

The Food Retailing Structure of the Northwest Territories

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ABSTRACT. Food retailers in the Northwest Territories face dramatically different conditions from those of southern food retailers. There are three main differences: (1) small market size, (2) limited geographical access to suppliers and (3) different types of competitors. These differences have resulted in higher food prices and smaller, more general, stores with a wider variety of merchandise than southern supermarkets. Resupply is much less frequent than in southern supermarkets because resupply must be made via either air or barge shipment rather than truck delivery. The N.W.T. food retailing structure comprises three types of food retailers: the independently operated stores, the cooperatives and chain stores. This first examination of the similarities and differences between the store types is drawn from a mail survey of all the food retailers in the N.W.T.

The food retailers have adapted to the small, isolated northern markets by expanding their merchandise line well beyond food products. The Hudson's Bay Company stores carry the widest variety of merchandise, while the others carry a more limited product line.

Inventory management varies among the store types. The cooperatives generally fail to use the cheaper alternative transportation modes (road or water) where possible. This is not due to location but may reflect poor managerial skills or simply a lack of profit motivation.

Key words: food retailing, Northwest Territories, mode, retail structure, management, Hudson's Bay Company, cooperatives, independents

RÉSUMÉ. Les détaillants en alimentation des Territoires du Nord-Ouest font face à des conditions radicalement différentes de celles des détaillants en alimentation du Sud. Il y a trois différences principales: (1) le marché est plus petit, (2) l'accès géographique aux fournisseurs est limité et (3) les concurrents sont d'un genre différent. Ces différences font que le prix de la nourriture est plus élevé, que les magasins sont plus petits et qu'ils ressemblent plus à un magasin général, offrant une plus grande variété de marchandises que les supermarchés du Sud. La fréquence du réapprovisionnement est moindre que pour ces derniers, car l'approvisionnement doit se faire par avion ou par péniche plutôt que par camion. La structure de l'alimentation de détail dans les T. N.-O. comprend trois types de détaillants: les magasins indépendants, les coopératives et les magasins appartenant à des chaînes. Ce premier examen des ressemblances et des différences entre les types de magasins a été obtenu à partir d'une enquête postée à tous les détaillants en alimentation des T. N.-O.

Les détaillants en alimentation se sont adaptés aux petits marchés isolés du Nord en élargissant la gamme de leurs produits bien au-delà des produits alimentaires. Les magasins de la Compagnie de la Baie d'Hudson ont la plus grande variété de marchandises, tandis que les autres ont une gamme de produits plus limitée.

La gestion des inventaires varie entre les différents types de magasins. En général, les coopératives ne profitent pas des autres moyens de transport (routiers et par voie d'eau) là où elles le pourraient. Cela n'est pas dû à leur situation géographique, mais c'est plutôt le reflet d'un manque d'expérience en gestion ou simplement d'un manque de motivation à réaliser des profits.

Mots clés: vente d'alimentation au détail, Territoires du Nord-Ouest, moyen, structure de vente de détail, gestion, Compagnie de la Baie d'Hudson, coopératives, magasins indépendants

INTRODUCTION

Food retailers in the Northwest Territories face dramatically different conditions from those of the southern food retailers. There are three main differences: (1) small market size, (2) limited geographical access to suppliers and (3) different types of competitors. Northern consumers and the government have monitored the high food prices, but little research has been directed at describing and/or understanding northern food retailers.

The major purpose of this paper is to describe, compare and contrast the three major types of food retailers in the N.W.T.: the independents, the cooperatives and the Hudson's Bay Company stores. This is the first time a comparison between the attributes and behavior of the three store types has been reported. The data used in the analysis were collected during the 1985 Consumer and Corporate Affairs Canada project on food retailing in the N.W.T. (Green *et al.*, 1986a).

The paper is organized as follows: (1) a description of the conditions inherent in the N.W.T. that make the competitive conditions facing northern retailers different from those in the South; (2) a brief description of the research design; (3) a comparison of products and services offered by the three store types; (4) differences/similarities in store size; (5) comparisons

and contrasts of managerial experience; (6) store location; and (7) behavior (inventory management) across the three competitors.

CONDITIONS IN THE N.W.T.

Small Market Size

The total N.W.T. population is approximately 50 000 (G.N.W.T., 1984), the size of a small southern city. These 50 000 people live in 60+ communities (62-66, depending upon source) spread across approximately 3.4 million km² (G.N.W.T., 1982). Fifty-eight percent of the N.W.T. residents are of native descent — Indian or Inuit heritage (Statistics Canada, 1981). Only 10 communities have a population of over 1000 people (G.N.W.T., 1984).

Limited Geographical Accessibility

Not only are the communities small, but their accessibility is limited. If the communities were self-sufficient with regard to food, then the isolation of the communities and the immense distances from outside food sources would not impact either the cost of food or retailing practices. The geography and climate of the region limits food production to hunting and fishing of

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country food (e.g., caribou, seal, arctic char, muktuk). All fruits, vegetables, dairy products, domestic meats, eggs, staples (flour, sugar, salt, etc.) and processed foods (e.g., baked goods, beverages) must be shipped in from outside the N.W.T.

The legal right to hunt and gather country food is restricted to natives (with only a few exceptions). As country food is sold in only a few northern communities, most non-natives (42% of the northern residents) rely exclusively on imported foods. Although natives have access to country foods, recent evidence suggests they are changing their dietary habits and use a large variety of southern foods in their diets (Green *et al.*, 1986b; Usher, 1985; and Schaefer and Steckle, 1980). This is in contrast to their presettlement days when the only non-country foods consumed were flour, lard, sugar and tea (Usher, 1985). All northern residents have come to depend on southern imports to meet their dietary requirements. This paper describes the current retailing system, which strives to meet the residents' needs.

The cost of shipment varies considerably, with barge shipment having the lowest cost, truck shipment being slightly more expensive and air shipment being considerably more expensive. For example, by air from Montreal to Frobisher Bay the general tariff rate for the smallest weight class is \$2.49 per kg, while the price is 16.6¢ per kg via barge (McLaughlin, 1985).

Only 35% of the communities are connected by a permanent road, winter road or rail. The surface network exists only in the west and only for communities located in the Yellowknife region.

Barge shipment is available in 77% of the communities, while scheduled air service is available in 85% (McLaughlin, 1985). If barge shipment were available year round, the impact of transportation costs on food prices would be minimal. Unfortunately the water passageways to the North are only serviceable during the summer. Most communities receive one barge a year; a few receive two or three during the summer. Given the large price differential between barge and air shipment, one would expect all nonperishable food products to be shipped to the communities via barge for a full year's supply. This supposition is explored later in the paper.

FOOD RETAILING IN THE N.W.T.

To understand food retailing in the N.W.T. it is important to compare its retailing environment and institutions to food retailing structures that developed under similar conditions elsewhere. Food retailing in frontier regions such as the N.W.T. has received very little attention in the literature. The only published article tangentially discusses food retailing while detailing the experiences of an Alaskan entrepreneur who tried to revolutionize retailing in the bush in Alaska (Hartman, 1986).

The N.W.T. food retailing system can also be compared and contrasted with food retailing as it exists in the rest of North America, both now and in the past. Table 1 summarizes the historical development of food retailing in North America and indicates which retailing innovations have been adopted in the N.W.T. As the table indicates, southern food retailing practices were adopted where conditions permitted. Adaptations requiring a large market (e.g., high volume and expanded services) cannot and have not been implemented.

The only other change in food retailing in the rest of North America that has not been fully implemented in the N.W.T. is the requirement that food be paid for with cash. In the N.W.T. most retailers still permit credit and many consumers still utilize it (Green *et al.*, 1986b).

TABLE 1. Attributes of modern food retailing systems in North America¹

Attribute	Date introduced	Presence in N.W.T.
Chain stores	1918-32	Yes
Self-service groceries	1916	Yes
Cash and carry	1916	Yes ²
Modified combination food stores	1920-40	Yes
High-volume, low price	1930	No
Self-service expansion (meats, dairy, produce)	W.W. 2	Yes
Non-food items introduced (paper and cleaning products, magazines)	W.W. 2	Yes
Other services (bakeries, delicatessen, flowers, wine, pharmacies, etc.)	1960s	No

¹The historical attributes and dates are drawn from Appel, 1972, and Peak and Peak, 1977.

²Credit is still permitted in 81% of the stores in the N.W.T.

Comparisons and contrasts between food retailing stores in the N.W.T. and those in southern Canada are highlighted in Green *et al.* (1986c). The major differences cited are:

1. N.W.T. stores are considerably smaller than their southern counterparts. (Median of 475 vs. 10 000-20 000 different items, median of 93 m² vs. 1858-4645 m² in a modern supermarket.)
2. The northern stores carry a large amount of non-food merchandise and services unavailable in southern food stores. Examples of this are credit for food purchases, fishing and hunting equipment and fur and handicraft buying and selling. They also carry many other non-food products such as clothing and hardware. Most northern food retailers could more appropriately be described as general retailers.
3. The majority of N.W.T. food stores do not carry fresh meats.
4. Southern supermarkets receive frequent (several times a week) deliveries by truck, while most northern food retailers rely on barge and air shipment for food deliveries.
5. Food prices are higher in the N.W.T.

The Food Retailers

Three types of stores characterize N.W.T. food retailers: independents, cooperatives and chain stores. There are 115 food retail stores: 48 independents, 31 cooperatives and 36 Hudson's Bay Company stores. Each type has developed at different times and for different reasons. What has not been examined, until this paper, is how similar or different are the operating strategies of the three types of stores.

It is necessary to review the history and philosophies of each type of store in order to understand the competitive realities present in the N.W.T. today. The research design and findings follow.

The Cooperatives

Unlike food retailing in southern Canada, where most participants' main objectives are to meet consumers' food needs while making a profit, not all of the northern retailers focus on the profit objective. Cooperatives, for instance, are not generally formed to make a profit. In southern communities cooperatives are formed to fulfill a special niche not commercially viable —

e.g., health foods in a small community. They are formed, not to make profits, but to meet specific needs of its members. By not competing head to head in the general food retailing market but catering to a specific niche, they are able to survive. It is generally acknowledged that cooperatives are inefficient, lack economies of scale and often lack adequate managerial skills (Marion and Aklilu, 1975). The profit motive does not drive cooperatives to maintain efficiency and low prices.

The N.W.T. cooperatives appear to be no exception to the general state of cooperatives. In the Canadian North cooperatives were encouraged by the federal government when natives began moving into settlements. It was felt that cooperatives could help "introduce formal organization in Inuit society for the purpose of producing wealth by co-operation and at the same time promoting native control in local enterprise" (Stager, 1982:15). Today, foremost in the objectives of most cooperatives is to provide training and employment in the local communities.

The cooperatives across the N.W.T. are involved in a variety of activities: retail stores, native crafts and carvings, limited fur trading, hotels and contracts. They are associated through the Arctic Co-operatives Limited. By organizing in this manner the cooperatives hoped to centralize certain functions for which local talent was not available, such as accounting, training and manager recruitment. Ideally this organization would allow the member cooperatives to coordinate orders and shipments to get lower supply prices than they could negotiate on their own. Unfortunately the central organization has suffered both managerial and financial difficulties since its inception, despite large influxes of money from both the Government of the N.W.T. (G.N.W.T.) and the federal government. Many member cooperatives have also suffered financially, with some going bankrupt (Stager, 1982).

In this paper only the food retailing operations of the cooperatives are examined. Thirty-one cooperatives indicated they are food retailers. Over 25% of the food retailers in the N.W.T. are cooperatives. Cooperatives, in comparison to their counterparts in the South, are more numerous and compete, not in a special niche, but in general food retailing.

The Hudson's Bay Company

There is only one chain in operation in the N.W.T. — the Hudson's Bay Company. It has operated in the North for several centuries, first as a fur trader and now as a general retail store. As native peoples began to settle into communities, the Hudson's Bay Company followed and set up permanent trading posts. As northerners developed a taste for southern goods, the trading posts evolved into stores. Mode of access should have had very little impact on the choice of location, as they were originally established for fur trading, before airstrips and roads were developed. Inefficient and unprofitable stores remain in many communities for political reasons, so an economic rationalization of store locations is unlikely to have taken place.

The Hudson's Bay Company also acts as its own wholesaler (it has a major warehouse in Montreal) and shipper (shipments into the Eastern Arctic are made on company-owned barges). Combining the supply needs of many retail stores means the Hudson's Bay Company is able to receive price reductions due to the large volume of sales (by ordering directly from the manufacturers) (N.W.T. Legislative Hansard, 1982:431). They are able to achieve lower freight costs than their competitors by (1) receiving volume discounts when common carriers are used,

(2) consolidation of small shipments, (3) palletisation on sealift and barge movement and (4) developing their own transportation fleet (trucks in the west). The Hudson's Bay Company should therefore be able to supply products at lower prices than unorganized retailers.

Despite the chain advantages, the Hudson's Bay Company operates under many constraints — many of which arose as a part of their historical legacy in the communities. First, the geographic locations of the stores were not based on a cost benefit analysis for today's type of store but generally arose as trading posts grew into permanent establishments. Given the size of the communities and the costs of operations, it is likely that many of the stores do not provide adequate profit or return on investment. The market potential in many of the smaller communities is so small that if a decision were required today as to whether or not to open a store the answer would probably be no. The corporation maintains these stores for the benefit of the northern residents and its corporate name.

Marvin Tiller, general manager of the northern stores division of the Hudson's Bay Company, stated it this way:

... our policy dictates that, where our store in the North or in an isolated area is a vital service to the community, we will continue to operate the store even if we are incapable of generating a reasonable return, and we do have some of those situations. Chesterfield Inlet, for example, is a small community which is slowly losing its population base due to outward migration. Overall, there are, perhaps 12 to 15 communities where our operations are not presently achieving our return objectives. [Northwest Territories Legislative Assembly Hansard, 1982:435.]

The self-imposed constraints under which the Hudson's Bay Company operates allow many of the smaller communities access to the goods and services available through an integrated chain department and food store. It is probable that general merchandise sales (with their higher markups) subsidize some of the food operations. This is true for all northern food retailers, not just the Hudson's Bay Company stores. The objectives the Hudson's Bay Company has set for its operations in its northern stores division provide some insight into the operating philosophy of the company in the N.W.T.:

1. To provide the inhabitants of this region with the broadest possible selection of merchandise, both foods and dry goods;
2. To offer the lowest possible prices; To provide comfortable and attractive facilities in which to shop and to work;
3. To be a major economic force in the North in terms of employment, development and transportation, and to swiftly adapt to changing environments;
4. To be good corporate citizens to the extent that we participate and make meaningful contributions to important social and economic issues;
5. To ensure a reasonable return on our investment, to the extent that we will continue to be a viable and productive operation in the North, and be in a position to improve upon our services and facilities for our customers, and enhance benefits and working conditions for our employees. [Northwest Territories Legislative Assembly Hansard, 1982:429.]

RESEARCH DESIGN AND FINDINGS

A mail questionnaire was forwarded to all food retailers listed in the *Northwest Territories Business Directory*. Food retailers are present in 55 of the 66 communities, as shown in Figure 1. Responses were received from 48 communities, 87% of the



FIG. 1. Food retailers in the Northwest Territories.

communities with stores. (The reader should note that communities labelled in gray are those that have a retailer but from whom no response was received.) A completed questionnaire was received from 73% of the stores (n=75) contacted. (The existence of 12 additional stores was determined after the mail survey had been completed, bringing the total number of food retailers in the N.W.T. to 115.) The number of responses by store ownership is summarized in Table 2.

TABLE 2. Store ownership of survey respondents (%)

Cooperative association (n = 19)		25
Hudson's Bay Company (n = 36)		48
Independents		
Family owned (n = 6)	8	
Other nonchain independent (n = 8)	11	
Other (n = 6)	8	27
Total		100

Products and Services Offered by the N.W.T. Retailers

An earlier article (Green *et al.*, 1986c) compared and contrasted N.W.T. food retailers with southern retailers. In this section those findings will be further explored to see what similarities and differences exist among the three types of stores.

Table 3 indicates that over 90% of the northern food retail stores sell snack foods, fresh fruits and vegetables, staples, bakery products, frozen meats, fresh dairy and canned goods. Only 40% of the stores carry fresh meats. Given the perishability of fresh meats and the limited accessibility of the communities, this fact is not surprising. A slightly smaller proportion of independent stores than the cooperatives and the Bay sell fresh fruits and vegetables, staples, frozen meats and fresh dairy. This may be because the independents require a profit in each store and therefore cannot afford to carry perishable products that may not be profitable.

TABLE 3. Percentage of stores carrying various food types

Type of food	Type of store			Total
	Independents	Cooperatives	Hudson's Bay	
Snack food	95	100	100	99
Fresh fruits and vegetables	89	100	100	97
Staples	84*	100	100	96
Bakery products	89	94	100	96
Frozen meat*	82	94	100	94
Fresh dairy*	83	94	100	94
Canned goods	84	89	100	93
Fresh meat	53	31	38	40

*Prob < .05 (ANOVA to test for differences in types of food carried in each type of store).

The food retailers were asked what, if any, country food was sold in each store. Several facts were revealed: (1) country fish is the most frequently sold country food; (2) less than 26% of the retailers sell any country food; and (3) the cooperatives are more likely than the other stores to carry country food products.

It is well known that many of the northern food retailers also sell non-food merchandise and services. Given the small market size of most communities, this is probably an economic necessity. The magnitude of the other offerings, however, has never before been systematically examined. Retailers were asked what proportion of their sales were food sales. They were also asked what other products and services they offered.

Approximately 86% of the stores report deriving over 50% of their gross sales from food products. Only 15% of the stores report receiving over 75% of their income from food sales (Table 4). The northern food stores are clearly supplementing their food sales with sales of other merchandise.

TABLE 4. Percentage of gross sales represented by food

% of dollar sales	Frequency of response	
5-19	n = 1	1.4%
20-49	n = 9	12.3%
50-75	n = 52*	71.2%
Over 75	n = 11	15.1%

*All 36 Hudson's Bay Company stores are in this category. The responses from the other types of stores lie in all categories.

Table 5 lists the proportion of retailers offering various non-food products and services. The first two items, tobacco and sundries, are also widely available in southern food stores. Many of the other items are unique to northern stores (e.g., hunting and fishing supplies and vehicles, fur buying and handicraft sales) or are simply more common in northern than southern food stores (e.g., credit for food purchases, clothing and footwear and special and bulk food orders).

It is noted by comparing across the various types of food stores that the Hudson's Bay Company stores have the widest range of offerings. The independents do not carry as many of the listed products or services. Once again, here is evidence that, rather than trying to be an all-purpose store, they may be trying to specialize in only the products and services in which a profit is likely to result.

Most Hudson's Bay Company and cooperative stores maintain the image of meeting all the customer's needs. Independents, if they are not the only store in the community, specialize in certain products or services in which they may achieve a competitive advantage. Independents are less likely than the other two store types to offer sundries, fishing supplies, hardware, clothing/footwear, hunting equipment, handicrafts, credit, special orders or fur buying.

N.W.T. Food Retailers: Their Sizes and Managers

The sizes of the three types of food stores do not significantly differ on the following physical dimensions: number of food items, food retail space and total retail space. The "average" northern retail food store therefore has 812 food products in 145 m² of retail space. The retail area of the entire store averages

TABLE 5. Products and services offered by N.W.T. food retailers (%)

Product or service	Independents	Cooperatives	Hudson's Bay	Total
Tobacco	90	100	100	97
Sundries*	80	100	100	95
Cheque cashing	70	95	100	91
Fishing supplies*	70	89	100	89
Hardware*	65	95	100	89
Clothing/footwear*	65	84	100	87
Hunting equipment*	60	89	100	87
Special orders*	50	89	97	83
Credit for food*	60	84	92	81
Hunting vehicles*	30	79	94	73
Fur buying*	35	63	100	73
Handicrafts*	35	84	44	52
Bulk orders	35	58	53	49
Public telephone	30	37	56	44
Home delivery	15	21	6	12
Post office	0	16	11	9

*Significant difference between stores (prob <.05).

about twice that size, meaning that northern stores typically devote about half their selling space to food products (Table 6).

On average the Hudson's Bay Company stores have twice as many employees as the other two types of food stores. They employ an average of about four and a half more full-time employees than their competitors.

There appear to be no differences in the training and experience of the store managers, with one exception. Five of the independent store managers indicate no training at all. None of the managers in the other two store types indicated this (Table 7).

Location of Stores

Table 8 summarizes the proportion of times that each type of food store is accessible by a particular mode. There are some differences apparent in the table between the joint occurrence of store type and mode type. For example, a larger proportion of independents (50%) lie on surface access than either the cooperatives (19%) or Hudson's Bay Company stores (31%). The question that arises is whether this represents a purposeful decision or is likely to have occurred by chance.

TABLE 6. Size of N.W.T. food stores

Size factor	Independents	Cooperatives	Hudson's Bay	Total	N	Prob*
Gross food sales (\$000s)	331	1256	**	904	29	<.385
Food items	762	535	962	812	64	<.404
Food retail space (m ²)	105	159	154	145	66	<.473
Total retail space (m ²)	217	238	441	309	55	<.153
Total number of employees	5.3	5.3	11.2	8.2	73	<.001
Full-time employees	3.9	3.8	8.3	6.0	75	<.001
Part-time employees	2.4	2.1	3.2	2.8	55	<.123

*An analysis of variance was computed to see if there is evidence of any statistical difference in size by type. Prob is the probability level associated with the F test.

**The Hudson's Bay Company did not provide gross dollar sales.

TABLE 7. N.W.T. managers: training and experience

Type of retail training (%)					
On-the-job training (n = 66)					89
Technical school/other (n = 3)					4
None (n = 5)					7
Years of retailing experience for store manager (n = 75)					
Type of store					
Independents	Cooperatives	Hudson's Bay	Total	N	Prob*
7.6	8.3	8.4	8.1	75	<.894

*All of the managers reporting no training are managers of independent stores.

TABLE 8. Mode access for each type of store*

Mode access	Type of Store			Total
	Independents	Cooperatives	Hudson's Bay	
Air	88%	97%	97%	85%
Surface	50%	19%	31%	26%
Water	71%	93%	92%	85%
Number of communities	24	31	36	55

*Each percentage represents the proportion of each type of store on each mode of access.

If store location is decided based on economic factors related to mode access and competition, then knowledge of these two factors should allow prediction of the final variable when the others are known. Since surface transportation accessibility (rail or road) allows more frequent orders at lower costs, this also means less need for inventory space and hence fewer financing requirements. In effect, a store located on a surface network faces fewer risks than stores not so located. One would also suspect that less competition provides a better chance for survival.

To phrase it another way, the presence/absence of all six variables (Hudson's Bay Company store, cooperative, independent, water access, surface access and air access) may impact on the store location decision. It is also likely that certain combinations are more or less likely. For instance, if these factors do influence store location choice, then the knowledge of the presence/absence of air access, water access, surface access, Hudson's Bay Company store and cooperative should allow one to suggest the presence/absence of an independent.

Therefore examination of a two-category six-way table is necessary. Log linear analysis allows examination of all possible combinations of the variables to examine the interrelationships among them. Some predictions are:

1. It is not likely that a relationship exists between the location of the Hudson's Bay Company stores and mode of access to the communities or other stores in the communities. This is because their locations were established for historic, not economic, reasons. Most stores have water access, so it should not be a discriminating factor.
2. There should be no relationship between the location of cooperative stores and the other factors. This is because the cooperatives were established for political, not economic, reasons. Although many have had financial difficulties, an economic rationalization of their locations is unlikely to have occurred yet as they have received financial assistance from the governments over the years.

3. There should be a relationship between the location of the independent stores, the mode of access to the communities and the presence of other stores in a community. The independent stores are profit oriented and unconstrained by a historical legacy, hence their locations should reflect more rational decision making.

ANALYSIS AND RESULTS

The log linear model generates maximum likelihood estimates of cell counts of a contingency table utilizing effect parameters. The estimates derived are constrained by the requirement that the marginal totals of the created contingency table must equal specified marginal totals of the original contingency table. The marginal totals that serve as the constraints are the effects included in the model.

The estimated cell counts are compared to the original table to test for statistical differences between the tables. If no statistical difference is found, the effects, included as constraints, can be used to describe the table.

Terms can be deleted to create simpler models. Terms are successively deleted until a model is found that is statistically different. The simplest model tested with no statistical difference (in the absence of other information) is chosen as the most parsimonious description of the relationships contained within the original table.

This model fitting is equivalent to testing for independence among variables. If, for instance, no interaction term between a set of variables is necessary to recreate the contingency table, these variables can be considered independent on their effect upon the cell counts.

All possible log linear models were tested using the contingency table. There was no non-significant model. This indicates that all the variables are independent. The parameter values for all combinations of the variables were near one. The geometric mean is therefore the best prediction for any cell in the matrix — that is, for any combination of the six variables, the expected cell size would be the geometric mean: 1.63. Knowledge of the presence/absence of mode type and competition does not allow one to give a better prediction of the frequency count for a particular cell than does the geometric mean alone.

This result was not anticipated. It says that the presence of the three types of mode access and competition cannot explain the location of any of the stores. It was expected that independents would use these two pieces of information when deciding where to locate a store. These results show that this is not the case.

As employment opportunities in the Northwest Territories are generally limited to government service, retailing provides the only real revenue-generating alternative. It is suspected that many of the independents were begun by individuals who migrated from the South, decided they wanted to remain in the community, needed some source of livelihood and wanted to be their own boss. Support of this explanation for the location of independent stores includes former Bay managers and former construction workers owning and operating independent stores, as well as the general lack of training reported by independent store managers.

Non-economic reasons for store locations, such as this, explain why there is no relationship between the locations of independents and economic factors. The presence of competitors or mode access does not appear to affect the store location decision for any of the three types of stores in the N.W.T.

N.W.T. Food Retailers: Inventory Management

The high cost of shipment into the N.W.T. and the long lead time required between orders means that inventory management is a critical skill for all northern retailers. Although the managers were not directly tested for their skill level in inventory management, it is possible to infer inventory management practices by examining in detail the retailers' responses to the questions about space utilization and mode usage.

Space Utilization. One crude gauge for inferring inventory management is through the examination of the ratio of inventory space to retail space. When the ratio of the mean inventory space/mean total space is compared across the types of stores, there is a dramatic difference among the types of stores. The results are as follows: independents 34%, cooperatives 46%, Hudson's Bay Company 61%, total for all stores 56%. The independents have the least amount of inventory space in proportion to their total space and the Hudson's Bay Company has the most. The probable explanation for this result is that the Hudson's Bay Company requires more storage because it relies more heavily on barge (generally once a year) shipment than do the other types of stores.

If stores are maximizing the use of barge shipment, one would expect the ratios for the store types to be related to the proportion of stores that lie on the road network (Table 8). This is because truck delivery is only slightly more expensive (than barge shipment) but also has the advantage of reducing the need for a large amount of inventory space since frequent deliveries are possible. Since half of the independents are accessible by road, their low ratio is as would be predicted. Only the cooperatives do not have a ratio consistent with this interpretation. This implies that the cooperatives are not utilizing barge shipment to as great an extent as the other stores.

Mode Usage. Table 9 lists the mode of transportation the retailers indicated they use to ship each product category. (It should be noted that if a retailer circled two modes of shipment only the more accessible, more frequent, mode was utilized.) In the sample there were only two communities accessible only by air, Colville Lake and Lac la Martre. This is approximately 3% of the respondents. Therefore for maximum transportation savings only about 3% of the respondents should be using air to ship nonperishables. As the figures in Table 9 indicate, this is not true for any of the eight classes of products. Approximately 28% of the sample import canned goods via air, while 18% ship in staples by air and 40% bring snack goods in via air.

For the three classes of nonperishables mode usage was

TABLE 9. Food supply transportation mode

Type of food ¹	Land delivery	Water delivery	Air, post office	Air, private	N
Canned goods	27%	46%	4%	24%	68
Fresh fruits and vegetables	26%	—	19%	56%	70
Fresh meat	31%	—	8%	62%	26
Frozen meat	25%	—	22%	53%	68
Fresh dairy	26%	1%	23%	49%	69
Staples	28%	55%	3%	15%	69
Snack food ²	27%	33%	3%	37%	70
Bakery goods	26%	1%	20%	52%	70

¹Nonperishables = canned goods and staples; perishables = fresh fruits, vegetables, fresh meat, frozen meat, fresh dairy, bakery goods.

²Snack food includes both perishables and nonperishables. Examples are candy, potato chips and soda pop.

examined by type of store. The results in the previous section indicated that the type of store and mode access are independent of each other. This means a difference in mode usage among various types of stores could not be attributed to differential mode access. Therefore one would expect the high use of air shipment to be present in all stores unless there is a difference in the management of orders and shipments among stores. The data in Table 10 indicate clearly that the cooperatives are using air delivery to a greater extent than the other two types of stores.

Multiple mode usage (air and water) may be part of the reason more stores than expected ship nonperishables via air. This may occur when supplies are exhausted prior to the arrival of the barge for resupply. (Barge orders are placed 3-4 months prior to each year's shipment. Projections therefore must be made for food sales for the next 15-16 months, as supplies must last until the following year's shipment.) On those occasions, there is no choice but to use air transportation to restock the store. The Hudson's Bay Company official policy is that under those circumstances the store absorbs the extra transportation costs and maintains the prices of basic food items such as flour, sugar, lard, canned milk and tea at the previous level.

Another reason for ordering by air may occur when the store manager finds it convenient to order in smaller lots but on a more regular basis. This could be due to (1) inability of the manager to make an accurate sales forecast, (2) miscalculated demand due to environmental changes (new competitor, change in consumer tastes, decrease in private barge orders for food), (3) lack of adequate financial resources to purchase in large quantities or (4) lack of inventory space and/or the capital to build it. Also, it may be that in monopolistic settings, the extra costs can be passed on to the consumer.

In summary, the cheapest mode of shipment is not always being used by retailers. As the cost of shipment by air is substantially higher than shipment by truck or barge, this results in higher food prices for the consumers and lower profits for the retailers unless the same volume can be sold — i.e., the consumers are indifferent to price. This finding is surprising given the transportation rates, and it partially explains higher prices for these goods. It is clear from the evidence that of the three types of stores, the cooperatives are not utilizing taking advantage of the lower freight rates available for barge or sealift shipment. Additional research is needed to determine which, if any, of the above-stated reasons is causing the managerial inefficiencies in the cooperative stores.

TABLE 10. Mode usage by type of store (%)

Food type	Mode access	Type of store			Total
		Independents	Cooperatives	Hudson's Bay	
Canned goods	Air	19	76	9	28
	Water & land	81	24	91	72
Staples	Air	12	38	11	17
	Water & land	88	62	89	83
Snack foods	Air	42	87	17	40
	Water & land	58	13	83	60

CONCLUSIONS

Food retailers (independents, cooperatives and Hudson's Bay Company stores) in the N.W.T. have adapted to the small, isolated markets by expanding their merchandise line well beyond food products. The Hudson's Bay Company stores carry the most varied merchandise, while the independents have a

more restricted product line. Cooperatives are more likely than the other store types to sell native products such as country food and handicrafts. With this variety in offerings between store types, it is surprising that in physical dimensions the stores are approximately the same size.

Inventory management varies among the store types. The mode of resupply that allows the smallest amount of on-site inventory space and planning horizon is air delivery. A larger proportion of the Hudson's Bay Company stores and the independents ship nonperishables via the cheaper alternatives of barge, rail and truck than do the cooperatives. The reliance on air transportation by cooperatives is not due to location but may reflect poor managerial skills or simply a lack of profit motivation. This practice undoubtedly results in lower profits and higher prices.

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