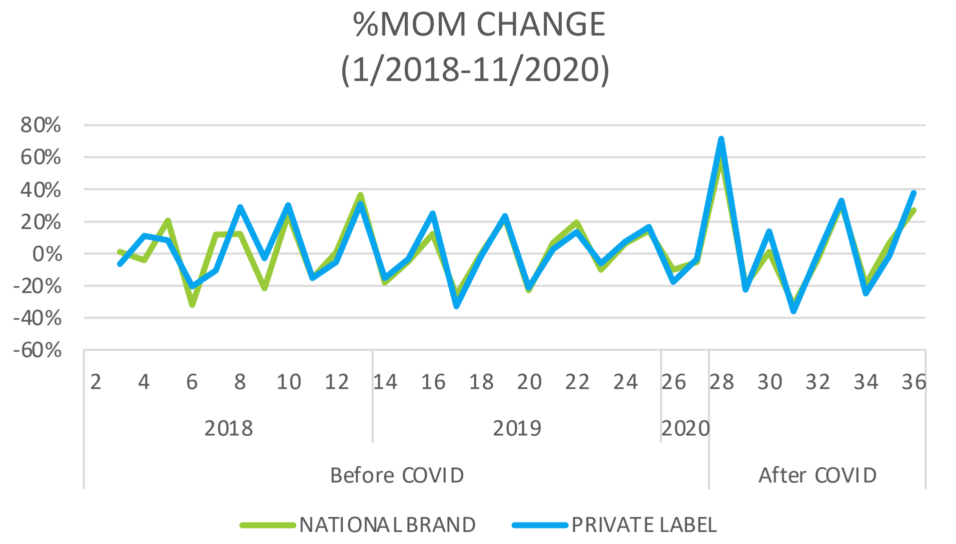
NATIONAL BRAND (1/2018-11/2020)

		UNITS	%	DOLLARS	%	AVG.PRICE
1	MICROWAVEABLE POPCORN	1,787,884	83%	5,529,336	81%	3.09
2	KERNEL POPCORN	285,138	13%	1,103,545	16%	3.87
3	OIL	71,099	3%	234,261	3%	3.29

PRIVATE LABEL (1/2018-11/2020)

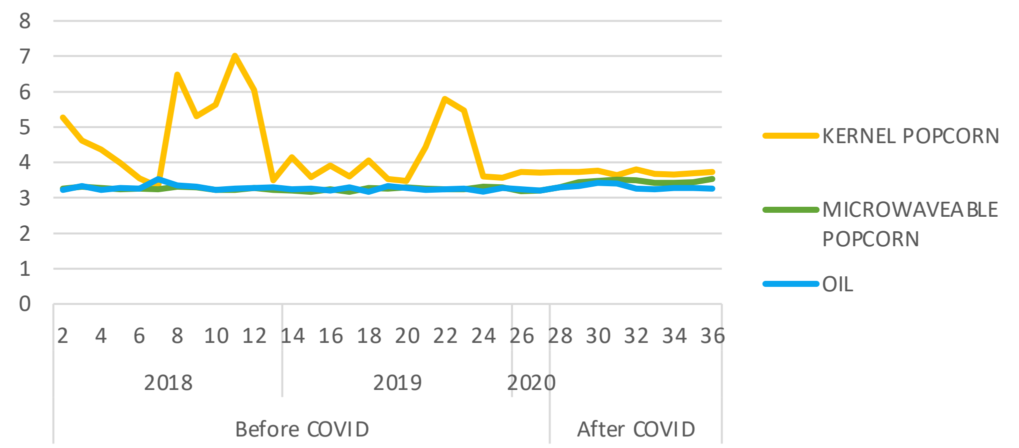
		UNITS	%	DOLLARS	%	AVG.PRICE
1	MICROWAVEABLE POPCORN	555,170	74%	1,509,931	79%	2.72
2	KERNEL POPCORN	195,727	26%	400,248	21%	2.04
3	OIL	735	0%	7,536	0%	10.25
4	READY TO EAT POPCORN	140	0%	159	0%	1.14



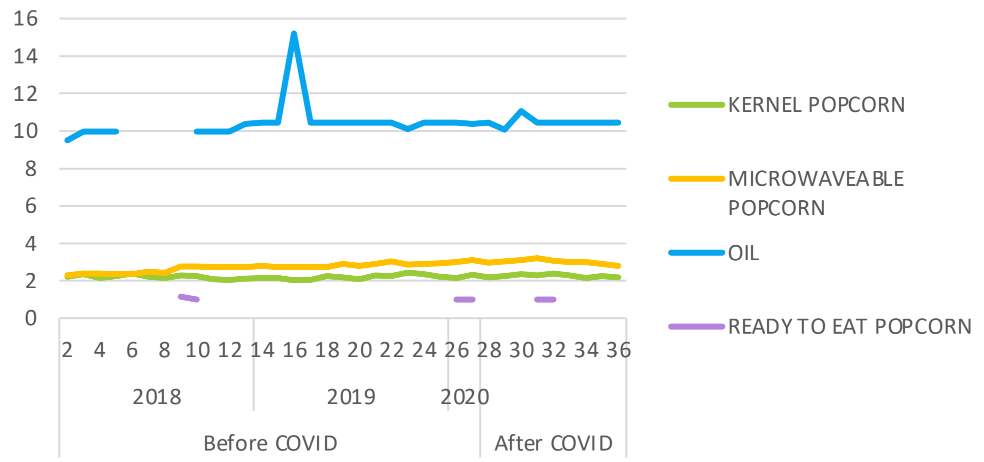


PRICE ELASTICITY

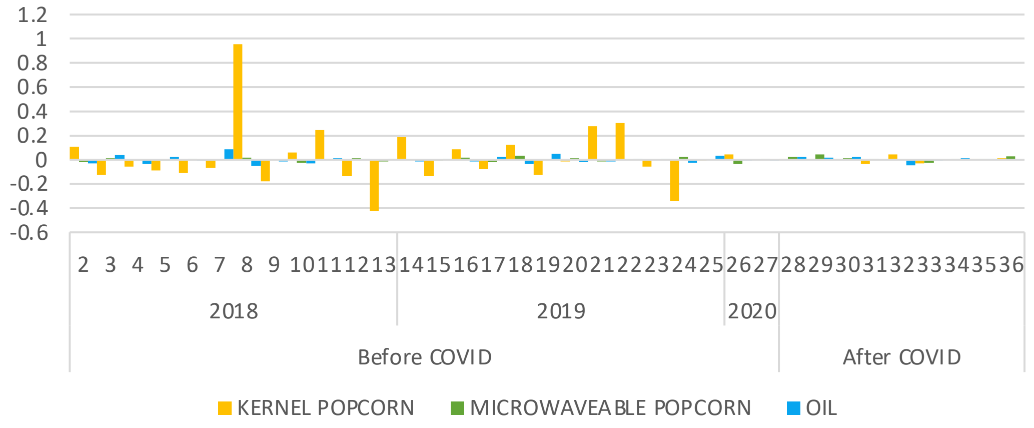
NATIONAL BRAND - AVERAGE MONTHLY PRICE (1/2018-11/2020)



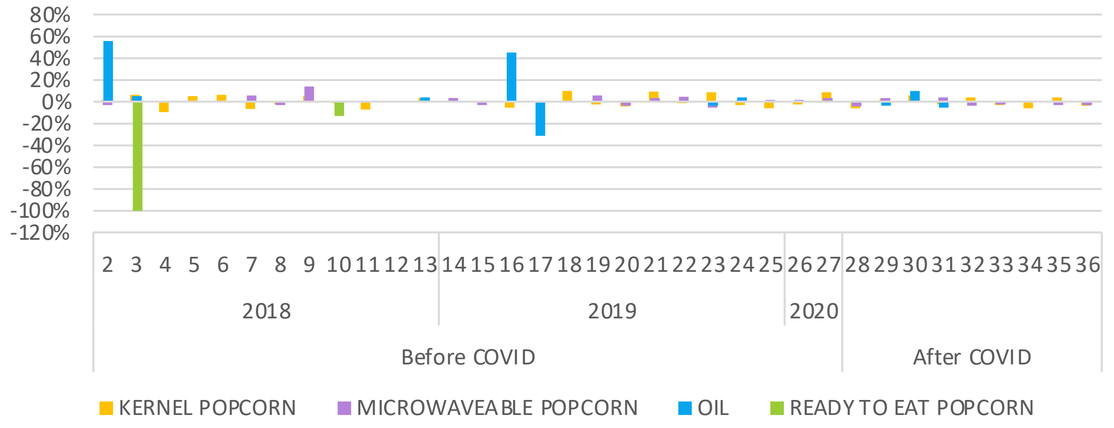
PRIVATE BRAND - MONTHLY AVERAGE PRICE (1/2018-11/2020)



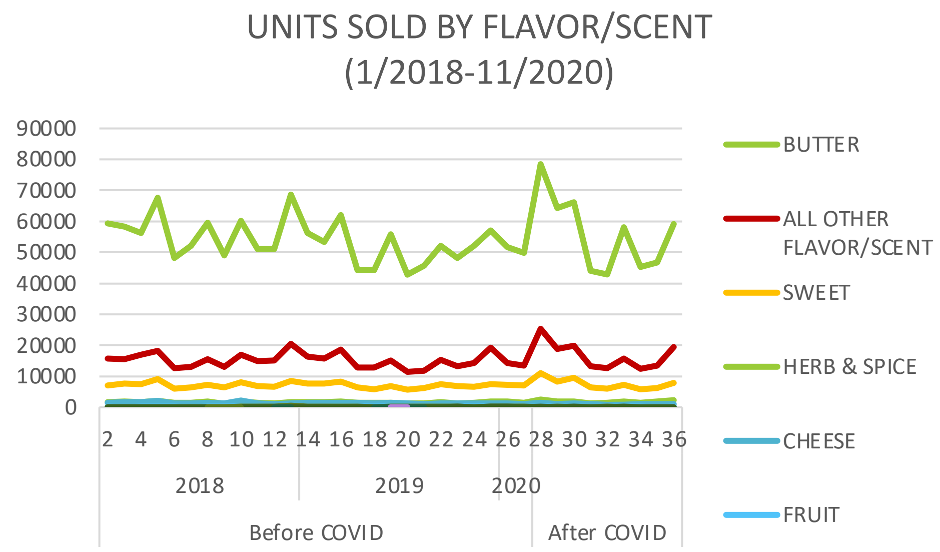
NATIONAL BRAND - %MOM MONTHLY PRICE CHANGE (1/2018-11/2020)

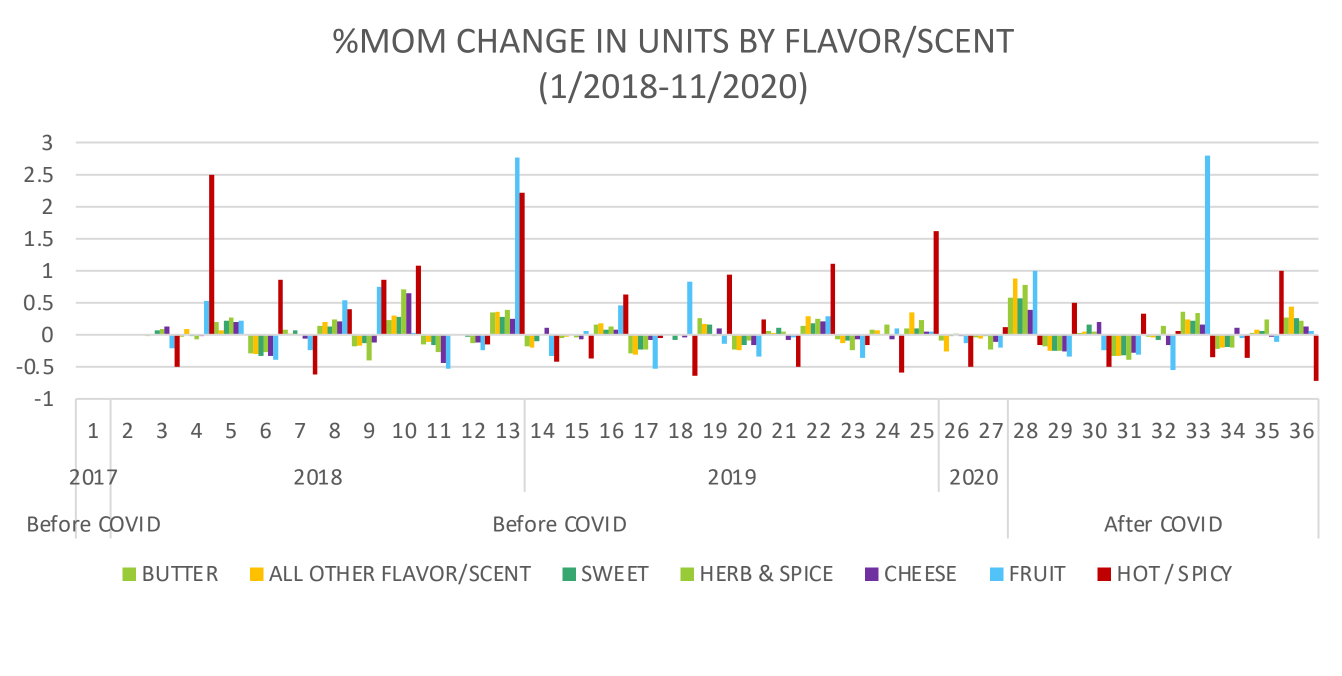


PRIVATE BRAND - %MOM PRICE CHANGE (1/2018-11/2020)



FLAVOR PREFERENCE





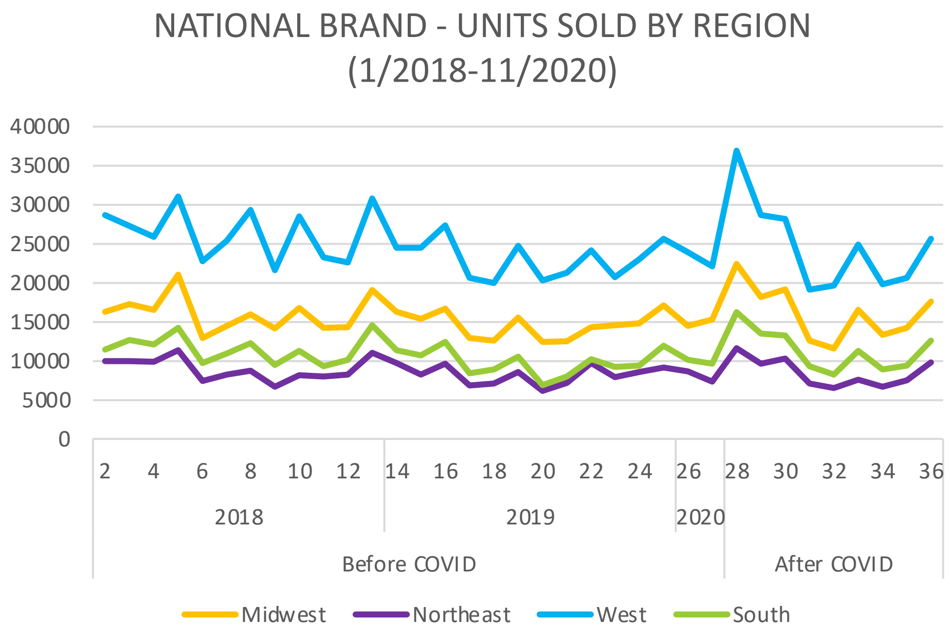
1

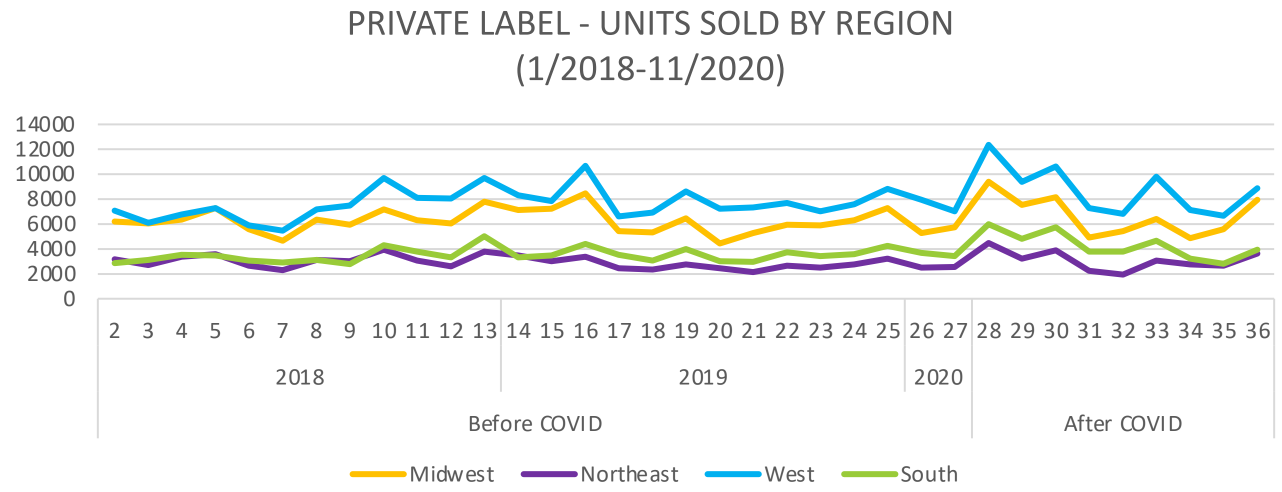
TOP 5 Flavors based on units sold include (excluding All Other Flavors & Scents):
1. Butter
2. All other flavor/scent
3. Sweet
4. Herb & Spice
5. Cheese

2

The secondary figure shows the month over month change in units by flavors. We see similar trends among most product flavor/scents, however, there is a decrease in the 'Hot & Spicy' flavor after COVID.

REGION





1

NATIONAL BRAND: We observe a HIGH DEMAND from all four regions after COVID; in terms of % change, within National Brands, the change is highest for Midwest & west regions . As expected, there is a decrease in all 4 regions, however it is the most observable in the west region relatively.

2

PRIVATE LABEL: We observe a high demand at all four regions after COVID, then, a sharp decline in demand just as with the National Brand.

- West region experienced a sharp peak followed by a ~**25% decrease** in the unit sales
- Midwest region follows the same sharp peak followed by a **~21% decrease** in unit sales
- The differences are significant to observe when comparing Private vs. National Brands in **Midwest (N Central), Northeast, West, and South**" After-COVID". The fluctuations in regional sales outside of COVID's impact in specific regions can be due to pricing strategies.

SUPPORTING ANALYSES – UNITS

COVID

- **OVERALL :** Demand spiked in March 2020 after covid because of panic buying difference in demand before and after COVID
- **NATIONAL BRANDS:** We see similar results corresponding to changes in sales of national branded products as well
- **PRIVATE LABEL:** Although we only see directional support for higher sales during COVID, it is not statistically significant

REGION

- **OVERALL:** West and Midwest regions have significantly higher demand before and after COVID
- **NATIONAL BRANDS:** We observe a similar demand for national branded products in the West and Midwest regions. There is also no meaningful effect of COVID on sales across regions
- **PRIVATE LABEL:** For private label products, however, we see significantly higher demand in the Midwest. There is so effect of COVID on sales across regions

BRAND

- **OVERALL:** A significantly high number of national branded products were sold.
- The ratio of number of sales increased for private brands after COVID.

PRODUCT TYPE

- **OVERALL: Microwaveable popcorn** group had significantly higher sales than other types before and after COVID
- **NATIONAL BRANDS:** From national branded popcorns, the same trend continues before and after COVID across regions
- **PRIVATE LABEL:** From private labelled meals, the same trend continues before and after COVID across regions

FLAVOR

- **OVERALL:** it is observed that Flavor/Scent factors follow the same direction as factors explored previously. The beginning of COVD had a short-term spike, but in the long term these all Flavor/Scent items re-stabilized overall
- **COVID IMPACT:** COVID had varying short-term impacts on various Flavor/Scent items. The highest grossing categories followed the overall direction while more miniscule categories had differing fluctuations causing the overall regression to be significant for the parameter overall.

MARKETING STRATEGY RECOMMENDATIONS

MARKETING RECOMMENDATIONS

REBRANDING CONAGRA

ConAgra should focus its marketing efforts on repositioning itself as a leader in sustainable food packaging and plant-based options. This would help the brand further its mission and offer a unique standing in a rapidly growing segment of the market

REGION & NUTRITION

Frozen Meals: West & Midwest are Conagra's highest selling markets. In all 4 regions, current preference is very low for "good" nutrition value products. Given ConAgra's commitment to the UN SDGs, we recommend that marketing efforts shift focus to these products in addition to the existing popular foods

Frozen Vegetables: For National Brands, the Northeast shows promising fluctuations, even through COVID. For Private Brands, we see a similar observation for the Midwest region. It is recommended that ConAgra continue pushing efforts in the West for all Brands, the Northeast for National Brands, and Midwest for Private Brands.

STRATEGIC TARGETING

Frozen Meals & Vegetables: With US' growing Gen-Z & Millennial population, marketing efforts must prioritize young working adults who are increasingly choosing healthier and sustainably packaged options

Popcorn: The primary target group for popcorn must be children and teens. Investing in store features and placing these product at an eye level visible to children would offer a great head start.

PERSONALIZATION

We recommend ConAgra to send personalized ad flyers and weekly coupons to customers based on dynamic user profiles and purchase history. By linking multiple data points around factors such as flavor, brand, choice, etc. for all 3 product categories including frozen meals, frozen vegetables and popcorn, ConAgra can better understand each consumer's behavior and offer personalized product suggestion

APPENDICES

DEFINING NUTRITION LEVEL

The variable Nutrition, used in our analyses was developed using the following framework –

- We use % Daily Values (DV) as a guide. Daily Values provide the average level of nutrients of a food/product for a person eating 2,000 calories a day.

There are 4 levels of nutrition in our analysis:

NUTRITION LEVEL	CALORIES	PROTEIN
Bad	High (>5%)	Low (<20%)
Average.High	High (>5%)	High (>20%)
Average.Low	Low (<5%)	Low (<20%)
Good	Low (<5%)	High (>20%)

For the list of Nutrition level for each PRODUCT TYPE, please refer to APPENDIX

1. Reference list of Product type groups – FROZEN MEALS

BURGER VEG
- VEGETABLE WRAP
- VEGETARIAN BURGER

BURGERNV
- BURGER
- CHEESEBURGER
- CHEESEBURGER SLIDER
- HAMBURGER
- SLIDER

CHICKEN
- CHICKEN SANDWICH
- CHICKEN SLIDER

DESSERT
- PASTRY
- PASTRY SANDWICH
- TURNOVER
- TURNOVER SANDWICH

EUROPEAN
- CROQUETTE
- KOLACHE
- PASTY

HOT DOG
- BAGEL DOG
- CHEESE DOG
- CHILI CHEESE DOG
- CORN DOG
- HOT DOG
- PRETZEL DOG

INDIAN
- KATI POUCH
- KORMA
- SAMOSA

ITALIAN
- CALZONE
- CRUSTOLI
- FRUSTA
- PANINI
- PANINI SANDWICH
- STROMBOLI

LATAM
- AREPAS
- CACHITOS
- CHALUPA
- CHILE RELLENO
- PASTELE
- PASTELILLO
- PUPUSA
- SORULLOS
- YUCCA RELLENA

MEALS
- DINNER
- DINNER OR ENTREE
- ENTREE
- MEAL KIT

MEASTERN
- BUREK
- GYRO

MEXICAN
- BURRITO
- CHIMICHANGA
- EMPANADA
- EMPANADILLA
- ENCHILADA
- QUESADILLA
- TACO
- TACO PUFF
- TAMALE
- TAQUITO

PIROSHKI
- PIROSHKI

PIZZA
- PIZZA
- PIZZA BURGER
- PIZZA POCKET
- PIZZA PUFF
- PIZZA ROLL
- PIZZA WRAP

POCKET FOOD
- POCKET MEAL
- POCKET PIE
- POCKET SANDWICH

ROLL
- BREADSTICK
- CHEESE PUFF
- ROLL

SANDWICH
- HOAGIE SANDWICH
- SANDWICH
- SANDWICH WRAP
- SUBMARINE SANDWICH

SIOPAO
- SIOPAO

2. PRODUCT TYPE & NUTRITION LEVEL – FROZEN MEALS

AVG.HIGH *

- BURGER
- BURRITO
- CACHITOS
- CHEESEBURGER
- CHEESEBURGER SLIDER
- CHICKEN SANDWICH
- CHICKEN SLIDER
- CHILE RELLENO
- CHILI CHEESE DOG
- CHIMICHANGA
- CORN DOG
- DINNER
- DINNER OR ENTREE
- EMPANADA
- EMPANADILLA
- ENCHILADA
- ENTREE
- GYRO
- HAMBURGER
- HOAGIE SANDWICH
- MEAL KIT

AVG.HIGH *

- PANINI SANDWICH
- PASTRY SANDWICH
- PIROSHKI
- PIZZA
- PIZZA BURGER
- PIZZA POCKET
- PIZZA PUFF
- PIZZA ROLL
- PIZZA WRAP
- POCKET MEAL
- POCKET SANDWICH
- PRETZEL DOG
- PUPUSA
- QUESADILLA
- SANDWICH
- SANDWICH WRAP
- STROMBOLI
- SUBMARINE SANDWICH
- TACO PUFF
- TAMALE
- TAQUITO
- TURNOVER SANDWICH
- VEGETABLE WRAP
- YUCCA RELLENA

AVG.LOW *

- CHEESE DOG
- CHEESE PUFF
- PANINI
- ROLL
- SORULLOS

BAD*

- AREPAS
- BAGEL DOG
- BREADSTICK
- BUREK
- CALZONE
- CHALUPA
- CROQUETTE
- CRUSTOLI
- FRUSTA
- HOT DOG
- KATI POUCH
- KOLACHE
- PASTELE
- PASTELILLO
- PASTRY
- PASTY
- POCKET PIE
- SIOPAO
- SLIDER
- TACO
- TURNOVER

GOOD*

- KORMA
- SAMOSA
- VEGETARIAN BURGER

***Noted:** There are 4 level of nutrition levels in our analysis:
BAD – High calories (>5%) & Low protein (<20%)
AVERAGE.HIGH – High calories (>5%) & High protein (>20%)
AVERAGE.LOW – Low calories (<5%) & Low protein (<20%)
GOOD – Low calories (<5%) & High protein (>20%)

THANK YOU!