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Syed Hussain A. Jafri and Dennis R. Lifferth*

Introduction

There are two major classes of brands in the food industry. They are: the national brands, processed and promoted by the large manufacturers; and, the private labels or store brands, processed and promoted mainly by the large retail distributors.

National brands feature product quality, image, and innovation; and, are usually backed by heavy promotional expenditures. The high cost of innovation and introduction of national brands in the market necessitates large expenditures and risk. Studies have indicated that the large-scale manufacturers are the main proponents of national brands [4]. Common examples of national brands are Birds-Eye, Kraft, Green Giant, and Hunts.

Private labels are standardized quality products and have a low-price appeal. The series of structural changes in the retailing sector of the food industry eventually synthesized a group that represents the large food retailers. These retailers have multi-state operations and handle substantial volumes of merchandise. Their size and extent of operation give them sufficient volume to carry their own brands. Other retail organizations, however, such as the regional chains and the independents also carry private labels. The independents frequently form cooperatives - with or without affiliation - with the wholesalers to merchandise private labels. Common examples of private labels are A & P, Grand Union, and Jewel.

In 1965 The National Commission on Food Marketing conducted a survey to examine price relationships between products manufactured under private labels and products produced as national brands [8]. From the survey it was estimated that there was, on an average, a 20 percent price differential between the two brand categories. Is this price difference still prevalent in markets today? If not, what may be the reason for a change in the price spread between the two brands? Are there substantial quality differences between national brand and private label products?

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The purpose of this paper is to examine the current pricing structure and price relationships between national brands and private labels; and, to compare selected quality attributes of products that are sold by each brand category.

Price Relationships

To examine the price relationship between private labels and national brands, a survey was taken of ten selected products over a period of ten weeks in New York City. The data were collected during the months of January through March of 1975 in cooperation with the New York City Branch of the New York State Department of Agriculture and Markets.

From the price survey, several observations regarding the price differences between private labels and national brands may be made. (1) Private labels were less expensive in all product categories surveyed. The price spread, however, varied by product. (2) The price spread between national brands and private labels was usually greater in national chains than in regional chains and independent stores; and, the price spread between the two brands in regional chains, for most products, was greater than in independent stores. And, (3) the average price difference between national brands and private labels has dropped from 20 percent in 1965 as reported by the National Commission on Food Marketing to 12.7 percent in 1975 as revealed in this study.

Price Differences Between Brand Categories

The price spread between private labels and national brands according to the type of product surveyed and the type of store is illustrated in Table 1. The difference between the two brands is expressed as a percentage of the private label price. The price, for example, of national brand frozen orange juice concentrate for all stores was 41.2 percent higher than the price of private label orange juice.

As shown in Table 1, private label brands were less expensive than national brands for all product categories surveyed. The average retail prices for national brands and private labels by product and by type of store are reported in Table 2.

Previous studies have suggested reasons why private label brands are less expensive than national brands [e.g. 8]. (1) Manufacturers with highly advertised brands charge more for processing services than small processors in order to recover costs of product innovation and development. (2) Transportation costs are usually less for private label products because distribution is normally more direct from the small private label packer to the chain store. (3) The price of national brand products has to cover the costs of the warehouse and distribution system needed to serve small accounts. Private label brands often eliminate these costs through central purchasing and a reduced sales force. And, (4) selling costs are greatly reduced in private label programs. Rather than large scale advertising and promotion, the retail chains that carry the private labels promote by point of sale merchandising.

It is also of interest to note the wide range in the percentage price difference among the various products as presented in Table 1. The range in percentage price differences for all stores varies from 41 percent in orange juice concentrate to 5 percent in evaporated milk. A needed extension of the current study is to examine the many factors that influence the variations in price spreads among products, such as product differentiation, brand preference, and product perishability.

Price Differences Between Retail Organizations

The price difference observed between national brands and private labels also varied according to the store type. Product samples of private brands and national labels were drawn from national chains, regional chains and independents. The greatest difference in prices between the two brand categories was observed in national chains followed by the regional chains and then the independents.

By observing the mean prices, we see that the variation in price spreads between store types is due to the difference in prices of private label items. Private labels tend to be less expensive in national chains than in regional chains; and, private labels are less expensive in regional chains than in independents. A summary of these differences is presented in Table 2.

The variation in prices of private labels between different retail organizations has been discussed in previous studies. It has been suggested that the causes of variation include differences in quality specifications, sources of supply, variations in merchandising practices, and variations due to ownership [8, 9, 10].

Price Comparisons Over Time

In 1965 the National Commission on Food Marketing surveyed 11 cities over a 12 week period and estimated the average price difference between national brands and private labels to be 20 percent [8, p. 137]. To make a comparison over time of the price differences between the two major brands, we took a 10 week survey in 1975 of ten products, nine of which were the same as those in the National Commission on Food Marketing survey.[1/] In 1975 the overall price difference between the two brands was an estimated 12.3 percent. Thus, over the ten year period from 1965 to 1975, the price difference between national brands and private labels decreased an estimated 7.7 percent.

Table 3 presents the price difference between private label and national brand products in 1965 and in 1975. Price differences are expressed as a percentage of the private label price. With the exception of frozen orange juice concentrate and canned sliced cling peaches, the price difference between the two brands decreased for all products from 1965 to 1975.

1/ It should be noted that one difference between our survey and the survey conducted by the National Commission on Food Marketing was that we limited our survey to New York City; whereas, the Commission included 11 different cities.

Table 1

Percentage Price Difference Between Private Labels and National Brands According to Type of Product and Store[1/]

Product	Price Difference as a Percentage In: All Stores	National Chains	Regional Chains	Independents
Frozen orange juice concentrate 6 oz.	41.20	43.00	42.50	35.50
Frozen cut green beans 9 oz.	13.08	13.96	14.11	10.12
Canned Sweet peas, 17 oz.	9.10	10.47	6.66	10.72
Canned sliced cling peaches 16 oz.	6.40	7.15	7.74	2.76
Canned Bartlett pear halves, 16 oz.	11.52	9.29	16.47	8.48
Canned applesauce, 35 oz.	8.92	8.20	8.63	11.13
Catsup, 14 oz.	11.97	10.65	14.24	11.30
Tuna in oil, light chunk 6.5 oz.	17.90	19.52	15.17	18.69
Evaporated milk, 13 oz.	5.06	5.70	4.89	4.07
Spaghetti, 16 oz.	15.66	14.83	16.27	17.05
Average	12.72	12.95	12.86	12.00

[1/] Difference expressed as a percentage of the private label price. Derived from Table 2.

Table 2 Average Retail Prices for National Brands and Private Labels by Type of Store[b/]

Product and Brand	STORES			ALL STORES[a/]
	National Chains	Regional Chains	Independents	
1. Frozen Orange Juice Concentrate 6 oz.				
National	.3236	.3262	.3220	.3240
Private	.2263	.2289	.2376	.2294
2. Frozen Cut Green Beans 9 oz.				
National	.3680	.3800	.3938	.3778
Private	.3229	.3330	.3576	.3341
3. Canned Sweet Peas 17 oz.				
National	.4618	.4961	.5060	.4816
Private	.4180	.4651	.4570	.4414
4. Canned Sliced Cling Peaches 16 oz.				
National	.4493	.4436	.4458	.4467
Private	.4193	.4117	.4338	.4198
5. Canned Bartlett Pear Halves 16 oz.				
National	.5282	.5458	.5408	.5369
Private	.4833	.4686	.4985	.4814
6. Canned Applesauce 35 oz.				
National	.8162	.8200	.8424	.8226
Private	.7543	.7548	.7580	.7552
7. Catsup 14 oz.				
National	.4444	.4556	.4538	.4500
Private	.4016	.3988	.4077	.4019
8. Tuna in Oil, Light Chunk 6.5 oz.				
National	.6612	.6588	.6780	.6638
Private	.5532	.5720	.5712	.5630
9. Evaporated Milk 13 oz.				
National	.3002	.2981	.3246	.3047
Private	.2840	.2842	.3119	.2900
10. Spaghetti 16 oz.				
National	.4885	.4894	.5087	.4917
Private	.4254	.4209	.4346	.4251

[a/] Prices are expressed as an average for all stores.

[b/] Mean prices are estimated over a 10-week period, including specials.

The decrease in price-spread between national brands and private labels of the selected products over the past ten years may be due to the result of several factors. One possible reason for the decrease may be due to the nature of the product life cycle and the stage of the life cycle in which private labels are introduced in the market.

The new product development stage often involves substantial amounts of money on research and development expenditures for national brands. Moreover, during the introductory stage of the product, a considerable amount of money is spent in advertising and selling cost to introduce the new product and to establish primary demand for national brand products. Hence, the price of national brands in the market tends to be high in order to recover the above mentioned expenditures.

The private labels enter the marketplace after the primary demand has been established for the product. They do so with a substantial price difference from its national brand counterpart because the expensive introductory stages of the life cycle are bypassed [8]. Private labels usually enter the marketplace during the growth stage or at the onset of the mature stage of the product life cycle [1, 2, 3]. At either of these stages the price of national brands is relatively high. Therefore, we may observe the price difference between national brands and private labels to be wide during the early stages of the life cycle.

As the product is passing through its mature stage or its decline phase, the large expenditures on advertising and other factors that were necessary during the earlier stages of the life cycle are generally reduced, allowing a decrease in the price of national brand products. This results in a reduction in the price spread between national brands and private labels. Thus, the price spread between the national brand and private label tends to narrow over time as the product advances through the later stages of its life cycle.

Another possible reason for the decrease in the price difference between national brands and private labels over the past ten years is due to consumer loyalty and/or product satisfaction. As consumers develop brand preference over time through repeat purchases, distributors may tend to increase the private label mark-up. Such action by distributors would result in relatively higher prices of private labels and, therefore, decrease the price spread between national brands and private labels.

A third possibility for the decrease in the price spread between the two brands is the result of competitive pricing. As product differentiation (both real and imaginary) between the two brands becomes minimal in the minds of the consumers, there is little reason for competing on a non-price basis. To compete with private labels, which are usually established with a low-priced image, national brand manufacturers often find it necessary to lower their prices to remain competitive.

Table 3

Estimated Percentage Price Difference
Between Private Label and National Brand
by Product for 1965 and 1975[1/]

Product	1965	1975
Frozen orange juice concentrate 6 oz.	35	41
Frozen cut green beans 9 oz.	30	13
Canned sweet peas 17 oz.	16	9
Canned sliced cling peaches 16 oz.	4	6
Canned Bartlett pear halves 16 oz.	19	11
Canned applesauce 35 oz.	11	9
Catsup 14 oz.	14	12
Tuna in oil, light chunk 6.5 oz.	24	18
Evaporated milk 13 oz.	15	5
Average	20	13

[1/] Price difference expressed as a percentage of Private Label price.

Quality

This study also analyzed selected attributes of product quality for three food items. Objective methods (laboratory techniques) were used to determine the quality differences between national brands and private labels for frozen orange juice concentrate, canned sweet peas, and canned applesauce. The analysis was done with cooperation from the Graduate School of Nutrition and the Food Science and Technology Department at Cornell University.

The concept of quality has been defined in different ways. Typically, the physical characteristics of a product, consumer preferences, psychological reasons, tradition, and educational background all play a part in conceptualizing quality. Since a number of attributes of quality (e.g. color, flavor, taste, aroma, and texture) are related to the sensory reactions of people, the perceptions of "good" quality often vary among individuals.

In our analysis of product quality, we chose selected, measurable attributes of quality with prescribed conditions of acceptance or preference. This section first describes those attributes of quality that were used to compare national brands and private labels. Following this description, the analysis and results are presented.

Quality Attributes

Viscosity: Viscosity or consistency is an important property of appearance. It is related to both the senses of feel and sight. Measurement of this attribute may be used to indicate the consistency of the finished product, or to test the produce at various stages of processing in order to predict the final consistency [6].

The instrument used to measure viscosity in this study was the Bostwick Consistometer, an instrument commonly used to test products such as applesauce and catsup. It was assumed that the more viscous the material, within a given range, the better it was.

Soluble Solids: Soluble solids is defined as the difference between total solids and alcohol-insoluble solids, or as the difference between total solids and water soluble solids [7, p. 172]. The soluble solids give an accurate reflection of the sweetness of the product which in turn indicates maturity or ripeness. For nearly all fruits, the higher the indicated soluble solids the riper, as well as the sweeter, is the sample.

The Abbe refractometer (which measures the angle of refraction in the product) was used to determine the amount of soluble solids in this study. The greater the angle of refraction, the greater is the amount of soluble solids in the sample.

Firmness: Texture can be regarded as a manifestation of the rheological properties of food. It is an important attribute in that it influences eating habits, affects consumer preference of accepted foods, affects processing and handling, influences oral health, and is often taken as a sign of spoilage or wholesomeness. Research indicates that the consumer is highly conscious of food texture and in certain foods it may be even more important than flavor [12]. Firmness is a measure of texture in peas. A Back Extrusion Cell[2/] (20 cm) developed by the Engineering Research Service, Research Branch of Agriculture, Ottawa, Canada, was used to measure the firmness in peas.[3/] The actual force is measured with an Instron Universal Testing Machine.[3/] Firm peas require more force than soft peas. In the case of canned peas, it is assumed that the firmest samples are the best. (The thermal treatment involved in processing (overcooking) may make peas too soft.)

Color: Color is an appearance property attributable to the spectral distribution of light, measurable in terms of intensity (radiant energy) and wavelength. It arises from the presence of light in greater intensities at some wavelengths rather than at others. Psychologically, it is further limited to the visual portion of the spectrum, i.e., nanometers (nm) since the human eye is practically indifferent to other wavelengths of radiant energy. Thus, the phenomenon of color is said to be psychological and is defined as the "characteristics of light -- light being the aspect of radiant energy of which a human observer is aware through the visual sensations which arise from the stimulation of the retina of the eye," [6, p. 20].

The instrument used in this study was developed by Hunter [6]. It is a tristimulus photoelectric colorimeter and is widely used in the food industry. The Hunter "a" values are measure of redness to greenness and the Hunter "b" values are measures of yellowness or blueness. Hunter "L" is a measure of the lightness or darkness of the product.

In the case of applesauce, the color is determined by multiplying the values of L x a x b directly, while in the case of peas L is multiplied with the ratio of a/b to determine the color. For example, a high value in applesauce of L x a x b will denote a preferred color, because the test will imply that the material is more light than dark, is more red than green, and is more yellow than blue.

In the case of peas, it is assumed that a low L value denoting a dark shade is preferred over a high value. The a/b ratio is used instead of taking them individually, and a high a/b value will denote that it is a combination of green and yellow. A pea that is more green than yellow will be considered better.

2/ Manufactured by Canners Machinery Ltd., Ontario, Canada.

3/ Manufactured by Instron Corp., 2500 Washington Street, Canton, Massachusetts.

Drained Weight: Conformance to declared weights in packaged foods is not always adequate protection to assure consumers that they get all for what they pay. Many processed food containers are filled with units of food after liquid is added that consists mostly of water plus some sugar, or salt, or other ingredients. In such packaged foods, the indicated net weight (total weight minus container weight) does not provide sufficient indication to the consumer as to how much solid food and how much of the less expensive liquid he is getting [5, p. 91]. For example, two brands of identical net weight may or may not be equal in food value depending on how much food and how much liquid is present in each.

Ascorbic Acid (Vitamin C): The nutritional properties of ascorbic acid (A.A.) are determined in this study for national brand and private food products. Ascorbic acid is a necessary nutrient for the promotion and protection of a continuing biological function.

The ascorbic acid content in frozen orange juice concentrate was determined in cooperation with the Graduate School of Nutrition, Cornell University. The method of determining A.A. in this study was by "The Determination of Dehydro Ascorbic Acid and Ascorvic Acid in Plant Tissues by the 2,4, Dinitro Phenyl Hydrazine Method" [11].

Analysis and Results

The quality of different products was measured by different attributes. Ascorbic acid content was used as an index of quality in frozen orange juice concentrate; and, the quality of canned sweet peas was measured by drained weight, color, and firmness. Viscosity, color and the amount of soluble solids were used as an indication of quality in canned applesauce.

Measurements of quality attributes were taken both for national brands and private labels. Three samples of each brand (four national brands and six private labels in orange juice concentrate, and four national brands and eight private labels each for peas and applesauce) were taken from local markets. Whenever possible, care was taken to see that the samples were from different batches by observing the code numbers on cans and selecting the sample with a different code. This was done to reduce the sampling error.

Analysis of variance was used to evaluate the individual attributes of quality. The analysis was designed to test the null hypothesis (at a 0.05 level of significance) that there is no difference between quality attributes of private labels and national brands.

Frozen Orange Juice Concentrate: The null hypothesis that there is no difference in the ascorbic acid content in orange juice concentrate of private labels and national brands was not rejected using the F test. This implies that consumers would receive the same amount of Vitamin C, an important nutrient, in both private label and national brands.

Table 4 presents the mean values and statistical results for each of the selected products and attributes of quality. The mean value of ascorbic acid, measured in milligrams per gram of sample, was 1.2742 for national brands and 1.5021 for private labels.

Table 4 Mean Values and 'F' Ratios for Selected Group of Products By Type of Brand and Factors of Quality

Product and Factor	Unit of Measurement	National Brand n[a]	National Brand Mean	Private Brand n[a]	Private Brand Mean	Statistical Analysis F. value	Statistical Analysis F .05
A. Frozen Orange Juice Concentrate 6 oz.							
1. Ascorbic Acid [A.A.]	Milligram of A.A./ gram of sample	12	1.2742	18	1.5021	3.62	4.17
B. Canned Sweet Peas 17 oz.[482 grams]							
1. Drained weight	Grams	12	304.5250	24	308.5375	.69	4.11
2. Firmness	Pounds of force/ 100 grams of sample	24	6.5167	48	6.1979	.72	3.98
3. Color	Radiant Energy[d]	72	-373.1060	144	-398.1765	14.49	3.89
C. Canned Applesauce 35 oz.							
1. Viscosity	Centimeters of flow/unit time	12	4.6917	24	5.4167	2.50	4.11
2. Soluble Solids	Angle of refraction	12	1.3622	24	1.3596	12.17	4.11
3. Color	Radiant energy[d]	12	-86.9167	24	-1232.2083	4.20[b]	3.84[c]

[a] n is the number of observations

[b] H statistic for color attributes in applesauce using the Kruskal-Wallis One-way Analysis of variance

[c] Chi-square

[d] The color values represent the relative amount of reflexed radiant energy as measured by the Hunter Color Difference Meter. (Hunter Associates Lab, Inc., Fairfax, VA.)

Canned Sweet Peas: The quality of canned sweet peas was measured using the attributes of drained weight, firmness, and color. The null hypothesis that drained weight is equal in private labels and national brands was not rejected. The implication of this result is that the total weight of food (excluding the weight of the liquid) is equal in private labels and national brands. The average drained weight of national brand peas was 304.5 grams per 17 oz. can as compared to 308.5 grams for private labels.

From the analysis of variance it also appears that there is no significant difference in firmness between private labels and national brand peas. However, differences in the color attributes between the two brands appear to be significant. The color attributes of national brand peas were judged to be preferred over private labels.

Applesauce: The attributes of viscosity, soluble solids, and color were used to evaluate the quality of national brand and private label applesauce. The null hypothesis that there is no difference between private labels and national brands was not rejected for viscosity; but, was rejected for soluble solids and color. This implies that national brand applesauce is equal in viscosity as that of private label products but unequal with respect to soluble solids and color. The mean values of the quality attributes of applesauce are presented in Table 4.

Summary and Conclusions

The purpose of this study was to examine price and quality variations between national brand and private label food products. A sample of ten products was chosen to give current comparisons reflecting the general status.

As anticipated, private labels were less expensive in all product categories surveyed. The price spread between national brands and private labels was usually greater in national chains than in regional chains and independent stores; and, the price spread between the two brands in regional chains, for most products, was greater than the price spread in independent stores. From 1965 to 1975 the price spread between national brand and private labels dropped from 20 percent to 12.7 percent.

Although the price spread has narrowed between the two brand categories, consumers still have the option to buy private labels at a substantially lower price. As other necessities such as education, housing, and transportation become more expensive, the consumer is certain to look for savings in the family budget and one of the important items will be the food bill. If the concern for economy in food purchases increases, the demand for private labels will increase.

In addition to price differences, this study also dealt with quality differences between national brands and private labels for frozen orange juice concentrate, canned sweet peas, and canned applesauce. There was no significant difference observed between national brands and private labels in the ascorbic acid (Vitamin C) content present in frozen orange juice concentrate. In the case of canned peas, national brands were equal to private labels in viscosity but were judged to be better in color and in the amount of soluble solids.

The quality differences observed between national brands and private labels were minor. Where differences existed, they were in favor of national brands. Although the statistical analysis indicates a difference in quality between some national brands and private label products, it is doubtful if the consumer can actually perceive the difference.

Each brand category makes a positive and important contribution to the American food market. National brands, with their innovative ability, provide an impetus for growth and development. Private brands serve as an economical alternative of standardized products at lower prices. Factors such as the costs of product innovation, product life cycle, image, and consumer loyalty appear to underly the differences in prices between national brands and private labels rather than variations in quality between the two brand categories.

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