Competitive Analysis of the Pasta Category: Focus on Mueller Brand

Presented by **Nazgul Altynbekova**

Overview of the Pasta Category

The dataset includes sales, household penetration, market share, loyalty measures, and churn benchmarks for various pasta brands, with a focus on Mueller.

Pivoted Data Analysis

Purchase_Class \ Quarter	1	2	3	4	5	6	7	8
0	68812	71682	69874	74089	74363	73049	73750	74233
1	17898	15364	17238	14072	13917	14646	14208	13842
2	3079	2691	2759	1985	1924	2263	2075	2016
3	767	767	674	521	465	645	568	532
4	235	253	243	177	158	214	205	201
5	93	102	90	59	71	70	66	62
6	37	52	47	27	24	32	37	32
7	20	18	15	15	15	16	21	10
8	5	15	3	3	4	8	11	11
9	3	4	3	2	5	4	5	2
10+	3	4	6	2	6	5	6	11

The majority of households (Class 0) consistently did not make any purchases, with around 70,000 non-buyers each quarter. Class 1 (one-time buyers) shows a stable count between 13,000 and 18,000 buyers, representing a large untapped segment. Mid-range classes (2-4 purchases per quarter) steadily decline, while higher purchase classes (5 and above) remain minimal but show slight growth in later quarters (Q7 and Q8).

There's a significant opportunity to move one-time and mid-frequency buyers into higher purchase frequency segments through targeted campaigns and promotions, especially in Q7 and Q8 where higher purchase activity spikes.

RFM Analysis

RFM analysis shows that customer engagement differs across brands. Private Label and Barilla have the highest recency and frequency scores, indicating that their customers are more engaged and make frequent purchases.

Brands with higher frequency scores enjoy higher loyalty. Mueller's lower frequency and recency suggest that re-engagement campaigns would benefit its long-term customer retention.

Cluster Analysis

Cluster	1	2	3	4
Recency	71.36	20.28	43.68	248.54
MonetaryValue	3.08	32.36	11.99	2.11
Frequency	2.38	19.00	8.11	1.49
Cluster Size	14335.00	766.00	4686.00	10350.00

- **Cluster 1** (Low Engagement): The largest group (14,335 customers) but with low frequency and spending.
- **Cluster 2** (High Value, High Frequency): A small, high-value segment (766 customers) with frequent purchases.
- **Cluster 3** (Moderate Engagement): Mid-level buyers (4,686 customers) with moderate frequency and spending.
- **Cluster 4** (High Recency, Low Frequency): A large group (10,350 customers) with high recency but low engagement.

Focus on converting **Cluster 1** and **Cluster 4** into higher-frequency buyers, while maintaining **Cluster 2** through personalized offers.

Buyer Class Analysis

Purchase_Class	Number_of_Buyers	Total_Revenue	Total_Items	Percent_Total_Buyers	Percent_Total_Revenue
0	74233	0.0	0	0.0	0.0
1	13842	20026.0	16909	83.0	65.0
2	2016	5940.0	4977	12.0	19.0
3	532	2324.0	1919	3.0	8.0
4	201	1267.0	1008	1.0	4.0
5	62	456.0	380	0.0	1.0
6	32	304.0	254	0.0	1.0
7+	34	557.0	383	0.0	2.0

- **Class 0** (non-buyers) represents the largest segment, with 74,233 households (83% of total buyers) contributing 0% of total revenue.
- **Class 1** (one-time buyers) is the most significant revenue driver, accounting for **65%** of total revenue, despite only representing 12% of total buyers.
- Higher-frequency buyers (Class 2–7+) contribute **19% of revenue** but represent a much smaller portion of total buyers (5%).

While Class 1 buyers dominate revenue generation, there is a substantial opportunity to engage higher-frequency buyers, as these segments contribute disproportionately higher revenue per household. Targeting one-time buyers to increase their purchase frequency would provide the largest revenue gains.

Double Jeopardy

The graph confirms the **Double Jeopardy** effect, where brands with higher penetration also have higher purchase frequency.

- **Private Label** dominates with the highest penetration (~65%) and frequency (~4.7).

- **Mueller** is mid-tier with ~22% penetration and ~2.7 frequency, similar to Creamette and Ronzoni.

Mueller needs to increase penetration to compete with higher-tier brands like Private Label and Barilla.

Double Jeopardy: Penetration vs Purchase Frequency
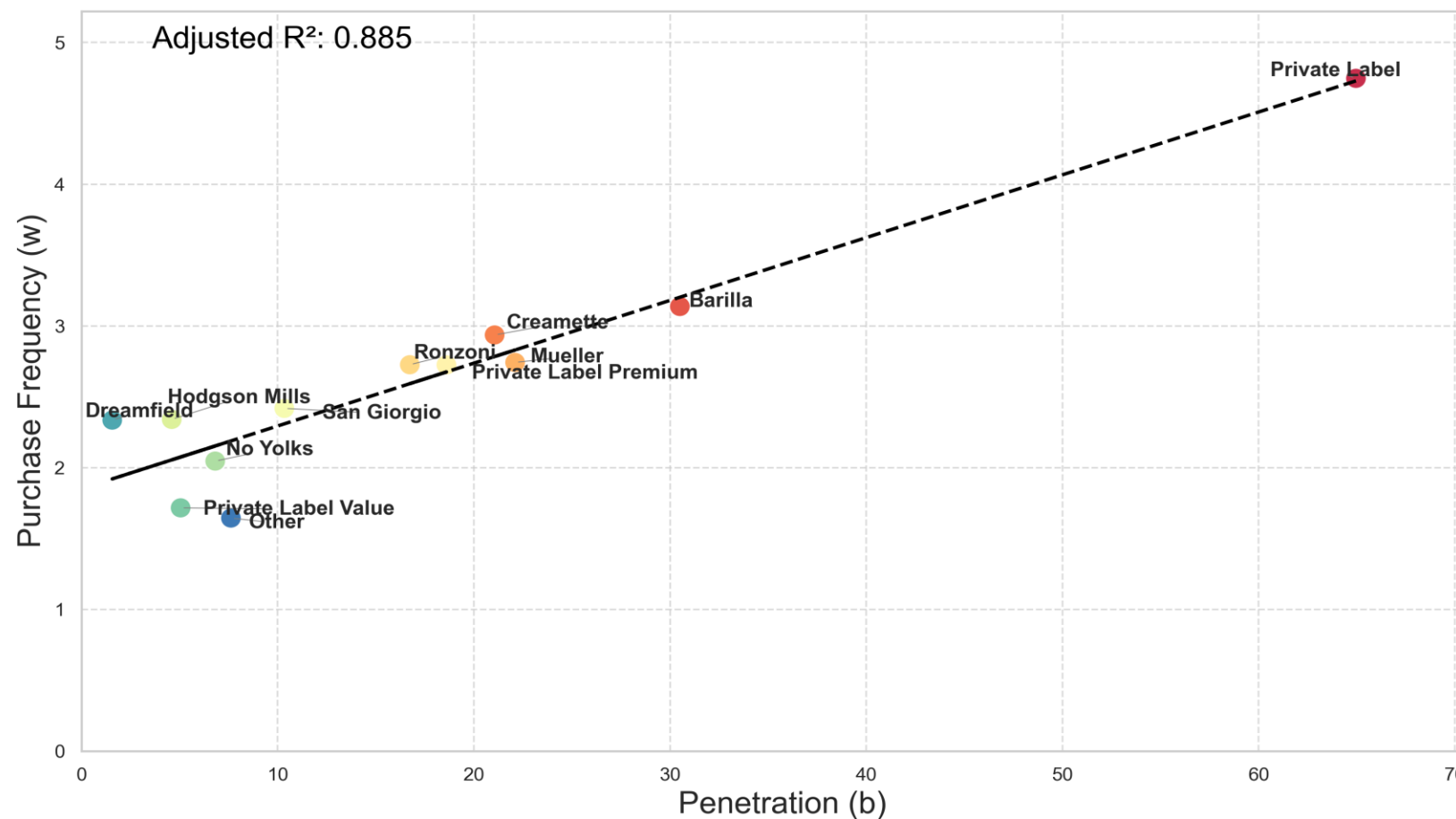
Brand Group Analysis

•**Private Label** leads with a 34.89% market share, 64.95% penetration, and high purchase frequency (4.747), dominating the pasta category.

•**Mueller** holds 9.5% market share, with a 22.1% penetration and a relatively lower SCR (8.67%). Its sole loyalty score (0.250) suggests moderate brand exclusivity among its customers.

•**Barilla** is the second-largest player, with 15.21% market share and high penetration (30.5%), but lower customer loyalty (SCR of 13.68).

Mueller is positioned in the mid-market but has room to grow its customer loyalty and purchase frequency to compete more effectively with Private Label and Barilla.

	brand	share	b_prop	b_%	w	SCR	Sole
0	Private Label	34.89	0.650	64.958	4.747	44.100	0.340
1	Barilla	15.21	0.305	30.500	3.137	13.680	0.163
2	Creamette	9.52	0.211	21.059	2.936	8.840	0.190
3	Mueller	9.50	0.221	22.102	2.742	8.670	0.250
4	Ronzoni	7.49	0.167	16.736	2.726	6.520	0.149
5	Private Label Premium	7.32	0.186	18.602	2.725	7.250	0.152
6	San Giorgio	4.35	0.103	10.341	2.418	3.580	0.099
7	Hodgson Mills	2.82	0.046	4.601	2.340	1.540	0.118
8	No Yolks	2.32	0.068	6.818	2.046	2.000	0.097
9	Private Label Value	1.44	0.051	5.055	1.716	1.240	0.135
10	Dreamfield	1.36	0.016	1.569	2.335	0.520	0.116
11	Other	3.77	0.076	7.619	1.644	0.045	0.087
12	Total	99.99	2.100	209.960	31.511	97.985	1.896

Repeat Buying Rates

Quarter	Repeat Buying Rate (%)
2	26.558266
3	29.512195
4	21.681374
5	24.325446
6	25.770089
7	24.995811
8	24.938961

The repeat buying rate for Mueller fluctuates across the quarters, ranging between 21.68% and 29.51%. The highest repeat rate was observed in **Quarter 3** (29.51%), while the lowest occurred in **Quarter 4** (21.68%).

Mueller's repeat buying rate is inconsistent, indicating potential issues with customer retention or engagement during certain periods. Focusing on stabilizing and improving repeat purchase behaviors, particularly in quarters where dips are observed, can help improve overall brand loyalty.

Quarterly Metrics Analysis

Quarterly Metrics for Mueller Brand Pasta
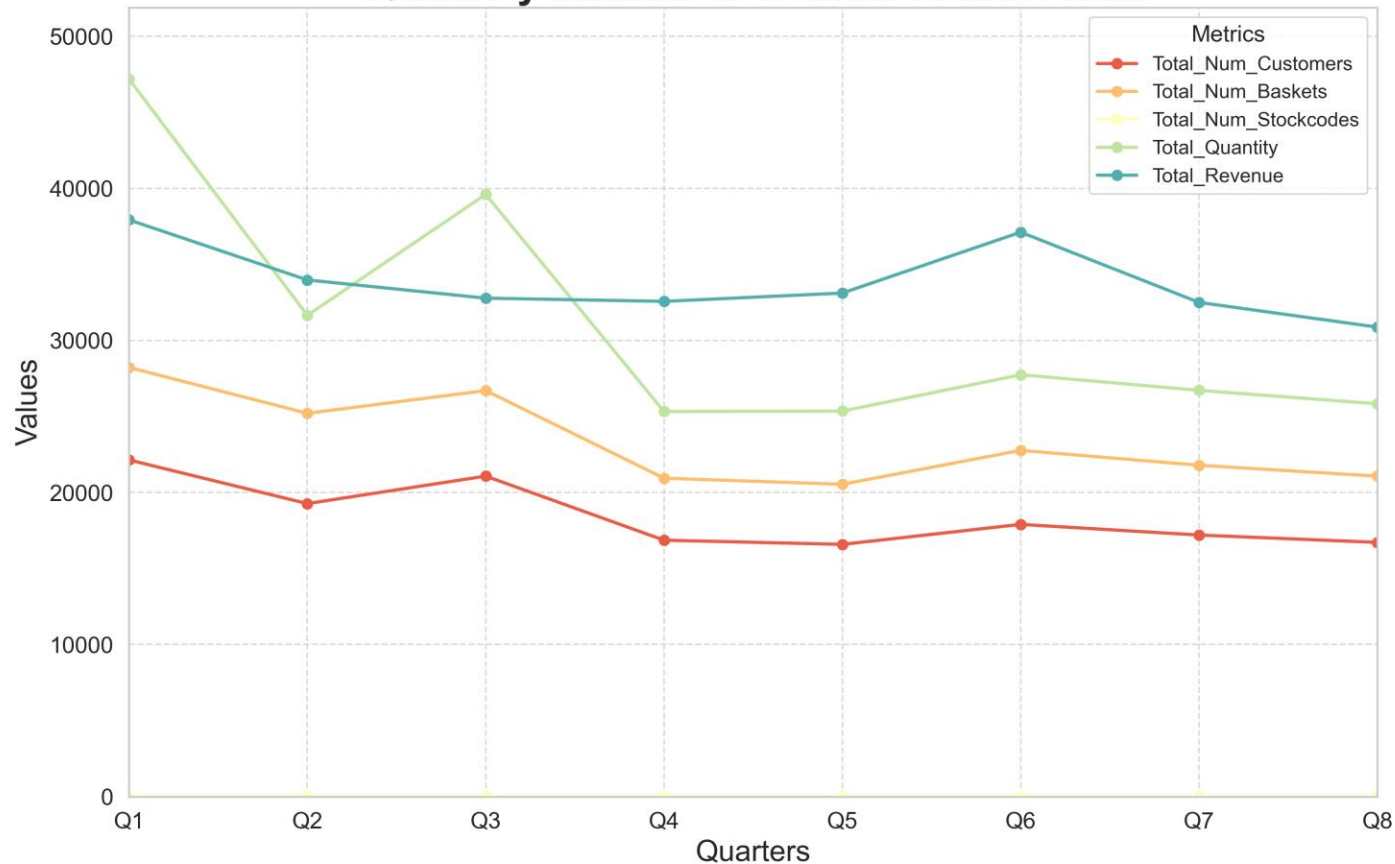
- **Total Revenue** (blue line) and **Total Quantity Sold** (green line) show a significant decline after Q1, stabilizing somewhat by Q4 and Q5, followed by a modest recovery in Q6-Q7, but both metrics drop again in Q8.

- **Total Customers** (red line) and **Total Baskets** (orange line) follow a similar downward trend, indicating that fewer customers are purchasing Mueller products as time progresses. However, there's some stabilization in Q5-Q7.

- **Total Stock Codes** (yellow line) starts high but drops sharply in Q2 and then levels out for the remainder of the period, suggesting a reduction in product variety or SKUs offered.

Deviation Summary

Brand	P1 Buyers	P2 Stayers	P2 Defectors	Share	Def Obs	Def Th	Dev
Private Label	24960	14006	10954	32%	44%	8%	36%
Creamette	13652	6418	7234	17%	53%	10%	43%
Barilla	10076	3130	6946	13%	69%	11%	58%
Mueller	8912	4227	4685	11%	53%	11%	42%
Ronzoni	6976	2406	4570	9%	66%	11%	54%
San Giorgio	3956	760	3196	5%	81%	12%	69%
Other	4241	1118	3123	5%	74%	12%	62%
Private Label Pr	3052	614	2438	4%	80%	12%	68%
No Yolks	2046	390	1656	3%	81%	12%	69%
Hodgson Mills	1301	425	876	2%	67%	12%	55%
SUM	79172	33494	45678		Corr	0.841737	
SWITCHING RATE			58%				
REPEAT RATE			42%				

Deviation Summary

The deviation summary shows that Mueller loses more customers to top brands like Private Label and Barilla, but gains higher-than-expected market share against mid-tier competitors. Private Label has the lowest deviation (36%), which is consistent with its dominant market position.

The high deviation across the board could indicate volatility in the pasta market. Mueller's mid-tier performance suggests it is vulnerable to both larger and smaller brands. Focusing on customer retention and loyalty-building strategies will be crucial.

Deviation Summary

Mueller has a higher-than-expected loss to Private Label (53% defection rate) but gains against Creamette and Ronzoni. The switching rate in the market is 58%, with a repeat rate of 42%, indicating a high level of brand switching.

High defection to top brands suggests that Mueller must work harder to keep customers loyal, especially with increased competition from Private Label. However, it can capitalize on gains from mid-tier brands by enhancing its differentiation strategy.

Detailed Deviation

Deviations	Private Label	Creamette	Barilla	Mueller	Ronzoni	San Giorgio	Other	Private Label Premiu	No Yolks	Hodgson Mills
Private Label		-296	243	-240	259	-47	64	-22	164	9
Creamette	970		153	-696	-617	190	40	-73	90	25
Barilla	493	60		27	512	-33	104	125	56	34
Mueller	-131	-661	89		487	-37	-37	-35	17	-14
Ronzoni	138	-718	499	465		-15	16	43	30	85
San Giorgio	211	342	118	6	16		23	1	92	6
Other	96	34	147	-32	159	11		33	8	127
Private Label Prem	204	-67	253	-18	89	-13	77		21	35
No Yolks	148	5	49	28	67	48	25	18		7
Hodgson Mills	-45	-64	9	-5	116	-16	61	6	3	

- **Mueller** gains significantly from **Ronzoni** (+487) and **San Giorgio** (+487), indicating a shift in customers from these mid-tier brands to Mueller.
- However, Mueller loses substantial market share to **Private Label** (-240) and **Creamette** (-661), suggesting strong competition from these brands.
- **Private Label** sees the most consistent gains across the board, particularly from Creamette (+970) and Barilla (+493), affirming its dominant position.

Mueller is successfully attracting customers from mid-tier competitors but struggles against top players like Private Label and Creamette. To strengthen its market position, Mueller needs to address the reasons behind its losses to these larger competitors, possibly by offering value propositions similar to Private Label.

Brand Performance Across Key Metrics for Q7

brand	share	b_prop	b_%	w	SCR	Sole
Private Label	33.97	0.55	54.972	2.352	47.85	0.638
Barilla	16.34	0.202	20.196	1.823	13.62	0.418
Creamette	9.31	0.135	13.541	1.767	8.86	0.471
Mueller	8.7	0.117	11.685	1.553	6.72	0.544
Ronzoni	8.45	0.11	10.992	1.693	6.89	0.4
Other	7.59	0.071	7.073	1.544	4.04	0.378
Private Label	6.47	0.092	9.221	1.696	5.79	0.384
San Giorgio	3.27	0.047	4.739	1.426	2.5	0.3
Hodgson Mills	3.18	0.027	2.697	1.576	1.57	0.398
No Yolks	2.72	0.04	4.037	1.457	2.18	0.326
Total	**100**	**1.392**	**139.153**	**16.888**	**100.02**	**4.257**

Brand Performance Across Key Metrics for Q7

- **Private Label** dominates the market with a 33.97% share, 54.97% penetration, and high loyalty (SCR of 47.85 and a Sole loyalty of 0.638). Its purchase frequency (w) is 2.35, showing strong engagement.
- **Mueller** has a respectable 8.7% market share, but its penetration is only 11.69%, significantly lower than Private Label and Barilla. Its purchase frequency is 1.55, lower than the top competitors.

Mueller's low purchase frequency and moderate penetration suggest that while it attracts a decent share of the market, it struggles to retain customers and drive frequent purchases. This can be improved through stronger customer retention efforts and frequent buyer programs.

Brand Performance Across Key Metrics for Q7

- **SCR** (Share of Category Requirement) highlights how much of each household's pasta purchases go to each brand. Private Label has the highest SCR (47.85%), showing strong category dominance, while Mueller's SCR is much lower at 6.72%.
- **Sole Loyalty**: Private Label again leads with 63.8% of customers buying only from their brand. Mueller's sole loyalty score is 54.4%, indicating that more than half of Mueller's customers buy exclusively from them, but it still lags behind top competitors.

Mueller's relatively low SCR and sole loyalty indicate that while it has a dedicated customer base, these customers are not purchasing as frequently as those of Private Label. Increasing engagement and creating incentives for repeat purchases will be crucial to improving these metrics.

Dirichlet Model – Predictions vs. Actual

Product	B	W	P0	M	T=
	27%	1.9	73%	0.5	1

Input Data

Brand	b	w	Mkt Share	Use to Est
Private Label	55%	3.7		Y
Barilla	20%	2.6		Y
Creamette	14%	2.4		Y
Mueller	12%	2.2		Y
Ronzoni	11%	2.2		Y
Other	7%	2.3		Y
Private Label Premiu	9%	2.0		Y
San Giorgio	5%	2.1		Y
Hodgson Mills	3%	1.7		Y
No Yolks	4%	1.5		Y

The Dirichlet model's market estimates for penetration and frequency provide useful benchmarks. Brands like Private Label far exceed these averages, indicating strong market dominance, while Mueller is closer to the market average. To grow, Mueller should focus on strategies that increase both penetration and frequency to move closer to brands like Barilla and Private Label.

Dirichlet Summary

Model Fitting Statistics

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Penetration			Purchases Per Buyer		
AVE%	6.0%	✗	AVE%	7.3%	✓
.r	0.74	✗	.r	0.89	✓
MAD%	48.5%	✗	MAD%	45.4%	✗
MAPE	47.1%	✗	MAPE	39.6%	✗

Number of Tests Passed: 2 out of 8

Penetration:

- The model's Average Error (AVE%) for penetration is 6%, with a moderate correlation ($r = 0.74$), but high error rates: MAD% (48.5%) and MAPE (47.1%), indicating that the model struggles to predict penetration accurately.

- Only **1 out of 4** penetration tests passed, suggesting that the model is underperforming in estimating how many households buy the product.

Purchases Per Buyer:

- The model performs better for **purchases per buyer** with a lower Average Error (AVE%) of 7.3% and a stronger correlation ($r = 0.89$). However, MAD% (45.4%) and MAPE (39.6%) still indicate room for improvement.

- **1 out of 4** tests for purchases per buyer passed, showing that the model is slightly better at predicting how often customers purchase, but still has significant discrepancies.

Dirichlet Model by Kearns – Model Fitting Insights

The Dirichlet model underperforms in accurately predicting penetration and purchases per buyer. The high error percentages (MAD% and MAPE) suggest the market might be more volatile or complex than the model can handle. Mueller, and other brands, should use this insight to re-evaluate their customer engagement and marketing strategies. Predictive models might need further refinement to reflect the true dynamics of the market.

Strategic Recommendations for Mueller

- **Increase Recency**: Target lapsed customers with personalized campaigns.
- **Improve Frequency**: Incentivize bulk purchases or subscription offers.
- **Reduce Defection**: Implement loyalty programs to prevent customer churn to Private Label and Barilla.

Insights from Competitor Strategies

Private Label's aggressive pricing strategy and Barilla's customer loyalty initiatives position them as dominant players. Mueller can learn from these strategies to defend its market share and grow.

By adopting multi-tiered pricing and loyalty-based marketing, Mueller can strengthen its competitive position in both the mid- and low-tier segments.

Key Takeaways

- Mueller is a mid-tier player with stable market performance but faces challenges from both top-tier and smaller brands.

- There are opportunities for Mueller to improve its market share through loyalty programs, targeted promotions, and customer retention initiatives.

- The high market churn indicates that customer loyalty is volatile across the entire pasta category, making retention efforts critical.