

# The U.S. Shredded/Grated Cheese Market: A Competitive Profile

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Porter links high market-share with *cost leadership* strategy which is based on the idea of competing on a price that is lower than that of the competition. But, *customer-perceived quality*—not low cost—should be the foundation of competitive strategy, because it is far more vital to long-term competitive position and profitability than any other factor. So, a superior alternative is to offer better quality vs. the competition. In most consumer markets, a business seeking market-share leadership should try to serve the *middle class* by competing in the *mid-price* segment; and offering quality better than that of the competition: at a price somewhat higher to signify an image of quality, and to ensure that the strategy is both profitable and sustainable in the long run. Quality, however, is an intricate concept consumers generally find difficult to understand. So, they often use *relative price* and a brand's reputation as a symbol of quality. The origin of the U.S. Dairy Industry goes back to family farms where cows grazed on grass. But today milk is produced in factories where cows are raised on corn feedlots which can make them prone to disease. Total U.S. shredded/grated cheese retail sales for 2008 were \$3 billion. There were 17 package sizes ranging all the way from 1 oz to 80 oz. Of these, the 8-oz size captured about two-thirds of the market at 66%: the segment our statistical analysis is centered on. The shredded cheese segment accounted for the lion's share of the market at 88.5%, with grated cheese way behind at 11.5%. It is a very competitive market with 509 brands in 2008. However, we have focused analysis on 28 brands whose 8 oz-pack sales were over \$1 million. We tested two hypotheses: (1) That a market leader is likely to compete in the *mid-price* segment; and (2) that the unit price of the market leader is likely to be somewhat *higher* than that of the nearest competition. Employing U.S. retail sales data for 2008 and 2007, we found that the results supported both hypotheses for 2008, as well as 2007. We also found strong support for the idea, that *relative price* is a strategic variable. We compared the results of this project with similar studies: the U.S. Men's Shaving Cream Market, the U.S. Beer Market, and the U.S. Shampoo Market. We found the results to be very similar, indicating a pattern emerging for consumer markets. Finally, we discovered *four* strategic groups in the industry.

**Keywords:** U.S. Shredded/Grated Cheese Market, cost leadership, price-quality segmentation, market-share leadership, relative price a strategic variable, strategic groups

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## Introduction

This work follows the paths of three studies: the U.S. Men's Shaving Cream, the U.S. Beer, and the U.S. Shampoo markets (Datta, 2012; 2017; 2018). That research is based on the premise that the way to market-share leadership does not lie in lower price founded in *cost leadership* strategy, as Porter (1980) suggests. Rather, it is based on the idea—according to the Profit Impact of Market Strategies (PIMS) database research—that it is *customer*-perceived quality that is crucial to long-term competitive position and profitability. So, the answer to market-share leadership for a business is to differentiate itself by offering quality that is *better* than that of the nearest competition (Datta, 2010a; 2010b; 2012; 2017; 2018).

To make this idea *operational* requires two steps. The first step is to determine which price-quality segment to compete in. Most consumer markets can be divided in *three basic* price-quality segments: *premium*, *mid-price*, and *economy*. These can be extended to *five* by adding two more: *ultra-premium* and *ultra-economy* (Datta, 1996; 2012; 2017; 2018). The solution lies in serving the *middle* class by competing in the *mid-price* segment. This is the socio-economic segment that embodies about 40% of households in America (Datta, 2011). It is also the segment that Procter & Gamble (P & G), one of the leading global consumer products companies, has successfully served in the past (Datta, 2010a; 2010b; 2012; 2017; 2018).

### The Strategic Importance of Price Positioning

The second step is to position the brand at a price that is *somewhat* higher than that of the closest competition in the *mid-price* segment. This is in accord with P & G's practice based on the idea that although higher quality does deserve a "price premium," it should *not* be excessive (Datta, 2010b). A higher price offers two advantages: (1) It promotes an image of quality; and (2) it ensures that the strategy is both profitable and sustainable in the long run (Datta, 2010b; 2012; 2017; 2018).

A classic example of price positioning is provided by General Motors (GM). In 1921, GM rationalized its product line by offering "a car for every purse and purpose"—from Chevrolet to Pontiac, to Oldsmobile, to Buick, and to Cadillac. More importantly, GM positioned each car line at the *top* of its segment (Datta, 1996; 2010a; 2017; 2018).

A more recent and familiar example is the *economy* chain, Motel 6, which has positioned itself as "offering the *lowest* price of any national chain." Another case is Fairfield Inn. When Marriott introduced this new chain, it targeted it at the *economy* segment. And then it positioned it at the *top* of that segment (Datta, 1996; 2017; 2018).

### Close Link Between Quality and Price

As mentioned above, *customer*-perceived quality is the most important variable contributing to the long-term success of a business. However, quality cannot really be separated from price (Datta, 1996). Quality, in general, is a complex multi-dimensional concept that is difficult to understand. So, consumers generally use *relative* price and a brands' reputation as a symbol of quality (Datta, 2010b; 2012; 2017; 2018).

## A Brief History of the U.S. Dairy Industry

Cheese is a very important part of the U.S. Dairy Industry which produces a host of food products. However, the most important of all is *milk*—cow's milk—that is the very foundation of the whole industry.

### History of Milk

Milk goes back all the way to the dawn of civilization. The Egyptian, Roman, and Greek civilizations, as

well as Bible, all mention milk (Selitzer, 1976, p. v). In India, millions of Hindus worship cows because they give life-sustaining milk. Hindus have raised cows to the level of Mother: “a care taker of her people, and a symbol of the divine bounty of earth.” A tenet of Hinduism is *ahimsa*, or non-violence; and so it forbids the killing and eating of cows<sup>1</sup>.

One of the problems with fresh milk is that many people cannot drink it because of lactose intolerance. So, during the early years of dairying, people consumed only *fermented* forms of milk like cheese and yogurt. Then, something happened: a genetic *mutation* occurred that enabled the body to continue producing lactose into adulthood. As a result, 80% of early dairying societies in Middle East and Europe carried this gene. Thus, dairying “became a cultural and dietary mainstay.”<sup>2</sup>

The American Indian was not familiar with milk and did not even milk the buffalos. It was Sir Thomas Dale of England who introduced cows to the New World when he brought a herd of 100 cows to Jamestown, Virginia in 1611 (Selitzer, 1976, p. 3).

### **Family-Farm Origins of the U.S. Dairy Industry**

The present-day Dairy Industry owes its origin to the American family farm. This is what Selitzer (1976, p. v; *italics added*) had to say about the Dairy Industry at that time:

There is a *spirit* of a special kind which permeates the dairy industry in America...In part, that spirit stems from the *farm* origin of dairy business, with its *industriousness* and *stability*...from family *continuity* of many dairy operations, some running through *five* generations. But most of all, it comes from the very kind of products the industry produces.

When you sell a product like *milk*, which has been called “nature’s most perfect food,” you sell it with a sense of *pride*.

### **Nitrogen Building Block of Life**

All life is determined by *nitrogen*. It is the building block from which nature puts together amino acids, proteins, and nucleic acids: the “genetic information that orders and perpetuates life.” That is why scientists talk of nitrogen providing life’s *quality*, while carbon supplies the quantity (Pollan, 2006, p. 42).

**Usable amount of nitrogen limited.** The quantity of nitrogen naturally occurring in the *soil* is limited, and so it restricted the amount of corn a farmer could grow. To make the nitrogen atoms in the atmosphere useful to plants and animals, they must be *split* and then combined with atoms of hydrogen and converted into molecules. Scientists call this process “fixing” nitrogen (Pollan, 2006, p. 42).

European scientists realized by 1900 that unless someone discovered a way to increase the naturally occurring nitrogen, growth of human population would come to a stop (Pollan, 2006, p. 43).

### **Power to “Fix” Nitrogen Most Important Invention of 20th Century**

In 1909, a German Jewish chemist, Fritz Haber, was able to figure out the secret of how to “fix” nitrogen. Haber’s discovery made it possible to produce a *synthetic* chemical fertilizer: ammonium nitrate, a type of fossil fuel. But, this turned out to be a “Faustian bargain” with nature. Because the same chemical also made it possible to make *bombs* (Pollan, 2006, p. 43).

Haber’s insight is the *most* important invention of the 20th century. One estimate is that two out of five humans would not be alive today, but for Haber’s invention (Pollan, 2006, p. 43).

<sup>1</sup> Retrieved August 1, from <http://ayurveda-sedona.com/knowledge-center/spirituality/holy-cow/>.

<sup>2</sup> Retrieved August 1, 2018, from <https://www.homestead.org/a-brief-history-of-milk/>.

The introduction of ammonium nitrate to American farms in the 1950s ushered in a quiet *revolution*. In the words of Pollan (2006, pp. 44-45; *italics added*):

Now [a farmer] could plant corn *every* year and on *as much* acreage as he *chose*, since he had *no* need for the legumes or the animal manure. He could buy fertility in a bag, fertility that had originally been produced a *billion* years ago halfway around the world.

**U.S. Govt. switches over from making bombs to making fertilizer.** After WW II, the U.S. Govt. found itself with a very large surplus of ammonium nitrate: a major ingredient in making bombs. But this chemical is also a great source of nitrogen for plants. So, in 1947, a military plant in Alabama switched over from making bombs to making chemical fertilizer. This was a great *turning* point not only in the modern history of corn, but also in the *industrialization* of the entire food chain in America (Pollan, 2006, p. 41).

### **Corn Is King**

Corn was native to Central America. The Mayans of Mexico are sometime referred to as “the corn people,” and corn has been a staple of their diet for almost 9,000 years. But, Europeans were not familiar with it until 1492, when Columbus discovered it in the New World in 1492 (Pollan, 2006, pp. 19, 23).

Few plants can make as much organic matter and calories from the same input of sunlight, water, and other elements as corn<sup>3</sup> (Pollan, 2006, p. 21).

No wonder corn became so successful. An important reason for this is corn’s *versatility*. It was able to do a multitude of things *no* other plant could. It was a ready-to-eat vegetable, a storable grain, a source of fiber and animal feed, a heating fuel, and an ingredient that could be used to brew beer, or distilled into making whiskey (Pollan, 2006, p. 25).

Pollan (2006, pp. 18-19) describes how *pervasive* corn has become a part of America’s food chain:

Corn is what feeds the steer that becomes the steak. Corn feeds the chicken and the pig, the turkey and the lamb, catfish and the tilapia.... The eggs are made of corn the milk and cheese and yogurt...now typically come from Holsteins [cows]...tethered [indoors] to machines, eating corn....

A chicken...nugget’s other ingredients include the modified corn starch that glues the thing together, the corn flour in the batter that coats it, and the corn oil in which it gets fried.

Since 1980s virtually all sodas and fruit drinks...have been sweetened with high fructose corn syrup (HFCS)...Grab a beer and you would still be drinking corn.

Today corn is “world’s most important cereal crop” (Pollan, 2006, p. 24).

### **Hybrid Corn a Technological Marvel**

The invention of hybrid corn F-1 was a major breakthrough in agriculture. It was so productive that it could produce 180 bushels of food per acre: compared to just 20 bushels per acre before. However, it has to be produced every season, and therefore farmers have to buy it from a corporation *each* spring (Pollan, 2006, p. 31).

Hybrid corn is the *greediest* of plants using more chemical fertilizer than any other crop, and most farmers tended to use it far more than the soil needed. This was based on the idea that it is better to err on the safe side, and use too much rather than too little (Pollan, 2006, pp. 41, 46).

**Environmental damage of using too much chemical fertilizer on farms.** What happens to the vast quantities of chemical fertilizer farms are unable to ingest? Some of it evaporates into the atmosphere where it

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<sup>3</sup> Because, compared to other major crops it has *four* atoms instead of three.

acidifies the rain which contributes to global warming. Some percolates down to the water table and contaminates it. And the remaining excess is washed off by rains into a drainage system, which then flows into a river, which eventually flows into an ocean where their deadly fertility poisons the marine ecosystem. This nitrogen assault stimulates the wild growth of *algae* which smothers the fish creating a dead zone (Pollan, 2006, p. 47).

**Florida's toxic algae disaster.** *Orlando Sentinel* reporter, Scott Maxwell (2018) reports "our state is cloaked in gloppy blue algae that is shutting down businesses, killing animals and sending people to the hospital."

He points out that the Govt. of Florida "shut down water-quality monitoring stations, stocked environmental boards with developers, slashed staff at the agencies that check for pollution and cut back on land preservation programs."

He places the primary responsibility for this disaster at the doorstep of the Republican Governor, Rick Scott.

Finally, he says "(you) cannot treat your state like a toilet bowl and then get surprised when it backs up."

### **New Deal Program to Protect Farmers From Vagaries of Weather**

Where food is concerned, Mother Nature, in the form of good or bad weather, can make a mockery of the classical economics of supply and demand. Also, human body can consume only so much food regardless of how plentiful supply may be. In Bible, the recommended farm policy was to maintain a food *reserve*. So, when drought or pestilence destroyed a crop, people would still have food to eat. Also, it kept the farmers "whole" by withholding food off the market when the harvest was plentiful (Pollan, 2006, p. 49).

The New Deal, initiated by President Roosevelt in 1935, started a farm program along the lines of the Biblical wisdom mentioned above. For storable commodities like corn, the U.S. Government set a target price based on cost of production. When the market price fell below the target, the farmer could get a *loan* from the government using his/her crop as collateral. When corn prices rebounded, the farmer could sell the corn and pay back the government loan. But if corn prices remained low, he could give the corn to the government in exchange for not having to pay the loan (Pollan, 2006, p. 49).

Another U.S. government program was to encourage farmers to avert overproduction and soil erosion by *idling* their most environmentally sensitive land (Pollan, 2006, p. 49).

This New Deal Program worked fairly well because it prevented the price of corn from collapsing given the continuous increase in the productivity of corn. But this program had attracted many powerful enemies. One group was the advocates of *laissez-faire* economics who did not like the idea of farming getting a special treatment, and wanted it to be treated just like any other industry. Other actors were food processors and grain exporters who would profit from overproduction leading to low corn price (Pollan, 2006, p. 50).

### **Nixon Administration's Policy of Cheap Corn Hurts Farmers**

By 1973, the rate of inflation for groceries had reached an all-time high, and housewives began protesting at the supermarkets. Farmers started killing chicks because they could not afford to feed them, and price of beef was getting beyond the reach of the middle class (Pollan, 2006, p. 51).

In response, Nixon administration instituted a new farm policy of increasing corn output to drive *down* its price. The government promised to pay farmers a target price when corn prices were low. Rather than *limiting* overproduction and keeping corn out of a falling market—as the New Deal *loan* program did—the new

program encouraged farmers to produce “fencerow to fencerow” and sell their corn *regardless* of how low the market price, because the Government said it was going to make up the difference. But, as it turned out, the Government made up only *some* of the difference because every farm bill since then has reduced the target price of corn. In addition, the Government also removed the floor from the target price (Pollan, 2006, pp. 52-53).

Although, ostensibly, the policy of cheap corn was supposed to help farmers, in actuality, the real beneficiaries of this program were *large* food processors and *grain* exporters, such as, Cargill and Archer Daniels Midland (Pollan, 2006, pp. 52-53).

After the policy of cheap corn was put into effect, corn prices kept on a path of steady decline and along with that the farm income. This forced millions of farmers deeper into debt, and thousands into bankruptcy (Pollan, 2006, pp. 52-53).

The policy of cheap corn has impoverished farmers, degraded the land, polluted the water, and imposed a cost of \$5 billion a year on U.S. Treasury (Pollan, 2006, p. 54).

### **Why Low Corn Prices Force Farmers to Produce Even More?**

According to Iowa State University, a bushel of corn cost about \$2.50 to grow in 2005, but for which Iowa grain elevators were paying just \$1.45. So, why Iowa farmers kept on selling corn for a dollar *less* than the cost to grow it? And why falling farm prices force farmers to increase production “in defiance of all rational behavior”? An Iowa farmer, who has studied this problem, seems to have come up with a persuasive answer (Pollan, 2006, pp. 53-54; *italics* added):

Farmers facing lower prices have only *one* option if they want to be able to maintain their standard of living, pay their bills, and service their debt, and that is to produce *more*. A farm family needs a certain amount of *cash flow* every year to support itself, and if the price of corn falls, the only way to stay even is to sell *more* corn.... [Farmers] desperate to boost yield end up *degrading* their land, plowing and planting *marginal* land, and applying more nitrogen—anything to squeeze a few more bushels from the soil.

Yet the *more* bushels each farmer produces, the *lower* prices go, giving another turn to the perverse cycle of *overproduction*. Even so, corn farmers persist in measuring their success in bushels per acre, a measurement that *improves* even as they grow *broke*.

### **CAFOs Push Animals off the Farm**

Prior to the fifties, a typical Iowa farmer operated an *integrated* and *diversified* farm that supported a dozen or so plants and animals. Every farm had livestock, so a large part of the farm was *green* where cattle could feed on *grass* (Pollan, 2006, pp. 38, 42).

Starting in the fifties and sixties, the flood of cheap corn made it profitable to fatten cattle on *feedlots* instead of on grass, and to raise chickens in huge factories instead of in farmyards. These places were so unlike farms and ranches that a special *term* had to be coined to define them: CAFO (*Concentrated Animal Feeding Operations*). As a result, Iowa livestock farmers could no longer compete with factory-farmed animals that their own cheap corn had helped create (Pollan, 2006, pp. 39, 67-68; *italics* added):

[So] the chickens and cattle *disappeared* from the farm, and with them the *pastures*, and hay fields and fences. In their place farmers planted more of the *one* crop they could grow more of than anything else: *corn*. By the 1980s the diversified family-farm was *history* in Iowa, and corn was *king*.

### **The Modern Milk Factory**

Earlier, we have mentioned the *family-farm* origins of the American Dairy Industry. In those days, farms had pastures that allowed cows to feed on *grass*. The “co-evolutionary” relationship between cows and *grass* has not been fully appreciated. Through the process of natural selection, cows have adapted themselves to live on grass. Over time, they have evolved with the “most highly digestive system in nature: the *rumen*.” This capability allows cows to convert *grass* into high quality *protein* (Pollan, 2006, p. 70).

As indicated before, by the 1980s, the diversified family-farm had disappeared in Iowa. Its place was taken by the modern milk factory that can have hundreds or even thousands of cows which are raised on *corn* feedlots. Today’s cow, on average, produces six to seven times as much milk compared to a century ago. To extract maximum milk output from the cows, they are kept in a *constant* state of pregnancy through artificial insemination. *Hormones* are used to increase milk production. Corn-fed cows develop two main problems: *bloat* and *acidosis*. So, the diseased cows are treated with *antibiotics*. Many believe this practice contributes to the evolution of antibiotic *superbugs*. After three or four years when their milk output goes down, they are sold off for hamburger meat (Kurlansky, 2014; Pollan, 2006, p. 78).

That is why farmers before the fifties felt a sense of pride in selling *milk* which they considered as “nature’s most perfect food.” Obviously, one cannot say the same thing about the milk produced in the milk factories of today.

### **A Short History of American Cheese**

According to a legend, cheese was accidentally discovered long time ago by an Arab after he put milk into his canteen that was made of a dried sheep’s stomach which happened to contain *renin* in an active condition. Renin is a digestive enzyme that is present in the stomach of all mammals. Thus, it was renin that converted milk into cheese (Kraft Foods Co., 1950, p. 6).

The credit for birth of the cheese industry in America goes to the immigrants from Europe who brought generations of knowledge and skill of cheese making to the New World (Selitzer, 1976, p. vi).

Jesse Williams established the first American Cheese factory in Rome, N.Y. in 1851. He built the factory large enough to process milk of all his neighbors’ herds. This was based on the idea of having one large factory instead of numerous small home dairies. This bold step made it possible to transform “the home dairy art farm into a factory science” (Kraft Foods Co., 1950, p. 4; Selitzer, 1976, pp. 65-66).

No individual has left a deeper footprint on the U.S. Dairy Industry than Canadian-born James L. Kraft. His genius was to make cheese “long-lasting, consistent in quality and easy to slice” (Wilson, 2012). In 1916, he received a patent for *processed* Cheddar cheese that he sold in four-ounce cans. The cheese had a *long* shelf life and therefore would not spoil on ocean voyages. So, the American military ordered this cheese in large quantities for its fighting forces during World War I. This turned out to be a *turning* point for the company because it transformed it into an empire (Selitzer, 1976, pp. 305-306; Wilson, 2012).

In 1921, Kraft patented a method of packaging processed cheese in tinfoil-lined wooden boxes: a type of package that was better than the can (Selitzer, 1976, pp. 305-306).

#### **Birth of Kraft Singles**

In 1950, Kraft came up with another major innovation. He introduced Kraft Singles *processed* cheese that was cut into three-inch-square *slices*. He did it to make cheese *easy* to use by consumers. Eight slices were stacked on top of each other to create a peelable block (Wilson, 2012).

Even though Kraft Singles was a great idea, it had not gone far enough. The problem was that the cheese slices often stuck together, and so consumers had trouble separating the slices without tearing them apart. In 1956, an engineer named Arnold Nawrocki developed a smart method for individually-wrapped slices into a transparent wrapper. But, it was not long before Kraft, too, was able to come up with a similar technology, and in 1965, introduced individually-wrapped Kraft Singles (Wilson, 2012).

### **What is American Cheese?**

Kraft Singles<sup>4</sup> symbolize American cheese. According to Food and Drug Administration (FDA) standards, Kraft is *not* allowed to label Kraft Singles as “cheese” because it does not meet the minimum requirement of 51% *real* cheese. That is why the label on Kraft Singles reads: “pasteurized prepared cheese product” (Bratskeir, 2015).

Kraft Singles is the first food to receive “Kids Eat Right” stamp of approval by the Academy of Nutrition and Dietetics to help families make healthy decisions about the food they buy at the grocery store (Bratskeir, 2015).

Why, one might ask, does Kraft *not* want to use real cheese to make its Singles? The major argument behind this is that when you are selling a product at a national scale, it is very important to maintain *consistency*. However, it is not possible to do so with *real* cheese if you want to be a mass marketer<sup>5</sup>.

But there is still another reason Kraft prefers the use of processed cheese. Their goal is to produce a product that “when heated with toasting supermarket sandwich bread, melts into the bread like shredded cheese without the inconvenience and without losing its shape” (Bratskeir, 2015).

### **Italian-Style Mozzarella Overtakes American Cheddar Cheese**

The American Cheddar processed cheese has been the most popular cheese in America for about hundred years. But in 2010, Mozzarella, an Italian-style cheese, was able to capture the top spot. The rise of Mozzarella started with the popularity of *pizza*, which began around the sixties<sup>6</sup> finally culminating in becoming number one (Adaway, 2018).

### **Shredded and Grated Cheese**

Shredded cheese looks like thin strips of cheese. The styles of shredded cheese that are most popular are Mozzarella and Cheddar. The heaviest use of shredded Mozzarella goes toward making *pizza*. On the other hand, the most common use of shredded Cheddar cheese is in *cooking*, e.g., mac and cheese, or pasta including spaghetti (Difference Guru, 2018).

Grated cheese looks like powdered cheese, and grating is done only to *harder* cheeses, like Parmesan or Romano which are used as a *topping* in salads, pasta, and pizza.

Finally, according to the U.S. Dept. of Agriculture, a *half*-pound of American Cheddar cheese has about the same amount of *protein* as *one* pound of average meat. It also provides a lot of milk minerals, milk fat, and vitamin A (Kraft Foods Co., 1950, p. 4).

<sup>4</sup> Kraft Singles are made with milk, whey, milk protein concentrate, milkfat, cheese culture, less than 2% of calcium phosphate, salt, sodium citrate, sorbic acid as a preservative, whey protein concentrate, sodium phosphate, enzymes, annatto, and paprika extract (Semigran, 2016).

<sup>5</sup> Retrieved August 23, 2018, from <https://www.quora.com/Why-doesnt-Kraft-make-their-Singles-out-of-real-cheese-Why-is-it-all-processed>.

<sup>6</sup> When Pizza Hut and Domino Pizza entered the market: this continued into the eighties when Papa John’s also joined the fray.



### **The U.S. Shredded/Grated Cheese Market—Price-Quality Segmentation Profile**

This study is based on U.S. retail sales for 2008 and 2007<sup>7</sup>. The data include total dollar and unit sales, no-promotion dollar and unit sales, and promotion dollar and unit sales<sup>8</sup>.

Total U.S. shredded/grated cheese retail sales for 2008 were \$3 billion. It is a very competitive market with 509 brands in 2008. There were 17 pack-sizes ranging all the way from 1 oz to 80 oz. Of these, the 8-oz size captured two-thirds of the market at 66%. So, we have focused analysis on 28 brands each of whose 8-oz pack sales were over \$1 million.

The shredded cheese segment accounted for a lion's share of the market at 88.5%, with grated cheese way behind at 11.5%<sup>9</sup>.

#### **Hierarchical Clustering as the Primary Instrument of Statistical Analysis**

We have used *cluster analysis* as the primary statistical tool in this study. As suggested by Ketchen and Shook (1996), we have taken several steps to make this effort as objective as possible.

First, this study is *not* ad-hoc, but is founded in a theoretical framework as laid out below.

Second, we are fortunate that we were able to get sales data for our study for *two* years. Thus, this data provided a *robust* vehicle for subjecting cluster consistency and reliability to an *additional* test.

Third, we wanted to use two different techniques—K-Means and Hierarchical—to add another layer of cluster consistency and reliability. However, we found Hierarchical cluster analysis to be superior in meeting that goal. So, we did not consider it necessary to use the K-Means technique.

#### **Theoretical Foundation for Determining Number of Clusters—And Their Meaning**

As already stated, a major purpose of this paper is to identify the market-share leader and determine the price-quality segment—based on unit *price*—it is competing in.

An important question in performing cluster analysis is determining the *number* of clusters based on an *a priori* theory. As mentioned earlier, most consumer markets can be divided in three *basic* price-quality segments: *premium*, *mid-price*, and *economy*. These three basic segments can be extended to *five*: with the addition of *super-premium* and *ultra-economy* segments (Datta, 1996).

Therefore, *three* represents the *minimum* and *five* the *maximum* number of clusters (Datta, 2018; 2017; 2012).

An equally crucial issue is to figure out what each cluster (e.g., *economy*, *mid-price*, and *premium*) really *means*.

Perhaps a good way to understand what each price-quality segment stands for in real life is to look at a socio-economic *lifestyle* profile of America. It reveals *six* classes. Each class is associated with a price-quality segment typified by the retail stores where they generally shop: each a symbol of their lifestyle (Datta, 2011)<sup>10</sup>.

#### **Guidelines for Cluster Consistency and Reliability**

<sup>7</sup> This data are from food stores with sales of over \$2 million, and drug stores over \$1 million; it also includes discount stores, such as Target and K-Mart, but *excludes* Wal-Mart as well as warehouse clubs, e.g., Sam's Club, Costco, and BJ's. It also does not include the "dollar" stores, such as Dollar General, and others.

<sup>8</sup> For those stores for which, during a week, there were feature ads, coupon ads, display, or temporary price decrease of at least 5%.

<sup>9</sup> These figures are based on brands that offered 8 oz-packs, which had a 96% market share.

<sup>10</sup> The six classes are: "The Poor", "The Near Poor", "Traditional Middle Class", "The Upper-Middle Class", "The Very Rich/The Rich", and "The Mega Rich—Masters of the Universe".

In addition to laying a theoretical foundation for the number of clusters, we set up the following guidelines to enhance cluster consistency and reliability (Datta, 2012, 2017, 2018):

- In general, there should be a *clean break* between *contiguous* clusters.
- The *anchor* clusters—the top and the bottom—should be *robust*. In a cluster-analysis project limited to a range of three to five clusters, a robust cluster is one whose membership remains constant from three- to four-cluster, or four- to five- cluster solutions.
- Finally, we followed a step-by-step procedure to determine the optimal solution. First, we start with a *three*-cluster solution. Thus, the bottom cluster obviously becomes the *economy* segment and the top cluster the *premium* segment. Next, we go to four clusters, and *tentatively* call them: *economy*, *mid-price*, *premium*, and *super-premium*. Then, we go to five clusters. If the membership of the bottom cluster remains unchanged from what it was in the four-cluster result, it clearly implies that the *ultra-economy* segment does *not* exist. Next, if the membership of the top cluster also remains the same from a four-cluster to a five-cluster solution, then the *top* cluster becomes the *super-premium* segment. This means that even in a five-cluster solution we have only *four* price-quality segments: *economy*, *mid-price*, *premium*, and *super-premium*. It implies that either the *premium* or the *mid-price* segment consists of two *sub*-segments (see Table 1).

In addition, whenever possible, we have tried to seek *external* evidence to validate the results of cluster analysis. For example, many companies identify on their websites a certain brand(s) as a *premium* or luxury brand. Another case is that P & G clearly says it does not compete in the *economy* segment (Datta, 2010b).

### Testing Hypotheses

- (1) That the market-share leader would be a member of the *mid-price* segment.
- (2) That the market-share leader would carry a price tag that is *higher* than that of the nearest competition.

In Table 1, we present the results of 2008 Hierarchical cluster analysis for the 8 oz-pack which had 66% market-share in 2008. This analysis is restricted to 28 brands with sales of over \$1 million for brands offering, among others, 8 oz-packs.

**What are private brands?** It is important to clarify what *private* brands are. These are brands made exclusively for individual retailers, e.g., a supermarket, or a drug store. Usually, such brands are targeted at the *economy* segment, and, as such, are generally sold at prices *lower* than those of major name brands. One reason, retailers like private brands is because private brands tend to be more profitable than name brands<sup>11</sup>.

### Results of Cluster Analysis

Table 1 shows Kraft as the runaway market leader in 2008 with a share of 27.5%, followed by Sargento, a distant-second runner-up, with a share of 9.2%. Both are members of the *mid-price* segment. Thus, the result strongly supports Hypothesis I, that the market-share leader is very likely to be a member of the *mid-price* segment.

Kraft's unit price is \$2.87 which is somewhat higher than the \$2.74 for Sargento. So, this result, too, fully supports Hypothesis II.

#### Other highlights.

- Out of the 28 brands in this analysis, five are *grated* parmesan cheese, and three of them—Locatelli, Rienzi, and Gabriella—have the highest unit price. One reason for this is that they are *imports* from Italy (mostly).

<sup>11</sup> Accessed June 27, 2018, from <https://study.com/academy/lesson/private-brands-definition-examples-quiz.html>.

Second, *parmesan* cheese is more expensive than *cheddar* or *mozzarella* cheese.

- The private-brand group—a member of the *economy* segment—had a market-share of 49%, compared to 41% for all *mid-price* brands.

- Besides Kraft and Sargento, as mentioned above, there are only two individual brands with a market-share above 1%: Crystal Farms with a 3.1% share and Borden with a 1.8% share.

For 2007, the results were identical to those for 2008.

Table 1

*Hierarchical Cluster Analysis: 2008 Shredded/Grated Cheese 8 oz (28 Cases)\*\**

| Price-quality segment | Brand name                          | Type of cheese | UPr 2008      | Clus Cntr     | MktSh (%)   | Total sales \$ million <sup>#</sup> |
|-----------------------|-------------------------------------|----------------|---------------|---------------|-------------|-------------------------------------|
| Super-premium         | Locatelli Cheese                    | Grated         | \$7.28        | <b>\$7.28</b> | 0.5         | \$16.3                              |
| Premium               | Rienzi Cheese                       | Grated         | \$6.08        | <b>\$5.74</b> | 0.1         | \$4.2                               |
|                       | Gabriella Cheese                    | Grated         | \$5.67        |               | 0.1         | \$2.1                               |
|                       | Haolam Cheese                       | Shredded       | \$5.46        |               | 0.1         | \$1.7                               |
| Mid-price I           | Colonna Cheese                      | Grated         | \$3.97        | <b>\$3.50</b> | 0.2         | \$7.2                               |
|                       | Polly-O Cheese                      | Shredded       | \$3.93        |               | 0.2         | \$5.0                               |
|                       | Cracker Barrel Cheese               | Shredded       | \$3.59        |               | 0.1         | \$2.6                               |
|                       | 4C Cheese                           | Grated         | \$3.57        |               | 0.3         | \$9.4                               |
|                       | Galaxy Nutrtrnl Cheese              | Shredded       | \$3.44        |               | 0.2         | \$6.2                               |
| Mid-price II          | Weight Watchers Cheese              | Shredded       | \$3.13        | <b>\$2.80</b> | 0.2         | \$6.6                               |
|                       | Tillamook Cheese                    | Shredded       | \$3.07        |               | 0.7         | \$20.3                              |
|                       | Velveeta Cheese                     | Shredded       | \$3.05        |               | 0.2         | \$6.7                               |
|                       | <b>Kraft Cheese</b> (market leader) | Shredded       | <b>\$2.87</b> |               | <b>27.5</b> | <b>\$822.1</b>                      |
|                       | Cache Valley Cheese                 | Shredded       | \$2.77        |               | 0.2         | \$6.2                               |
|                       | <b>Sargento Cheese</b> (runner-up)  | Shredded       | <b>\$2.74</b> |               | <b>9.2</b>  | <b>\$273.8</b>                      |
|                       | Cabot Vermont Cheese                | Shredded       | \$2.70        |               | 0.3         | \$8.7                               |
|                       | Maggio Cheese                       | Shredded       | \$2.59        |               | 0.1         | \$1.7                               |
|                       | Borden Cheese                       | Shredded       | \$2.56        |               | 1.8         | \$53.6                              |
|                       | Heluva Good Cheese                  | Shredded       | \$2.54        |               | 0.1         | \$3.7                               |
| Economy               | Crystal Farms Cheese                | Shredded       | \$2.41        | <b>\$2.19</b> | 3.1         | \$91.7                              |
|                       | Wisconsin's Finest Cheese           | Shredded       | \$2.36        |               | 0.1         | \$2.6                               |
|                       | Yoder's Cheese                      | Shredded       | \$2.30        |               | 0.1         | \$1.9                               |
|                       | Morning Fresh Farms Cheese          | Shredded       | \$2.28        |               | 0.1         | \$4.1                               |
|                       | Great Lakes Cheese                  | Shredded       | \$2.25        |               | 0.1         | \$2.0                               |
|                       | Private Brands Cheese               | Shredded       | \$2.20        |               | 49.4        | \$822.0                             |
|                       | Hillandale Farms Cheese             | Shredded       | \$2.10        |               | 0.1         | \$3.4                               |
|                       | Dutch Farms Cheese                  | Shredded       | \$1.99        |               | 0.4         | \$10.7                              |
|                       | Westfield Farms Cheese              | Shredded       | \$1.81        |               | 0.1         | \$2.4                               |
| <b>Total sales</b>    |                                     |                |               |               | <b>96</b>   | <b>\$2,853</b>                      |

Notes. Total sales of all brands in 2008 were \$3 billion. \* The UPr. data are based on the *best-selling* style of each brand. <sup>#</sup> The sales and market-share data are for *all* pack-sizes. \*\* Brands with 2008 sales >\$ 1 million.

### Why Private Brands are so Strong in this Market?

To address this query, we would like to look at other consumer markets we have cited in this study. In these studies, the private-label group appears as CTL brand. We found this group to be either a minor player, or non-existent:

- U.S. Men's Shaving Gel—4.5% (*economy*);
- U.S. Beer—No entry;
- U.S. Shampoo—3.5% (*mid-price*).

Men's shaving *gel* serves an important role in men's personal grooming. While men from the "Poor" or the "Near-poor" class are likely to use an *economy* brand, most men from the *middle class* are unlikely to do so for a mission of personal grooming<sup>12</sup>, such as shaving.

It is interesting to note that the private brands are totally absent from the Beer market. The main reason is that the Beer market represents a rather harsh arena for such brands. First, the U.S. Beer market is highly concentrated in which the two largest corporate groups—Anheuser Busch In-Bev, and Molson Coors—owned 72% share of the *lager* segment in 2008: a segment that represented 92% of total U.S. Beer sales. Second, it is a global market, in which imports play an important role, too. Third, it is a product where personal taste is very important. Fourth, it is often consumed in *social* settings, where most members of the middle class would generally drink familiar *national* or imported brands (Datta, 2017).

Like the Beer market, the Shampoo market, too, is highly concentrated. In 2008, the three leading corporate groups—Procter & Gamble, Unilever, and L'Oreal—had a market-share of 65%. Second, shampoos are largely marketed to women, who often see their hair as a reflection of their identity and a symbol of their beauty and femininity. So, in such a market, most women are likely to rely on well-known brands, leaving not much scope for private brands (Datta, 2018).

Now let us examine the Shredded/Grated Cheese market. As we have indicated above, the Kraft brand is the only major player in this market with a 27.5% share. Next in line are much smaller competitors: Sargento at 9.2%, Crystal Farms at 3.1% and Borden at 1.8%. They are then followed by 23 family-owned businesses with a total market-share of 4.5%<sup>13</sup>.

Thus, such a market, with a proliferation of small enterprises, is an ideal arena for private brands. And, that is why private brands were able to capture about *half* the share of the Shredded/Grated Cheese market in 2008.

### Relative Price a Strategic Variable

Finally, we performed one more test to determine the consistency and reliability of the results of cluster analysis in this study. So, we *ranked* the unit price of each brand—both for 2008 and 2007.

For both years, and *all* three measures of bivariate correlation—Pearson, and non-parametric measures Kendall's tau-b, and Spearman's rho—were found to be significant at an amazing 0.01 level!

We believe this surprising result—that covers such a large number of brands—became possible only because management in the U.S. Shredded/Grated Cheese market must have been treating *relative* price as a *strategic* variable, as we have suggested.

While the price of a brand, compared to its nearest competition, may change over time, it is *unlikely* to change much from one year to the next. This is significant not only for the market-share leader, but also for every brand no matter which price-quality segment it is competing in.

Another conclusion one can draw from such incredible results is that the U.S. Shredded-Grated Cheese market is highly competitive.

<sup>12</sup> For a framework of personal grooming for men and women see Datta, 2010b, Figure 2.

<sup>13</sup> These numbers are based on brands with 2008 sales of over \$1 million.

### A Pattern Emerging for Consumer Markets

Now let us compare the results of this study so far to similar studies of other consumer markets:

- In the U.S. Men's Shaving Gel market Edge Gel, the market leader, was a member of the *mid-price* segment. Also, its unit price was somewhat higher than that of the number two brand, Gillette Series Gel (Datta, 2012).
- In the U.S. Lager Beer<sup>14</sup> market, the market leader, Bud Light, was not only a member of the *mid-price* segment, its unit price was also somewhat higher than that of the runner-up, Miller Light (Datta, 2017).
- In the U.S. Shampoo market, the market leader, P & G's Pantene, was a member of the *mid-price* segment. But, the runner-up, P & G's Head & Shoulders, had a unit price that was higher. However, this is because the latter is an anti-dandruff shampoo: a type of specialty shampoo generally priced *higher* than general-purpose shampoos (Datta, 2018).

Similarly, all three studies concluded that *relative* price was a *strategic* variable.

It is clear from the foregoing that the results of this study do not just stand by themselves, but rather, are part of an emerging pattern in consumer markets.

### The Role of Promotion

For 2008, promotional sales averaged 46% of total net sales for 28 brands with sales over \$1 million that represented 96% of total net shredded/grated cheese sales. We performed bivariate correlation between total (net) sales vs. promotional (PROMO) sales. The results were significant for *all* three measures—Pearson, Kendall, and Spearman—at the 0.01 level.

In Table 2, we present *promotional* sales data for 2008 for 15 brands with sales over \$6 million. We have divided the brands in four broad groups in terms of level of promotion.

The following are the highlights of this data:

- Sargento, a *mid-price* brand, is in the *very heavy* group with a 54% score. It is the market-share runner-up about one-third the size of the market leader, Kraft. As Table 1 shows, Sargento's unit price is not very far from that of Kraft. So, it seems the company is banking more heavily on *promotion* to keep pace with its much bigger rival, Kraft.
- Kraft, the market leader and Borden—both *mid-price* brands—fall in the *heavy* group with scores of 50% and 48%, respectively. This implies that Kraft is relying on *heavy* promotion to foster and protect its high market share.
- Private Brands, and Crystal Farms brand—both members of the *economy* segment (see Table 1)—have also relied on *heavy* promotion, each with a score of 44%. One could argue that an *economy* brand, unlike a *mid-price* brand, would generally not need heavy promotion. And yet the private-brands group—along with Crystal Farms brand—has used a more potent weapon: heavy promotion.
- We have mentioned earlier that private brands are more profitable than name brands. So, with that being the case, it seems retailers of private brands were able to employ the dual weapon of an *economy* price—matched by *heavy* promotion—to become the market leader, with 49% share of the market (see Table 1).

**Comparing promotion profile of four consumer markets.** Figure 1 shows promotion scores for four consumer markets: U.S. Men's Shaving Gel (Datta, 2012), U.S. Beer (Datta, 2017), U.S. Shampoo (Datta, 2018), and the current study: U.S. Shredded/Grated Cheese.

<sup>14</sup> Lager beer had a 92% market share in 2008.

The chart shows two different patterns. One is the food group: Beer and Cheese; the other is the non-food group of Shaving Gel and Shampoo.

The Men's Shaving Gel-Shampoo Group's score is in the low thirties (30, 32), whereas, the Beer-Cheese Group has a score in the mid to high forties (48, 45).

One explanation for this disparity is that most people need to shop for food far more frequently than for non-food items. So, perhaps, the producers discount food items more heavily than non-food items, in order to induce customers to come to the store more often, and to buy more at each visit. Also, Men's Shaving Gel and Shampoo are products that serve the *personal* needs of individual customers. So, promotional discounts are likely to play a *less* important role in such markets.

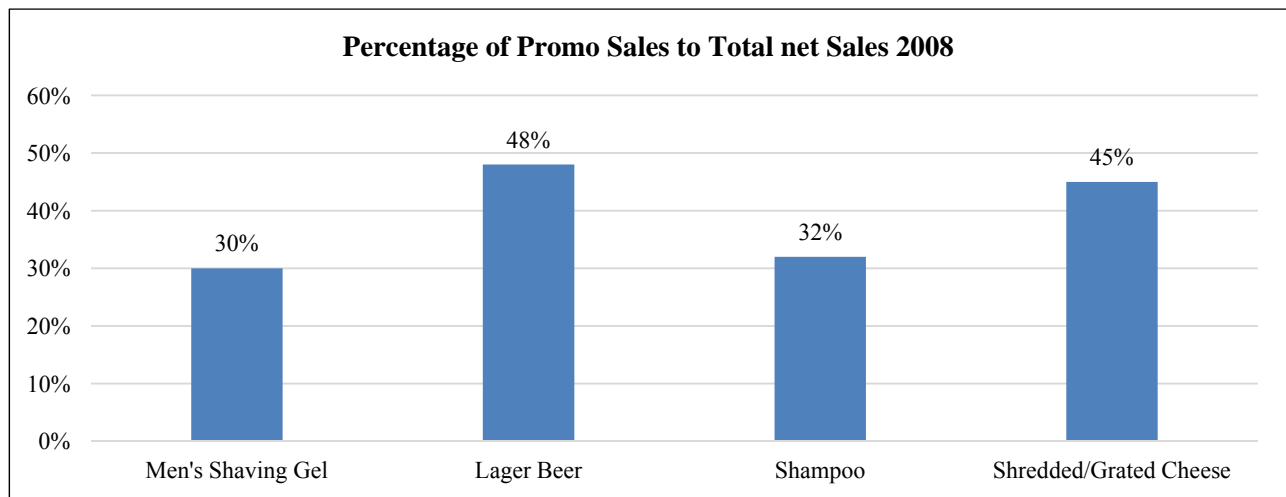


Figure 1. Promotion profile of four consumer markets.

Table 2

*Percentage of Promotional Sales to Total (net) Sales: Shredded/Grated Cheese, 2008*

| Brand name   | Promo level         | PROMO (%) | Sales \$ M     |
|--|---------------------|-----------|----------------|
| Grand Total Sales Shredded/Grated Cheese             |                     | <b>45</b> | <b>\$2,987</b> |
| Brands with 8 oz 2008 Sales > \$6 million (15)       |                     |           |                |
| Dutch Farms Cheese                                   | <b>Very Heavy</b>   | 58        | \$11           |
| Sargento Cheese                                      |                     | 54        | \$274          |
| Tillamook Cheese                                     |                     | 54        | \$20           |
| Kraft Cheese   | <b>Heavy</b>        | 50        | \$822          |
| Cache Valley Cheese                                  |                     | 50        | \$6            |
| Borden Cheese  |                     | 48        | \$54           |
| Cabot Cheese   |                     | 46        | \$9            |
| Private Brands Cheese                                |                     | 44        | \$1,476        |
| Crystal Farms Cheese                                 |                     | 44        | \$92           |
| Velveeta Cheese                                      | <b>Moderate</b>     | 39        | \$7            |
| Colonna Cheese                                       |                     | 32        | \$7            |
| Locatelli Cheese                                     |                     | 31        | \$16           |
| 4C Cheese  | <b>Low-moderate</b> | 24        | \$9            |
| Weight Watchers Cheese                               |                     | 17        | \$7            |
| Galaxy Nutritional Foods Cheese                      | <b>Light</b>        | 1         | \$6            |
| Total brands with 8 oz 2008 Sales > \$6 million (15) |                     | <b>47</b> | <b>\$2,815</b> |

### Strategic Groups in the Shredded/Grated Cheese Market 2008

We have discovered *four* strategic groups in this market; a profile of which can be found in Figure 2<sup>15</sup>:

- 1. Kraft Heinz Group—Market Leader: 28%;
- 2. Sargento—Runner-up, and others: 14% (3);
- 3. Private Brands: 49%;
- 4. Family-owned Enterprises: 5% (23).

#### Kraft Heinz Co

The Kraft Heinz Co. was formed in 2015 with the merger of Kraft Foods Co. and H. J. Heinz Co. The new company is now the *fifth* largest food and beverage company in the world (McClay, 2018). Its sales for the year 2017 were \$23.2 billion<sup>16</sup>.

The company is the runaway market leader in the shredded/grated cheese market with a 28% share in 2008 (Figure 2). As we have indicated earlier, the present state of the U.S. Dairy industry owes more to James L. Kraft, the founder of the Kraft Co., than anyone else.

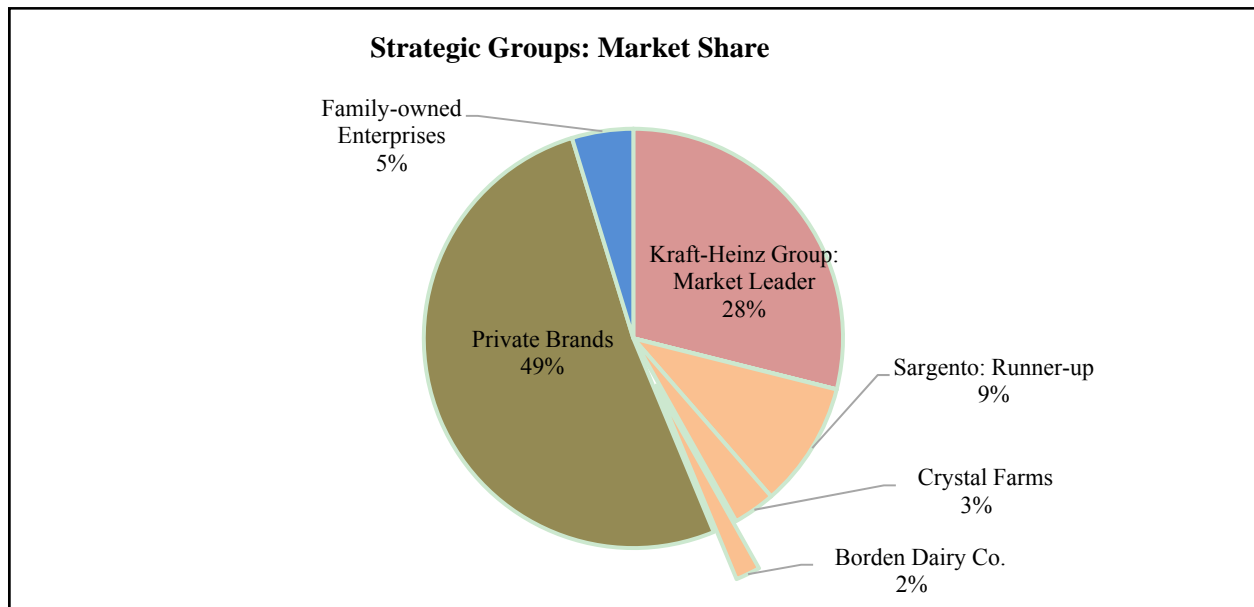


Figure 2. U. S. Shredded/Grated Cheese Market 2008: Strategic Groups.

#### Sargento Foods Co., Runner-up and Others

Sargento Foods Co. was the runner-up for 2008 with a market-share of 9%: way behind the market leader, Kraft Heinz Co. It is a privately-held company and was founded in 1953, with current estimated yearly sales of \$500 million. While Kraft's forte was *processed* cheese, Sargento has focused its attention on *real* cheese—Italian-style. The company came up with the first vacuum-sealed package of cheese, the first packaged sliced cheese, and the first packaged shredded cheese<sup>17</sup>.

Following Sargento, there were two more companies, both private: Crystal Farms with a 2008

<sup>15</sup> Based on 28 brands with 8oz sale of shredded/grated cheese > \$1 million for 2008.

<sup>16</sup> Retrieved August 22, 2018, from <http://ir.kraftheinzcompany.com/static-files/1a9c7a40-532d-4c55-b0b1-b97d552013a9>.

<sup>17</sup> Retrieved August 22, 2018, from <https://www.sargento.com/our-story/our-principles>; <https://www.sargento.com/our-story/our-achievements>.

market-share of 3%, and estimated current annual sales of \$208 million; and Borden Dairy Co. with a 2008 share of 2%, and estimated current annual sales of \$150 million.

### **Private Brands**

As mentioned above, private brands are brands made exclusively for individual retailers, e.g., a supermarket, or a drug store. As a group they took a whopping 49% market-share in 2008 mainly on the strength of competing in the *economy* segment vs. the *mid-price* of the market leader Kraft.

### **Family-Owned Enterprises**

Finally, there were 23 family-owned businesses that accounted for 5% market-share in 2008.

## **Conclusion**

This study is based on the idea that in most consumer markets, a business seeking market-share leadership should try to serve the *middle* class by competing in the *mid-price* segment; and offering quality better than that of the competition: at a somewhat higher price to connote an image of quality, and to ensure that the strategy is both profitable and sustainable in the long run. This is the socio-economic segment that embodies about 40% of households in America.

Quality, however, is a complex concept that consumers generally find difficult to comprehend. So, they often use *relative* price and a brand's reputation as a symbol of quality.

The shredded/grated cheese is a very competitive market. Total U.S. shredded/grated cheese retail sales for 2008 were \$3 billion. We have focused our analysis on 8-oz packs which captured about two-thirds of the market at 66% in 2008 that include 28 brands each of whose 8 oz-pack sales were over \$1 million.

The shredded cheese segment accounted for a lion's share of the market at 88.5%, with grated cheese way behind at 11.5%.

The main objective of this study is to test two hypotheses: (1) That the market-share leader would be a member of the *mid-price* segment; and (2) that the market-share leader would carry a price tag *higher* than that of the nearest competition.

Employing Hierarchical cluster analysis, we found that Kraft, the market leader, and Sargento, the runner-up, were members of the *mid-price* segment for both 2008 and 2007. Second, Sargento had a unit price that was *lower* than that of Kraft for both years. Thus, these results supported both Hypothesis I and II.

To determine the consistency and reliability of the results of cluster analysis, we found bivariate correlation of unit price *rank* data of each brand for 2008 and 2007 to be significant at a remarkable 0.01 level.

An important conclusion one can draw from such an amazing result is that management in the U.S. Shredded/Grated Cheese market must have been treating *relative* price as a *strategic* variable, as we have suggested.

We compared the results of this project with three similar studies: the U.S. Men's Shaving Cream market, the U.S. Beer market, and the U.S. Shampoo market. We found the results to be very similar, indicating a pattern emerging for consumer markets.

Similarly, all three above-mentioned studies concluded that *relative* price was a *strategic* variable.

Bivariate correlation between net sales and promotional sales was significant at 0.01% level for both 2008 and 2007, implying that *promotion* played an important role in the industry, as it did in the other three consumer markets mentioned above.



The origin of the U.S. Dairy industry goes back to family farms where cows grazed on *grass*. Through the process of natural selection cows have adapted themselves to live on grass. However, several factors—the development of highly-productive hybrid corn, the discovery of chemical fertilizer, ammonium nitrate, and the Nixon Administration’s policy of cheap corn—brought about a momentous change in America’s entire food chain. Consequently, it became more profitable to produce milk in factories which are more productive, but where cows are raised on *corn* feedlots, which can make them prone to disease for which they are treated with antibiotics. Many believe this practice leads to the evolution of antibiotic *superbugs*.

We found *four* strategic groups in the market: (1) Kraft Heinz Co, the market leader; (2) Sargento Co., the runner-up, and two others; (3) The Private Brands group; and (4) Family-owned enterprises.

Finally, it is important to recognize that no one has left a deeper imprint on the U.S. Dairy industry than James L. Kraft. Perhaps the most important innovation that is part of his rich legacy is the introduction of individually-wrapped Kraft Singles.

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