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ITEM PRICING IN NEW YORK STATE

Sponsored by:

New York State Food Merchants Association

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ITEM PRICING IN NEW YORK STATE:

A THREE PHASE STUDY FOCUSING ON PRICING SYSTEM ACCURACY, CONSUMER PERCEPTION AND RELATED COSTS TO THE FOOD INDUSTRY

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ABSTRACT

SCOPE OF THE STUDY

For several years the item pricing issue in New York State has been clouded by many misconceptions. Most have focused on the level of accuracy in supermarket pricing systems and consumer perceptions regarding the importance of pricing individual items on supermarket shelves.

Contained within the Agriculture and Markets Law, the requirement of item pricing in New York State was first adopted in 1976. Due to expire on December 31, 1989, the most recent version of the law was extended through June 30, 1991. The intent of limiting the life of the law was to, " ...permit the legislature to observe and study the economies and efficiencies of the laser scanning system..."[1]

With the current law due to expire, it seemed appropriate that the "economies and efficiencies" of laser scanning technology be "observed and studied" to determine the impact the law has had on the food industry. Furthermore, an examination of the current perceptions held by the public regarding item pricing seemed timely.

To address this issue, a multi-phase study was conducted which focused on three related concerns regarding item pricing:

1) The accuracy of supermarket pricing systems.
2) Consumer's perceptions of the importance of item pricing.
3) The related costs to supermarkets associated with item pricing.

Sixteen supermarkets representing ten supermarket chains were selected by Cornell University and subsequently participated in the study. Of the 16 supermarkets, 12 were scanning stores and 4 were non-scanning. Four of the scanning supermarkets operated with either partial or total price removal.[2]

SUPERMARKET PRICING SYSTEM ACCURACY

The first section of this study focused on the accuracy of scanning and non-scanning supermarket pricing systems. Specifically, Cornell researchers reviewed accuracy from two perspectives:

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[1]Agriculture and Markets Law, Section 214-i.

[2]The supermarkets with "partial" price removal had removed prices from the grocery department and had partial removal in other departments.

1) As it pertains to subsection 5 of the Item Pricing Law which addresses only scanning stores. Subsection 5 pertains to whether the customer was charged more at the cash register than they were "told" at the point of selection either by the price marked on the item or by the shelf tag price. To access the level of accuracy, a comparison of item and receipt price was made to determine the rate of overcharges. In all cases the price at the point of purchase was assumed to be correct. Although, not specifically addressed in the Item Pricing Law, undercharges were also noted.

2) A general comparison was made between all available prices (item, shelf, receipt and headquarter) to determine the specific source of errors for both scanning and non-scanning stores. In accessing the level of accuracy, the headquarter price was assumed to be correct. In this case, an error occurred when one or more of the available prices were not identical to the headquarter price.

RATE OF OVERCHARGES/UNDERCHARGES

The Cornell researchers found very few overcharges in scanning stores. An average of 1.08 overcharges per store was detected in scanning supermarkets for an error rate of 2.1 percent. An average of .92 undercharges per store was observed for an error rate of 1.8 percent.

When the scanning stores were subdivided into scanning stores which price and those who practice either partial[3] or total price removal, the error rate was very low. Scanning stores with price removal had .75 errors per store for an overcharge rate of 1.5 percent. Scanning stores that priced individual items had .80 errors per store for an overcharge rate of 2.5 percent. Based on these results, it can be concluded that price removal does affect pricing accuracy in scanning stores that price and those that do not price.

RATE OF OVERALL ERRORS

When reviewing all available prices and comparing them to the headquarter price, an overall average of 3.5 errors per store was detected in scanning supermarkets and 5.7 errors per store in non-scanning supermarkets.

However, when the scanning stores were subdivided into scanning stores which price and those who practice either partial or total price removal, the error rate dropped to 2 errors per store for those with partial or total price removal and increased to 4.3 errors per store for scanning stores that price. Based on these results, it can be concluded that scanning stores with partial or total price removal have a more accurate pricing format than either scanning stores that price or non-scanning stores.

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[3]The supermarkets with "partial" price removal had removed prices from the grocery department and had partial removal in other departments.

CONSUMER PERCEPTION OF ITEM PRICING

The second phase of the study focused on consumer perception regarding the importance of item pricing. Over 1000 supermarket shoppers were surveyed in New York State and Pennsylvania using a four part questionnaire. The scope of the questionnaire ranged from asking open ended questions about grocery shopping in general to prompting shoppers with specific questions about their attitudes toward item pricing.

Out of over 1000 supermarket shoppers, 98 percent of the consumers which were surveyed showed no concern about item pricing when asked general questions regarding what they like and dislike about the store where they were shopping. Twenty or 2 percent mentioned not having individual items marked with a price tag as something that they didn't like about the store where they were shopping. One shopper mentioned price removal as a positive store attribute.

When supermarket shoppers were asked to identify two store characteristics which were the most important to them out of a list of five possibilities they chose cleanliness as most important followed by low prices. Accurate pleasant checkout clerks was third, price tag on every item fourth and freshness date marked on products was the least important.

Sixty four percent of shoppers who were surveyed in pricing stores felt that the absence of price tags on exempt items[4] had never been a problem for them while they shopped. Thirty six percent said that this had been a problem for them. Over half of those shoppers who were concerned about this mentioned hard to read or mixed up shelf tags as the reason they were concerned.

After asking the general questions mentioned above, consumers which did not mention item pricing voluntarily were prompted with an open ended question which specifically addressed price removal in supermarkets. Consumers of pricing and non-pricing supermarkets in all major market areas of New York State and one store in Pennsylvania were asked, "if items were not individually priced, would it cause you any particular problems while shopping." Thirty two percent expressed no concern over price removal while 68 percent of the respondents said yes, they would have concerns if prices were removed. Of those shoppers who indicated price-removal would be a problem, mixed up and hard to read shelf tags was a major concern.

When shoppers were asked what a store could do beside pricing individual items to overcome their concerns about price removal, 70 percent indicated that shelf tags should be improved.

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[4]Exempt items are exempt from individual pricing by the item pricing law in New York State either by virtue of the general 4 1/2 % exclusion, by their package size or by a specific product exemption.

COST OF ITEM PRICING

The final phase of the study determined the costs associated with item pricing. Pricing individual items represents a significant expense to supermarkets, and may put supermarkets that price at a competitive disadvantage over those that do not price individual items.

Based on a study of four supermarket chains, pricing individual items in the grocery, dairy and frozen food department represents an additional cost of $54,501 per year per store to stores that price individual items. This figure is based solely on three departments (grocery, dairy and frozen) for a store with average weekly sales of $672,411.

If there were no statutory exemptions on fixed weight prepackaged products included in the Item Pricing Law, based on the figures gathered for this study, a store with average weekly sales of $672,411 would incur an additional annual cost of $134,482 which would be directly attributed to item pricing.

CONCLUSIONS

It can be concluded from the results of this study that laser scanning technology does provide supermarkets and consumers with an accurate pricing system. If utilized fully, thereby removing individual price tags and relying solely on shelf tags for price identification, scanning can result in financial savings to the supermarket which in turn may benefit the consumer. Furthermore, it appears that price removal alone is not an important factor in why a consumer chooses to shop (or not to shop) in a particular supermarket. When specifically asked about price removal, consumers appear to have adjusted by utilizing shelf tags that contain unit and item pricing information.

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INTRODUCTION

New York State is one of only seven states that has an item pricing law. At the time of this writing, the current law is due to expire on June 30, 1991. This study was undertaken to determine the impact the law has had on the food industry and the consuming public. The study focused on: 1) the accuracy of supermarket pricing systems, 2) consumer perception of the importance of item pricing and, 3) the cost of item pricing to supermarkets.

This study was conducted by Cornell University under the sponsorship of the York State Food Merchants Association.

PART I

ACCURACY OF SCANNING AND NON-SCANNING SUPERMARKET PRICING SYSTEMS

A BRIEF REVIEW OF SCANNING TECHNOLOGY

During the mid 1970's, supermarkets began utilizing the Universal Product Code (UPC) system for item identification and scanners for in-store automatic check-out and inventory control.[5] Most UPC's are horizontal codes of alternating dark lines and light spaces. The presence of a UPC on nearly every item in a supermarket eliminates the need for individual items to be priced. This is because the scanning system "reads" the UPC rather than the checker reading the price. The scanner is connected to a display device known as a cathode ray tube (CRT). The CRT allows information being scanned to be seen. Scanners are termed on-line devices because they are usually interfaced directly to a computer or terminal within the supermarket for on-line data collection. When an item is passed over the scanner, a low energy laser beam, located under the scanner, reads or scans the UPC. The UPC identifies the product and then the in-store computer identifies the price by looking it up in the computer or scan file. The price which has been fed into the store computer by the main computer at company headquarters is then sent back to the checkout counter and the price is shown on a display screen.

Depending on the policy of the supermarket chain, access to the scan file by local store management may be possible. Some chains do not allow any access to the scan file at the local store. That is, all price changes are transmitted electronically to local stores by headquarters and usually cannot be altered at the store level. There are some chains however, that do allow the store manager to make local price changes.

METHODOLOGY

The objective of the first phase of this three phase study was to determine and compare the accuracy of scanning and non-scanning supermarket pricing systems. To assess the pricing accuracy, two Cornell researchers visited supermarkets throughout New York state and one supermarket in Pennsylvania. Specifically the researchers reviewed accuracy from two perspectives:

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[5]Bar Code Technology May 1982, Joint Financial Management Improvement Program, Washington D.C.

1) As it pertains to subsection 5 of the Item Pricing Law (which addresses only scanning stores). Subsection 5 addresses whether the customer was charged more at the register than they were "told" at the point of selection. To access the level of accuracy, a comparison of item and receipt price was made to determine the rate of overcharges. In all cases, the price at the point of purchase was assumed to be the correct price. Although, not specifically addressed in the Item Pricing Law, undercharges were also noted.

2) A general comparison was made between all available prices (item, shelf, receipt and headquarter) to determine the specific source of errors for both scanning and non-scanning stores. For this comparison, the headquarter price was assumed to be the correct price.

Sixteen supermarkets representing ten supermarket chains were selected by Cornell University and subsequently participated in the study. Of the 16 supermarkets, 12 were scanning stores and 4 were non-scanning. Four of the scanning supermarkets operated with either partial or total price removal.[6] One non-scanning store was removed from this phase of the study because of incomplete pricing information.

At each supermarket, the researchers selected a market basket of 51 products. When the shopping was completed, the market basket was passed through a checkstand as a normal order so that a register receipt was obtained. The market basket shopping list consisted of:

- 50 percent dry grocery products
- 15 percent meat products
- 10 percent dairy products
- 10 percent fresh produce products
- 6 percent health and beauty care products
- 5 percent bakery products
- 4 percent general merchandise products

Since all items which were "purchased" were subsequently returned to their respective department following check out, highly perishable foods such as scratch bakery products,

[6] Ibid # 1.

service deli items, and frozen foods were avoided to prevent spoilage and loss to the store. The mix of items purchased from each supermarket department for our market basket was obtained from a previous study which had determined the representative percentages of a typical consumer's market basket. Fifty-one items were purchased in each supermarket for a total of 612 items purchased in scanning supermarkets and 153 items purchased in non-scanning supermarkets. The average price (retail) of the market basket for this study was $102.56.

To assess the pricing accuracy, four prices were noted. They were 1) item price, 2) shelf tag price, 3) receipt price and 4) headquarters' price. The headquarter's price may be defined as the price set by headquarters for a particular store. The item and shelf prices (if available) were noted at the time the product was selected. The headquarter prices were obtained from the supermarkets' price books or fiches or from the receipt if headquarter prices were transmitted directly from the supermarket's headquarters to the scanners.

Supermarket pricing accuracy was determined in two ways. First as it related specifically to the New York State Item Pricing Law which pertains only to scanning supermarkets. In this instance overcharges and undercharges were noted as they would be experienced by a shopper. There are however, other types of pricing errors that are not detectable by a supermarket shopper. These more detailed and specific errors were also determined for this study.

CALCULATION AND RESULTS OF OVERCHARGES AND UNDERCHARGES

Since Subsection 5 of the Item Pricing Law is specifically concerned with overcharges, in order to determine pricing errors, the item price (or shelf tag price if an item price was not present), and the scan or receipt price were compared for every item that was purchased. An overcharge occurred when the scan or receipt price **EXCEEDED** the item (or shelf) price. An undercharge occurred when the scan or receipt price was **LESS** than the item (or shelf) price.

GENERAL ERRORS

Scanning supermarkets had a total of 13 pricing errors which resulted in an average of 1.08 pricing errors per store. Of the 612 items purchased in the twelve scanning stores, 2.1 percent of the items had pricing overcharges. There were 11 undercharges detected which resulted in .92 undercharges per store. This caused an overall undercharge rate of 1.8 percent (Table 1).

TABLE 1
Summary of General Pricing Errors in Scanning Stores

Error Type	Number of Items Purchased	Number of Errors	Range of Errors Per Store	Error Percent
Overcharges	612	13	0 - 3	2.1
Undercharges	612	11	0 - 3	1.8

COMPARISON AND SUMMARY OF ERRORS IN SUPERMARKETS WITH AND WITHOUT ITEM PRICING

Four scanning stores which participated in the study practiced either partial or total price removal. These four stores experienced a total of 3 errors. The average number of errors per store for our market basket was .75 errors for an error rate of 1.5 percent. On the other hand, scanning stores that price individual items had a total of 10 errors. The average number of errors per store was 1.25 giving an error rate of 2.5 percent (Table 2).

TABLE 2
Comparison of Overcharges in Supermarkets with Item Pricing Versus Supermarkets with Partial or Total Price Removal

	STORE TYPE		
	Scanning with Item Pricing	Scanning with Partial or Total Price Removal	TOTAL
Number of stores	8	4	12
Number of items purchased	408	204	612
Number of errors	10	3	13
Average number of errors per store	1.25	.75	1.1
Percent of total items purchased with pricing errors	2.5%	1.5%	2.1%

From this comparison it can be concluded that pricing format has an affect on pricing accuracy (specifically pricing overcharges). Scanning stores with total or partial price removal have the fewest number of overcharges with .75 errors per store giving them an overcharge rate of 1.5 percent. Scanning stores that price individual items had an average of 1.25 overcharges per store which resulted in an overcharge rate of 2.5 percent. When pricing and non-pricing scanning stores were combined, the error rate was 2.1% with an average of 1.1 overcharges per store.

CALCULATION AND RESULTS OF GENERAL PRICING ERRORS

For the purpose of determining general pricing errors, they were characterized in the following ways:

A. Average number of pricing errors per store. An error occurred if either the item, shelf or receipt price did not match the headquarter price.

B. Pricing errors by supermarket department.

C. Specific types of errors. Specific types of errors were determined by comparing the item, the shelf, and the receipt price to the headquarter price. The headquarter price was always assumed to be correct.

D. Item price errors. The purpose of determining incorrectly priced items is to gauge the degree of human error involved in individually pricing an item and checking an item out in a non-scanning cash register. For both scanning and non-scanning stores, an item price was deemed incorrect if it was different from the headquarter price. An error found in a scanning store would indicate an incorrectly marked item or perhaps a managers special.[7] An error detected in a non-scanning store may indicate either 1) an error while pricing the item, or 2) a keying error by the checker.

E. Shelf tag errors. This type of error occurred when the shelf tag was different than the headquarter price in scanning and non-scanning stores. An incorrect shelf tag is also an indication of human error in creating/updating/and or maintaining the shelf tag.

F. Receipt errors. A comparison was made between the receipt price and all other prices for each item. If the headquarter, item and shelf prices were all in agreement but the receipt price was different, this type of error would specifically indicate a keying error by the checker in a non-scanning store. A

[7]A manager would most likely change the scan file to create a "managers special" for the purpose of placing unadvertised items on sale or to add or delete an item from the scan file.

receipt error in a scanning store could indicate either 1) an in store scan file discrepancy (possibly as a result of a manager's special), 2) a keying error, or 3) misidentification of produce.

In all cases, the consumer experienced an overcharge (loss) if the receipt price was higher than the headquarter price. Likewise, the consumer experienced an undercharge (gain) if the receipt price was lower than the headquarter price. The supermarket experienced a loss or gain if the headquarter price was lower or higher then the receipt price, respectively.

GENERAL ERRORS

Scanning supermarkets had a total of 42 pricing errors which resulted in an average of 3.5 pricing errors per store. Non-scanning supermarkets had a total of 17 errors for an average of 5.7 per store. On average, of the 51 items which were purchased in each store, 7 percent had pricing errors in scanning stores and 11% had pricing errors in non-scanning stores (Table 3.)

TABLE 3
Summary of General Pricing Errors

Supermarket Type	Total Items Purchased	Total Number of Pricing Errors	Percent of Items Purchased with Pricing Errors
Scanning supermarkets	612	42	7%
Non-Scanning supermarkets	153	17	11%

ERRORS BY DEPARTMENT

Seven departments were shopped in each store which included: meat, fresh produce, dairy, bakery, general merchandise, health and beauty care, and dry grocery. The results of this study show that errors do not occur evenly throughout the supermarket but that certain departments produce more errors than others. For scanning stores the errors by department ranged from a low of 0 percent in general merchandise to a high of 13 percent in produce. Likewise, in non-scanning stores, both general merchandise and health and beauty care had no pricing errors while one third of the items purchased in the bakery department had pricing errors (Table 4 and Table 5).

TABLE 4
Rate of Pricing Errors by Supermarket Department - Scanning Stores

DEPARTMENT	Total Number of Items Purchased	Total Number Pricing Errors	Percent of Errors
Dry grocery	300	17	6%
Meat	96	11	11%
Produce	60	8	13%
Dairy	60	3	5%
Bakery	36	2	6%
Health & beauty care	36	1	3%
General merchandise	24	0	0%

TABLE 5
Rate of Pricing Errors by Supermarket Department - Non-Scanning Stores

DEPARTMENT	Total Number of Items Purchased	Total Number Pricing Errors	Percent of Errors
Dry Grocery	75	5	7%
Meat	24	3	13%
Produce	15	4	27%
Dairy	15	2	13%
Bakery	9	3	33%
Health & beauty care	9	0	0%
General merchandise	6	0	0%

In summary, both scanning and non-scanning stores did a good job in correctly pricing both general merchandise and health and beauty care departments. Both store types also experienced similar error rates in the meat and dry grocery departments. Non-scanning stores had over twice as many pricing errors in the produce and dairy departments than scanning stores. One third of the bakery items which were purchased in non-scanning stores had pricing errors while only 3 percent had errors in scanning stores.

COMPARISON OF SPECIFIC PRICING ERRORS

SCANNING AND NON-SCANNING STORES

A review was done of all errors to determine which of the possible prices (item, shelf tag, receipt) caused a pricing error when compared to the headquarters price (Table 6).

Pricing errors are a result of either, 1) human error, 2) mechanical error, or 3) a combination of one and two. Errors in item and shelf prices are an indication of human error in marking individual items and maintaining current shelf tags. Combined, these two types of "human" errors accounted for 43 percent of the pricing errors in scanning stores.

The remaining errors (57 percent) could be characterized as scanning system errors. The most common causes for an inconsistency in headquarter price when compared with other prices occurs when the store manager holds "managers special," adds or deletes an item from the scan file or does not synchronize alteration of the scan file with sale dates. Other possible causes of errors in scanning systems include; keying errors when checking out non-scannable items (such as produce), misidentification of produce items, and incorrect store level micro fiches.

Pricing errors in non-scanning stores are a result of human error, mechanical error or a combination of the two. Thirty-five percent of all the errors which occurred in non-scanning stores involved human error (Table 7). Specifically, item and shelf tag errors are an indication of incorrectly priced individual items and poor maintenance of shelf tags.

The remainder of the errors, or 65 percent can be attributed to headquarters errors in maintaining correct, up-to-date master price files such as fiches or price books (Table 7).

TABLE 6
Comparison of Specific Pricing Errors - Scanning Stores

TYPE OF ERROR	NUMBER OF ERRORS	PERCENT OF TOTAL
Item price incorrect when compared to the headquarter price	13	31%
Shelf tag incorrect when compared to the headquarter price	5	12%
Receipt price incorrect when compared to the headquarter price	6	14%
Item and receipt price were the same but different from the headquarter price[8]	5	12%
Shelf and receipt price were the same but different from the headquarter price[9]	3	7%
Item, shelf and receipt price were the same but different from the headquarter price[10]	5	12%
Shelf and receipt price were different from each other and also different from the headquarter price	2	5%
Only two prices available for comparison	3	7%

[8]The items identified in this category had no shelf tags available.

[9]The items in this category had not item prices available.

[10]The most frequent cause of this type of error is a "managers special," or if the manager does not synchronize scan file changes with sales dates.

TABLE 7
Comparison of Specific Pricing Errors - Non-Scanning Stores

TYPE OF ERROR	NUMBER OF ERRORS	PERCENT OF TOTAL
Item price incorrect when compared to the headquarter price	0	0%
Shelf tag incorrect when compared to the headquarter price	1	6%
Receipt price different when compared to the headquarter price[11]	5	29%
Item and receipt price were the same but different from headquarter price[12]	6	35%
Shelf and receipt price where the same but different from headquarter price[13]	2	12%
Item, shelf and receipt price were the same but different from headquarter price	2	12%
Shelf and receipt price were different from each other and also different from headquarter price	0	0%
Headquarter price not available	1	6%

[11]The most probable cause of this type of error is checker error.

[12]The items identified in this category had no shelf tags available.

[13]The items identified in this category had no item prices available.

In summary, despite the technology of scanning systems, human error accounted for 43 percent of all mistakes in scanning stores, while in non-scanning stores human error accounted for 35 percent of all errors. On the other hand, the technology utilized in scanning stores resulted in a smaller "mechanical" error rate for scanning stores than for non-scanning stores (57 percent compared to 65 percent in non-scanning stores).

COMPARISON OF ITEM PRICE AND HEADQUARTER PRICE

A comparison between the item price and the headquarter price provides one measure of the human error involved in marking individual items and keying item prices into non-scanning cash registers. For both scanning and non-scanning stores the item price was deemed incorrect if it was not the same as the headquarter price. An error found in a scanning store would indicate an incorrectly marked item or a managers special. An error found in a non-scanning store indicated either an error while marking the individual item or a keying error at the checkstand.

In comparing the item price to the headquarter price, scanning stores had 23 instances where the two prices were not the same. The net result of these errors was a loss to the consumer of $0.11 per store per market basket (Table 8). Non-scanning stores had 8 discrepancies between the item and headquarter price which resulted in a net gain to the consumer of $0.06 per store per market basket (Table 8). The average price of the market basket for this study was $102.56.

TABLE 8
Summary of Incorrect Item Prices in Scanning and Non-Scanning Stores

	STORE TYPE	
ITEM PRICE ERRORS	SCANNING	NON-SCANNING
Number of incorrect item prices when compared to headquarter price	23	8
Percent of	55%	47%
Net effect of item pricing errors	$0.11 Consumer LOSS/store/market basket	$0.06 Consumer GAIN/store/market basket

COMPARISON OF SHELF TAG PRICE AND HEADQUARTER PRICE

A comparison was made between the shelf tag and headquarter price for every item as a second means of measuring human error, specifically with regards to maintaining and updating shelf tags. There were 15 instances in scanning stores were the shelf tag and headquarter price were not the same. This resulted in a net loss to the consumer of $0.10 per store per market basket (Table 9). Non-scanning stores had 4 shelf tags which were not the same as the headquarter price. This resulted in a net gain to the consumer of $0.05 per store per market basket (Table 9).

TABLE 9
Summary of Shelf Tag Errors for Scanning and Non-Scanning Stores

	STORE TYPE	
SHELF TAG ERRORS	SCANNING	NON-SCANNING
Number of incorrect shelf tags when compared to headquarter price	15	5
Percent	36%	29%
Net effect of pricing errors	$0.10 consumer LOSS/store/market basket	$0.05 consumer GAIN/store/market basket

COMPARISON OF RECEIPT PRICES

For scanning stores there were 6 errors where the headquarter price, the item, and the shelf price were the same but the receipt price was different. Receipt errors represented 14 percent of all the errors detected in scanning stores. The net result of receipt errors was a net loss to the consumer of $0.08 per store per market basket (Table 10). Receipt errors in a scanning store may be the result of a "managers special", keying errors of non-scanned items incorrectly identified produce items or scanning system error.

For non-scanning stores there were 5 errors where the headquarter, item, and shelf price were the same but the receipt price was different. Receipt errors represented 29% of all the errors detected in non-scanning stores. The net result of these receipt errors was an average consumer gain of $0.24 per store per market basket (Table 10). Receipt errors are an indication of checker error.

TABLE 10
Comparison of Receipt Prices for Scanning and Non-Scanning Supermarkets

RECEIPT ERRORS	STORE TYPE	
	SCANNING	NON-SCANNING
Number of incorrect receipts	6	5
Percent of total errors which were receipt errors	14%	29%
Net effect of receipt errors	$.08 consumer LOSS/store/market basket	$.24 consumer GAIN/store/market basket

COMPARISON AND SUMMARY OF ERRORS IN A PARTIAL OR TOTAL PRICE REMOVAL ENVIRONMENT

Four scanning stores which participated in the study practiced either partial or total price removal. These four stores experienced a total of 8 errors, with a range from 0 to a high of 5 errors per store. The average number of errors per store for our market basket was 2 errors for an error rate of 4 percent. Scanning stores that price individual items had over twice as many errors (4.3) while non-scanning stores had almost three times as many errors (5.7) as scanning stores that practice partial or total price removal.

When the sample of stores which participated in the study were divided into three subsets, that is 1) scanning with item pricing, 2) scanning with partial or total price removal, and 3) non-scanning stores, stores with partial or total price removal were found to be the most accurate (Table 11).

TABLE 11
Comparison of Errors in Supermarkets with Three Pricing Strategies

PRICING ERRORS	STORE TYPE			
	Scanning With Item Pricing	Scanning With Partial or Total Price Removal	Non-Scanning	TOTAL
Number of stores	8	4	3	15
Number of items purchased	408	204	153	765
Number of errors	34	8	17	59
Average number of errors per store	4.3	2	5.7	3.9
Percent of items purchased with pricing errors	8%	4%	11%	7.7%
Net result of comparison of shelf price and headquarter price	$0.10 consumer LOSS/store per market basket	$0.03 consumer GAIN/store per market basket	$0.05 consumer GAIN/store per market basket	

From this comparison, it can be concluded that partial or total elimination of individually priced items is a more accurate pricing format for the store and consumer. There were over twice as many pricing errors in scanning stores that price individual items and almost three times as many errors in non-scanning stores than in stores that practice some degree of price removal. Therefore, by eliminating item pricing, these stores increased their pricing accuracy two and threefold by eliminating the human error associated with pricing individual items. Furthermore, price removal also resulted in the smallest discrepancy in gain or loss to the consumer ($ .03) compared with the other two store types.

STATUS OF SHELF TAGS

SCANNING AND NON-SCANNING STORES

During the accuracy check the researchers discovered missing shelf tags while shopping in the participating stores. It should be noted that in general meat, bakery, fresh produce and general merchandise are exempt from unit pricing and therefore one would generally not expect to find shelf tags in these departments. In scanning stores, the dairy and dry grocery department had very few missing shelf tags while health and beauty care department had slightly more with 17 percent of the shelf tags missing (Table 12.).

TABLE 12
Missing Shelf Tags - Scanning Stores

DEPARTMENT	Total Number of Items Purchased	Total Number Missing Tags	Percent of Missing Shelf Tags
Dairy	60	3	5%
HBC	36	6	17%
Dry grocery	300	12	4%

Over half of the items purchased in the Health and Beauty Care Department had missing shelf tags and almost half of the shelf tags were missing from the Dairy Department in non-scanning stores. The Dry Grocery Department had 11 percent of its shelf tags missing in these stores (Table 13).

TABLE 13
Missing Shelf Tags - Non-Scanning Stores

DEPARTMENT	Total Number of Items Purchased	Total Number of Missing Shelf Tags	Percent of Missing Shelf Tags
Dairy	15	7	47%
HBC	9	5	56%
Dry grocery	75	8	11%

In summary, the absence of shelf tags was high in the non-scanning stores included in this study (Table 13). However, it could also be concluded that the number of shelf tags missing from scanning stores was also at a level far above that which consumers would find acceptable.

PART I
General Conclusions

RATE OF OVERCHARGES/UNDERCHARGES

The Cornell researchers found very few overcharges in scanning stores. An average of 1.08 overcharges per store was detected in scanning supermarkets for an error rate of 2.1 percent. An average of .92 undercharges per store was observed for an error rate of 1.8 percent.

When the scanning stores were subdivided into scanning stores which price and those who practice either partial or total price removal, the error rate was very low. Scanning stores with price removal had .75 errors per store for an overcharge rate of 1.5 percent. Scanning stores that priced individual items had .80 errors per store for an overcharge rate of 2.5 percent. Based on these findings, it can be concluded that price removal in scanning stores results in more accurate pricing.

GENERAL PRICING ERRORS

An average of 3.5 errors per store were found in scanning supermarkets and 5.7 errors per store in non-scanning supermarkets. When specifically comparing the shelf and headquarters' price, the result was a net loss to the consumer of scanning stores of $0.10 per store per market basket. The result for consumers shopping in non-scanning stores was a net gain of $0.05 per store per market basket.

However, when the scanning stores were subdivided into scanning stores which price and those who practice either partial or total price removal, the error rate dropped to 2 errors per store for those with partial or total price removal and increased to 4.3 errors per store for scanning stores which price. Therefore, it can be concluded that in a partial or total price removal environment, a more accurate pricing system exists for the consumer and the store.

Missing shelf tags present a significant problem to the consumers particularly while shopping in scanning stores that do not price individual items as well as in non-scanning stores. This is one area within the pricing system which should be improved by both scanning and non-scanning supermarkets.

PART II
CONSUMERS' PERCEPTION OF THE IMPORTANCE OF ITEM PRICING

PURPOSE AND METHODOLOGY

The objective of the second phase of research was to determine the relevance of item pricing to consumers. Although the Item Pricing Law in New York State regulates food stores and food departments in general merchandise stores, only supermarket shoppers were surveyed regarding their attitudes towards item pricing.

Over 1000 supermarket shoppers were surveyed in New York State and Pennsylvania. Since Pennsylvania does not have an item pricing law, supermarket shoppers were surveyed there to measure and compare their attitudes towards price removal with shoppers in New York State. Seven hundred ninety seven consumers were initially surveyed to gauge their perceptions regarding the importance of item pricing in supermarkets. Two hundred fifty additional consumers were later surveyed using a follow-up survey to gather additional insight into shoppers' perceptions regarding item pricing.

THE INITIAL SURVEY

The first portion of the questionnaire was designed to provide shoppers with an opportunity to express concern or satisfaction with the store's item pricing policy without prompting. If they did not mention item pricing during the first portion of the interview, shoppers were explicitly asked to address the issue.

Shoppers were then asked to describe any problems they had or believed they would have if the supermarket in question did not mark individual items with price tags. Other questions designed to determine the shoppers' price sensitivity and preferred form of pricing were also asked.

During the final portion of the survey, shoppers were asked to complete demographic information about themselves.

Frequency tabulation was used to determine the respondents' demographics and the proportion of respondents who were concerned about the supermarket's item pricing policy.

Cross-tabulation was used to determine what factors were associated with concern or satisfaction with the store's item pricing policy, as well as other associations concerning consumers' behavior.

THE FOLLOW-UP SURVEY

The first portion of the follow-up survey was similar in design to the initial survey. It provided shoppers with an opportunity to express concern or satisfaction with the store's item pricing policy without prompting.

The second part of the follow-up survey focused on two related areas. First, the relative importance of item pricing when compared to other store characteristics such as low prices and cleanliness was examined. The store characteristics used in the survey were taken from a national survey conducted by an independent agency for Progressive Grocer magazine.[14] For the Progressive Grocer Survey, consumers ranked a list of twenty store characteristics in order of importance. The top five characteristics ranked by consumers for the Progressive Grocer study were used in the Cornell Study.

The relative concerns shoppers had regarding the absence of individual price tags on items which by law are exempt from item pricing was then examined. These items traditionally do not have an individual price tag on them. Such items might include milk or a small box of jello.

The third part of the questionnaire was the similar to the initial survey. It specifically gauged consumer reaction to the presence or absence of item pricing. If a shopper did not mention the issue of item pricing on their own during the first part of the survey, a specific question was asked about their feelings regarding the presence or absence of price tags on individual items.

If a shopper felt concerned about the possibility of price removal, a follow-up question was asked to the consumer which focused on the possible actions a store could take to overcome customer concerns regarding price removal.

The fourth part of the survey collected general demographic information which the respondents completed themselves.

RESULTS

RESPONDENTS' PROFILE

The majority of respondents were female (81 percent). Income levels were fairly evenly spread; the majority of incomes were in the under $55,000 per year range. Consumers 55 years and older comprised 48 percent of the respondents. Consumers between 35 and 54 years old comprised 35 percent of the respondents and shoppers between the age of 18-34 accounted for 17 percent of survey respondents (Table 14).

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[14]Progressive Grocer Magazine, 57th Annual Report, Mid April 1990, p. 57.

TABLE 14
Survey Demographics (n=1047)

AGE:	
18-34 years old	17%
35-54 years old	35%
55 years and older	48%
SEX:	81%
Female	19%
Male	
ANNUAL TOTAL HOUSEHOLD INCOME:	
Under $24,999	
$25,000-54,999	29%
$55,000-84,999	43%
$85,000 and over	20%
	8%

SHOPPERS LIKES AND DISLIKES ABOUT THE STORES WHERE THEY SHOP

The first three questions which were asked to supermarket shoppers included:

1. What do you enjoy about shopping in this store ?
2. What don't you like about shopping in this store?
3. What can this store do to improve your shopping experience?

Out of over 1000 supermarket shoppers, 20 or 2 percent mentioned not having individual items marked with a price tag as something that they did not like about the store where they were shopping. One shopper mentioned it as a positive store attribute.

STORE CHARACTERISTICS IMPORTANT TO SHOPPERS

In order to gauge what characteristics were most important to supermarket shoppers, the surveyor asked shoppers; "I'm going to list 5 store characteristics. Please tell me which are the two most important to you."

Accurate, pleasant checkout clerks
Cleanliness
Price tag on every item
Freshness date marked on products
Low prices

Shoppers felt that cleanliness was the most important followed closely by low prices. "Price tag on every item" was fourth in importance to supermarket shoppers (Figure 1).

SHOPPERS REACTIONS TO PRICE REMOVAL ON ITEMS EXEMPT BY NYS LAW

Following these general questions about store likes and dislikes, and important store characteristics, a series of questions was asked specifically about the presence or absence of individual price tags. Shoppers, in pricing stores, were asked one set of questions while shoppers in non-pricing stores were asked another set of questions.

Shoppers who were surveyed in **PRICING** stores were asked:

> "In this store there are some items that have never had a price tag on them like milk or a small box of jello. Does this present any problems for you when you shop?"

If they answered yes, a card was held up and the surveyor asked:

> "Which of these describes the problems you are concerned with?
>
> A. Shelf tags are sometimes hard to read
>
> B. I have nothing to compare receipt prices with
>
> C. Sometimes shelf tags are mixed up
>
> D. I don't have anything to compare shelf-tag prices with
>
> E. Other

Sixty four percent of shoppers surveyed indicated that this has never been a problem for them while 36 percent indicated that it had caused them problems. Over half of those shoppers who were concerned about this mentioned hard to read or mixed up shelf tags as a reason (Figure 2).

Figure 1. Store characteristics by percent preference

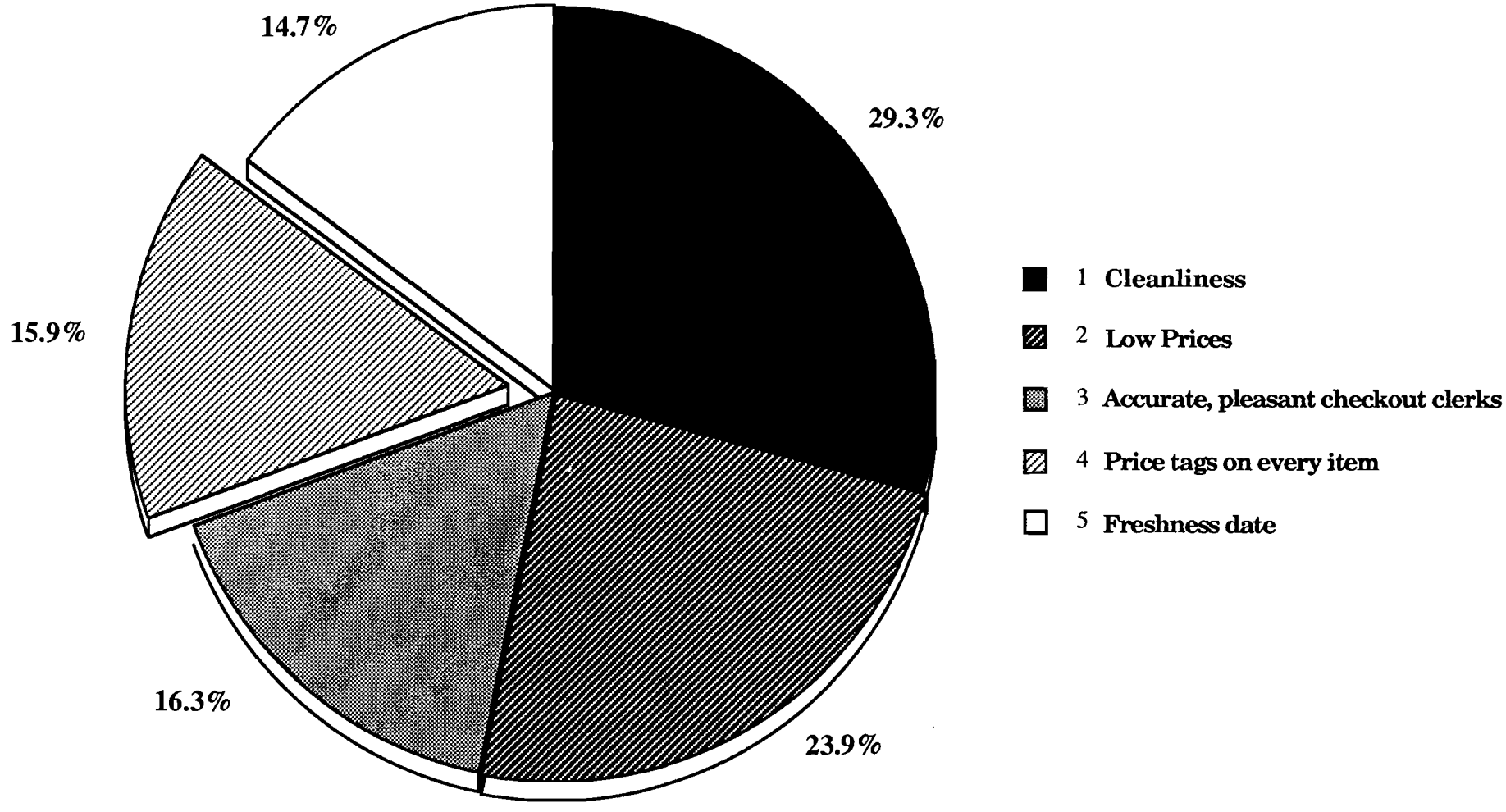
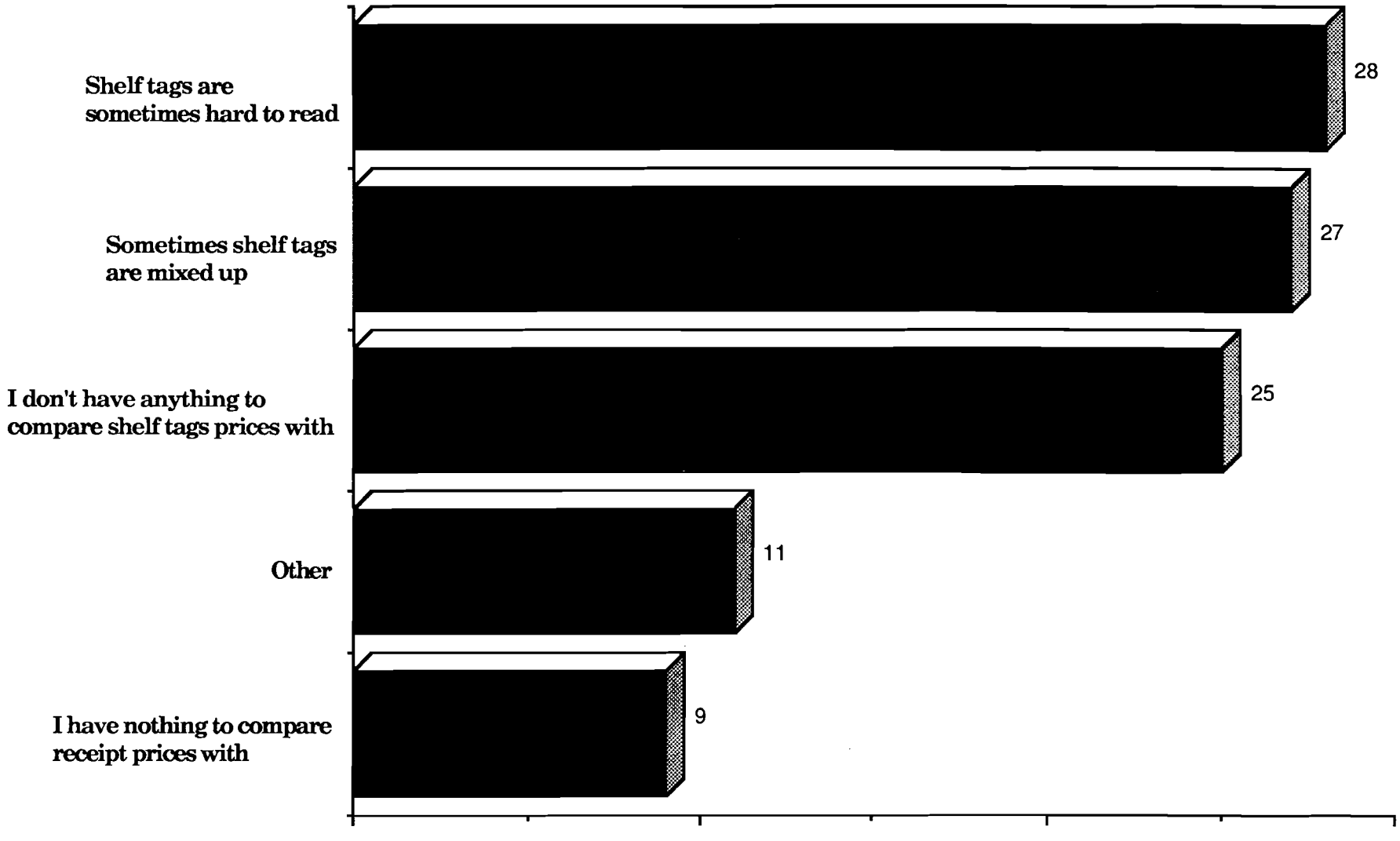


Figure 2. Concerns shoppers expressed regarding price removal on exempt items (percent)



SHOPPERS RESPONSES TO POSSIBLE OR EXISTING POLICY OF PRICE REMOVAL

Shoppers were then asked a very specific question about item pricing.

Shoppers in **PRICING** stores were asked;

> "There are some stores that don't put price tags on any of their items. If this store did not put price tags on any of it's items, would this present any particular problems for you?"

Consumers who were surveyed in **NON-PRICING** stores were asked:

> "Most of the items in this store are not marked with an individual price tag. Does this present any particular problems for you?"

If the shopper indicated yes, they were shown the card which listed the same options as in the question above. Over half of these shoppers expressed concern about hard to read or mixed up shelf tags as the reason they were concerned about price removal.

When the results from pricing and non-pricing stores were combined, 32 percent indicated that price removal was not a problem to them while 68 percent said, yes it was a problem for them while they shop (Table 15).

Shoppers in non-pricing stores were almost split in their feelings about price removal. Forty eight percent said yes, it was a problem for them, while 52 percent said no, that price removal was not a problem for them while they shopped (Table 15).

Seventy-two percent of shoppers in pricing stores felt that price removal would be a problem to them, while 28 percent were not concerned about price removal (Table 15).

Again, over half of those shoppers expressed concern about hard to read or mixed up shelf tags as the reason they were concerned about price removal (Figure 3).

Table 15
Responses of Shoppers to a Possible or Existing Price Removal Situation by Store Pricing Format (Percent)

RESPONSES	PRICING STORE	NON-PRICING STORE	TOTAL
NO, it is not a problem for me while I shop	28%	52%	32%
YES, it is a problem for me when I shop	72%	48%	68%
TOTAL	100%	100%	100%

PRICE SENSITIVITY

During the interview, shoppers were asked the following question:

> "When deciding where to shop, how important is it that the store has low prices?"

Possible answers included:

a) Very important

b) Somewhat important

c) Not important

Of respondents who said prices were very important, a significantly higher percentage indicated that not having every item marked with a price tag would be a problem. The difference between the responses of shoppers who said prices were not important was much less marked. Therefore, although there was no relationship between income and price sensitivity, a significant association was found between the respondent's price sensitivity and their concern about item price removal (see Table 16).

Figure 3. Concerns shoppers expressed regarding price removal (percent)

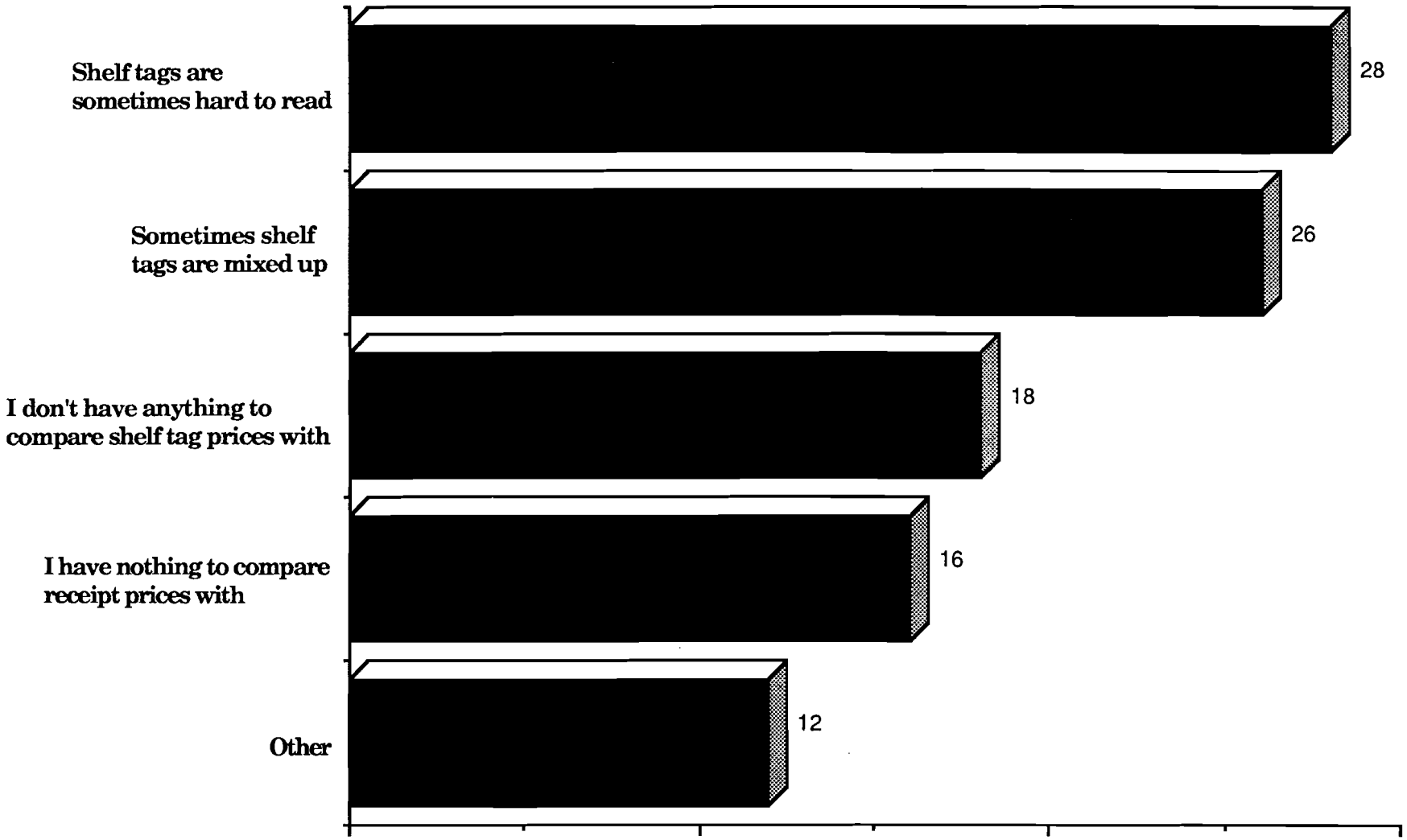


TABLE 16
Percent Comparison Between Price Sensitivity and Consumer Concern Over Price Removal (n=797)

PROMPTED RESPONSE	PRICE SENSITIVITY		
	Prices are Not Important	Prices are Somewhat Important	Prices are Very Important
The removal of individual item price tags WOULD be of concern	60.3	63.3	70.8
The removal of individual item price tags WOULD NOT be of concern	39.7	36.8	29.2
TOTAL	100.0	100.0	100.0

From these results, it can be concluded that shoppers who are very price conscience, also felt that removing individual price tags would present a problem for them while they were shopping.

It could be speculated that one reason price sensitive shoppers are more concerned with price removal is that they feel they have no way to compare prices of similar items while shopping. While it is true that they may not have item price tags to compare with, (in a non-item pricing store) they actually have a far more powerful and useful tool in the unit pricing information provided on the shelf tag. Perhaps shoppers need to become better educated on "reading" and understanding the unit price information on shelf tags.

ACTIONS A STORE COULD TAKE TO MINIMIZE CONCERN OVER PRICE REMOVAL

If a shopper of either a pricing or non-pricing store indicated yes to any of the questions which specifically regarded the possible or existing policy of price removal, they were asked:

> "Besides pricing individual items, which of these best describes the actions this store could take to overcome the concerns you just mentioned?"

A card was held up with the following possibilities:

A. Make shelf tags easier to read
B. Receive an item free if charged the wrong price
C. Reduce my food bill by $50-$100 per year by not pricing items
D. Make sure shelf tags are in the correct place
E. Other

Seventy percent of the shoppers asked this question were concerned about shelf tags. They either wanted the store to make them easier to read or make sure they are kept in the correct place (Figure 4).

FORMS OF PRODUCT PRICING MOST USEFUL TO CONSUMERS

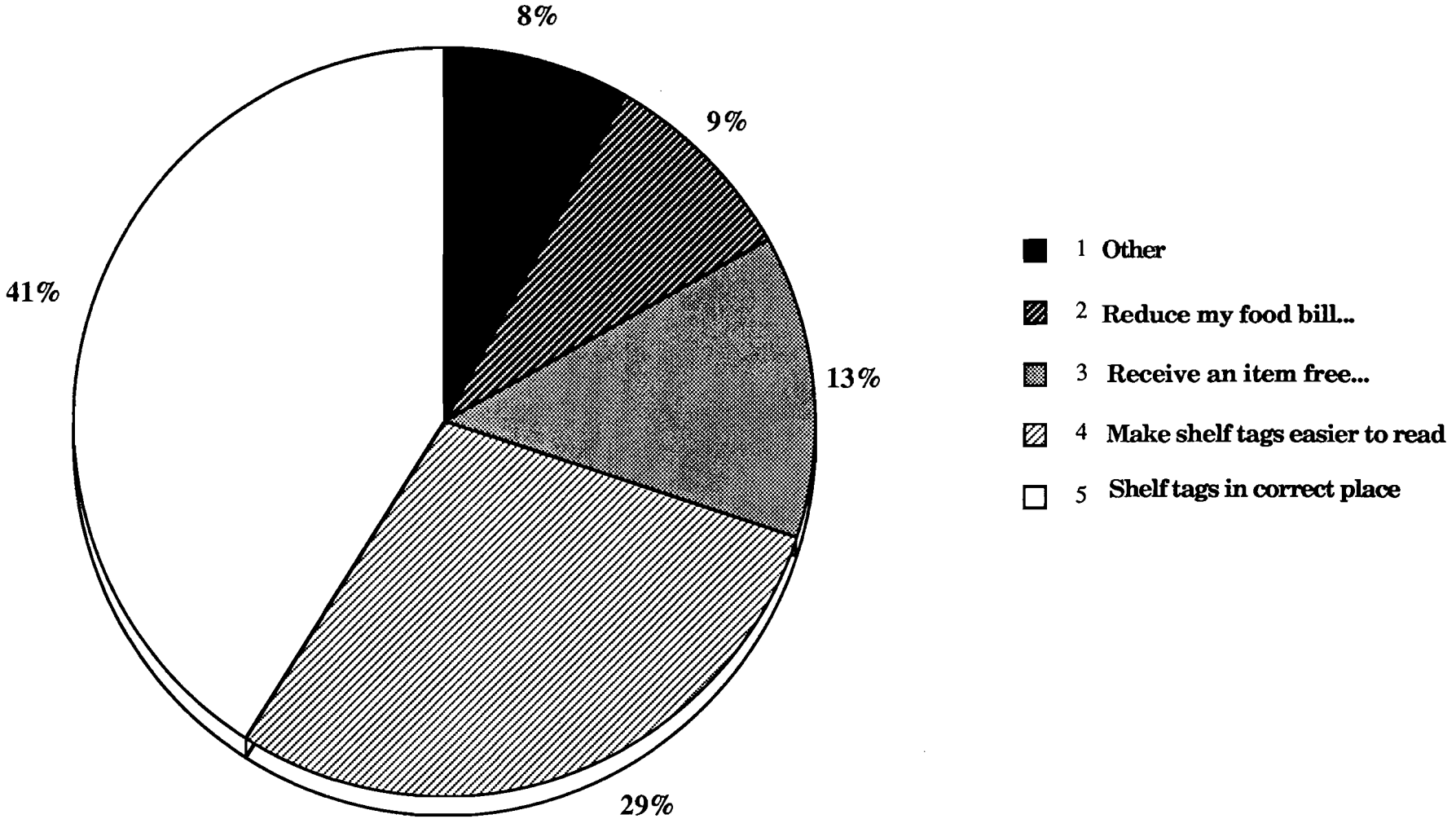
During the interview, shoppers were asked what form of pricing is most useful to them. That is, did they rely on 1) shelf tags, 2) individual price tags, 3) special in-store signs, 4) in-store flyers, or 5) they had no preferred form of product pricing.

Almost two-thirds (64.5 percent) of the shoppers surveyed indicated that they found individual price tags to be the most useful form of pricing products. Almost 20 percent of the respondents indicated that they feel shelf tags are the most useful form of pricing (Table 17).

TABLE 17
Comparison Between the Most Useful Forms of Product Pricing Mentioned by Consumers

FORM OF PRICING	PERCENT RESPONSE
Individual price tag	64.5%
Shelf tag	19.2%
Special store sign	.6%
In-store flyer	2.4%
Other	4.7%
No preference	8.5%

Figure 4. Actions supermarkets could take to overcome shoppers concerns regarding price removal (percent)



RELATIONSHIP BETWEEN FORM OF PRICING AND ITEM PRICING SENSITIVITY

A comparison was made between the form of price shoppers found most useful and how sensitive they were regarding price removal. Results indicate that consumers who found individual price tags to be the most useful form of product pricing were also the most concerned about price removal.

Shoppers who expressed no concern regarding the presence or absence of individual price tags tended to be those who stated that the form of pricing did not matter or found shelf tags most useful (Table 18).

The forms of pricing found most useful by shoppers in stores which item price did not significantly differ from those indicated by shoppers in supermarkets which do not item price. However, a higher percentage of shoppers in supermarkets which do not price individual items stated the form of pricing does not matter. This may be because shoppers have adjusted to a non-pricing format and no longer regard individual item prices as important. Results indicate shoppers over 55 years old found individual prices most useful.

TABLE 18
Percent Comparison Between Item Pricing Sensitivity and Form of Pricing

FORM OF PRICING PREFERRED BY CONSUMERS	ITEM PRICING SENSITIVITY	
	Price Removal WOULD be a Problem	Price Removal WOULD NOT be a Problem
Shelf tags	40.8	59.2
Individual price tags	82.4	17.6
No preferred form of price	25.0	75.0

Analysis shows that shoppers of stores which do not mark individual items with price tags have learned to use shelf tags for identification of individual item prices. However, it should be noted that senior citizens still rely heavily on item prices and if individual prices are removed, special care should be taken to design shelf tags that are easily read and understandable for senior citizens.

PART II
General Conclusions

The issue of item pricing does not seem to be a major concern to supermarket shoppers when asked general questions about what they like and dislike about the particular supermarket(s) where they shop. When shoppers think about their likes and dislikes regarding supermarket shopping, item pricing is rarely mentioned, with only 2 percent of shoppers mentioning item pricing voluntarily. When shoppers were asked to rank store characteristics that are important to them, item pricing was ranked fourth out of five in importance.

Sixty four percent of shoppers who were surveyed in pricing stores felt that the absence of price tags on exempt items[15] had never been a problem for them while they shopped. Thirty six percent said that this had been a problem for them. Over half of those shoppers who were concerned about this mentioned hard to read or mixed up shelf tags as the reason they were concerned.

When prompted with a question asking if items were not individually priced would it cause them any particular problems while shopping, 68 percent of the respondents said yes. However, shoppers from stores with price removal were less concerned with the item pricing issue than shoppers in pricing stores.

Of those shoppers who indicated price-removal would be a problem, mixed up and hard to read shelf tags surfaced as a major concern. It is important to note that consumers who shop in stores which currently practice partial or total price removal were less concerned with the item pricing issue than were consumers who typically shop in stores which item price. Part of this adjustment has occurred because shoppers are using shelf tags more frequently for price identification in stores which do not price individual items. Therefore, it can be concluded that shoppers have adjusted their shopping habits to a non-item pricing situation.

When shoppers were asked what a store could do beside pricing individual items to overcome their concerns, 70 percent indicated that shelf tags should be improved.

Neither income, gender or age had any direct relationship to how the respondents felt about item pricing.

Those shoppers who felt that prices were very important were also the most concerned with price removal. Likewise, those people who indicated they rely mostly on individual price tags for price identification were also very concerned about potential or existing price removal.

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[15]Exempt items are exempt from individual pricing by the item pricing law in New York State either by virtue of the general 4 1/2 % exclusion, by their package size or by a specific product exemption.

PART III
THE COST OF ITEM PRICING TO SUPERMARKETS

PURPOSE AND METHODOLOGY

The typical supermarket stocks over 15,000 individual items.[16] The placing of individual price tags represents a substantial cost to the supermarket - a cost that is passed directly to the consumer. The purpose of this section was to determine the magnitude of this cost, by measuring several inputs related to pricing individual items.

To determine the cost of item pricing to supermarkets, information was gathered from four supermarket chains specifically for the grocery, dairy and frozen foods departments (Table 19).[17] Other store departments were not included because of varying pricing policies and item pricing exemptions practiced within those departments.

TABLE 19
Average Weekly Figures Used to Determine the Cost of Item Pricing

Grocery Department: stocked per week		9,950 cases
Dairy/Frozen Department: stocked per week		4,224 cases
Average cost per case: Grocery		$19.67
Dairy & Frozen	$17.50	
Percent of total weekly store sales attributable to grocery, dairy and frozen food sales[18]		40.1%
Average hourly wage rate (including benefits)[19]		$10.49
Average number of cases which can be priced and stocked on shelves per hour - pricing store		43
Average number of cases which can be stocked on shelves per hour - non-pricing store		51
Average number of price changes per week in the grocery, frozen, and dairy departments excluding sale items		675
Average time needed for price changes		3.5 minutes per item
Average cost of a price gun		$33.11
Average number of price guns necessary in a pricing store		35
Average number of price guns necessary in a non-pricing store		6
Average cost of price labels		$5.10 per 10,000

[16]Progressive Grocer 58th Annual Report, April 1991, p. 48. The average chain supermarket in the North Atlantic states stocks 15,861 items.

[17]Average figures were not included for the number of cases which can be re-priced and re-stocked per hour before and/or after a sale because the participating stores had different pricing policies regarding pricing specials and sale items. The cost of shelf tags was also not included in the calculations because they were assumed to be the same in pricing and non-pricing stores.

[18]1990 Supermarket Business, Consumer Expenditures Study.

[19]This average hourly wage rate represents the average wage rate including benefits for a person who would typically be doing the job of stocking shelves and pricing items.

RESULTS

Average Weekly Volume and Cost of Grocery, Dairy and Frozen Foods

The grocery department would have weekly sales volume of $195,717 and the dairy/frozen food departments would have combined weekly sales volume of $73,920.

Initial Shelf Stocking

Pricing Situation and Non-Pricing Situation

For one store, stocking 14,174 cases of grocery, frozen and dairy products per week, at a rate of 43 cases per hour, requires 330 hours per week to complete. Annualized, this amounts to $180,008 per store.

Stores which do not price individual items simply have to place them directly on the shelf from the case when initially stocking the product. This results in a significant time savings since an individual price tag does not have to be put on every item. Stocking the same number of cases (14,174) at the increased rate of 51 cases per hour, requires 278 hours per week. Annualized this amounts to $151,643 per store.

Price Changes

Pricing Situation and Non-Pricing Situation

During a one week period, on average there are 675 price changes in the grocery, frozen and dairy departments. Each price change takes 3.5 minutes to complete. Annualized this totals $21,478.

A store that does not price individual items is able to make price changes much faster than a pricing store (.5 minutes per change compared to 3.5 minutes per change in a pricing store). Based on the same 675 price changes this represents an annual cost to a non-pricing supermarket of $3,068.

Cost of Price Labels and Price Guns

Assuming an average of 18 labels per case and 14,174 cases priced per week, the annual cost of labels for just initial shelf stocking is $6,766 per store for stores which price individual items.

The average item pricing store requires 35 price guns at an average cost of $33.11 per gun for a total annual cost of $1,159. A non-pricing store requires 6 price guns for a total cost of $199.

SUMMARY OF COSTS ASSOCIATED WITH ITEM PRICING

The average annual cost to one store for pricing the grocery, dairy and frozen food departments is $209,411. A non-pricing store could expect an annual cost of $154,910. Therefore, pricing individual items in the grocery, dairy and frozen food department represents an additional cost of $54,501 per year (Table 20). This is a conservative estimate since it is for only three departments, it does not include the costs associated with changing prices when items go on or off sale, nor does it include the personal costs associated with hiring, training, etc. the extra personnel needed in a pricing store.

TABLE 20
Annualized Costs Associated With Pricing Individual Items in the Grocery, Dairy and Frozen Food Departments of a Typical New York State Supermarket

	PRICING	NON-PRICING
Initial shelf stocking	$180,008	$151,643
Price changes	21,478	3,068
Cost of labels	6,766	0
Cost of price guns	1,159	199
TOTAL COST PER STORE	$209,411	$154,910
ADDITIONAL COST TO PRICING STORES	$54,501 per year	

Although the grocery, dairy and frozen food departments are three major departments in a grocery store, most grocery stores may have a dozen or more departments and may item price the majority of items in all departments. Depending on the item pricing policy of various chains, the cost of item pricing could be considerably higher if they are item pricing in the majority of other departments.

EXTENDING THE COST OF ITEM PRICING TO THE ENTIRE STORE

Beyond the three departments discussed above, extending the cost of item pricing to the entire store is very difficult. This is because by law, statutory exemptions are permissible on:

- specific items (such as eggs and milk)
- certain packaging sizes and formats (multi-item package)
  -- bulk or fresh produce
- items sold in vending machines
- food sold for consumption on the premises
- sale items
- snack foods
- cigarettes, cigars, tobacco and tobacco products

In addition, food retailers are permitted to refrain from placing item prices on up to 4.5 percent of the non-exempt commodities offered for sale. As a result of these exemptions (particularly the 4 1/2 percent exemption) it is difficult to determine the level of exemptions for an individual store because of differing store policies on how they exercise the 4 1/2 percent exemption.

However, one way to extend this to an entire store is to remove all statutory exemptions on fixed weight prepackaged products included in the Item Pricing Law. Based on the figures gathered for this study, a store with average weekly sales of $672,411 would incur an additional annual cost of $134,482 which would be directly attributed to item pricing assuming no statutory exemptions (Table 21).

TABLE 21
Calculation to Determine the Cost of Item Pricing if There are No Statutory Exemptions

Cases stocked per week		x	Average retail cost/case		
Grocery:	9950	x	$ 19.67	=	$195,717
Dairy/Frozen:	4224	x	$ 17.50	=	$ 73,920
		Weekly sales volume of grocery, dairy/frozen food departments			**$269,637**

If grocery, dairy/frozen foods represent 40.1% of total store sales than ($269,637 / 40.1%) **$672,411** represents total weekly store sales for a store with $269,637 sales in the grocery, dairy/frozen departments.

If $54,501 is the cost to item price the three departments, and they have weekly sales of $269,637, this represents **.20** ($54,501 / $269,637) of sales. Therefore, **.20** of total store sales of $672,411 equals a cost of **$134,482 per year** or **$2,586 per week** for one store to item price.

PART III
General Conclusions

Pricing individual items represents a significant expense to supermarkets and to consumers who eventually pay for this service. Pricing may also put supermarkets that price at a competitive disadvantage over those that do not price individual items.

CONCLUSIONS

For several years the item pricing issue in New York State has been clouded by many misconceptions. Most have focused on the level of accuracy in supermarket pricing systems and consumer perceptions centered around the importance of having individually priced items on supermarket shelves. This three phase study is an attempt to clarify this emotional and important issue. Specifically, this study focused on three related concerns:

1) The accuracy of supermarket pricing systems.
2) Consumer perception of the importance of item pricing.
3) The related costs to supermarkets associated with item pricing.

Study results indicate that supermarkets which utilize scanning technology along with partial or total price removal had the most accurate pricing systems of the three pricing formats that were reviewed. Supermarkets which still utilize manual cash registers and price all items had the greatest number of pricing errors. Scanning supermarkets which item price ranked second in the number of pricing errors which were detected by the researchers.

The issue of item pricing was not seen as a major concern to supermarket shoppers when asked general questions about what they like and dislike about the particular supermarket(s) where they shop. Out of over 1000 supermarket shoppers, 98 percent of the consumers surveyed showed no concern about item pricing when asked general questions regarding what they like and dislike about the store where they were shopping. Only 2 percent mentioned not having individual items marked with a price tag as something that they didn't like about the store where they were shopping.

When 250 supermarket shoppers were asked to identify two store characteristics which were the most important to them out of a list of five possibilities they chose cleanliness as most important followed by low prices. Accurate pleasant checkout clerks was third, price tag on every item fourth and freshness date marked on products was the least important.

Sixty four percent of shoppers who were surveyed in pricing stores felt that the absence of price tags on exempt items[20] had never been a problem for them while they shopped. Thirty six percent said that this had been a problem for them. Over half of those shoppers who were concerned about this mentioned hard to read or mixed up shelf tags as the reason they were concerned.

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[20]Exempt items are exempt from individual pricing by the item pricing law in New York State either by virtue of the general 4 1/2 percent exclusion, by their package size or by a specific product exemption.

However, when specifically asked, two-thirds of the shoppers interviewed felt that the absence of individual price tags on all items in the store would make it difficult for them while shopping. Shoppers of scanning stores with partial or total price removal, were much less concerned with the item pricing issue.

Shoppers in non-pricing stores were less dependent on item pricing for product price information and relied more on shelf tags than shoppers from other types of stores. It seems as though these shoppers appear to have adjusted to a price removal format. Furthermore, it appears that price removal alone is not an important factor in why a consumer chooses to shop (or not to shop) at a particular store.

The annual costs associated with item pricing are substantial. Based on conservative averages from four major supermarket chains, for eleven variables associated with pricing items, it is estimated that a scanning supermarket which prices individual items has an additional cost of $54,501 per year for the grocery, dairy and frozen food departments. In an industry which typically operates on a very small profit margin, stores which do not item price may have a competitive advantage over supermarkets which price each item.

Study results indicate that shoppers adjust to non-pricing situations by learning to use the information provided on shelf tags. However, when shelf tags are not available or are difficult to read, it presents a significant problem for consumers. Inadequate shelf tags was also a problem frequently encountered by the researchers in this study.

Pricing individual items is a practice which is surrounded by many perceptions which have placed an inordinate amount of importance on a practice which is characterized by high costs, high rates of human error, and variable consumer sentiment. If a common goal of all involved is to provide the consumer with accurate price information, and a visible and understandable means of product pricing information, perhaps the focus of public interest groups, state government, and the food industry should be on the development of a comprehensive educational program focused on improving shelf tags in food stores.

Retailers and consumers need further education about shelf tags. Retailers should concentrate their efforts on: 1) the development of clearly understandable and readable tags, 2) maintenance of current shelf tags, 3) accurate placement of shelf tags, and 4) the development of an educational program for consumers focused on "how to read" shelf tags. Consumers should learn how to use shelf tags not only for specific product price information but also for use in comparison shopping by using unit pricing information contained on the tag.

APPENDIX I
INITIAL SURVEY

Store: _____ Date: _____

Begin: _____ End: _____

Scan: Yes No

IN STORE CUSTOMER SURVEY

1. How many times a month do you shop at this store? _____ times per month

2. What do you enjoy about shopping in this store?

3. What don't you like about shopping in this store?

4. What could this store do to improve your shopping experience?

5. Do you shop at other supermarkets?

_____Yes What stores? _____ (go to 6)

_____No (go to 9)

6. Do you think this store is better, worse, or equal to the other stores where you shop?

better worse equal

7. What do you like MOST about this store compared with the other stores that you shop?

8. What do you like LEAST about this store compared with the other stores that you shop?

9. When deciding where to shop, how important is it that the store has low prices?

_____ Very important

_____ Somewhat important

_____ Not important

10. Which store, in the area, do you think has the lowest prices?

_____ named store that is currently being surveyed

_____ named store other than one currently being surveyed

_____ not sure

IF ITEM PRICING WAS MENTIONED ABOVE GO TO 12, OTHERWISE GO TO 11a or 11b

11a. **(For scanning store, not pricing)** Most of the items in this store are not marked with an individual price tag. Does this present any particular problems for you?

_____ Yes **(show card and ask:** Which of these describe the problems you're concerned with? ___ **A** ___ **B** ___ **C** ___ **D** ___ **E** ___ **F**

(go to 13)

_____ No (go to 13)

11b. **(For all other stores)** Most, but not all, of the products in this store have a price tag stuck to each item. There are supermarkets that don't put individual price tags on ANY of their products. If THIS store didn't put individual price tags on any of their products, would it present any particular problems for you?

_____ Yes **(show card and ask:** Which of these describe the problems you're concerned with? ___ **A** ___ **B** ___ **C** ___ **D** ___ **E** ___ **F**

(go to 13)

_____ No (go to 13)

12.**(If existence of item pricing earlier mentioned as a positive attribute)**

_____ **a.** You earlier mentioned item pricing as a positive store attribute. Why do you like item pricing?

b. How do you use the item pricing?

(If lack of item pricing earlier mentioned as a negative attribute)

_____ You earlier mentioned a lack of item pricing as a negative store attribute. **show card and ask:** Which of these describe the problems you're concerned with? ___ **A** ___ **B** ___ **C** ___ **D** ___ **E** ___ **F**

(go to 13)

13. While you're shopping, which form of pricing is most useful to you?

_____ shelf tag
_____ individual item pricing
_____ special store sign (such as front window signs)
_____ in-store flyers
_____ doesn't matter

***** GO TO DEMOGRAPHICS *****

This survey is confidential.

Please check the spaces that correctly describe you and your household:

✍ Your age:

_____ under 18

_____ 18 to 34

_____ 35 to 54

_____ 55 years and over

✍ Sex: ___ Female

___ Male

✍ How many people (INCLUDING YOURSELF) in your household are in the following age groups?:

Note: *"household" refers to the group of people for whom you are shopping*

_____ Under 6 years old

_____ 6 - 12 years

_____ 13 - 17 years

_____ 18 - 34 years

_____ 35 to 54 years

_____ 55 years and over

✍ Number of people employed in your household: ____ people

✍ Annual total household income:

_____ under $15,000

_____ $15,000 - $24,999

_____ $25,000 - $34,999

_____ $35,000 - $44,999

_____ $45,000 - $54,999

_____ $55,000 - $64,999

_____ $65,000 - $74,999

_____ $75,000 - $84,999

_____ $85,000 - $94,999

_____ $95,000 - $104,999

_____ more than $105,000

Thank you - **This survey is confidential**

APPENDIX II
FOLLOW-UP SURVEY

Store:_____
Date: _____
Scan: Y N

IN STORE CUSTOMER SURVEY

Consumers will be intercepted in the produce section of the supermarket.

Hi, I'm a Cornell University researcher doing a study on supermarket shopping. Do you have a couple of minutes to answer a few questions?

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1. What do you enjoy about shopping in this store?

2. What don't you like about shopping in this store?

3. What can this store do to improve your shopping experience?

4. When deciding where to shop, how important is it that the store has low prices?

____ Very Important
____ Somewhat Important
____ Not important

5. I'm going to list 5 store characteristics. Please tell me which are the two most important to you.

___ Accurate, pleasant checkout clerks
___ Cleanliness
___ Price tags on every item
___ Freshness date marked on products
___ Low Prices

6a (**for pricing stores**) In this store, there are some items that don't have a price tag stuck to them like ( ). Does this present any particular problems for you?

____ Yes **show card and ask**: Which of these describes the problems you are concerned with?

___ A ___ B ___C
___ D ___ E _____

(go to6b)

____ No (go to 6b)

6b. **(for pricing stores)** There are some stores that don't put price tags on any of their items. If this store did not put price tags on any of it's items, would this present any particular problems for you ?

____ Yes **show card and ask**: Which of these describes the problems you are concerned with?

___ A ___ B ___C
___ D ___ E _____

(go to7)

____ No (go to 7)

6c. **(for non-pricing stores)** Most of the items in this store are not marked with an individual price tag. Does this present any particular problems for you?
____ Yes **show card and ask**: Which of these describes the problems you are concerned with?

___ A ___ B ___C
___ D ___ E other _____

(go to 7)

____ No (go to 7)

6d. **(if lack of item pricing earlier mentioned as a negative attribute)**
You earlier mentioned that a lack of item pricing was a negative store attribute.
show card and ask: Which of these describes the problems you are concerned with?

___ A ___ B ___C
___ D ___ E other_____

(go to 7

6e **(if lack of item pricing earlier mentioned as a positive attribute)**
You earlier mentioned item pricing as a positive store attribute. Why do you like not having prices on every item? (go to 7)

7. Besides pricing individual items,which of these best describes the actions this store could take to overcome the concerns you just mentioned **?**

___ A ___ B ___C
___ D ___ other_____

GO TO DEMOGRAPHICS

This survey is confidential.

Please check the spaces that correctly describe you and your household:

✍ Your age:

_____ under 18

_____ 18 to 34

_____ 35 to 54

_____ 55 years and over

✍ Sex: ____ Female

____ Male

✍ How many people (INCLUDING YOURSELF) are in your household?
Note: *"household" refers to the group of people for whom you are shopping*

____ people

✍ Number of people *employed* in your household: ____ people

✍ Annual total household income:

_____ under $15,000

_____ $15,000 - $24,999

_____ $25,000 - $34,999

_____ $35,000 - $44,999

_____ $45,000 - $54,999

_____ $55,000 - $64,999

_____ $65,000 - $74,999

_____ $75,000 - $84,999

_____ $85,000 - $94,999

_____ $95,000 - $104,999

_____ more than $105,000

Thank you - **This survey is confidential**

A. Shelf tags are sometimes hard to read

B. I have nothing to compare receipt prices with

C. Sometimes shelf tags are mixed up

D. I don't have anything to compare shelf-tag prices with

E. Other

A. Make shelf tags easier to read

B. Receive an item free if charged the wrong price

C. Reduce my food bill by $50-100 per year by not pricing items

D. Make sure shelf tags are in the correct place

Other Agricultural Economics Extension Publications

No. 91-20	National and State Trends in Milk Production, 1991	Andrew Novakovic Kevin Jack Maura Keniston
No. 91-21	New York Milk Production from 1979 to 1989: A County and Regional Analysis	Kevin E. Jack Andrew M. Novakovic
No. 91-22	Fruit Farm Business Summary Lake Ontario Region New York 1990	Darwin P. Snyder Alison M. DeMarree
No. 91-23	Time-of-Use Pricing for Electric Power: Implications for New York Dairy Farmers	Mark C. Middagh Nelson L. Bills Richard N. Boisvert
No. 91-24	Custom Raising Dairy Replacements: Practices and Costs, 1990	Jason A. Karszes B. F. Stanton
No. 91-25	The Year 2000: A Food Industry Forecast	David M. Russo Edward W. McLaughlin
No. 91-26	List of Available Agricultural Economics Publications July 1, 1990 - June 30, 1991	Dolores Walker
No. 91-27	Pro-Dairy Financial Data Collection Workbook	Jonas B. Kaufman Stuart F. Smith Linda D. Putnam
No. 91-28	Income Tax Myths, Truths, and Examples Concerning Farm Property Dispositions	Stuart F. Smith
No. 91-29	Farm Income Tax Management and Reporting Reference Manual	George L. Casler Stuart F. Smith
No. 91-30	Considerations in Establishing Retirement Plans for Farm Employees	George Casler Tom Maloney