Advancing Knowledge About
Processing, Distribution,
Sales, and Food Service

Working Paper 98-03
The Retail Food Industry Center
University of Minnesota
Printed Copy $22.50

CONVENIENCE STORE PRACTICES AND PROGRESS WITH EFFICIENT CONSUMER RESPONSE: THE MINNESOTA CASE

Sara M. Ashman and Robert P. King

Department of Applied Economics
University of Minnesota
St. Paul, MN 55108
ashm0001@tc.umn.edu

September 1998

Sara Ashman is a Ph.D. graduate student in the Department of Applied Economics. Robert P. King is the E. Fred Koller Professor of Agriculture Management Information Systems. This paper derives from Ms. Ashman's Master's research which was supported by The Retail Food Industry Center, 317 Classroom Office Building, 1994 Buford Avenue, St. Paul, Minnesota 55108-6040, USA. The Retail Food Industry Center is an Alfred P. Sloan Foundation Industry Study Center.

CONVENIENCE STORE PRACTICES AND PROGRESS WITH EFFICIENT CONSUMER RESPONSE: THE MINNESOTA CASE

Sara M. Ashman and Robert P. King

ABSTRACT

The adoption of Efficient Consumer Response (ECR) practices by Minnesota convenience store (C-store) is explained in this study. Data were collected through a mail survey distributed to more than 250 Minnesota C-stores ranging in size from single, independently owned stores to over 100 store chains. The survey instrument was developed to collect data on the following components important to C-store operations and the implementation of ECR: information systems, ordering, receiving, inventory management, and pricing practices. Findings are presented from three distinct perspectives:

1. Location: Rural C-stores, which often meet customer needs that were once met by small supermarkets, carried a wider range of products and offered more services than C-stores in urban and suburban locations. However, rural stores had the lowest adoption rate for practices related to the ECR initiative. Urban chains coordinated business practices with suppliers to a greater degree than suburban and rural chains.

2. Chain size: Larger chains were more likely to have implemented the more costly technological practices than were small chains. This was expected since large chains can spread the fixed costs of ECR adoption over a larger number of stores. Larger chains also cooperated and communicated more with their suppliers than small chains. Again, this was expected, since larger chains can economize on transaction costs involved in maintaining these business relationships.

3. ECR practices: ECR adoption and superior performance were positively related. Having adopted six to nine practices was positively correlated with higher inside and outside sales per square foot of selling area and higher annual inventory turns. However, it was not clear whether there was a casual relationship in either direction between ECR practices and store performance.

The C-store industry is changing, as new information technologies, new business practices, and new retail strategies are developed. The results from this survey can serve as a baseline for future research monitoring the adoption of these innovations and assessing their impact on productivity and profitability. Minnesota C-Stores appear to be smaller but more productive than the national average. Overall, it appears ECR is just beginning to impact the Minnesota C-store industry. Nonetheless, regression analyses confirmed ECR practices are positively related to store sales performance and those stores adopting the most practices had higher productivity measures.

Working Paper 98-03
The Retail Food Industry Center
University of Minnesota

CONVENIENCE STORE PRACTICES AND PROGRESS WITH EFFICIENT CONSUMER RESPONSE: THE MINNESOTA CASE

Sara M. Ashman and Robert P. King

For information of other titles in this series, write The Retail Food Industry Center, University of Minnesota, Department of Applied Economics, 1994 Burford Avenue, 317 Classroom Office Building, St. Paul, MN 55108-6040, USA, phone Mavis Sievert (612) 625-7019, or E-mail **msievert@dept.agecon.umn.edu.** Also, for more information about the Center and for full text working papers, check out World Wide Web site **[http://trfic.umn.edu].**

TABLE OF CONTENTS

CONVENIENCE STORE PRACTICES AND PROGRESS WITH EFFICIENT CONSUMER RESPONSE: THE MINNESOTA CASE

Introduction

The retail food industry has been undergoing major changes as a result of the Efficient Consumer Response (ECR) initiative launched by the supermarket industry in 1993. What is ECR? According to Kurt Salmon Associates, Inc. (KSA), "ECR is a grocery industry strategy in which distributors, suppliers and brokers jointly commit to work closely together to bring greater value to the grocery consumer" (KSA, 1993, p. 13). ECR helps retail food businesses evaluate each aspect of their supply-side activities in order to determine methods by which the system can become more efficient for all participating players. Four strategies--efficient product assortment, continuous replenishment, promotion and product introduction--have been identified to facilitate the implementation of ECR. Essentially, the goal of ECR is to drive excess distribution costs out of the system and then provide the consumer with the right products, at the right time, at the lowest cost.

Most of the changes associated with the ECR initiative have occurred within the supermarket arena and further upstream in the retail food supply chain. Although convenience stores (C-stores) are part of the retail food industry, in general they have been slow to respond to the ECR initiative. According *Convenience Store News*, C-stores have been practicing category management--an element of ECR that facilitates efficient product assortment--with varying degrees for several years, but the industry has been slow to adopt other ECR principles (Azzato). Recently, the nation's largest C-store operator, Southland Corp (owner of 7-Eleven), started testing a new distribution system that will deliver a wider selection of fresh products each day. According to the Food Institute, this distribution system incorporates many key elements of ECR, even though the company has not labeled the effort

as such ("Re-Engineering the Grocery System: The Challenge (and Controversy) of Efficient Consumer Response", p. 291). Furthermore, recent industry initiatives, especially in the area of category management, are aimed at facilitating the introduction of more efficient and effective business practices in the C-store industry.

Are there differences between C-stores and supermarkets that might explain why C-stores have been slower than supermarkets to adopt ECR? Parts of the grocery industry appear to be different in their primary business emphasis, product assortment, customer base, and employees' skill level. A C-store has been defined as "a retail business with a primary emphasis placed on providing the public a convenient location to quickly purchase from a wide array of consumable products and services" ("NACS Expands C-store Definition, Releases Census," p. 8). The definition implies three major differences between C-stores and supermarkets. First, "convenient location" implies C-stores are located in areas where consumers regularly travel. Second, "quickly purchase" implies the stores are small enough to allow shoppers to get in and out of the store in a minimal amount of time. Finally, "wide array of consumable products" implies you will find a little of everything, but not in all the sizes or varieties you would find in a supermarket. Because C-stores' limited square footage constrains shelf space, they obviously cannot carry the product assortment found in a supermarket.

Another major difference is that C-stores deal with a very different typical shopper than supermarkets. The typical C-store customer is a white male in his twenties to thirties. The products most often sold in C-stores are cigarettes and gasoline, not food. C-stores tend to price food items higher than supermarkets and food sales in the average C-store are only one-tenth of average supermarket sales. A C-store's smaller scale might make technology, such as scanners at the checkout counter, more costly to implement and the benefits not as readily visible. Another

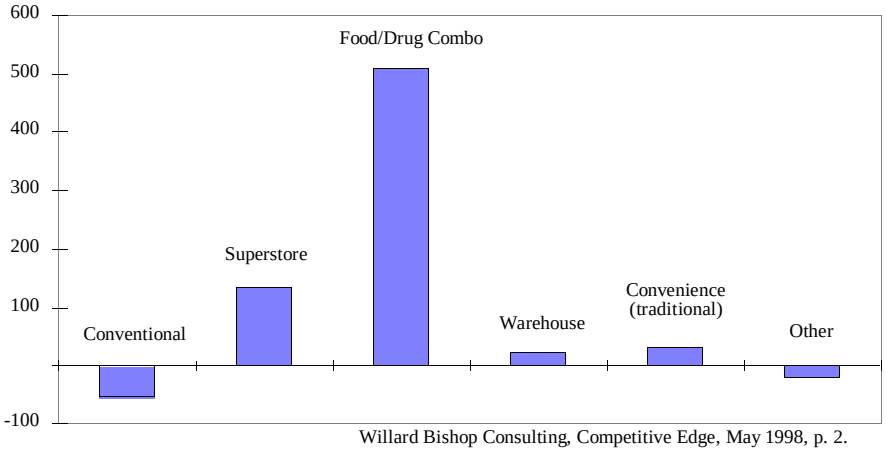
difference is that C-stores tend to employ lower skill labor and experience higher employee turnover rates than supermarkets. Both of these factors affect the level and sophistication of technology adopted and the quality of customer service delivered. Finally, C-stores tend to lack product freshness and quality, when compared to supermarkets.

Despite these differences, C-stores play a prominent role in the United States retail food industry. As of early 1998, there were 95,700 C-stores[1] in the United States (1998 Industry Report, 1998a). This compares with some 29,870 supermarkets currently in operation (1998 Marketing Guidebook). According to the 1998 Industry Report (1998a), the C-store industry had $72.4 billion worth of in-store (food) sales in 1997, an increase of 2.4 percent over 1996. These food sales accounted for almost fifty percent of total C-store industry sales. Average per-store sales increased to $757,000 in 1997 and the C-store industry continued to outpace the growth of supermarket and restaurant retail sales (1998 Industry Report, 1998a).

Figure 1 illustrates the increasing role C-stores are playing in the retail food industry. C-stores are outpacing the growth of conventional supermarkets. From 1980 to 1997, traditional C-stores grew in number by 28 percent. During the same period, conventional supermarkets declined by 52 percent, while food/drug combination stores experienced a tremendous growth rate of 510 percent.

[1.] This number represents both petroleum-based and conventional C-stores.

Figure 1: Percent Change in Number of Retail (Grocery) Stores, 1980-1997



Willard Bishop Consulting, Competitive Edge, May 1998, p. 2.

C-stores' efficient store layout and convenient location should help the industry capitalize on a growing segment of consumers. As people's lives become increasingly busy, C-stores are well positioned to serve the increasing number of time-constrained individuals. At the same time, C-stores are facing new sources of competition. Drug stores and discount variety stores are now offering many of the same products as C-stores, often times at lower prices. The growing number of food/drug combo retail food stores is a further source of competition. As noted in figure 1, the growth rate of the food/drug combo stores is remarkable. According to Lidsay Hunter, Vice President for Industry Relations and Communications for the National Association of Convenience Stores (NACS), the attributes that formally defined C-stores are no longer unique (Bohen). To stay competitive, C-stores need to find new ways to remain a unique retail source for consumers. For example, by focusing on home meal replacement entrees or ready-to-eat meals, C-stores could differentiate themselves from their new sources of competition.

Given the significant and growing role C-stores play in the retail food industry, it seems plausible that ECR can benefit the C-store industry as it has the supermarket industry. Each of the

four strategies of ECR--efficient store assortment, efficient replenishment, efficient promotion, and efficient product introduction--is important to a C-store's performance. For example, C-stores are concerned with providing the right assortment of products in their limited shelf space. Re-stocking high volume items efficiently and stream-lining the ordering process can help increase sales and lower costs. Cost-effective promotion of goods and efficient introduction of new products can also benefit C-stores. Furthermore, for C-stores to stay competitive within the retail food industry, they should understand how key competitors, primarily supermarket operators, are changing their business practices and strategies.

This study was designed to explore how the fairly new ECR initiative was impacting the C-store segment of the retail food industry. It adds to the knowledge about the C-store industry and the ECR initiative by:

1) describing the store operations and business practices of Minnesota C-stores.

2) examining the relationships between productivity and C-store characteristics.

3) determining to what extent ECR practices are being used in Minnesota C-stores and exploring how these ECR practices are related to store productivity.

To accomplish the first two objectives, a mail survey was designed and administered to C-store chains within Minnesota. The results of the survey describe typical business practices and store operating procedures and are the basis for an analysis of the relationships between store productivity and store characteristics. To accomplish the third objective, stores using ECR practices were identified and adoption rates for these practices were determined. Relationships between adoption rates and store productivity measures were then analyzed.

The plan for the study is as follows. The next section reviews the ECR initiative in theory and practice and explains how it relates to the C-store industry. Section 3 outlines the methodology behind the development and analysis of the mail survey. In section 4 the results of the survey are presented and the ECR practices currently in use are examined to learn whether these practices are benefitting Minnesota's C-store industry. The final section summarizes the findings and conclusions.

The Efficient Consumer Response Initiative

In mid 1992, key players in the grocery industry created a joint task force to examine the supermarket supply chain and determine ways to make it more competitive. In January 1993, KSA published the findings of the ECR working group in a publication titled, *Efficient Consumer Response, Enhancing Consumer Value in the Grocery Industry*.

These findings highlight the goal of ECR: turn the grocery supply chain into a consumer driven supply chain that incurs minimal costs. Consumer satisfaction would be maximized by having products "pulled" through the system by consumers wants and needs, rather than "pushed" through by the manufacturers offering price cuts to retailers. Costs will be minimized by distributors and suppliers jointly focusing on the efficiency of the total supply system, rather than the efficiency of individual components. The end result will be "greater consumer value created by better products, better assortment, better in-store service, better convenience and better prices delivered through a leaner, faster, more responsive and less costly supply chain" (KSA, 1993, p. 13).

The ECR initiative is based on four strategies: efficient product assortment, efficient continuous replenishment, efficient promotion, and efficient product introduction. Efficient product assortment links suppliers with consumers. It focuses on using store and shelf space to increase sales

per square foot and decrease cost per unit, without losing sight of which products consumers prefer. Category management and accurate store-level scanner data both play key roles in successfully executing this strategy. Category management strives to maximize total category profits while minimizing space and costs. Having accurate scanner data facilitates store and shelf space allocation decisions.

Efficient continuous replenishment links stores, distributors, and suppliers together with a goal of products flowing through the supply chain with few interruptions and lower costs. According to KSA, efficient replenishment seeks to "provide the right products, to the right place, at the right time, in the right quantity, and in the most efficient manner possible" (KSA, 1993, p. 45). Electronic data interchange (EDI) and scanner data are key components in achieving efficient replenishment. If stores send accurate product movement information in a timely and consistent manner, suppliers are better equipped to make certain the right products get delivered to the stores on time.

Efficient promotion focuses on making a store's promotion practices more effective. The challenge is to reduce the costs of promotion practices incurred by the suppliers, brokers, and distributors while, simultaneously, maintaining the purchase incentive for the consumer and the competitive position of the distributor (KSA, 1993).

Efficient product introduction strives to maximize the effectiveness of new product development and introduction. Although more products are being introduced now than 10 years ago, many are replications of existing products or line extensions of currently sold products. Few new products are original concepts and very few are on the grocer's shelf one year after introduction. Furthermore, as stores have grown in size and mass marketing has become more commonplace, some

retailers have lost touch with their consumers. All of these issues have increased the costs and difficulty of introducing new products.

The four strategies outlined above are not meant to be addressed independently by the parties within the supply chain. According to the Joint Industry Project on ECR, joint programs are essential for successful implementation of ECR (KSA, 1995). For example, joint category management programs between grocery retailers and suppliers have raised gross margins for retailers and increased sales for suppliers. Continuous replenishment programs are another example. By working with retailers, suppliers are better equipped to get the right products to retailers at the right time. The ordering process can be expedited with more timely and accurate information regarding product movement in the warehouse and in the retail store. Improved cooperation between grocery retailers and suppliers has resulted in decreased warehouse and store inventories, increased warehouse inventory turns and lower transportation costs.

Joint direct store delivery (DSD) programs and joint enabling technology programs are also important. Direct store delivery is only meaningful if both the retailer and supplier take steps together to implement DSD practices. Enabling technologies deal with the ability of the retailer and supplier to transmit and receive information via EDI. Again, the more steps both parties take together to implement EDI, the better the end results will be.

How ECR Relates to the Convenience Store Industry

Each of the four ECR strategies plays a role in C-store operations, with some being more prominent than others. Efficient product assortment is particularly important to C-stores due to their limited shelf space and product variety. For example, according to the NACS, “scanning provides

the retailer with better inventory control, improved pricing accuracy and decreased bookkeeping time" (Smith, p. 56). Also, scanning can help detect slow movers, those products that sit for weeks taking up valuable shelf space. C-stores tend to be familiar with whom their primary customers are and what they want. However, over time this typical customer is apt to change. Efficient product assortment practices can help stores respond efficiently and effectively when this happens.

Evidence of using an efficient continuous replenishment strategy is already apparent within the industry. An industry leader, 7-Eleven, is implementing an information system to track over 2,300 items and develop better sales forecasts (Zellner and Thornton). Although the new system is costly, it is expected to tie together distribution centers, stores, and headquarters. Store owners can use the system to track inventory item by item and to analyze sales trends based on time of day, weather, and other factors (Zellner and Thornton). Despite 7-Eleven's high-tech information system, as a whole, the C-store industry's management information capability trails mass merchandise and grocery systems (Dwyer, p. 58).

Efficient promotion and efficient new product introductions are important, but perhaps play a lesser role in C-store operations than product assortment and efficient replenishment. Due to the limited selling space, C-stores are constrained in the types of promotions they can use. For the most part, vendors provide the promotions. C-stores usually are known for their snack foods, beverages, ready-to-eat sandwiches, and a few staple grocery products. Given their limited space, taking chances on new products may be more risky. Their value to consumers is in predictability and convenience, not in shifting varieties.

Evidence suggests that cooperation is a successful business strategy. Cooperation and information sharing are at the heart of the ECR initiative. Despite C-store wholesalers' lack of

familiarity with grocery marketing, there is evidence they are making efforts to work more closely with their retailers. According to *Convenience Store News*, "some wholesalers are turning to manufacturers to help in making grocery-minded C-stores more competitive" (Francella, 1996, p. 52). Relationships with DSD vendors may be slower to change. According to *Convenience Store News*, many C-stores still rely on DSD vendors to manage shelf space. The DSD vendor's efforts, however, may be directed by his own sales goals or an aversion to returned products (Francella, 1998, p. 20). In essence the DSD vendor is determining what is placed on the shelf, not the store owner or management.

ECR strategies appear to be relevant for C-store operating procedures and business practices. Results of the effect of ECR on the supermarket industry appear positive and promising. Thus, it seems ECR can play a positive role in helping C-stores remain competitive in today's changing retail food environment. By examining how ECR practices relate to economic theory, the effects on the C-store industry can be better understood.

How ECR Relates to Economic Theory

By definition, efficient consumer response is about creating efficiencies within the retail food supply chain. Creating efficiencies means implementing business and management practices that lower operating costs and/or increase productivity. As a result, a positive relationship should exist between the adoption of ECR practices and superior performance levels. That is, those chains adopting more ECR practices should also have lower costs or higher productivity than those chains adopting fewer or no ECR practices. Economic theory can help explain how each ECR strategy can lower costs and/or increase productivity for C-stores.

Efficient product assortment relates to economies of size. Economies of size is the notion that as the size of a firm increases, the fixed costs incurred by the firm are spread over larger and larger outputs, causing average costs to decrease. Product assortment strategies rely on using scanning technology effectively. Technology, such as scanning, is costly to implement and use effectively. The larger the chain size, the more easily the fixed costs--searching for the technology and learning how to use the technology--can be spread over a larger number of stores. As a result, a large C-store chain can benefit from economies of size when purchasing costly technology by incurring lower average costs than a smaller chain. Furthermore, larger chains may pay a lower price per unit of the technology because of the greater number of units purchased.

Efficient replenishment relates to transaction cost economics. Transaction costs are the costs related to maintaining a business relationship. Efficient replenishment strategies rely on efficient communication and cooperation between stores, distributors and suppliers. Efficient communication and cooperation can decrease the costs of maintaining the relationship by products arriving "just in time," decreasing inventory costs, or preventing stock outs where a product's in-store demand outpaces its supply resulting in lost sales.

Efficient promotion also relates to transaction cost economics. Efficient promotion strategies rely on cooperation between the retailers, distributors and suppliers to develop promotions that are cost effective and appealing to each store's customers. When business relationships are not cooperative, costs of maintaining the relationship can be excessive to all parties involved.

Efficient product introduction relates to information economics. If a producer does not have accurate information about consumer needs when developing a new product, uncertainty will affect the success of the new product. Successful product introduction strategies rely on obtaining accurate

information about consumer preferences. If accurate information is not available, new product introductions will be risky for all parties involved. The risk can result in higher costs and lower sales productivity measures for retailers.

In addition to the relationships between ECR strategies and economic theory described above, one would expect the following relationships in the C-store industry to also exist. In terms of location economies, rural chains may have greater product assortment than suburban and urban chains. Chains in rural areas likely face less competition from grocery and non-traditional retail food stores due to the distance between stores. As a result, rural chains can benefit from carrying more stock keeping units (SKUs) because consumers may think of a rural C-store as a substitute for a supermarket.

Location economies also explain why urban chains will coordinate more business practices with vendors than suburban and rural chains. Urban stores are located in high density metropolitan areas where the distance between stores is minimal relative to rural and suburban stores. As a result, vendors will visit urban located stores more often then rural and suburban stores because the costs incurred traveling to urban stores are less.

Finally, transaction costs also explain why large chains will coordinate business practices with vendors to a greater degree then small chains. Large chains require vendors to service a larger number of stores. The costs involved to maintain the business relationship between the vendor and the chain's stores can be extensive. As a result, there is more of an incentive for large chains to coordinate and cooperate operating practices with vendors. Furthermore, due to the large volume of goods purchased from each vendor, large chains are more likely to receive price discounts on items ordered.

Methodology

Survey Design

A mail survey was used to collect the data for this study. The survey instrument (see Appendix A) was developed with the goal of collecting data on the following components important to C-store operations and the implementation of ECR: information systems, ordering, receiving, inventory management, and pricing practices. Other complementary issues, such as store layout, shelf space allocation, product assortment, management, and decision making where also addressed. An interview based survey, developed earlier by others to determine the role of ECR in Minnesota supermarkets, was used as a framework for designing the C-store survey (See Phumpiu and King, 1997).

The C-store chain was chosen as the unit of analysis. As a result, questions were designed to obtain information about a typical store within a chain. The information collected on the typical store was assumed to be an accurate representation of how each chain operated its stores. When collecting typical store characteristics, respondents were allowed to differentiate their stores by location. That is, if a chain operated stores in more than one location--urban, suburban, and/or rural--they were asked to give characteristics for a typical store within each relevant location. In all, 150 questions were incorporated into the survey. Prior to mailing, the survey was pretested with an industry executive to ensure its comprehensibility and cohesiveness.

The sample was compiled using the 1996 Minnesota Grocers Association Membership and Industry Directory and Resource Guide and the yellow pages of several city telephone books. In all, some 250 C-store chains and independently owned stores within the state of Minnesota were

identified. This sample included single independently owned stores and chains ranging in size from two to more than 100 stores. The majority of the chains included in the study sell gasoline.

The instrument was mailed to C-store operators during the months of April through June 1997. The Dillman method, described in *Mail and Telephone Surveys, The Total Design Method*, (Dillman) was used to determine when to mail the first and follow-up rounds of the survey, as well as to enhance the response rate. Of those contacted, 58 chains returned a completed survey form for an overall survey response rate of 23 percent. In total, the respondents operate 824 stores; approximately 40 percent of C-stores in Minnesota.

Data Analysis

Initially the data were sorted by chain size and location to determine meaningful grouping categories. Guided by the goal of maintaining confidentiality of the respondents while creating meaningful groups for data analysis, two grouping schemes were created to categorize the respondents.

First, the respondents were grouped by three locations: chains with stores in urban areas, suburban areas, and rural areas. Many respondents operated stores in more than one location. To account for this, if a multi-store chain had stores in rural and urban areas, its responses were included in both the rural and urban categories. Similarly, if a chain operated stores in all three locations, its responses were included in the urban, suburban and rural categories. The location grouping allows comparisons based on the store's geographic location. For example, urban stores may be open longer hours and see more customers in one day than rural stores, thus affecting their weekly sales figures. Rural stores may have a larger selling area, affecting their sales per square foot.

Second, responding chains were grouped by the number of stores in their chain. Single stores and two store chains were included in one group, and chains with three or more stores were included in the second group. This grouping allows comparisons based on the size of the chain's operations. For example, smaller chains may not be implementing new technology as quickly as larger chains because the average adoption cost per store might be much higher. Larger chains may offer lower-priced products because their greater buying power with suppliers. Unfortunately, the large chain grouping of three or more stores could not be broken down into smaller groups while still maintaining the confidentiality of the respondents.

Finally, average responses are also reported for the entire sample. This allows comparisons between the two grouping schemes and, when applicable, comparisons to national averages. Sample averages can help detect outliers and illustrate if the data are biased in favor of one group.

Once the data were organized, simple averages were computed for each question. These averages represent only those respondents who answered the question. That is, if a chain chose not to disclose the selling area of a typical store, it would not be included in the sample average for that question. Similarly, when computing average outside sales in terms of gallons of gasoline sold, only those chains selling gasoline and responding to the question were included in the computed average. Also, on two-tiered questions, averages for secondary questions were calculated using only data for chains that answered "yes" to the primary questions. For example, for the question "If you use a computer, what do you use your computer for?" the averages represent only those respondents who initially answered yes to using a computer. When fewer than five chains responded to a question, the sample size was deemed too small to be meaningful. An asterisk is used in place of the average in these cases.

Because the chain is the unit of analysis, averages are not weighted by the number of stores. That is, a response from a chain with one store was treated the same as a response from a chain with fifty stores. Unweighted averages were used due to the large percentage of single store operator responses (see Table 1). Weighting the responses by chain size, could result in large chains unduly influencing the results. This is especially important when trying to determine the adoption rate of specific ECR practices. If more large chains have adopted a practice than smaller chains, a weighted average would likely cause misleading conclusions to be drawn about the industry's adoption rate in general. Also, using unweighted averages helped ensure the confidentiality of responses for large chains.

Once averages were computed across all groupings, the questions were organized into tables to illustrate business practices in Minnesota C-stores. Each table represents a section of the survey or a compilation of sections.

Distribution of Survey Sample

The distribution of the 58 responding chains in terms of size, location, and whether they sell gasoline is reported in Table 1 below.

Table 1: Distribution of Survey Sample

	Urban Located Chains	Suburban Located Chains	Rural Located Chains	One and Two Store Chains	Three or More Store Chains
Number of Chains Responding	21	16	29	44	14
Number of Chains Selling Gasoline	9	9	25	27	10
Number of Stores Represented	117	135	547	52	772

In terms of location of the 58 chains responding, 21 chains operated stores in urban areas, 16 chains operated stores in suburban areas, and 29 chains operated stores in rural areas. These totals do not sum to 58 because some stores are located in more than one geographic location.

In terms of chain size, 44 operated one and two store chains. Of the 44 chains, 37 operated single stores and 7 operated two-store chains. Of the 58 chains responding, 14 operated three or more store chains. Of these, 8 operated three to seven store chains and 6 operated chains with eleven or more stores.

With respect to gasoline sales, 64 percent of the chains sold gasoline. By location, 43 percent of the urban chains, 56 percent of the suburban chains and 86 percent of the rural stores sold gasoline. Of the chains in the one and two store category, 61 percent sold gasoline. Of the chains in the three or more store category, 71 percent sold gasoline.

In total, some 824 C-stores are represented. In terms of location, significantly more rural stores are represented than urban and suburban stores. The location totals do not sum to 824 because some respondents chose not to disclose how many of their stores operate in each location.

Store Operations and Business Practices in Minnesota Convenience Stores

The results that were returned to the participants in August 1997 are presented in nine tables in Appendix B. Each table contains a grouping of questions pertaining to a common subject. The subjects are: store characteristics; percentage of respondents offering selected products and services in a typical store; percentage of respondents using DSD for selected products; scanning, shelf tags, and computer use in a typical store; product assortment and shelf space allocation decisions for non-DSD and DSD products; ordering, receiving and inventory management practices for non-DSD and

DSD products; and pricing and promotions practices.

The major conclusions for each subject, along with the corresponding table, are presented in this section. Some tables that follow are abbreviated versions of the full tables appearing in the appendix. If this is the case, it will be denoted in the table's title by "(abbreviated)".

Before presenting the survey results, it should be noted that there appeared to be some confusion over the term "direct store delivery". As a result, the questions pertaining to what products are DSD (Table 3 in Appendix B) are not discussed. A DSD product is one that is delivered by the manufacturer directly to the store, bypassing the warehouse facilities operated by a distributor or retail chain. According to the Joint Industry Project on ECR, shelf inventory can be managed by the DSD supplier with varying degrees of retailer oversight, although product check-in is done by both the supplier and store receiver.

Store Characteristics

C-stores come in many shapes and sizes. Location, number of vendors, number of SKUs, number of full-time and part-time employees, and square footage of retail space vary by chain. To illustrate the differences and similarities between Minnesota C-stores, typical store characteristics are summarized in Table 2.

The location categories in Table 2 suggest store selling area and backroom space tend to be greater in suburban stores, but fuel area tends to be larger in urban and rural stores. Labor hours are fairly similar for all locations, as is the number of hours open. Suburban stores tend to have slightly more DSD and fewer non-DSD suppliers than rural and urban stores. The total number of SKUs and average inside weekly sales is highest in rural stores and lowest in suburban stores. The high number

of SKUs (and inside sales) in rural stores suggests that rural stores are closer substitutes to supermarkets than urban and suburban C-stores. Although urban stores have the lowest level of inside sales, they sell the most gasoline--twice as much as rural stores and three times as much as suburban stores. Finally, suburban stores have about 25 percent more in-store inventory than both rural and urban stores.

Table 2: Typical Store Characteristics

Store Characteristics	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Hours Open (per day)	16.2	16.0	16.9	16.4	19	17.0
Store Selling Area (sq. ft.)	1,476	2,303	1,730	1,659	2,142	1,809
Backroom Storage Area (sq. ft.)	334	509	404	412	429	417
Backroom Office Area (sq. ft.)	111	125	98	136	68	115
Fuel Area (sq. ft.)	6,413	3,088	4,584	2,986	8,883	5,382
Full Time Labor Hours (per week)	106	108	90	85	164	109
Part Time Labor Hours (per week)	80	86	96	83	115	91
Number DSD Suppliers	16.4	18.8	16.7	14.0	24.6	17.1
Number of Non-DSD Suppliers	4.7	1.3	4.1	4.4	3.3	4.0
Number of Deliveries per week from warehouse/primary supplier	3.1	1.4	3.4	3.2	1.7	2.8
Total Number of SKUs	2,910	1,663	3,602	3,037	4,100	3,446
Average Inside Weekly Sales ($)	$7,682	$7,856	$12,727	$10,668	$12,211	$10,945
Average Outside Weekly Sales (gallons)	33,138	9,664	12,942	14,127	29,795	18,603
Average Total Weekly Sales ($)[1]	$20,548	$18,487	$25,310	$20,282	$43,765	$24,559
Average In-Store Inventory Value ($)	$40,306	$50,929	$39,173	$38,498	$55,421	$41,952

1. One gallon equals $1.10.

Comparing responses by chain size, stores in larger chains have greater store selling and fuel areas. Large chains' small backroom office area may be evidence that more administrative tasks,such as payroll, are performed at headquarters. Larger chains employ approximately two more full-time employees per week, but they are also open almost 20 more hours per week. Stores in larger chains carry more SKUs, rely more on DSD, and have slightly higher inside sales and inventory than stores in smaller chains. Finally, gasoline sales are considerably higher in stores that are part of larger chains.

The store characteristics of C-stores in Minnesota who responded to the survey can be compared to the national averages reported in annual industry reports published by *Convenience StoreNews*. The comparisons appear in Table 3.

Table 3: Store Characteristics: Minnesota Convenience Stores and National Average

	Minnesota Sample	National Average
Average square footage of store	2,341	2,912
Square footage of selling area	1,809	2,066
Percent merchandise arriving via DSD vendor	75	33
Percent of merchandise inventory arriving from warehouse/primary supplier	5	10
Number of SKUs	3,446	4,170
Average in store merchandise inventory value	41,952	68,765
Number of gallons pumped per week	18,603	21,125

Adding the averages of store selling area, backroom storage area and office area, the Minnesota sample averaged 2,341 square feet per store. According to the 1998 Industry Report[2] (1998b), the average store was 2,912 square feet. In the Minnesota sample, the average store selling area was 1,809 square feet. In 1997, the national average sales area in a new store was 2,066 square feet. For the Minnesota sample, almost 72 percent of merchandise arrived via DSD vendors, while over 10 percent came from the warehouse or primary supplier. In contrast, in 1996 one third of the industry's merchandise inventory arrived at the store via DSD vendors and five percent of the inventory came from the company's warehouse. The Minnesota sample averaged some 3,446 SKUs per store; according to the 1998 Industry Report (1998a), the industry averaged 4,170 SKUs per store. Minnesota's in-store merchandise inventory value totaled only $41,952 while the industry averaged $68,765 in 1997. Finally, Minnesota C-stores pumped 18,603 gallons per week while the 1997 national average was 21,125 gallons per week.

Products and Services Offered in a Typical Store

Providing the right mix of products and services is essential for the continued profitability of C-stores. According the NACS, C-stores need to develop new attributes that will uniquely define their role in retail food (Bohen). In some cases, this may mean adopting the latest payment technology such as being able to pay for gas at the pump or being able to safely accept personal checks. It may also mean adding other services that benefit the consumer, such as automated teller machines (ATMs), or equipping the store to offer home meal replacement entrees, video rentals, or

[2.] The data reported for the industry averages pertain to the traditional operators figures as reported in the industry reports.

services such as processing film or dry cleaning. According to the director of new concept development at White Hen Pantry, "offering customers convenience has many facets. It's not just getting them in and out of the store fast. It includes anticipating their needs and bending to meet those needs" (Harper, p. 20). The array of products and services Minnesota C-stores offer is summarized in Table 4.

Table 4: Percentage of Respondents Offering Selected Products and Services in a Typical Store (abbreviated)

Product or Service	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Payment Methods:						
Bank Debit Card Payments	22%	40%	36%	29%	25%	28%
Check Verification System	37%	53%	27%	28%	38%	30%
Financial Services:						
ATM	37%	75%	33%	29%	71%	40%
Money Orders	33%	29%	15%	13%	46%	21%
Prepared Meals:						
Bakery	65%	75%	46%	48%	85%	56%
Branded Fast Food	39%	71%	54%	49%	62%	52%
Sandwich Bar	61%	53%	48%	46%	69%	52%
Seating for Fast Food	28%	40%	44%	26%	67%	35%
Entertainment Services:						
Video Rentals	44%	60%	75%	54%	71%	58%
Video Games	29%	36%	64%	44%	43%	43%
Misc. Services						
Lottery Tickets	79%	88%	86%	79%	93%	82%

According to the survey results, 30 percent of respondents use a check verification system

while 46 percent offer check cashing. More specifically, stores in small chains are less likely to use check verification systems but are more likely to offer check cashing. According to the 1996 industry average, 14.8 percent of sales were paid for with a personal check, double the previous year's average. If this trend is correct, perhaps Minnesota operators need to invest in the technology that will make this method of payment viable.

ATMs are a convenient and fast way for consumers to get cash instead of going to their bank. In this study, only 40 percent of respondents have ATMs in a typical store, and stores in large chains are twice as likely to have ATMs. According to the 1998 industry report (1998a), 62 percent of the chains responding have ATMs in some or all of their stores. Because C-stores are readily available to many people, this industry statistic is not surprising. Twenty one percent of chains in this survey sell money orders in a typical store, and stores in large chains are three times as likely to sell money orders. According to the 1997 industry report (Francella and Ross), 55 percent of chains sell money orders in some or all stores, with 27 percent of the respondents selling money orders in all of their stores.

Prepared foods and ready-to-eat meals are important, new, and growing product categories. According to the 1998 Industry Report (1998a), over twelve percent of in-store sales and 21 percent of the gross margin dollars were attributed to food service items. With just over half of Minnesota survey respondents offering branded fast food and/or a sandwich bar, and stores in large chains being twice as likely to provide seating for fast food as stores in small chains, it appears that this service area could experience significant growth over the next few years.

Renting videos has become a popular pastime for Americans. In the Minnesota sample, 58 percent of survey respondents rent videos and 43 percent rent video games in a typical store. More

specifically, video and video game rentals are most frequently offered in rural and suburban stores. This compares with only 36 percent of the industry respondents offering video rentals and 43 percent offering video games in some to all of their stores.

Finally, it is no surprise that 82 percent of Minnesota respondents offer lottery tickets. This compares with 73 percent of the industry respondents selling lottery tickets in some or all of their stores. With the large number of C-stores selling lottery tickets, it is worth mentioning that the costs of handling a lottery transaction erode any profit the lottery customer brings to the store through the purchase of other items (Food Industry Report). As a result, non-lottery customers tend to be more profitable than lottery customers. Other services offered in Minnesota C-stores, but to a lesser extent, include: car washes, dry cleaning and laundry, bait and tackle, fax and copy, UPS shipment, and gifts.

Scanning, Shelf Tags, and Computer Use

Technology continues to be at the forefront of innovation in food retailing. Many believe retailers, who have more information about store operations and effectively manage the information make, better decisions about day-to-day operations and will be better equipped to efficiently communicate with suppliers. Using information effectively can lead to increased productivity and decreased costs. For example, the use of scanners can reduce time at the checkout counter for consumers, and expedite the ordering and receiving process for employees. There is evidence that tasks taking several hours to complete can be reduced to minutes. The nation's largest privately-owned C-store chain recently implemented a multi-purpose information system. According to the Vice President of Information Systems, before the system was implemented, the ordering process

consumed two or more hours per day of the store manager's time. With the new system, the process takes about 30 minutes (Fox).

Furthermore, scanner data can help stores react to customer behavior more quickly, help identify shrink, and isolate sales volume by individual stores. According to the Vice President and Director of Independent Retailers for ACNielsen Corp., "clear accurate scanner data helps the C-store category manager implement the right strategies for products and provide an in-depth look at how consumers shop their stores with quantitative results, as opposed to instincts" (Francella, 1998, p.22). Ideally, a paperless flow of data can be achieved between suppliers and retailers, facilitating ordering, receiving, inventory, pricing, and payment. All these issues are related to efficient replenishment, efficient promotion strategies, and to how technology can facilitate their implementation. Table 5 summarizes technology adoption and use by Minnesota C-stores.

When looking at Table 5, only 17 percent of chains responding to the survey currently scan merchandise. This contrasts sharply with the more than 97 percent of supermarkets currently scanning. According to the 1997 Technology Study (Francella and Kileen), 33 percent of the responding chains have implemented scanning and more than half are exploring the technology.

Chains with stores in urban locations are least likely to use scanning, while chains with stores in suburban locations are most likely to use scanning. When chains scan merchandise, the data are used most often to generate reports on sales and item movement. Rural stores generate both types of reports more frequently then suburban stores. Few chains share data with suppliers or sell scanner data. Finally, large chains are slightly more likely to use scanning than small chains. This supports the economies of size relationship, where the fixed costs of adopting the technology can be spread over the large number of existing stores.

Shelf tags are part of the information technology package in a typical C-store. They support scanning, since they replace manual placement of prices on individual items. They can also support electronic order assembly by reducing the time spent taking inventories and determining when re-orders should be placed. For chains grouped by location, shelf tags are most commonly used for non-DSD products in chains with stores in suburban areas. There are no striking differences in the use of shelf tags for DSD products or in information contained on shelf tags for stores grouped by location. For chains grouped by size, large chains are more likely to use shelf tags for non-DSD products, but less likely to use them for DSD products.

Table 5: Scanning, Shelf Tags, and Computer Use in a Typical Store (abbreviated)

Scanning, Shelf Tags, or Computer Use	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Percentage Scan Merchandise	10%	31%	21%	16%	21%	17%
Percentage that Scan Merchandise to:						
Generate reports on Sales	*	80%	100%	86%	*	90%
Generate reports on Movement of Items	*	67%	86%	86%	*	80%
Share scanner data with suppliers	*	20%	14%	0%	*	21%
Sell scanner data	*	20%	14%	0%	*	9%
Use Shelf Tags for non-DSD Products:	41%	79%	39%	30%	92%	45%
Use Shelf Tags for DSD Products:	78%	67%	76%	76%	55%	73%
Use a Computer	43%	81%	69%	56%	64%	58%
Use a computer for:						
Accounting	80%	83%	95%	96%	78%	91%
Payroll	44%	55%	65%	70%	13%	55%
Pricing	44%	58%	53%	50%	56%	52%
Ordering	22%	27%	25%	30%	11%	24%
Networked with Headquarters	33%	30%	29%	6%	67%	27%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
* The number of chains responding to this question is too small to calculate a meaningful average.

Computer use is more common than scanning. Of those who responded, 58 percent of Minnesota C-store chains use a computer. According to the 1997 Technology Study (Francella and Kileen), 60 percent of the chains have back office computers in all of their stores. When comparing responses by location, urban stores are less likely to have a computer than are suburban and rural

stores. In stores that have a computer, accounting is the most common application. According to the 1997 Technology Study (Francella and Kileen), 60 percent of the respondents use the computer to automate daily store reporting, 33 percent use the computer for automated time and attendance and 33 percent use it for labor scheduling. Less than one-third of the Minnesota stores in each location use a computer for ordering or have a computer networked to chain headquarters. Compared with the 1997 national average, 38 percent of the respondents use the computer for e-mail (Francella and Kileen).

Comparing responses by chain size, stores in larger chains are slightly more likely to have a computer, and those that have a computer are much more likely to be networked to headquarters. This may allow stores in large chains to transfer more accounting and payroll tasks to headquarters, since those functions are more likely to be supported by an in-store computer in small chains.

Product Assortment and Shelf Space Allocation Decisions

Category management is a prominent component of the ECR initiative and is important to the C-store industry. Recent industry initiatives are aimed at facilitating the adoption of category management practices in C-stores. For example, the NACS Category Management Task Force has created a framework specifically designed for C-store operators interested in category management. The Category Management Framework, compiled into a guidebook available to C-store operators, "was designed as a flexible tool that retailers can customize to their own corporate strategies and implement according to the resources available to them" (Francella, 1998, p. 20).

Category management focuses on issues relating to a single category, such as candy or salty snacks. The issues include: how much space should a certain brand have on the shelf, what is the best

way to position the products on the shelf, how many different brands should a store offer, and how should the prices be determined. Ideally a category manager identifies who the consumers are and what they want and then determines the best mix of products to offer. Category management is more that just collecting accurate and timely data; it also requires a good process and technology to analyze and manipulate the information efficiently (Francella, 1998, p. 22).

The mail survey focused on how these category management decisions are made and to what degree these decisions are coordinated with the vendors. These types of questions address the efficient product assortment strategy of ECR. Tables 6 and 7 illustrate if and how Minnesota C-stores are using this strategy for non-DSD and DSD products, respectively.

When looking at Table 6, in all locations and chain size groupings, the store manager and/or single store owner is the principal decision maker for product approvals, shelf space allocation, and product placement for non-DSD items. This implies some degree of flexibility exists in day-to-day store operations.

Few chains in any grouping delegate non-DSD product assortment, shelf space allocation, or product placement decisions to a vendor, but it is quite common for stores to coordinate these decisions with a vendor. Coordination with vendors is lower in rural chains than in urban and suburban chains, and it is also lower in chains with one or two stores than in chains with three or more stores. The greater degree of coordination by large chains and urban chains supports the expected relationship due to transaction cost economics. Large chains have more to gain by coordination than small chains due to the larger number of stores the vendor must service. Also, it is easier for vendors to visit urban chains than rural or suburban chains because the travel distance, and costs, are lower.

Table 6: Product Assortment and Shelf Space Allocation Practices for Non-DSD Products (abbreviated)

Product Assortment or Shelf Space Practice	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Who Approves Items for Sale in Stores:						
Corporate Headquarters	11%	20%	12%	8%	23%	12%
Store Manager/Single Store Owner	68%	53%	64%	92%	54%	83%
Item Approval Decisions are Coordinated with Vendor	71%	64%	55%	48%	83%	59%
Who Decides on Shelf Space Allocation:						
Corporate Headquarters	11%	13%	13%	5%	23%	10%
Store Manager/Single Store Owner	78%	80%	67%	97%	69%	90%
Shelf Space Allocation Decisions are Coordinated with Vendor	56%	45%	45%	43%	67%	50%
Who Decides how Items are Arranged on the Shelf:						
Corporate Headquarters	11%	13%	8%	8%	23%	12%
Store Manager/Single Store Owner	78%	73%	67%	95%	77%	90%
Item Arrangement Decisions are Coordinated with Vendor	59%	45%	37%	41%	60%	46%
Within Products Categories, shelf layouts vary across stores:	75%	87%	71%	100%[1]	92%	94%
Standardized Layout of Stores[1]	54%	8%	12%	10%[1]	36%	21%
Use Formal Planograms	50%	47%	19%	18%	64%	30%
Planograms Vary Across Stores	100%	100%	60%	75%[1]	86%	75%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
[1] These questions do not pertain to single store chains and their responses are not used in calculating these averages.

Responses to questions about standardization of store layout and the use of formal planograms are summarized at the bottom of Table 6. Chains with urban stores use standardized layouts much more frequently then chains with suburban and rural stores. Chains with urban stores also use formal planograms slightly more often than chains with suburban stores and over twice as

often as chains with rural stores. For the chains that use planograms, shelf space arrangements vary across stores in all the urban and suburban chains and in over half of the rural chains. In terms of chain size, small chains rarely use standardized layouts while large chains use them more frequently. Large chains are also much more likely than small chains to use formal planograms. This supports the expected relationship between costly technology adoption and the economies of size of large chains. Both chain sizes vary the planograms across stores.

Responses to questions pertaining to DSD products are presented in Table 7. As with non-DSD products, the store manager and/or single store owner is the principal decision maker for product approval, shelf space allocation, and product placement for DSD items in all location and chain size categories. For chains grouped by location, all three decisions tend to be more centralized in corporate headquarters or a district office for DSD products than for non-DSD products. However, this pattern seems less evident for chains grouped by chain size.

The other striking difference revealed by this table is that shelf space allocation and arrangement decisions are consistently more likely to be coordinated with vendors for DSD products than for non-DSD products. However, this does not necessarily hold true for item approval decisions. Again, large chains are more likely to coordinate DSD product decisions than small chains. This supports the expected relationship between large chains and transaction cost economics.

Table 7: Product Assortment and Shelf Space Allocation Practices for DSD Products (abbreviated)

Product Assortment or Shelf Space Practice	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Who Approves Items for Sale in Stores:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
Store Manager/Owner	80%	75%	92%	90%	77%	87%
Item Approval Decisions are Coordinated with Vendor	59%	79%	62%	63%	77%	67%
Who Decides on Shelf Space Allocation:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
Store Manager/Owner	65%	75%	92%	86%	69%	82%
Shelf Space Allocation Decisions are Coordinated with Vendor	63%	79%	50%	56%	77%	62%
Who Decides on how items are Arranged on the Shelf:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
Store Manager/Single Store Owner	80%	75%	89%	86%	77%	84%
Item Arrangement Decisions are Coordinated with Vendor	60%	71%	50%	52%	77%	59%
Within Products Categories, shelf layouts vary across stores[1]	63%	93%	75%	80%	85%	83%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
1 These questions do not pertain to single store chains and their responses are not used in calculating these averages.

Ordering, Receiving, and Inventory Management Practices

The efficient replenishment strategy of ECR strives to minimize time and cost in the replenishment system (KSA, 1993). The survey asked about measures taken and technology used to reduce the amount of time it takes to process and receive an order. Tables 8 and 9 show results for ordering, receiving, and inventory management practices for non-DSD and DSD

products, respectively and the degree to which technology is being used to facilitate these practices by Minnesota C-stores.

Ordering, receiving and inventory management practices for non-DSD products are reported in Table 8. These practices are remarkably similar across chain groupings.

Table 8: Ordering, Receiving and Inventory Management Practices for Non-DSD Products (abbreviated)

Inventory Management Practice	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Who Generates the Orders:						
Store Manager/Single Store Owner	94%	93%	96%	97%	100%	98%
How Orders are Assembled:						
Written Order Form	82%	80%	84%	81%	77%	80%
Hand Held Telxon Unit	18%	40%	16%	22%	38%	26%
How Orders are Sent to Supplier:						
Phone	67%	60%	67%	71%	62%	69%
Fax	22%	13%	13%	21%	8%	18%
Electronic Transmission	17%	27%	8%	8%	23%	12%
How Orders are Verified for Accuracy:						
Visual Count/Purchase Order	100%	100%	92%	95%	100%	96%
How Suppliers are Paid:						
Check	100%	93%	96%	95%	100%	96%
The Primary Suppliers Assemble Orders to Facilitate	31%	40%	22%	26%	33%	28%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

Store managers and/or owners of single stores are primarily responsible for generating non-DSD orders. Orders are most often assembled with written order forms, but they are also occasionally assembled with hand-held Telxon units, especially in suburban and large chains. An average of 26

percent of the respondents use hand-held Telxon units when assembling orders. According to the 1997 Technology Study (Francella and Kileen), 33 percent of the respondents nation wide use hand-held data entry terminals for inventory functions. The higher rate of adoption of hand-held Telxon technology by large chains, 38 percent versus 22 percent for small chains, supports the relationship between large chains and technology adoption explained by economies of size.

Orders are usually phoned to the supplier, though they are also occasionally faxed or sent via electronic transmission, especially in urban and suburban chains and large chains. According to the 1997 Technology Study (Francella and Kileen), 8 percent of the respondents use EDI between the vendors and the stores, and 15 percent use EDI between the vendors and headquarters.

When orders arrive, they are verified by visual counts, and suppliers are typically paid by check. Finally, suppliers for suburban stores are most likely to assemble orders in a manner that facilitates shelf restocking in the store, while suppliers for rural stores are least likely to follow this practice.

Ordering, receiving, and inventory management practices for DSD products are presented in Table 9. There are some notable differences in practices for chains grouped by location and by chain size. For chains grouped by location, chains with urban and suburban stores are more likely to allow vendors to generate orders than chains with rural stores, though store manager approval is generally required. This practice is more common in large chains than in small chains, supporting the expected relationship between large chains and coordination with vendors explained by transaction costs.

Chains with urban and suburban stores are somewhat more likely to pay DSD vendors in cash than are chains with rural stores, and large chains are also less likely to pay DSD vendors in cash. The other major difference in practices is in the placement of products on store shelves. DSD

vendors are much likely to do this in chains with urban and suburban stores. Finally, there are not large differences across chains in practices related to order verification or product placement on store shelves.

Table 9: Ordering, Receiving and Inventory Management Practices for DSD Products (abbreviated)

Inventory Management Practice	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Who Generates the Orders:						
DSD Vendor with Store Manager /Single Store Owner Approval	67%	56%	38%	40%	92%	52%
Store Manager/Single Store Owner	39%	38%	69%	60%	15%	50%
How Orders are Verified for Accuracy:						
Visual Count	95%	100%	100%	98%	100%	98%
How Suppliers are Paid:						
Check	100%	100%	100%	100%	100%	100%
Cash	30%	25%	15%	28%	15%	25%
Who Places Orders on the Shelf:						
Vendor	43%	50%	11%	33%	38%	33%
Store Manager/Owner of single store	62%	63%	82%	77%	46%	70%
Store Employee	48%	69%	59%	52%	69%	56%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

Pricing and Promotion Practices

This section of the survey addresses product pricing decisions and practices. The use of technology in pricing has been shown to reduce time and costs. For example, by maintaining an accurate pricebook, price changes can be sent directly to a store's scanning system, eliminating the need to manually enter price changes. The pricing philosophy of a chain may influence the

sophistication of a chain's business strategy.

A component of the efficient product introductions strategy, which is concerned with how to maximize the effectiveness and minimize the costs of new product development and introduction activities, is also addressed. The survey asked what types of promotions are used in a typical store. Responses to pricing and promotions practices are summarized in Table 10.

Table 10: Pricing and Promotion Practices (abbreviated)

Pricing and Promotion Practices	Percent of Respondents					
	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Who Determines Prices for Products Sold in the Store:						
Corporate Headquarters	25%	31%	18%	14%	36%	19%
Store Manager/Owner of single store	55%	62%	75%	84%	43%	70%
Suppliers	20%	6%	25%	2%	14%	11%
How Price Changes are Transmitted to the Store(s):						
Delivered by: invoice/supplier	21%	31%	50%	57%	17%	45%
Delivered by: dist. manager/supervisor	36%	31%	25%	23%	42%	29%
Prices are the Same in All Stores[1]	44%	70%	44%	57%	50%	52%
Prices Vary in Each Store	33%	10%	44%	43%	21%	29%
Prices are the Same for Stores Grouped by Size/Location	22%	20%	11%	0%	29%	19%
Promotions Used in Typical Store:						
Special Displays Provided by Vendor	89%	100%	85%	88%	92%	89%
In Store Coupons	47%	33%	26%	21%	38%	25%
Newspaper Adds	21%	20%	41%	21%	31%	24%
Home Delivered Circulars	21%	33%	19%	14%	23%	16%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
[1] These questions do not pertain to single store chains and their responses are not used in calculating these averages.

For chains grouped by location, suburban stores are most likely to have prices determined by corporate headquarters or district managers, while rural stores rely more on store managers or owners to set prices. Chains with urban and suburban stores are more likely to use the same prices in all stores or to have consistent prices for stores grouped by size or location. On the other hand, chains with rural stores are more likely to vary prices in each store. Finally, regarding promotions, chains with urban stores are more likely to use in-store coupons, while chains with rural stores are more likely to use newspaper adds.

For chains grouped by size, large chains are more likely to have product prices set at corporate headquarters or a district office than are smaller chains. Thus, it follows that prices are more likely to vary from store to store in small chains than in large chains and that large chains are more likely to rely on district managers or supervisors to deliver price changes.

These responses also seem to provide evidence that suppliers and retailers work together to determine product prices. In terms of efficient promotion, the vendor is the largest source of promotions, suggesting that many Minnesota C-stores may have adopted this component of ECR.

Store Productivity Measures

Several store productivity measures were calculated from survey responses, including weekly inside sales per labor hour ($/hour), weekly outside sales per labor hour (gallons/hour), weekly inside sales per square foot of selling area ($/square foot) and weekly outside sales per square foot of fuel area (gallons/square foot). Weekly total sales per labor hour ($/hour) were calculated by multiplying gallons sold per week by $1.10, summing inside sales and outside sales in dollars and dividing by weekly labor hours. Annual inventory turns were calculated by dividing annual inside sales--weekly

sales multiplied by 52--by the average inventory value. These productivity values, summarized in Table 11, are only approximations and should be interpreted with caution.

For chains grouped by location, rural stores have higher average inside sales productivity than urban and suburban stores. In contrast, urban stores have the highest average outside sales productivity measures. This reflects a difference in relative emphasis on inside and outside sales as much as a fundamental difference in productivity. In terms of total sales, rural stores outperformed suburban and urban stores in labor hour productivity. Also, rural stores have the highest average for inventory turns, perhaps because they carry more high volume, staple items than urban and suburban stores. For all but one productivity measure, average values for suburban stores lie between averages for urban and rural stores.

Table 11: Store Productivity Measures

Productivity Measures	Location			Chain Size		Average	National Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains	
Weekly Inside Sales per Labor Hour ($/hour)	$64.18	$59.28	$78.09	$72.98	$54.02	$69.35	$47.00
Weekly Outside Sales per Labor Hour (gallons/hour)	128.1	99.9	85.5	82.3	127.4	95.6	81.9
Weekly Total Sales per Labor Hour ($/hour)	$117.03	$125.21	$161.24	$126.80	$188.79	$139.45	$124.00
Weekly Inside Sales per Square Foot of Selling Area ($/sq. ft.)	$5.86	$7.37	$7.93	$6.76	$8.30	$7.07	$7.05
Weekly Outside Sales per Square Foot of Fuel Area (gallons/sq. ft.)	22.3	10.8	9.2	9.0	17.2	11.7	NA
Annual Inventory Turns	11	16	20	16	16	16	11

For chains grouped by size, small chains only outperformed large chains in inside sales per labor. Perhaps small chains used significantly fewer labor hours or the owners of the small chains are the main source of labor. Stores in both chain sizes have the same average inventory turns. Stores

in large chains have higher values for the remaining four productivity measures. Total sales per labor hour in large chains is 49 percent higher than small chains.

Compared to the industry averages, the Minnesota sample outperforms the industry average in labor productivity, selling area productivity and inventory turns. In terms of average in-store sales per labor hour, the Minnesota sample averaged $69.35 while the industry averaged $47.00 in 1997. The Minnesota sample averaged $139.45 for total sales per labor hour, and the industry averaged $124.00 in 1997. The Minnesota sample averaged $7.07 for weekly in-store sales per square foot, and the industry averaged $7.05 in 1997. The Minnesota sample averaged 16 inventory turns, and the industry averaged 11 in 1997.

Summary

Few Minnesota C-stores are using technology to assist in the ordering, receiving and pricing of products sold in their stores. Only 17 percent of the respondents currently scan merchandise at the checkout. Orders are assembled with hand-held Telxon units by only one-quarter of the respondents. Orders are electronically transmitted to suppliers by only 12 percent of the respondents. Upon arrival, orders are visually verified for accuracy and price changes are delivered to the store via the supplier or the suppliers' invoice.

Decisions regarding products sold, shelf space allocation, and item arrangement are usually made at the store level, with minimal involvement from corporate headquarters. Product assortment and shelf space allocation decisions are made by store managers or single store owners most of the time. Corporate headquarters are involved in these decisions for only 10 to 15 percent of the respondents. Vendors are involved, via coordination, to a much larger extent. Roughly 60 percent

of the respondents coordinate product assortment and shelf space allocation decisions with vendors. Pricing decisions for products sold are also made at the store level, with corporate headquarters assisting in the decisions of almost 20 percent of the respondents.

ECR Practices in Minnesota Convenience Stores

Three analyses were performed to determine the role ECR practices are playing in Minnesota C-stores. First, practices associated with ECR were identified and adoption rates and ECR readiness indices were calculated for Minnesota C-stores. Second, relationships between the adoption of ECR practices, store characteristics and store productivity measures were explored. Finally, regression results were analyzed to determine the relationship between store characteristics, the level of ECR readiness and store productivity measures.

C-store adoption rates, relationships between ECR practices and store productivity, and statistical analyses were compared with selected Minnesota supermarket findings. Also, the survey results were analyzed for evidence that retailers and suppliers were working together on related tasks.

Evidence of ECR Practices

To determine what ECR practices Minnesota C-stores are using, survey questions designed to capture this information were analyzed by C-store groups. Practices were identified from "best practice" publications prepared by the Joint Industry Project on Efficient Consumer Response. Others were included as a result of observations regarding technological, organizational, and management practices that were likely to differ across retail food stores. In all, nine practices considered important for ECR and appropriate for C-stores were identified.

Adoption percentages for the nine practices were calculated using only data from the 42 chains that responded to all nine questions. This sub-sample of 42 gives a more accurate picture of what ECR practices are being used by different types of C-store chains. Furthermore, by creating the sub-sample, an ECR readiness index could be computed to illustrate how adoption rates of ECR practices relate to store characteristics and performance measures. The ECR readiness index is simply an unweighted average of the nine adoption percentages.

In addition to the ECR readiness index, two sub-indices were also calculated, an ECR technology index and an ECR relationship index. The ECR technology index is an average of five technological practices: scan merchandise, have a computer, electronically transmit non-DSD orders, have shelf tags with reorder information and use formal planograms. The ECR relationship index is based on four practices that encourage cooperation and communication with suppliers and other outside parties: non-DSD shelf space decisions and items for sale decisions are coordinated with outside parties and DSD shelf space decisions and items for sale decisions are coordinated with outside parties. Table 12 summarizes adoption patterns for the nine practices for the subsample of 42 chains.

Among chains grouped by location in Table 12, suburban chains have the highest average ECR readiness index. As the ECR technology index illustrates, suburban chains are more advanced than urban and rural chains in information technology adoption. In terms of the ECR relationship index, urban chains have a slightly higher average than suburban chains. Urban chains have higher rates of cooperation with non-DSD vendors while suburban chains are coordinating decisions with DSD vendors to a greater extent. This supports the expected relationship between urban stores and vendors explained by location economies.

Table 12: ECR Readiness

Productivity Measures	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Chains
Scan Merchandise	15%	38%	19%	13%	23%	19%
Typical Store has Computer	38%	83%	67%	57%	62%	60%
Electronic Transmission of non-DSD Orders	15%	31%	10%	4%	23%	12%
Shelf Tags Have Reorder Information	54%	69%	57%	57%	69%	62%
Use Formal Planograms	62%	46%	29%	14%	77%	36%
Non-DSD Shelf Space Decisions Coordinated with Outside Parties	77%	46%	48%	36%	77%	50%
Non-DSD Items for Sale Decisions Coordinated with Outside Parties	85%	62%	48%	43%	85%	57%
DSD Shelf Space Decisions Coordinated with Outside Parties	85%	92%	52%	57%	92%	69%
DSD Items for Sale Decisions Coordinated with Outside Parties	62%	85%	57%	57%	85%	67%
ECR Readiness Index[1]	55	62	42	38	66	49
ECR Technology Index[2]	37	54	36	29	51	44
ECR Relationship Index[3]	77	71	51	48	85	77

1. ECR readiness index is an average of all 9 practices.
2. ECR technology index is an average of the first 5 practices.
3. ECR relationship index is an average of the last 4 practices.

For chains grouped by size, large chains have a higher average ECR readiness index than small chains. They have only slightly higher levels of technology adoption except in the use of formal planograms. As a result, the average ECR technological index for large chains is 76 percent higher. This higher average rate supports the expected relationship between large chains and the adoption of more costly technological practices explained by economies of size. In terms of average ECR relationship indices, again large chains are more likely to coordinate decisions for both non-DSD and DSD products with outside parties. Large chains' higher average relationship index supports the expected relationship explained by transaction cost economics.

Table 12 was designed to facilitate comparison to ECR readiness measures from a recent study of business practices in Minnesota supermarkets (Phumpiu, 1997). That study reported on adoption of 17 practices. Many practices included in the supermarket ECR readiness index were not considered in the C-store survey, because they are either not relevant for C-stores or rarely, if ever, used by C-stores. Table 13 compares the rates of adoption for those ECR practices common to both the C-store and supermarket studies. The table is not meant to directly compare the adoption rates of ECR practices for Minnesota C-stores and supermarkets. This would be unfair given that the supermarket industry has been actively involved in the ECR initiative from its beginning.

Table 13: Adoption Rates of ECR Practices: Minnesota Convenience Stores and Supermarkets

ECR Practice	Convenience Stores Adoption Rate (%)	Supermarkets Adoption Rate (%)
Scan Merchandise	17	88
Typical Store has Computer/Manager has Access to Computer[1]	58	15
Electronic Transmission of Orders	12	98
Scanning of Incoming Shipments	0	40
Have Shelf Tags with Reorder Information[2]	62	20
Product Assortment Decisions Coordinated with Outside Parties	59	60

1. The question pertaining to use of computers was worded differently in each survey. In the C-store survey, the respondents were asked "does a typical store have a computer?". In the supermarket study, the interviewer asked, "does the manager have access to a personal computer".
2. This question was designed to capture whether a store was using shelf tag technology to communicate: when a product needed to be reordered, how fast the product moves off the shelf or when the product was last reordered. Because the C-store survey was not interview based, the intended interpretation of the question is not guaranteed.

Overall, it appears that supermarkets are adopting the more costly technological and information based practices to a much greater extent than C-stores. In particular it is interesting to note that supermarkets use scanning technology and electronic transmission of orders to a much greater extent than C-stores. Both of these practices are key elements of ECR. The higher adoption

of computers in C-stores may be explained by the computer applications: accounting, payroll, and pricing activities. These do not necessarily represent ECR practices, although they do create efficiencies within store operations.

The similarity in the coordination of product assortment decisions should also be interpreted cautiously. According to *Convenience Store News*, "the C-store industry's reliance on wholesale distributors and DSD vendors to get products into the store has a down side" (Francella, 1998, p. 22). According to a C-store owner and a member of the joint-industry ECR project, a recent evaluation of implementing category management and ECR initiatives in various trade channels found non-self-distributing retailers and wholesalers were making the least progress (Francella, 1998, p. 22).

Comparisons by ECR Readiness, Store Characteristic and Productivity Measures

To aid in the analysis of how ECR practices relate to C-store characteristics and store performance, a store productivity table was computed for the sub-sample of 42 chains. First, the 42 chains were grouped into three categories--low, medium, and high--based on their ECR readiness index. The 11 chains in the low ECR readiness categories had indices ranging from 0 to 22. This means the chains have adopted at most two of the nine ECR practices. The 23 chains in the medium ECR readiness category had indices ranging from 33 to 67, meaning they have adopted from three to six practices. The 8 chains in the high ECR readiness category had indices ranging from 77 to 100, meaning they have adopted seven or more practices.

For the ECR technology index, 15 chains comprise the low category with indices ranging from 0 to 20, meaning chains have adopted at most one of the five ECR technology practices. The medium category contains 16 chains that have adopted two practices. The high category contains 11 chains,

all adopting three or more practices.

For the ECR relationship index, 11 chains comprise the low category with indices ranging from 0 to 25, meaning the chains have adopted at most one of the four ECR relationship practices. The medium category contains 15 chains that have adopted two to three of the four practices. The high category contains 16 chains that have adopted all four practices.

Next, store characteristics and productivity measures for the chains grouped in the three ECR readiness categories were averaged. The results appear in Table 14 and 15. Store characteristics for chains grouped by ECR indices are presented first, followed by store performance levels for chains grouped by ECR indices. These tables are not meant to imply a causal relationship between the use of ECR practices and store performance. Rather, they help identify relationships that may exist.

In Table 14, all measures of store size, sales, and inventory level increase with ECR readiness. The typical store in a chain with high ECR readiness has, on average, more inside and outside selling area; higher inside, outside and total weekly sales; and more inventory than typical stores in chains with lower levels of ECR readiness.

In terms of the ECR technology index, the low adopters have smaller store areas, sales and inventory when compared with the other groupings. The pattern between the high and medium technology adopters is not as consistent. Chains adopting two technology practices outperform chains adopting three to five practices in store areas, inside sales and inventory. These results should be interpreted with caution.

Table 14. Store Characteristics for Chains Grouped by ECR Indices

Characteristics	ECR Readiness Index			ECR Technology Index			ECR Relationship Index			Avg.[1]
	Low	Med.	High	Low	Med.	High	Low	Med.	High	All Chains
Typical Store Characteristics										
Store Selling Area (sq. ft.)	1,451	2,002	2,208	1,314	2,341	2,188	1,628	2,052	1,911	1,809
Fuel Area (sq. ft)	2,350	3,766	7,452	1,132	6,114	5,743	2,800	5,024	4,657	5,382
Average Inside Weekly Sales ($)	$8,178	$12,415	$15,708	$6,726	$16,825	$12,767	$10,511	$11,982	$12,136	$10,945
Average Outside Weekly Sales (gallons)	9,786	17,039	31,874	10,857	18,026	24,199	10,571	19,405	21,444	18,603
Average Total Weekly Sales ($)[2]	$16,550	$22,613	$50,769	$12,698	$31,696	$37,258	$19,556	$21,656	$31,436	$24,559
Average In-store Inventory Value ($)	$28,750	$44,786	$60,429	$25,881	$61,043	$51,800	$32,500	$42,459	$52,476	$41,952

1. Chains for which an ECR readiness index could not be calculated are included in the average for all stores. Therefore, these averages are not always inside the range for the chains grouped by ECR readiness.
2. One gallon equals $1.10.

As mentioned previously, most computers were being used for administrative tasks and were not being used to facilitate the ordering and receiving process. An examination of a correlation matrix determined that many technology practices were negatively related with inside sales figures. Furthermore, these somewhat counter intuitive results could be evidence that the mix of practices adopted makes a difference, or that synergies among some practices exist. Adopting complementary practices, such as scanning merchandise and transmitting orders electronically, could boost efficiency more than adopting electronic transmission of orders, using shelf tags with reorder information and using formal planograms. Finally, small sample sizes could also be affecting the results.

In terms of the ECR relationship index, those chains adopting all four relationship practices

have higher sales and inventory values than those chains adopting fewer practices. This seems reasonable given that efficient cooperation between vendors and stores should directly impact sales and inventory through efficient replenishment, fewer stock outs and better product assortment.

Store performance values for chains grouped by ECR indices are presented in Table 15.

Table 15: Store Performance Levels for C-store Chains Grouped by ECR Indices

Productivity Measures	ECR Readiness Index			ECR Technology Index			ECR Relationship Index			Avg.[1]
	Low	Med.	High	Low	Med.	High	Low	Med.	High	All Chains
Productivity Measures										
Inside Sales per Labor Hour ($/hour))	$56.98	$75.49	$48.91	$60.64	$84.36	$42.98	74.68	62.25	63.49	$69.35
Outside Sales per Labor Hour (gallons/hour)	80.8	77.0	91.5	70.59	79.80	94.93	$79.59	$72.05	$89.09	95.6
Total Sales per Labor Hour ($/hour)	$126.10	$118.38	$149.59	$99.46	$148.20	$140.23	$142.78	$96.69	141.88	$139.45
Inside Sales per Square Foot of Selling Area ($/sq. ft.)	$6.20	$5.42	$8.50	$5.33	$6.66	$6.87	$7.04	$4.55	$6.85	$7.07
Outside Sales per Square Foot of Fuel Area (gallons/sq. ft.)	4.6	9.4	26.9	11.63	5.12	22.31	4.59	7.85	16.27	11.7
Annual Inventory Turns	19	16	22	16	18	16	20	17	15	16

1. Chains for which an ECR readiness index could not be calculated are included in the average for all stores. Therefore, these averages are not always inside the range for the chains grouped by ECR readiness.

Looking first at the ECR readiness index, there is no consistent relationship between ECR readiness and the six productivity measures. For labor efficiency, the typical stores of chains in the high ECR readiness category have the lowest value of inside sales per labor hour. This suggests that chains using fewer ECR practices outperform chains using the most ECR practices in terms of inside sales per labor hour. The reverse relationship exists for outside sales per labor hour. In terms of efficiency

in using inside and outside selling area and annual inventory turns, however, stores of chains with high ECR readiness clearly outperform those in the low and medium readiness groups. In general, these results suggest that superior performance is associated with a higher level of ECR readiness

In terms of the ECR technology index, stores of chains in the high category outperform those in the medium and low categories in sales area efficiency. In terms of labor productivity, no clear relationship exists. Again, due to unknown synergies that may exist between technology practices and small sample sizes these results should be interpreted with caution.

In terms of the ECR relationship index, stores of chains in the low category outperformed those chains in the medium and high category in four of the six productivity measures. That is, chains adopting zero or one of the four relationship practices outperformed chains adopting more than one practice in inside and total sales per labor hour, inside sales per store selling area and inventory turns. Those chains adopting all four practices outperformed medium and low adopters in the remaining two productivity measures: outside sales per labor hour and outside sales per fuel area. Assuming cooperation with outside parties is correlated with increased inside sales, as the previous table suggested, it is not clear why coordination is impacting outside sales more than inside sales productivity measures. Again, these results should be interpreted with caution given the small sample sizes.

The ECR readiness index results in Tables 14 and 15 can be compared with the findings for Minnesota supermarkets. The definitions of high, medium, and low ECR readiness differ between the supermarket and C-store studies. The supermarket study identified 17 ECR related practices. A supermarket in the high ECR readiness category had adopted from 13 to 17 practices, a store in the medium ECR readiness category had adopted from seven to 12 practices, and a store in the low ECR

category was using at most six practices.

Table 16 contains the productivity measures determined in the supermarket study along side the equivalent measures determined in this C-store study. The respondents are grouped by their ECR readiness index. These results are not meant to directly compare C-store productivity to supermarket productivity based on ECR readiness. This table is for descriptive purposes and is not meant to imply a causal relationship between the use of ECR practices and store productivity.

Table 16: Minnesota Convenience Store and Supermarket Productivity, Grouped by ECR Readiness Level

Productivity Measures	ECR Readiness Index		
	Low	Medium	High
Weekly Sales per Labor Hour ($/hour)			
Convenience Stores (inside sales)	$57	$76	$49
Convenience Stores (total sales)	$126	$118	$150
Supermarkets	$78	$105	$124
Weekly Sales per Sq. Ft. of Selling Area ($/sq.ft.)			
Convenience Stores (inside sales)	$6.20	$5.42	$8.45
Supermarkets	$6.06	$10.70	$13.65
Annual Inventory Turns			
Convenience Stores	19	16	22
Supermarkets	16	26	37

When looking at Table 16, the patterns between the level of adoption of ECR practices and store productivity are much more distinct for supermarkets than for C-stores. For C-stores, there is no meaningful pattern between the number of ECR practices in use and the inside sales per labor hour. In terms of total sales per labor hour, C-stores adopting the most number of practices outperform those adopting fewer practices. On the other hand, the supermarket numbers depict a

positive relationship between the level of ECR adoption and labor efficiency.

In terms of selling area, both supermarkets and C-stores adopting the least number of ECR practices achieved the similar inside sales per selling area. It is the stores adopting the most ECR practices that differ; supermarkets averaged $13.65 in sales per square foot, while C-stores averaged $8.45 for inside sales per square foot. Given that supermarkets averaged 32,720 square feet of selling area and C-stores only averaged 1,809 square feet of inside selling area, the differences are substantial. The total sales per square foot figures for C-stores depict a positive relationship between the level of adoption and selling area efficiency.

Utilizing category management practices effectively would likely have a positive effect on sales per square foot. One such practice is coordinating product decisions with vendors; there is evidence Minnesota C-stores are doing this. Further evidence of Minnesota C-stores adopting practices that would facilitate category management, such as scanning and electronic data interchange, is minimal.

In terms of annual inventory turns, again the stores adopting the fewest ECR practices have fairly similar rates of turnover, but the stores adopting the most practices have very different rates of turnover. Given the high volume of customers they service daily, it is not surprising that supermarkets turn their inventory over faster than C-stores. The magnitude of the difference is important. Strong ordering and receiving practices would likely be associated with higher inventory turns. Evidence of Minnesota C-stores adopting technologically-enhanced ordering and receiving practices, such as using hand-held Telxon units or scanning, is minimal.

Overall, the comparison between supermarkets and C-stores seem to verify that supermarkets are further along in implementing ECR. Also, there seems to be a relationship in both studies

between the number of practices implemented and performance. The benefits of ECR appear to increase with the number of practices implemented. As stores move from low to high or medium to high levels of readiness, productivity measures increase. This seems to support a positive interaction of ECR practices. That is, ECR practices may be beneficial in isolation, but when many are implemented together they tend to generate positive synergies.

Relationships between Productivity and ECR Adoption

The survey results suggest that a chain's size, store location, and ECR readiness are all related to store profitability measures. A regression model was constructed to determine the relative importance of these factors. The independent variables included the ECR readiness indices and several store characteristics, such as chain size, store location, and whether the store sells gasoline. The dependent variables were the computed store productivity measures: weekly inside sales per labor hour, weekly outside sales per labor hour, weekly total sales per labor hour, weekly inside sales per square foot of selling area, weekly outside sales per square foot of fuel area, and annual inventory turns. The following equation was estimated for each of the six productivity measures using ordinary least squares (OLS).

$$\text{Productivity Measure} = ß_0 + ß_1(\text{ECR Readiness Indices}) + ß_2(\text{Chain Size}) + ß_3(\text{Sell Fuel}) + ß_4(\text{Urban Store}) + ß_5(\text{Suburban Store}) + \mu$$

For coefficient signs, one would expect those chains adopting more ECR practices to be more efficient and productive than those chains adopting fewer practices. Larger chains may have economies of size advantages, resulting in lower average costs and potentially higher productivity measures. Stores selling fuel may be able to generate more sales due to sales to customers visiting

the store, although with new pay-at-the-pump technology it will be harder to get gasoline customers into the store. Also, stores selling fuel are likely to have higher labor productivity measures because of their higher total sales than stores that do not sell gasoline. Rural stores, acting as substitutes for rural supermarkets, should have higher sales volume. Also, labor productivity may be higher in single store rural chains when the owner is the principal source of labor.

Only one productivity measure, weekly inside sales per square foot of selling area, showed any sign of being related to the above independent variables. The ECR readiness index was the best predictor among the ECR indices. The estimated results for this equation are shown in Table 17. It should be noted the regression was performed on a sample size of 27. Chains were eliminated from the sample if they did not provide responses needed to construct all regression variables.

Table 17: Coefficients of OLS Regression of Weekly Inside Sales per Square Foot of Selling Area and the ECR Readiness Index

	Dependent Variable: Weekly Inside Sales per Square Foot of Selling Area				
Independent Variable	(1)	(2)	(3)	(4)	(5)
Constant	3.133	2.985	2.579	2.683	2.529
	(2.11)	(2.147)	(2.066)	(2.203)	(2.185)
ECR Readiness Index	7.756	7.789	6.630	7.223	6.528
	(2.82)	(2.891)	(2.644)	(3.028)	(2.815)
Chain Size	0.0420				
	(0.339)				
Sell Fuel dummy	-0.812	-0.619	-0.144		
	(-0.565)	(-0.479)	(-0.123)		
Urban dummy	-0.529	-0.307		-0.074	
	(-0.375)	(-0.251)		(-0.067)	
Suburban dummy	-2.102	-1.909		-1.701	
	(-1.42)	(-1.431)		(-1.371)	
R^2	0.31	0.31	0.24	0.30	0.24
Sample Size	27	27	27	27	27

Notes: t-statistics in parenthesis. The ECR Readiness Index comprises nine technical, organizational, and management practices. The urban dummy variable takes a value one when the chain's store locations are predominantly urban and the value zero when the chain's stores are predominantly suburban or rural. The suburban dummy variable takes a value one when the chain's store locations are predominantly suburban and the value zero when the chain's store locations are predominantly urban or rural.

As expected, the ECR readiness index had a statistically significant positive relationship with weekly inside sales per square foot of selling area. Chain size also had the expected, but not statistically significant, positive relationship with weekly inside sales per selling area. Chains selling fuel have slightly lower weekly inside sales per selling area than chains not selling fuel. Perhaps the added volume of customers is not as significant as expected or customers stopping to buy gasoline seldom purchase goods from inside the store. Finally, as expected, the location dummy variables indicate rural chains have higher weekly inside sales per square foot of selling area than suburban and urban chains.

The regression equation where the independent variables are the ECR readiness index, urban dummy and suburban dummy (column labeled (4)), appears to be the best specification based on the combination of t-statistic and R^2 values. The ECR readiness index variable is highly significant at the 0.006 level. Interpretation of the $ß_1$ coefficient for the ECR readiness index variable says, if you increase the number of practices adopted by one–that is increase the ECR readiness index by one-ninth, or 0.11--weekly inside sales per square foot of selling area will increase by $0.80, all else held constant. The suburban location dummy also seems to be explaining part of the variation in the productivity measure, though it is only significantly different from zero at the 0.183 level.

The result that the ECR Readiness Index is positively associated with weekly inside sales per square foot of selling area is especially noteworthy. This same positive relationship was found in the Minnesota supermarket industry study (Phumpiu, 1997). Because the same variables were not used in both OLS regressions, more specific conclusions cannot be drawn. What can be said is that those practices associated with ECR in the grocery industry as well as in the C-store industry are positively impacting each industry's sales per square foot performance figures.

Keeping in mind that joint programs are essential for successful implementation of ECR, the survey results were analyzed for evidence of retailers taking steps to work with their suppliers. Evidence was apparent in the store operating procedures related to product assortment and shelf space allocation decisions and ordering and receiving practices.

In terms of the expected relationships explained by economic theory, supporting evidence was found in several cases. Larger chains are implementing the more costly technological practices to a greater extent than small chains due to their economies of size advantage. Larger chains are also cooperating and communicating more with their suppliers than small chains due to the transactions costs involved in maintaining these business relationships. Rural chains carry more product variety and selection, supporting the expected relationship between rural C-stores and supermarkets explained by location economies. Finally, also explained by location economies, urban chains coordinate business practices with suppliers to greater degree than suburban and rural chains.

Efforts being made by retailers and suppliers to implement enabling technologies that facilitate communication and business practices were not investigated. Given the low levels of technology use--namely scanning and hand-held Telxon use--it appears most C-stores are not ready to begin working with their suppliers to implement technology-based business practices, such as electronic transmission of orders and other forms of electronic data interchange.

Summary and Conclusion

The C-store industry is changing, as new information technologies, new business practices, and new retail strategies are developed. The results from this survey can serve as a baseline for future research monitoring the adoption of these innovations and assessing their impact on productivity and

profitability.

The survey found significant differences in store characteristics, technology adoption, business practices, and performance for stores grouped by location and by chain size. An improved understanding of the reasons for and implications of these differences will help C-store operators to understand the evolution of their industry and develop strategies for responding to these changes.

There is some evidence Minnesota C-stores are adopting ECR practices. There is little evidence, however, that firms have adopted enabling technologies which would facilitate ECR implementation. Scanning is not yet as common in the C-stores as it is in supermarkets. Only 19 percent of Minnesota respondents scan merchandise; this compares with 97 percent of the nation's supermarkets. Evidence that chains are building relationships with vendors and increasing communication between stores and headquarters is more significant. Both non-DSD and DSD shelf space and product assortment decisions are being coordinated with outside parties 50 to 70 percent of the time, with large chains leading the way.

In terms of the ECR readiness index, chains with more store selling area and fuel area, with higher inside and outside weekly sales, and with higher in-store inventory value have adopted more ECR practices. Having adopted six to nine practices is highly correlated with higher inside and outside sales per square foot of selling area and higher annual inventory turns. The relationship to inside sales per labor hour is not as impressive.

For those chains adopting less than six of the nine ECR readiness practices, the impact on productivity varied by the number of practices implemented. Those chains adopting one to two practices outperformed those adopting three to six practices in four of the six productivity measures. This may imply synergies exist among certain practices. That is, the mix of practices is what matter,

not the sheer number adopted. Also, if a store had recently implemented an ECR practice, it might have been too soon to note changes in the store's performance. Further research into why this pattern exists and the how specific ECR practices interact with one another is needed.

In terms of the ECR technology index, those chains using all five technology practices tend to outperform those chains adopting fewer practices in both selling area productivity measures. No clear pattern exists in the labor productivity measures. In terms of the ECR relationship index, chains using all four relationship practices have higher sales and inventory values than those chains using fewer practices.

Economic theory helps explain further relationships. In terms of economies of size, larger chains are implementing the more costly technological practices to a greater extent than small chains. Larger chains are also cooperating and communicating more with their suppliers than small chains due to the transactions costs involved in maintaining these business relationships. In terms of location economies, rural chains carry more product variety and selection, supporting the expected relationship between rural C-stores and supermarkets. Also urban chains coordinate business practices with suppliers to a greater degree than suburban and rural chains.

In the supermarket study, ECR adoption rates were higher and more strongly correlated with store productivity than in C-stores. Nonetheless, regression analyses confirmed ECR practices are positively related to store sales performance in both supermarkets and C-stores. Also, in both studies, stores adopting the most practices had higher productivity measures.

Overall, it appears ECR is just beginning to impact the Minnesota C-store industry. Minnesota C-stores appear to be smaller but more productive than the national average. With ECR playing an increasingly dominant role within the entire supermarket industry, the C-store industry can

take advantage of the lessons learned by supermarkets.

Appendix A: Convenience Store Mail Survey

1. Does your company operate a distribution warehouse? ☐ YES ☐ NO

   a. If NO, who is your primary supplier? _____

   b. What % of SKUs do they supply? _____

CHARACTERISTICS OF TYPICAL STORES

(Complete each applicable category)	**Urban**	**Suburban**	**Rural**
2. Number of Corporate Stores	_____	_____	_____
3. Number of Franchised Stores	_____	_____	_____
4. Hours Open	_____	_____	_____
5. Store Selling Area (sq ft)	_____	_____	_____
6. Backroom Storage Area (sq ft)	_____	_____	_____
7. Backroom Office Area (sq ft)	_____	_____	_____
8. Fuel Area (sq ft)	_____	_____	_____
9. Labor Hours per week:			
a. Full Time	_____	_____	_____
b. Part Time	_____	_____	_____
10. Number of Suppliers:			
a. Direct Store Delivered (DSD)	_____	_____	_____
b. non-DSD	_____	_____	_____
11. Number of Deliveries per week from Distribution Warehouse or Primary Supplier	_____	_____	_____
12. Total Number of SKUs	_____	_____	_____
13. Percentage of SKUs that are:			
a. DSD	_____	_____	_____
b. non-DSD	_____	_____	_____
14. Average Weekly Sales			
a. Inside ($)	_____	_____	_____
b. Outside (gallons)	_____	_____	_____

15. Which of the following products/services do you offer in a typical store?

	Yes	No	Plan To		Yes	No	Plan To
a. ATM	☐	☐	☐	j. Lottery Tickets	☐	☐	☐
b. Bakery	☐	☐	☐	k. Money Orders	☐	☐	☐
c. Bank Debit Card Payments	☐	☐	☐	l. Sandwich Bar	☐	☐	☐
d. Check Cashing	☐	☐	☐	m. Seating for Fast Food	☐	☐	☐
e. Check Verification System	☐	☐	☐	n. Transportation Tickets	☐	☐	☐
f. Credit Card Payments	☐	☐	☐	o. Video Rentals	☐	☐	☐
g. Branded Fast Food	☐	☐	☐	p. Video Games	☐	☐	☐
h. Event Tickets	☐	☐	☐	q. Other:_____	☐	☐	☐
i. Film Processing	☐	☐	☐	r. Other:_____	☐	☐	☐

16. In a typical store, what products are DSD? (please check all that apply)

a. ☐ Automotive Supplies
b. ☐ Bakery Items--Freshly Baked
c. ☐ Bakery Items--Other
d. ☐ Candy (confectionery)
e. ☐ Canned Goods
f. ☐ Carbonated Soft Drinks
g. ☐ Carbonated and Natural Water
h. ☐ Cigarettes
i. ☐ Chips and Snacks
j. ☐ Coffee
k. ☐ Dairy
l. ☐ Deli Items
m. ☐ Dry Grocery Items
n. ☐ Frozen Pizza
o. ☐ Frozen Ice Cream Products
p. ☐ Other Frozen Foods: _____
q. ☐ Other Frozen Foods: _____
r. ☐ Health and Beauty Aids
s. ☐ Juices Carbonated and Natural
t. ☐ Meats
u. ☐ Newspapers and other Publications
v. ☐ Paper Products
w. ☐ Produce
x. ☐ Refrigerated Sandwiches
y. ☐ Smokeless Tobacco
z. ☐ Other: _____
zz. ☐ Other: _____

17. Does a typical store have a computer? ☐ YES ☐ NO

If YES, what capabilities does it provide?

	Yes	No	Plan To		Yes	No	Plan To
a. f.Accounting	☐	☐	☐	Networked with Hdqrts	☐	☐	☐
b. gOrdering	☐	☐	☐	Shelf Space Allocation	☐	☐	☐
c. hPersonnel Scheduling	☐	☐	☐	Other:_____	☐	☐	☐
d. i.Payroll	☐	☐	☐	Other:_____	☐	☐	☐
e. \ Pricing	☐	☐	☐				

18. Does a typical store scan merchandise at the checkout? ☐ YES ☐ NO

If YES, what reports do you generate from the scanner data?

	Yes	No	Plan To
a. Movement of Items	☐	☐	☐
b. Sales	☐	☐	☐
c. Other:_____	☐	☐	☐
d. Other:_____	☐	☐	☐

e. If YES, do you sell your scanner data? ☐ YES ☐ NO
f. If YES, do you share your scanner data with your suppliers? ☐ YES ☐ NO

SHELF SPACE ALLOCATION AND PRODUCT ASSORTMENT

19. If you have multiple stores, do they have a standardized layout? ☐ YES ☐ NO

19a. If NO, what is the job title(s) of the person(s) who decides on the layout for a typical store?

_____

20. Do you use formal planograms for shelf space allocation? ☐ YES ☐ NO

a. If YES, who provides the planograms? _____

b. If YES, do the planograms vary across stores? ☐ YES ☐ NO

Non-DSD Products

21. For non-DSD products, who approves individual items for sale in the stores?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the Non DSD vendors? ☐ YES ☐ NO

22. For non-DSD products, who decides on the shelf space allocation for individual items?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the non-DSD vendors? ☐ YES ☐ NO

23. For non-DSD products, who decides on the arrangement of the items on the shelf?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the non-DSD vendors? ☐ YES ☐ NO

24. Within product categories, do shelf layouts vary across stores for non-DSD goods? ☐ YES ☐ NO

DSD Products

25. For DSD products, who approves individual items for sale in the stores?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the DSD vendors? ☐ YES ☐ NO

26. For DSD products, who decides on the shelf space allocation for individual items?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the DSD vendors? ☐ YES ☐ NO

27. For DSD products, who decides on the arrangement of the items on the shelf?

☐ Corp. Headquarters ☐ Store Manager ☐ Vendor ☐ District Office ☐ Other: _____

a. Are the decisions coordinated with the DSD vendors? ☐ YES ☐ NO

28. Within product categories, do shelf layouts vary across stores for DSD goods? ☐ YES ☐ NO

INVENTORY MANAGEMENT, ORDERING, AND RECEIVING

29. How often are physical inventories performed in a typical store? _____

30. What is the average in-store inventory value? _____

Non-DSD Products

31. Who generates orders for non-DSD products?

☐ Store Manger ☐ Assistant Store Manger ☐ Other:_____

32. How are orders assembled for non-DSD products?

☐ Written Order Form ☐ Hand-Held Telxon Unit ☐ Other: _____

33. How are non-DSD orders sent to the supplier?

☐ Fax ☐ Electronic Transmission ☐ Phone ☐ Other: _____

34. How are non-DSD orders verified for accuracy upon delivery?

☐ Visual Count ☐ Scanned Count ☐ Not Verified ☐ Other _____

35. How are non-DSD suppliers paid?

☐ Check ☐ Electronic Funds Transfer ☐ Both ☐ Other: _____

36. Does your primary supplier assemble non-DSD orders to facilitate restocking of the shelves? ☐ YES ☐ NO

DSD Products

37. Who generates orders for DSD products,?

☐ DSD Vendor with Store Manager Approval ☐ Store Manger ☐ Other:_____

☐ DSD Vendor without Store Manager Approval ☐ District Manger/Supervisor

38. How are DSD orders verified for accuracy upon delivery?

☐ Visual Count ☐ Scan Count ☐ Not Verified ☐ Other:_____

39. How are DSD suppliers paid?

☐ Check ☐ Cash ☐ Money Order ☐ Electronic Funds Transfer ☐ Other:_____

40. Who places DSD orders on the shelf?

☐ Vendor ☐ Store Manger ☐ Asst. Store Manager ☐ Store Employee
☐ Other:_____ ☐ Other: _____

PRICING AND PROMOTIONS

41. Who determines the prices for products sold in the store?
☐ Corp. Headquarters ☐ District Manger ☐ Store Manger ☐ Other:_____

42. How are price changes transmitted to the stores?

☐ Electronically ☐ Delivered by District Manager/Supervisor ☐ Other:_____

☐ Faxed ☐ Delivered by _____ ☐ Other:_____

43. Do you have shelf tags for Non DSD products? ☐ YES ☐ NO

a. If YES, who provides the shelf tags? _____

44. Do you have shelf tags for DSD products? ☐ YES ☐ NO

a. If YES, who provides the shelf tags? _____

45. What information is contained on the shelf tags?

☐ Vendor	☐ Category	☐ Price
☐ Size	☐ Reorder Point	☐ Movement Information
☐ Price/Unit	☐ Reorder Quantity	☐ Other: _____
☐ Other: _____		☐ Other: _____

46. Which phrase best describes your company?

☐ Prices are the same in all stores ☐ Prices are the same for stores grouped by size/location
☐ Prices vary in each store ☐ Other:_____

47. What kinds of promotions are used in a typical store?

☐ Special Displays Provided by Vendor ☐ In Store Coupons ☐ Other:_____
☐ Home Delivered Circulars ☐ Newspaper Adds ☐ Other:_____

THANK YOU!

Appendix B: Survey Results

Table 1. Typical Store Characteristics

	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Hours Open (per day)	16.2	16.0	16.9	16.4	19	17.0
Store Selling Area (sq. ft.)	1,476	2,303	1,730	1,659	2,142	1,809
Backroom Storage Area (sq. ft.)	334	509	404	412	429	417
Backroom Office Area (sq. ft.)	111	125	98	136	68	115
Fuel Area (sq. ft.)	6,413	3,088	4,584	2,986	8,883	5,382
Full Time Labor Hours (per week)	106	108	90	85	164	109
Part Time Labor Hours (per week)	80	86	96	83	115	91
Number DSD Suppliers	16.4	18.8	16.7	14.0	24.6	17.1
Number of Non-DSD Suppliers	4.7	1.3	4.1	4.4	3.3	4.0
Number of Deliveries per week from warehouse/primary supplier	3.1	1.4	3.4	3.2	1.7	2.8
Total Number of SKUs	2,910	1,663	3,602	3,037	4,100	3,446
Average Inside Weekly Sales ($)	$7,682	$7,856	$12,727	$10,668	$12,211	$10,945
Average Outside Weekly Sales (gallons)	33,138	9,664	12,942	14,127	29,795	18,603
Average In-Store Inventory Value ($)	$40,306	$50,929	$39,173	$38,498	$55,421	$41,952

Table 2. Percentage of Respondents Offering Selected Products and Services Offered in a Typical Store

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Stores
Bank Debit Card Payments	22%	40%	36%	29%	25%	28%
Check Cashing	41%	60%	46%	49%	38%	46%
Check Verification System	37%	53%	27%	28%	38%	30%
Credit Card Payments	30%	63%	71%	52%	46%	51%
Financial Services:						
ATM	37%	75%	33%	29%	71%	40%
Money Orders	33%	29%	15%	13%	46%	21%
Prepared Meals:						
Bakery	65%	75%	46%	48%	85%	56%
Branded Fast Food	39%	71%	54%	49%	62%	52%
Sandwich Bar	61%	53%	48%	46%	69%	52%
Seating for Fast Food	28%	40%	44%	26%	67%	35%
Entertainment Services:						
Event Tickets	13%	15%	8%	5%	17%	8%
Video Rentals	44%	60%	75%	54%	71%	58%
Video Games	29%	36%	64%	44%	43%	43%
Misc. Services						
Lottery Tickets	79%	88%	86%	79%	93%	82%
Transportation Tickets	13%	8%	4%	3%	17%	6%
Film Processing	28%	7%	11%	15%	15%	15%

Table 3. Percentage of Respondents Using Direct Store Delivery (DSD) for Selected Products

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two Stores	Three or More Stores	All Stores
Bakery Items -freshly baked	62%	63%	58%	56%	69%	59%
Bakery Items-Other	67%	63%	78%	68%	69%	68%
Canned Goods	71%	69%	59%	86%	54%	79%
Dry Grocery Items	71%	75%	85%	86%	54%	79%
Health and Beauty Aids	95%	100%	89%	93%	85%	91%
Paper Products	67%	69%	81%	80%	54%	74%
Carbonated Soft Drinks	90%	100%	93%	93%	92%	93%
Carbonated and Natural Water	95%	100%	96%	95%	100%	96%
Coffee	62%	88%	85%	80%	77%	79%
Juices, Carbonated and Natural	81%	81%	93%	95%	69%	89%
Candy	81%	75%	93%	95%	54%	86%
Chips and Snacks	100%	100%	96%	98%	100%	98%
Dairy	90%	94%	96%	93%	92%	92%
Deli Items	52%	69%	85%	75%	54%	70%
Meats	24%	44%	59%	43%	38%	42%
Produce	29%	56%	37%	39%	54%	42%
Refrigerated Sandwiches	76%	75%	89%	86%	77%	84%
Frozen Pizza	81%	100%	93%	86%	100%	89%
Frozen Ice Cream	90%	94%	93%	93%	77%	89%
Cigarettes	81%	75%	89%	93%	54%	84%
Smokeless Tobacco	71%	75%	85%	86%	54%	79%
Newspapers and other	100%	100%	89%	93%	100%	95%
Automotive Supplies	62%	73%	78%	73%	62%	70%

Table 4. Scanning, Shelf Tags, and Computer Use in a Typical Store

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Percentage Scan Merchandise	10%	31%	21%	16%	21%	17%
Percentage that Scan Merchandise to:						
Generate reports on Sales	*	80%	100%	86%	*	90%
Generate reports on Movement of Items	*	67%	86%	86%	*	80%
Share scanner data with suppliers	*	20%	14%	0%	*	21%
Sell scanner data	*	20%	14%	0%	*	9%
Use Shelf Tags for non-DSD Products:	41%	79%	39%	30%	92%	45%
Use Shelf Tags for DSD Products:	78%	67%	76%	76%	55%	73%
Information Contained on Shelf Tags:						
Reorder Information	71%	73%	68%	72%	75%	76%
Size	71%	53%	77%	64%	75%	67%
Price	45%	53%	27%	28%	42%	31%
Category	18%	20%	14%	14%	25%	17%
Vendor	18%	7%	18%	11%	8%	10%
Price/unit	0%	7%	9%	6%	8%	6%
Use a Computer	43%	81%	69%	56%	64%	58%
Use a computer for:						
Accounting	80%	83%	95%	96%	78%	91%
Payroll	44%	55%	65%	70%	13%	55%
Pricing	44%	58%	53%	50%	56%	52%
Ordering	22%	27%	25%	30%	11%	24%
Networked with Headquarters	33%	30%	29%	6%	67%	27%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
* The number of chains responding to this question is too small to calculate a meaningful average.

Table 5. Product Assortment and Shelf Space Allocation Practices for Non-DSD Products

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Who Approves Items for Sale in Stores:						
Corporate Headquarters	11%	20%	12%	8%	23%	12%
District Office	16%	27%	4%	0%	38%	10%
Store Manager/Single Store Owner	68%	53%	64%	92%	54%	83%
Vendor	11%	0%	0%	5%	0%	4%
Item Approval Decisions are Coordinated with Vendor	71%	64%	55%	48%	83%	59%
Who Decides on Shelf Space Allocation:						
Corporate Headquarters	11%	13%	13%	5%	23%	10%
District Office	6%	13%	0%	0%	15%	4%
Store Manager/Single Store Owner	78%	80%	67%	97%	69%	90%
Vendor	6%	0%	4%	3%	8%	4%
Shelf Space Allocation Decisions are Coordinated with Vendor	56%	45%	45%	43%	67%	50%
Who Decides how Items are Arranged on the Shelf:						
Corporate Headquarters	11%	13%	8%	8%	23%	12%
District Office	0%	7%	0%	0%	8%	2%
Store Manager/Single Store Owner	78%	73%	67%	95%	77%	90%
Vendor	0%	0%	4%	3%	0%	2%
Item Arrangement Decisions are Coordinated with Vendor	59%	45%	37%	41%	60%	46%
Within Products Categories, shelf layouts vary across stores:	75%	87%	71%	100%[1]	92%	94%
Standardized Layout of Stores[1]	54%	8%	12%	10%[1]	36%	21%
Use Formal Planograms	50%	47%	19%	18%	64%	30%
Planograms Vary Across Stores	100%	100%	60%	75%[1]	86%	75%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.
[1] These questions do not pertain to single store chains and their responses are not used in calculating these averages.

Table 6. Product Assortment and Shelf Space Allocation Practices for DSD Products

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Who Approves Items for Sale in Stores:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
District Office	10%	13%	0%	0%	23%	5%
Store Manager/Owner	80%	75%	92%	90%	77%	87%
Vendor	0%	0%	4%	2%	0%	2%
Item Approval Decisions are Coordinated with Vendor	59%	79%	62%	63%	77%	67%
Who Decides on Shelf Space Allocation:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
District Office	20%	13%	0%	5%	23%	9%
Store Manager/Owner	65%	75%	92%	86%	69%	82%
Vendor	5%	0%	4%	2%	8%	4%
Shelf Space Allocation Decisions are Coordinated with Vendor	63%	79%	50%	56%	77%	62%
Who Decides on how items are Arranged on the Shelf:						
Corporate Headquarters	20%	25%	12%	12%	23%	15%
District Office	5%	6%	0%	0%	15%	4%
Store Manager/Single Store Owner	80%	75%	89%	86%	77%	84%
Vendor	5%	13%	8%	10%	8%	9%
Item Arrangement Decisions are Coordinated with Vendor	60%	71%	50%	52%	77%	59%
Within Products Categories, shelf layouts vary across stores	63%	93%	75%	80%[1]	85%	83%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

[1] These questions do not pertain to single store chains and their responses are not used in calculating these averages.

Table 7. Ordering, Receiving and Inventory Management Practices for Non-DSD Products

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Who Generates the Orders:						
Store Manager/Single Store Owner	94%	93%	96%	97%	100%	98%
Assistant Store Manager	11%	20%	4%	3%	23%	8%
Other Employee	6%	20%	4%	3%	15%	6%
How Orders are Assembled:						
Written Order Form	82%	80%	84%	81%	77%	80%
Hand Held Telxon Unit	18%	40%	16%	22%	38%	26%
How Orders are Sent to Supplier:						
Phone	67%	60%	67%	71%	62%	69%
Fax	22%	13%	13%	21%	8%	18%
Electronic Transmission	17%	27%	8%	8%	23%	12%
How Orders are Verified for Accuracy:						
Visual Count/Purchase Order	100%	100%	92%	95%	100%	96%
Scanned Count	0%	0%	0%	0%	0%	0%
Not Verified	0%	0%	4%	3%	0%	2%
How Suppliers are Paid:						
Check	100%	93%	96%	95%	100%	96%
Cash	0%	7%	17%	14%	0%	10%
Money Draft	6%	7%	4%	0%	8%	2%
Electronic Funds Transfer	0%	0%	8%	3%	8%	4%
The Primary Suppliers Assemble Orders to Facilitate Restocking of the Shelves:	31%	40%	22%	26%	33%	28%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

Table 8. Ordering, Receiving and Inventory Management Practices for DSD Products

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Who Generates the Orders:						
DSD Vendor with Store Manager /Single Store Owner Approval	67%	56%	38%	40%	92%	52%
DSD Vendor without Store Manager Approval	14%	6%	12%	9%	8%	9%
District Manger/Supervisor	10%	13%	4%	5%	8%	5%
Store Manager/Single Store Owner	39%	38%	69%	60%	15%	50%
How Orders are Verified for Accuracy:						
Visual Count	95%	100%	100%	98%	100%	98%
Not Verified	5%	0%	0%	2%	0%	0%
How Suppliers are Paid:						
Check	100%	100%	100%	100%	100%	100%
Cash	30%	25%	15%	28%	15%	25%
Money Order	0%	6%	0%	0%	8%	2%
Electronic Funds Transfer	0%	0%	4%	2%	0%	2%
Money Draft	5%	6%	4%	0%	8%	2%
Who Places Orders on the Shelf:						
Vendor	43%	50%	11%	33%	38%	33%
Store Manager/Owner of single store	62%	63%	82%	77%	46%	70%
Assistant Store Manager	19%	13%	7%	9%	15%	11%
Store Employee	48%	69%	59%	52%	69%	56%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

Table 9. Pricing and Promotions Practices

	Location			Chain Size		Average
	Urban	Suburban	Rural	One and Two	Three or More	All Stores
Who Determines the Prices for Products Sold in the Store:						
Corporate Headquarters	25%	31%	18%	14%	36%	19%
District Manager	20%	31%	0%	7%	36%	14%
Store Manager/Owner of single store	55%	62%	75%	84%	43%	70%
Suppliers	20%	6%	25%	2%	14%	11%
How Price Changes are Transmitted to the Store(s):						
Delivered by: invoice/supplier	21%	31%	50%	57%	17%	45%
Delivered by: dist. Manager/supervisor	36%	31%	25%	23%	42%	29%
Electronically	7%	15%	15%	7%	17%	10%
Delivered by: mail/owner/manager/phone	7%	8%	10%	7%	0%	0%
Faxed	21%	23%	15%	7%	42%	17%
Prices are the Same in All Stores[1]	43%	55%	44%	57%	50%	52%
Prices Vary in Each Store[1]	29%	9%	44%	43%	21%	29%
Prices are the Same for Stores Grouped by Size/Location	29%	18%	11%	0%	29%	19%
Promotions Used in Typical Store:						
Special Displays Provided by Vendor	89%	100%	85%	88%	92%	89%
In Store Coupons	47%	33%	26%	21%	38%	25%
Newspaper Adds	21%	20%	41%	21%	31%	24%
Home Delivered Circulares	21%	33%	19%	14%	23%	16%

Note: the totals may exceed 100 percent where respondents identified multiple ways to perform store operations.

[1] These questions do not pertain to single store chains and their responses are not used in calculating these averages.

References

"1996 Industry Report Online." National Association of Convenience Stores, http://www.csnews.com.

"1998 Industry Report, Part I." *Convenience Store News*, May 25, 1998a, pp. 23-62.

"1998 Industry Report, Part II." *Convenience Store News*, June 15, 1998b, pp. 23-60.

1998 Marketing Guidebook. Trade Dimensions, September, 1997.

Azzato, Maureen. "ECR: Trust and Collaboration." *Convenience Store News*, May 22, 1995, p. 48.

Bohen, Jim. "You Can't Stand Still, A Report on Convenience Stores." *Minnesota Grocer*, Spring 1997, pp. 18-19.

Dillman, Don A. *Mail and Telephone Surveys, The Total Design Method*. John Wiley & Sons, New York, 1978.

Dwyer, Steve. "New Category Management Tool Enhances C-store Information Flow." *National Petroleum News*, February 1996, pp. 58-61.

Food Industry Report. August 4, 1997, p. 2.

Fox, Bruce. "C-stores Play Catch-Up." *Chain Store Age Executive*, January 1995, pp. 88-94.

Francella, Barbara Grondin. "Partners in Time?" *Convenience Store News*, 4 May 1998, pp. 17-22.

Francella, Barbara Grondin. "More for Less: Progressive C-store operators move groceries by selling supermarket favorites at supermarket prices." *Convenience Store News*, 6 May 1996, pp. 47-52.

Francella, Barbara Grondin and Wendy Turett Ross. "1997 Industry Report, Mighty Merchandise Sales Win Out, Part 1." *Convenience Store News*, 5 May 1997, pp. 35-67.

Francella, Barbara Grondin and Wendy Turett Ross. "1997 Industry Report, Mighty Merchandise Sales Win Out, Part 2." *Convenience Store News*, 2 June 1997, pp. 33-76.

Francella, Barbara Grondin and Barbara Killeen. "1997 Technology Study." *Convenience Store News*, 25 August 1997, pp. 19-29.

Harper, Roseanne. "On Line Service." *Supermarket News*, 16 February, 1998, pp. 19-22.

Joint Industry Project on Efficient Consumer Response. *The ECR Roadmap; Organizing Your Effort* . 1995.

Kaplan, Andrew. "Report Claims: C-stores To Benefit From Supermarket Decline." *US Distribution Journal*, April 15, 1995, p. 38.

Kurt Salmon Associates, Inc. ECR 1995 Progress Report. Joint Industry Project of Efficient Consumer Response, 1995.

Kurt Salmon Associates, Inc. Efficient Consumer Response; Enhancing Consumer Value in the Grocery Industry. *Food Marketing Institute*, January 1993.

Minnesota Grocer. Grocery Industry Directory and Resource Guide. Spring 1996.

"NACS Expands C-store Definition, Releases Census." *National Petroleum News* , February 1995, p. 8.

Phumpiu, Paul Fernando. "Institutional and Technological Innovations and the Changing Form of Business Relationships: Evidence from the Food Industry." Ph.D Thesis, Department of Applied Economics University of Minnesota, December 1997.

Phumpiu, Paul F. and Robert P. King. "Adoption of ECR Practices in Minnesota Grocery Stores." Working Paper 97-01, The Retail Food Industry Center, Department of Applied Economics, University of Minnesota, February, 1997.

"Re-Engineering the Grocery System: The Challenge (and Controversy) of Efficient Consumer Response." *Food Retailing Review*, Food Institute, 1995, p. 291.

Smith, Don. "Category Management: Re-shaping the World of C-store Marketing." *National Petroleum* News, February 1996, pp. 55-56.

Zellner,Wendy and Emily Thornton. "How Classy Can 7-Eleven Get?" *Business Week*, September 1, 1997, pp. 74-75.

Willard Bishop Consulting, Ltd. "U.S. Store Format Update." Competitive Edge, May 1998.