



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

ANALYSIS OF PRICES AMONG DISCOUNT FOOD STORES

Contributed by William A. Smallbrook, Undergraduate Student
and

Ulrich C. Toensmeyer, Associate Professor
Department of Agricultural and Food Economics
University of Delaware

A student initiated paper consisting of a study comparing food prices among stores adopting a discount image.

National and regional chains have converted their stores into discount food stores. Food stores located in New Castle County, Delaware have not escaped the drive for conversion to the discount concept. Formerly, a low price image was not stressed in this area and stamps were popular.

With the continued rise in food price from the farm through the retail level, price became a very significant factor in competition. Thus, management shifted emphasis and adopted the discount image. The question one must ask - what is a discount image? Is the store considered to have a discount image if all prices are lower than competitors or does only a mix of goods need to be cheaper? Does discount include national brands or only private brands?

Objectives

Determine the extent of the price difference among chain retail food stores which have promoted a discount image.

Procedures

Five chain stores were chosen in New Castle County, Delaware as representative stores.

A list of fifty-four products were utilized as the market basket. All items are national brands so that the exact item with the same weight and size can be found

in all stores. Private label brands, except for hot dogs, bacon, and milk were not selected because of the real or imaginary quality differences.

The survey was taken for a three week period, each Wednesday, January 10, 17, and 24, 1973. The results were further analyzed for significance of difference using Chi-Square statistical procedure.

PRICE ANALYSIS OF FIVE DISCOUNT FOOD STORES

The first analysis involves the composite total of 39 items for a three week period, Table 1. Only 39 items could be considered due to some items being out of stock. The lowest cost store for January 10 was Store C with a total of \$20.21 and the highest was Store E with \$20.74, with a difference of 53 cents.

In the second survey, January 17, the lowest cost store was Store B with \$20.89 and the highest was Store E with \$21.23, resulting in a difference of 34 cents between the highest and the lowest. The third survey, January 24, Store C had the lowest cost \$22.06 and Store E the highest with \$22.55, for a difference of 49 cents.

The three week total ranged from a low of \$63.21 for Store C to a high of \$64.52 for Store E. Thus, a food shopper for the specified three week period could have saved \$1.31 by shopping at Store C compared to shopping at Store E, the highest cost store. Choosing Store C instead of Stores A, B and D could have saved shoppers only 16 cents, 15 cents and 17 cents respectively.

Table 1
Total Cost of Market Basket,
Selected Days and Markets, Delaware, 1973¹

Market	Day			Total
	January 10	January 17	January 24	
	- Dollars -			
Store A	20.31	20.93	22.12	63.36
Store B	20.29	20.89	22.19	63.37
Store C	20.21	20.94	22.06	63.21
Store D	20.29	20.96	22.13	63.38
Store E	20.74	21.23	22.55	64.52

Source: Interview and calculations

¹ The market basket includes 39 similar food items for each week.

Statistical Tests -
Chi-Square Analysis -
39 Items

b) Critical Value X^2 , 38 d.f. at .05
level of significance

$$X^2 = 53.384$$

A statistical test using Chi-Square was made to determine if any significant price differences do exist among the five stores for the 39 items considered each week. The expected value was obtained by constructing a contingency table.

The computed $X^2 = 19.167$ is less than the critical value of $X^2 = 53.384$, therefore, we accept the hypothesis that there is no difference in prices among the stores.

January 17

The following hypothesis was made and tested:

Chi-Square Test:

$$H_0 P_1 = P_2 = P_3 = P_4 = P_5$$

$$X^2 = 9.461$$

$$H_1 P_1 \neq P_2 \neq P_3 \neq P_4 \neq P_5$$

Critical Value X^2 , 38 d.f. at .05 level
of significance $X^2 = 53.384$

If the computed X^2 is less than the critical value of X^2 , we accept the hypothesis that there is no differences in prices among the stores.

The computed $X^2 = 9.461$ is less than critical value, therefore, we accept the hypothesis that there is no difference in prices among the stores.

January 10

January 24

a) Chi-Square Test:

Chi-Square Test:

$$X^2 = 19.167$$

$$X^2 = 11.023$$

Critical Value X^2 , 38 d.f. at .05 level of significance. $X^2 = 53.384$

The computed $X^2 = 11.023$ is less than the critical value $X^2 = 53.384$, therefore, we accept the hypothesis that there is no difference in prices among the stores.

Thus, in summary no significant price difference exists between the five stores considering 39 national brand products.

Price Analysis of Fifty-Four Items

Analyzing the same survey period, but considering all 54 items, the differences are again very slight, Table 2. Previous week prices were substituted for the current prices in cases where no price was available for the week under consideration. During the first week, Store A had the lowest total cost market basket, \$26.30 with Store E being the most expensive with \$26.95, a difference of 65 cents.

The second week, Store A was the lowest cost with \$26.30 and Store E the highest

cost at \$26.95, a difference again of 65 cents between the lowest and highest cost store.

The third week, Store A again was the lowest and Store E, the highest, with \$26.44 and \$27.11 respectively. For the entire three week period, the difference between the lowest and highest cost store was \$1.97. However, very little difference was found among the first four stores.

A few food products had price differentials which were more pronounced and are shown in Table 3.

Items Out of Stock

One of the most frustrating experiences for a consumer is to find an item out of stock. Of the 54 items checked, the first week Store A did not have eight, Table 4. This was followed by Stores B, D, E, and C with 7, 6, 5, and 1 respectively. The results would indicate that a customer would have to shop at more than one market each week to obtain his particular mix of products.

Table 2
Total Cost of Market Basket,
Selected Days and Markets, Delaware, 1973

Food Market	Survey Week			
	January 10	January 17	January 24	Total
- Dollars -				
Store A	26.30	26.30	26.44	79.04
Store B	26.31	26.33	26.45	79.09
Store C	26.48	26.52	26.46	79.46
Store D	26.78	26.78	26.87	80.43
Store E	26.95	26.95	27.11	81.01

Source: Interview and calculations

¹ The market basket includes 54 food items for each week.

Table 3
Food Products Which Exhibit Unusually Large Price Differentials,
Selected Food Markets, Delaware, 1973

Item	Markets				
	A	B	C	D	E
- Dollars -					
Chicken of The Sea Tuna	.49	.49	.49	.55	.55
Welch's Grape Jelly	.38	.39	.38	.45	.45
Spry	.87	.87	.87	.84	.93
Pillsbury Flour	.48	.50	.50	.50	.59
Gravy Train	1.59	1.59	1.59	1.69	1.69
Cascade	.69	-	.69	-	.99

Source: Survey and calculations

Table 4
Number of Items Out-of-Stock Per Store, Selected Days
and Food Markets, Delaware, 1973

Food Market	Survey Week			
	January 10	January 17	January 24	Total
- Number -				
Store A	8	5	5	18
Store B	7	3	4	14
Store C	1	7	6	14
Store D	6	6	8	20
Store E	5	6	3	14

Source: Survey and calculations