Cattle - Marketing

# AN ECONOMIC COMPARISON OF ALTERNATIVE SELLING METHODS FOR SLAUGHTER CATTLE IN ONTARIO

by Larry Martin
Robert R. Richards
W.R. Usborne



School of Agricultural Economics and Extension Education
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# PREFACE

This study is an economic analysis of five alternative methods for selling cattle: country auctions; terminal markets; direct to packers; a listing service; and an electronic system. The major emphasis of the analysis is on the costs of each method, although the implications of each method for pricing efficiency is also discussed.

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The authors are grateful for the support and assistance of a number of people, and agencies during the study. These include: The Computer Communications Group of Bell Canada; The Meat Packers Council of Canada; the Ontario Cattlemen's Association; the Ontario Beef Exchange Ltd.; the Ontario Pork Producers Marketing Board; and the many individuals and companies who provided data for the study.

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L. J. Martin
R. R. Richards
W. R. Usborne

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Jan. 1979

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# AN ECONOMIC COMPARISON OF ALTERNATIVE SELLING METHODS FOR SLAUGHTER CATTLE IN ONTARIO

Larry Martin, Robert R. Richards, W. R. Usborne[1/]

## 1.0 INTRODUCTION

The period from 1974 through 1977 brought with it a significant cost-price squeeze for the Canadian and world beef industries. This cost-price squeeze had as its major causes: 1) cyclically large supplies of cattle; 2) unprecedented high levels of input costs; and 3) further increased cattle supplies as breeding herds were substantially liquidated.

Although the fundamental market situation caused the cost-price squeeze, some observers, both within and outside the beef industry, searched widely for other villains. The marketing system for cattle came under particular attack from these people. Others, while recognizing that the exchange mechanism has little effect on the fundamental market situation, questioned whether the existing exchange mechanism is the most efficient available.

This period of introspection resulted in several changes in the marketing system for cattle. Among these were the initiation, in late 1977, of a carcass auction at the Ontario public stockyards and the initiation, in early 1977, of a listing service by a private corporation. It also resulted in a resolution at the 1977 annual meeting of the Ontario Cattlemen's Association, to undertake a study to evaluate alternative selling methods for cattle. This report is the result of that study.

### 1.1 The Research Problem

To evaluate alternative marketing methods, the central question is, how well does each perform? Market performance is a concept with several dimensions. The two dimensions most commonly considered are operational efficiency and pricing efficiency.

Operational efficiency refers to the amount of marketing service which results per unit of input used in the marketing process. It, therefore, refers to costs involved in marketing. The marketing of cattle is a multistage process involving the movement of animals from the producer's feed lot to the packer's kill floor. Depending upon the method used, this process requires that marketing costs be incurred by the producer, a market intermediary (e.g. a terminal market or a local sales barn) and the packer buyer. Hence, the question of operational efficiency is concerned with the costs of the entire marketing process.

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1/ The authors are Associate Professor of Agricultural Economics, Research Assistant in Agricultural Economics and Associate Professor of Meat Science, respectively at the University of Guelph.

Pricing efficiency refers to the quality of price discovery in the market place. The concept is therefore concerned with the following kinds of questions: Do prices reflect current supply and demand conditions? In the long run, do prices at various levels of the market reflect the costs of providing the eventual product to consumers? Do prices at various points reflect transfer costs between those points? Does the price for an individual unit of product reflect that unit's quality? Does the market system transmit price information accurately and rapidly to all buyers and sellers so that production and purchasing decisions can be made with reliability?

The primary concern of this study is the assessment of the operational efficiency of the selling methods analyzed. Hence the major emphasis is on determination of costs of marketing cattle through the various alternatives. However, it is also important that pricing performance of each alternative studied be addressed. Thus, while no attempt is made to measure pricing efficiency, each of the alternatives have structural characteristics which may affect pricing performance. These will be discussed in the report.

## 1.2 Objectives

The following objectives are specified for the study.

1. To determine the relative costs of currently available and technically feasible alternative selling methods for Ontario cattle. In order to fulfill this objective, the following sub-objectives are required:

   A. to determine and design technically feasible alternative selling methods.

   B. to determine producer, intermediary and buyer costs for each of the alternative methods.

2. To determine the implications of structural characteristics of each of the alternatives on pricing efficiency.

## 1.3 Outline of the Report

To fulfill these objectives, the remainder of this report is organized as follows. In section 2.0, the current marketing system for cattle in Ontario is briefly described and the alternative selling methods analyzed in the study are presented. Section 3.0 contains a discussion of the methodology used in the analysis. Sections 4.0 and 5.0 contain the participant costs for each alternative method - i.e. producer, intermediary and packer costs, respectively. Section 6.0 contains total cost comparisons for each selling method. Finally, the cost analysis is summarized, the implications of each method on pricing efficiency are discussed and advantages and disadvantages of the alternatives are presented in section 8.0.

## 2.0 CURRENT SELLING METHODS AND ALTERNATIVES ANALYZED

This section contains a brief description of the beef cattle market in Ontario, the selling methods which are currently in use and the alternative methods which were chosen for analysis in this study.

### 2.1 Production and Marketing of Cattle in Ontario

While beef cattle production takes place throughout Ontario, the bulk is concentrated in Western and Southern Ontario (Table 2.1). Twenty-one counties in Southern and Western Ontario represent over 80 percent of the cattle slaughtered. Furthermore, in 1976, there were 13 counties with slaughterings of 20,000 or more head each. These 13 counties produced 78 percent of the total.

The current marketing system for slaughter cattle in Ontario offers the producer several choices among selling methods. In 1977 over 35 percent of sales were through country auctions, 38 percent through public stockyards (or terminal markets) and 24 percent direct to packers, (Table 2.2).[1/]

Table 2.2: Number and Proportion of Slaughter Cattle Sold Through Country Auctions, the Ontario Public Stockyards and Direct to Packer, Ontario, 1977

| | 1977 | |
|---|---|---|
| | # | %[1/] |
| Country Auctions | 446,777 | 35.2 |
| Ontario Public Stockyard | 481,903 | 37.9 |
| Direct to Packer | 307,657 | 24.3 |

Source: Ontario Cattlemen's Association, Breeder and Feeder, Toronto, 1978.

1/ An additional 32,000 cattle or 2.6 percent of total slaughter originated outside of the province during 1977.

#### 2.1.1 Country Auctions

In 1974, there were 67 country auctions in Ontario, of which 36 were located in Southern or Western Ontario. However, the largest nine firms

1/ The listing service introduced by the Ontario Beef Exchange Ltd. (OBEX) during 1977 is a fourth alternative. However, OBEX represented a very small share of the market in 1977 and made substantial operational changes earlier in 1978. For this reason, a listing service will be discussed in a subsequent section.

Table 2.1: Slaughter Cattle Marketed at Stockyards and Shipped Direct to Packing Plants by County of Origin, Ontario 1976

| | 1976 # | % |
|---|---|---|
| Brant | 6,891 | 0.7 |
| Elgin | 45,918 | 4.5 |
| Essex | 3,075 | 0.3 |
| Haldimand | 6,048 | 0.6 |
| Kent | 51,375 | 5.1 |
| Lambton | 26,080 | 2.6 |
| Middlesex | 66,753 | 6.6 |
| Niagara | 3,874 | 0.4 |
| Norfolk | 3,804 | 0.4 |
| Oxford | 47,569 | 4.7 |
| Wentworth | 15,278 | 1.5 |
| Southern Ontario | 276,665 | 27.3 |

| | 1976 # | % |
|---|---|---|
| Bruce | 71,329 | 7.0 |
| Dufferin | 26,811 | 2.6 |
| Grey | 44,020 | 4.3 |
| Halton | 6,051 | 0.6 |
| Huron | 96,027 | 9.5 |
| Peel | 9,348 | 0.9 |
| Perth | 73,609 | 7.3 |
| Simcoe | 77,916 | 7.7 |
| Waterloo | 98,425 | 9.7 |
| Wellington | 66,082 | 6.5 |
| Western Ontario | 569,618 | 56.3 |

| | 1976 # | % |
|---|---|---|
| Durham | 24,316 | 2.4 |
| Hastings | 4,347 | 0.4 |
| Muskoka | 237 | - |
| Northumberland | 10,360 | 1.0 |
| Ontario | 1,921 | 0.2 |
| Parry Sound | 1,628 | 0.2 |
| Peterborough | 12,632 | 1.2 |
| Prince Edward | 355 | - |
| Victoria | 11,363 | 1.1 |
| York | 16,912 | 1.7 |
| Haliburton | 18 | - |
| Central Ontario | 84,089 | 8.3 |

| | 1976 # | % |
|---|---|---|
| Carleton | 17,079 | 1.7 |
| Dundas | 4,915 | 0.5 |
| Frontennac | 2,944 | 0.3 |
| Glengarry | 10,943 | 1.1 |
| Grenville | 1,100 | 0.1 |
| Lanark | 9,788 | 1.0 |
| Leeds | 7,335 | 0.7 |
| Lennox & Addington | 1,044 | 0.1 |
| Prescott | 3,124 | 0.3 |
| Renfrew | 7,901 | 0.8 |
| Russell | 2,441 | 0.2 |
| Stormont | 1,315 | 0.1 |
| Eastern Ontario | 69,929 | 6.9 |

| | 1976 # | % |
|---|---|---|
| Algoma | 710 | - |
| Cochrane | 2,639 | 0.3 |
| Kenora | 295 | - |
| Manitoulin | 1,786 | 0.2 |
| Nipissing | 960 | 0.1 |
| Rainy River | 2,231 | 0.2 |
| Sudbury | 65 | - |
| Thunder Bay | 656 | - |
| Timiskaming | 2,709 | 0.3 |
| Northern Ontario | 12,051 | 1.1 |

Source: OMAF, Publication #20, 1976 edition.

had 50.7 percent and the largest 17 firms had 69.6 percent of total sales [1].

Country auctions are privately owned and obtain revenue by assessing a selling charge. These charges vary considerably from auction to auction. Most auctions handle several classes of livestock so that slaughter cattle represent only a portion of their entire business.

Country auctions perform two important functions. First, they provide an exchange and assembly point for livestock from local areas for shipment to packing houses. Second, they provide a means for farmer-to-farmer transfer of livestock. The importance of the latter function is shown by the data in Table 2.3.

The way in which country auctions operate varies widely among firms. For slaughter cattle sales, the owner or operator of the auction acts as the selling agent and charges a commission. Cattle are usually sold in owner's lots which vary considerably in size. Cattle are weighed immediately prior to sale. Packer buyers bid on the basis of their assessment of the potential grade and yield of the cattle, knowing the aggregate weight of the lot on offer. Prices paid reflect this assessment and are based on live weight. The producer usually maintains the right to reject the highest bid.

Table 2.3: Volume of Sales Through Country Auctions in Ontario, 1966-1974

| Sales of | Ave. 1966-1970 | 1971 | 1972 | 1973 | 1974 |
|---|---|---|---|---|---|
| | | | (Head) | | |
| Slaughter Cattle | 320,961 | 340,531 | 337,581 | 352,282 | 358,972 |
| Cattle Sold Back to Country | 322,365 | 432,095 | 474,061 | 466,117 | 427,023 |

Source: Ontario Ministry of Agriculture and Food.

Dissemination of price information through local media is usually undertaken by the owners of country auctions as an advertising technique. As a result, price information is usually limited to the immediate area. The single exception to this in Ontario is the Kitchener-Waterloo Stockyards Ltd. for which Agriculture Canada issues reports over the C.B.C.

### 2.1.2 Terminal Market

The Ontario Public Stockyards is one of nine terminal markets operating in Canada and is the only one in Ontario. Like the country auctions, terminal markets handle all classes of livestock.

Selling operations at terminal markets are conducted somewhat

differently than at country auctions. The terminal market, which is a crown agency operating under federal legislation,[1] is responsible for providing receiving, shipping, penning and selling facilities for livestock moving by both rail and truck. In addition to providing facilities for cattle sold at the terminal market, public stockyards must, by federal law, provide feeding and watering facilities for cattle moving by rail, truck working facilities and crippled animal disposal.

Livestock sales at the terminal market are conducted by commission firms which rent sales rings and office space from the public stockyards and employ auctioneers and other sales staff. Sales are conducted by auction with prices bid on a liveweight basis. Unlike most country auctions, cattle are weighed immediately after leaving the sales ring. Therefore, packer buyers bid on the basis of estimated weight, grade and yield.

Operations at terminal markets are financed by commissions, which are paid by producers to the commission firms, and by yardage fees, which are paid by producers to the public stockyards. These fees are charged according to a schedule which must be approved by Agriculture Canada. Payment to producers is guaranteed.

Price information from the terminal markets is widely and rapidly disseminated throughout the province by both the press, Agriculture Canada market reporters, and by telephone tapes made available by provincial and federal governments.

### 2.1.3 Direct to Packer

As its name implies, this selling method involves the direct movement of cattle from the producer to the packer, thereby negating the need for and cost of an intermediary. In essence, with this selling method the producer acts as his own commission agent.

A number of operational alternatives exists under the general rubric of direct sales. With the first, the producer contacts a number of packers, describes and offers his cattle. The packer buyer may choose to visit the farm and view the cattle. Offers are then made - either on a liveweight or carcass grade and yield basis - and the producer accepts or rejects the bids according to his evaluation of current and expected market conditions.

Under the second alternative, the producer does not obtain price bids before shipping the cattle, but rather ships them to the packing plant and accepts the price the packer is paying on the day of settlement. This arrangement normally evolves when the packer knows the quality of the producer's cattle and the producer feels that he is treated equitably by the packer.

The third alternative occurs when a producer and/or an abbatoir develops a local specialized market; for example a local freezer trade.

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[1] The Livestock and Livestock Products Act (1939).

There are likely many pricing arrangements under this alternative. At one extreme, the producer develops a market for his product, prices it to the consumer and pays the abbatoir a custom killing fee to cut and wrap meat to the customer's specifications. At the other extreme the abbatoir develops the market and pays the producer to supply a specific quality product.

Because direct to packer selling is essentially conducted by private treaty, very little price information is generated beyond the two parties to the sale.

## 2.2 Alternative Selling Methods Analyzed

In addition to the three selling methods listed above, two new selling methods are analyzed in the study. The reasons for their choice and a brief description of each is presented below.

### 2.2.1 A Listing Service

In late 1977 the Ontario Beef Exchange Ltd. (OBEX) introduced a listing service as a new selling method in Ontario. This service continues to operate at present and its operations incorporate some rather unique concepts in marketing cattle. For these reasons a listing service structured similarly to OBEX is included as an alternative in the analysis.

The listing service as structured for this study is described below. Producers with cattle to sell phone in to the listing service their names, addresses, number of cattle, estimated live weights, sex and a description of breeding background and feeding regime. Producers also indicate whether they wish to sell on a live weight or rail grade and yield basis. Listing service personnel then visit the feed lot and make a video tape of the cattle. The video tape saves the packer the cost of sending buyers to the farm.

The video tape is made available to packer buyers who then bid on the cattle. The producer is informed of the highest bid and has the option of accepting or rejecting it. Cattle are moved directly from the feedlot to the packing house and are weighed on a third party scale en route.

Price information from sales by a listing service could be made widely available in much the same manner as is now done by the terminal markets.

### 2.2.2 Electronic Auction[1/]

The final alternative evaluated is an electronic teletype auction.

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1/ In this study, a teletype system is evaluated. However, there are technological alternatives which could be substituted for the teletype

...continued next page

This alternative was chosen for two reasons. First, Johnson [ 7 ] in a similar study, has indicated that an electronic auction offers potential advantages for selling cattle. Second, an electronic teletype system is used to sell hogs in Ontario and it would, therefore, seem logical to evaluate it as an alternative for cattle.

The electronic auction designed for this study is considerably different than either the system used currently by the Ontario Pork Producers' Marketing Board or that visualized by Johnson. The hypothetical system considered here attempts to accommodate some of the differences inherent in marketing cattle relative to hogs. It is also designed to allow producers to place a reserve bid on cattle in recognition of the fact that the timing of selling cattle is more flexible than for hogs and that a marketing board for cattle does not exist; i.e. that producers would not be required to sell cattle via this alternative. This implies that the system could be established by a private organization. The selling procedures are described below.

Producers with cattle to offer on a given day would phone in their offer the night before. In the telephone call, the producer would identify himself and provide a description of the cattle he is offering; i.e. number, sex, breeding history, estimated weight, estimated grade (including the estimated number in various grades), feeding program, and a reservation price - i.e. the minimum price he will accept. He will also indicate whether he wants the cattle sold on a live weight or carcass weight and grade basis.

On the day of sale, each lot of cattle on offer will be electronically transmitted to all buyers. Transmittal will be made by a master controller located at a central office over circuits to each packer's office and printed out on the packer's buying machine. Each lot will be assigned a lot number and include the description of the cattle provided by the producer (producer, number, sex, breed, estimated weight, estimated grade - including number in each grade), feeding program and whether the cattle are being offered on a live or carcass weight and grade basis. Each element of the description will be transmitted as an alpha-numeric code (e.g. each producer will be assigned an identification number) which translates the description back to conventional English type on the packer's printout.

After the day's offerings have been transmitted and buyers have been given time to evaluate the offerings, each lot will be offered for sale. Offer prices would be established on a Dutch-clock auction basis - i.e. offers are made at the top of a range with decreasing decrements to

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1/ continued

auction. For example, [ 5 ] has performed a cost analysis for a computerized selling method which could be used for cattle. The essence of such a system is not significantly different than the teletype and preliminary cost analysis of the computerized system indicated that costs are similar. Hence, only the teletype system is addressed here.

the bottom of a range.[1/] The starting price, decrements and stop price would be established by a thumbwheel type price generator for each lot.[2/] If a producer establishes a reservation price, it would be the stop price (this would not be transmitted to buyers). The offers would then be transmitted simultaneously to all buying stations with changes in the pre-set decrements until either a sale takes place when a buyer presses the buy button and breaks the circuit, or until the reservation or stop price is reached. In the event of a sale, it would then be confirmed privately between the selling office and buyer. This information would not be printed on the other buying machines. A broadcast message is then sent to all buyers confirming the sale.

In the event that no sale takes place, the lot would either be offered later in the day (with the possibility of allowing the producer to lower his reservation price) or on a subsequent day.

After a sale is confirmed, the buyer would contact the seller and arrange for delivery of the cattle.

The selling system designed here is substantially different than that currently used for hogs. First, the system would include no marketing or assembly yards. All cattle would be shipped directly to the packing plant from the feed lot. In this regard, the assumption was made in evaluating the costs of the system that all cattle offered on the teletype would be in minimum lots of ten head. This level represents the minimum size of lot at which it appears feasible for packers to maintain identification of cattle sold on a carcass weight and grade basis.

Second, the system provides for considerable description of the cattle. This is done because the grading system for cattle does not precisely reflect yield or quality and because there is considerable variation in perceived quality factors within grade. Furthermore, some producers have established a reputation for producing quality cattle and this would be reflected in the system since producers are identified. The ability to describe the cattle would assist in allowing prices to reflect quality premiums or discounts. There are a number of additional implications of this which will be addressed in the final section of the report.

Finally, the system is designed such that producers' freedom of choice is maintained. Cattle can be offered on a live or carcass weight and grade basis. Reservation prices may be established and producers can re-offer at a later time if the reservation price is not bid or indeed, they can sell the cattle by an alternative method.

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1/ It is possible to use a progressive bidding system instead of the Dutch-clock, but would likely increase the time required to complete a sale.

2/ A thumb-wheel price generator is a series of circular switches which can be used to establish the starting price, decrements and stop price. This is a substitute for the mylar tapes currently used by the Ontario Pork Producers Marketing Board.

## 3.0 METHOD OF ANALYSIS

This section describes the procedures used to analyze the five alternative selling methods for cattle outlined in section 2.0.

### 3.1 Related Studies

A study by Johnson [ 7 ] evaluated the operational and pricing efficiency of eight[1/] selling methods used by the U.S. beef industry. He equated operational efficiency with the total marketing costs of each method, which in turn, were disaggregated according to the costs of each market participant. Each of the eight methods was ranked according to total costs.

Pricing efficiency was evaluated on the basis of the relationship between each method and four components of the pricing mechanism as follows:

1. the relative bargaining position of buyers and sellers;
2. the ability to price products according to their value-determining characteristics;
3. the opportunity for each buyer to bid on all offers to sell; and
4. the ability to provide all buyers and sellers with perfect knowledge of the exchange price.

Evaluation of pricing efficiency was accomplished by a subjective analysis of each method's structural characteristics related to each component of pricing efficiency. Each method was ranked preferentially (Table 3.1).

Table 3.1: Summary of Johnson's Rankings of Eight Selling Methods for Cattle

| | Marketing Cost | Pricing Efficiency |
|---|---|---|
| Consignment | 1 | 8 |
| Teletype | 2 | 1 |
| Telephone Auction | 3 | 2 |
| Telephone Direct | 4 & 5 | 5 & 6 |
| Direct | 4 & 5 | 5 & 6 |
| Country Commission | 6 | 4 |
| Country Auction | 7 | 7 |
| Terminal | 8 | 3 |

Source: Johnson [ 7 ].

1/ The eight included: terminal markets, country auctions, direct, country commission, consignment, telephone auction, telephone direct and teletype auction.

A second study was carried out in Canada by Van Egteren [12]. Its major objective was to evaluate the teletype, direct, terminal and country auction methods for all of Canada with emphasis on costs. The analysis followed closely that of Johnson by adjusting Johnson's cost estimates to reflect Canadian conditions. Results of the study were similar to those of Johnson.

## 3.2 The Analytic Framework

The general framework for the current analysis will be similar to that used by Johnson and Van Egteren. To analyze the operational efficiency of the six selling methods, cost relationships will be analyzed for each market participant (producer, intermediary and packer).

While the general framework will be similar, the approach to analyzing costs followed by Johnson and Van Egteren will not be used. These studies employed point estimates of costs. For example, they included an average cost of transportation for moving cattle from the feed lot to their initial destination, and current commission and yardage charges were used as a proxy for intermediary costs. While the use of point cost estimates assists in simplifying the analysis and provides an "average" overview of operational efficiency, actual costs of operation at a point in time depend upon such factors as the physical capacity of an operation and the proportion of capacity which is being utilized. In other words, unit costs depend upon marketing volumes. The relationship between cost and volume can be important in determining the operational efficiency of a selling method and in determining whether an economic incentive exists to adopt new selling methods.

For example, if a selling method is characterized by relatively high fixed costs, its unit costs may increase substantially with a decrease in its market share or with a cyclical decrease in cattle marketings. In the same vein, for a producer whose operation is large enough to allow him to ship cattle in truck load lots, the potential attraction of a given selling system may be different than for a producer who ships in smaller lots. With the current expectation that cattle marketings will decline cyclically over the next few years and with the wide variation in the size and concentration of production units in Ontario, these are important considerations. Hence, wherever possible in this study, cost-volume relationships are analyzed.

### 3.2.1 Problems of Cost Analysis

Two general methods of cost analysis are employed in this study including: (1) descriptive analysis and (2) the economic-engineering approach.

Descriptive analysis is defined as "combining point estimates of average costs into various classes for comparative purposes" (French [4]). With this method, average costs for a particular time period are obtained by a sample survey. The sample is classified for purposes of analysis and an attempt is made to explain the reasons for variations in cost.

There are the following limitations with this approach:

i) It is difficult to ensure that the sample is representative of the firms within the industry.

ii) Firms, traditionally have cost accounting systems tailored to their individual needs making cost comparison between firms difficult.[1/]

iii) Some firms offer a variety of products or services other than those concerned with the study. For example, auctions or terminals are used to sell slaughter cattle and other classes of livestock. In this situation, costs collected from such firms may differ greatly, because of allocation of overhead and costs.

iv) The approach is heavily dependent on the co-operation of the firms or individuals being surveyed for the quality and/or quantity of sample data.

v) Finally, there is the problem of firms operating at differing levels of capacity. As a result, cost-volume relationships tend to be a "hybrid" of the underlying short and long run relationships.

However the descriptive analysis approach does offer two advantages. First, it can provide reliable cost data and is inexpensive when relatively simple cost relationships are desired. Second, cost data collected represent "real" costs, i.e. costs to which those involved in the industry can relate.

The economic-engineering approach involves the synthesis of costs and/or cost functions from "engineering ... or other detailed specifications of input-output relationships" (French [ 4 ]). Although this approach requires a greater depth of knowledge about technical aspects of the firms under study than does the descriptive approach, it offers several advantages.

First it overcomes the problems of comparison of accounting cost data from different firms by providing a model firm from which cost data of known background can be estimated.

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1/ Mansfield discusses the problems associated with the use of accounting data for the estimation of cost functions; in [9, pg. 178-180]. The problems are listed as follows.

1) The time period used for accounting purposes generally is longer than the economist's short run.
2) The depreciation of an asset over a period of time is determined by the tax laws rather than economic criteria.
3) Many inputs are valued at historical, rather than alternative opportunity cost.
4) Accountants often use arbitrary allocation of overhead and joint costs.

Second, it overcomes the problems of non-availability of data either because a firm or individual "just doesn't know", or because of lack of co-operation. There are many instances in which a firm will not release cost data but will release the necessary technical data for cost synthesis.

Third, it is the only way to develop data for hypothetical operations such as the teletype auction which is not currently functioning.

A disadvantage of the economic-engineering approach is that the costs provided are not "real" costs in the sense of representing existing firms. It is therefore necessary to compare the estimated costs with those of a similar operating firm in order to validate them.

### 3.2.2 Producer Costs

Producer cost information was obtained using a mail survey questionnaire[1/] which was distributed in the September 1977 and January 1978 issues of the Breeder and Feeder, the official publication of the Ontario Cattlemen's Association. It was felt that this would provide adequate coverage of producers across the province because of its large circulation.[2/]

The purpose of this questionnaire was to provide information about 1976 slaughter cattle marketings, in the following categories:

(1) Producer Classification

- i) location of the farm, in one of five OMAF designated regions of Ontario[3/]
- ii) size of the enterprise, in head shipped annually
- iii) type of enterprise

(2) Marketing Practices

- i) head sold via each of three[4/] selling methods

(3) Transportation Data by Sales Method

- i) average size of load
- ii) average cost per load
- iii) distance shipped

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1/ A copy of this questionnaire is found in Appendix #1.

2/ The Breeder and Feeder has a mailing list of approximately 14,000.

3/ Southern Ontario, Western Ontario, Central Ontario, Eastern Ontario, Northern Ontario (see Table 2.1 for counties included in each region).

4/ Ontario Public Stockyards, Country Auctions, Direct-to-Packer.

The information provided was utilized to determine the per head transport costs associated with each of the three selling methods on the basis of producer location and size. A transport cost function was developed using load size and distance as explanatory variables.

### 3.2.3 Intermediary Costs

#### Country Auctions

The costs associated with three sizes of country auction were estimated based on the economic-engineering approach with a procedure used by Kuehn in West Virginia [8]. Technical coefficients used in this study were adapted to suit Ontario conditions where necessary. Cost figures were updated for 1977 using the appropriate cost and price indexes. Additional supporting cost and validation information was supplied by the owners of a large Ontario community sales barn.[1/]

#### Ontario Public Stockyards

Information about operating procedures and costs of the Ontario Public Stockyards was obtained in several personal interviews with the General Manager and by a questionnaire completed by the Ontario Stock Yards Board. Commission and yardage fees for 1976, 1977 and 1978 were obtained from commission firms as well as the Board. These figures were used as a proxy for actual operating costs[2/] because sufficient technical data required for an economic-engineering study were not available.

#### A Listing Service

Information concerning the concept, structure, operation and potential volume of a listing service was obtained from an interview with several directors of OBEX. Using the technical information so supplied, the costs of operating a listing service similar to OBEX was estimated using the economic-engineering approach.

#### Electronic Auction

Estimates of the operational costs for an electronic system were determined with the aid of Bell Canada and by adapting appropriate cost figures supplied by the Ontario Pork Producers Marketing Board. The correspondence containing cost estimates received from Bell Canada is contained in Appendix 2.

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1/ The bookkeeping system employed by this firm is of such a standard that Revenue Canada uses its figures as a basis for tax audit purposes.

2/ Keeping in mind that the Ontario Public Stockyard is ostensibly a non-profit crown corporation.

### 3.2.4 Packer Costs

A survey questionnaire[1/] for packers was developed with the co-operation of several industry executives. The content of the questionnaire was approved by the Beef Committee of the Meat Packers Council of Canada. Its purpose was to obtain the following information for calendar year 1976:

(1) Classification of packing plants

  i) plant location
  ii) volume of slaughter cattle purchased annually

(2) Purchasing practices

  i) region where cattle were purchased
  ii) number purchased by selling method

(3) Average transport costs by region

(4) Procurement costs by selling method

(5) Shrink and carcass damage by selling method

(6) Pricing policy

With the buying cost data from this survey, weighted average purchasing and transport costs were calculated.

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1/ See Appendix #3.

# 4.0 PRODUCER AND PACKER COSTS

This section contains information on beef producers' marketing practices, transportation cost relationships for producers selling cattle by different selling methods and the costs incurred by packers for alternative methods.

## 4.1 Producers' Marketing Practices and Costs

There were 380 responses to the producer questionnaire from approximately 4000 mailings. Of these, 325 contained sufficient information to make them useful for the analysis. Given this rather limited response (from the people who commissioned this study), it is not possible to determine whether the information obtained is representative of the entire industry.

The remainder of this section summarizes the information obtained on marketing practices and transportation costs.

### 4.1.1 Beef Producers' Marketing Practices

The existing market system for slaughter cattle is characterized by considerable flexibility in selling method because the producer has the choice of several selling methods. This raises such questions as: Do producers with different sizes of operation use one selling method more than others? Are there regional variations in the use of selling methods? Are there differences among producers with varying sizes of operation in the amount of flexibility used - i.e. are some producers more likely to use all the selling methods available to them than others? Some answers to these questions were obtained from the questionnaires.

Based on the sample obtained 160 producers marketing 100 or fewer cattle per year responded to the questionnaire. Sixty-nine producers (43%) sold through the terminal market, 78 (49%) sold through country auctions and 37 (23%) sold direct.[1/] (Table 4.1). Most smaller producers tend to use either the terminal market or country auctions, while only a few sell direct. Producers marketing from 100-500 cattle annually, tend to use all three methods about equally. Finally, producers with larger operations tend to use either the terminal market or sell direct to packers, with fewer sales through country auctions.

A larger proportion of producers located in Western and Central Ontario sold through the terminal market (Table 4.2).[2/] Producers located in Southern, Eastern and Northern Ontario sold through country auctions more frequently. The largest proportion of those selling direct were

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1/ The number selling by each method totals more than the number of respondents because some producers sold more than one way (see Table 4.3).

2/ Counties included in each region are listed in Table 2.1.

Table 4.1: Producers Selling Cattle By Each of Three Methods According to Size of Operation, Ontario, 1976[1/]

| Size (Cattle Marketed by Farm, 1976) | Number of Producers | Country Auctions | | Ontario Public Stockyards | | Direct-to-Packer | |
|---|---|---|---|---|---|---|---|
| | | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers |
| 1 - 100 | (160) | 49 | (78) | 43 | (69) | 23 | (37) |
| 100 - 500 | (129) | 50 | (64) | 46 | (59) | 43 | (56) |
| 500 + | (38) | 42 | (16) | 68 | (26) | 68 | (26) |

Source: Beef Producer Survey

1/ The number selling by each method totals more than the number of respondents because some producers sold more than one way (see Table 4.3).

Table 4.2: Producers Selling Cattle by Three Methods, According to Region of the Province, Ontario, 1976[1/]

| Region | | Country Auctions | | Ontario Public Stockyards | | Direct-to-Packer | |
|---|---|---|---|---|---|---|---|
| | Number of Producers | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers |
| South | 96 | 54 | (52) | 32 | (31) | 43 | (41) |
| West | 130 | 44 | (57) | 53 | (63) | 45 | (58) |
| Central | 46 | 26 | (12) | 85 | (39) | 7 | (3) |
| East | 30 | 80 | (24) | 33 | (10) | 40 | (12) |
| North | 25 | 52 | (13) | 44 | (11) | 20 | (5) |

Source: Beef Producer Survey

1/ The number selling by each method totals more than the number of respondents because some producers sold more than one way (see Table 4.3).

located in Southern, Western and Eastern Ontario. These regional differences can likely be explained by the relative costs of transporting cattle and the proximity of the facilities for the various selling methods.

Only 102 or 31% of the responding producers utilized more than one method of sale (Table 4.3). Producers with larger operations tend to make the most use of the flexibility offered by the system.

### 4.1.2 Transport Costs

The major costs incurred by producers when selling cattle are commission and yardage (if any) charged by the market intermediary and transport costs incurred in moving cattle to the intermediary or packer. Some beef producers hire truckers to ship cattle to market while others ship them in their own trucks. Two of the most important factors affecting transportation cost are distance travelled and average load size. Per head costs are expected to increase with distance travelled and decrease with the average size of load.[1/] Thus with the extreme variation in distance faced by producers across Ontario and in size of operations, it would be expected that different producers face different transfer costs.

Table 4.4 contains the average cost per head, average size of load and average distance to market reported by producers in each region of the province for cattle sold by the three existing selling methods. Data in this table show the differences in costs incurred by selling by various methods - i.e. costs to the terminal are highest and to country auctions are lowest for all regions. At the extremes, it also illustrates the effects of distance on transport costs. For example, note the costs and distances for shipping to country auctions in Northern Ontario relative to those in the remaining four regions, or those for Northern and Eastern Ontario for shipments to the terminal market.

To illustrate the effect of size of load on transport costs, Table 4.5 contains average costs per head reported by producers with six sizes of operation in Southern Ontario. By concentrating on only one region, variations in distance are minimized and the inverse relationship between average cost and size of load is emphasized. For example, the average cost of shipping to country auctions when the size of load is 40 head is exactly half the average cost for shipping when the size of load is 10-11 head (Table 4.5). This also suggests that the marketing costs for larger producers, or at least those who are able to ship in large lots, provides these producers with a considerable advantage in the market place. Similarly, data in Table 4.4 suggest that those producers who are located at a considerable distance from marketing facilities experience a substantial disadvantage in marketing costs.

To obtain a more precise estimate of the relationship between transportation cost, size of load and distance to market, the data

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1/ Other factors such as the existence of a backhaul, truck capacity, number of stops and road grid, were not considered in the analysis.

Table 4.3: Producers Selling Cattle One, Two or Three Ways, By Size of Operation, Ontario, 1976[1/]

| Size | Number of Producers | One Way | | Two Ways | | Three Ways | |
|---|---|---|---|---|---|---|---|
| | | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers | Percent of Producers | Number of Producers |
| 0 - 100 | 160* | 79 | (127) | 17 | (27) | .6 | (1) |
| 100 - 500 | 129 | 65 | (84) | 29 | (37) | 6 | (8) |
| 500 + | 38 | 34 | (13) | 53 | (20) | 13 | (5) |
| Total | 327 | 69 | (224) | 26 | (84) | 4 | (14) |

Source: Beef Producer Survey

* 5 producers reporting in this size category indicated that they did not ship any cattle during 1976.

1/ The number selling by each method totals more than the number of respondents because some producers sold more than one way (see Table 4.3).

Table 4.4: Average Per Head Cost to Ship Cattle to Country Auctions, Ontario Public Stockyards and Direct-to-Packer, By Region of the Province, Ontario, 1976

| Region | Country Auction | | | Ontario Public Stockyards | | | Direct-to-Packer | | |
|---|---|---|---|---|---|---|---|---|---|
| | Average Cost/ Head | Average Size of Load | Average Distance | Average Cost/ Head | Average Size of Load | Average Distance | Average Cost/ Head | Average Size of Load | Average Distance |
| | | (Head) | (Miles) | | (Head) | (Miles) | | (Head) | (Miles) |
| South | $2.67 | 19 | 28.6 | $6.40 | 30 | 140.2 | $5.56 | 32 | 125.4 |
| West | 2.80 | 13 | 18.1 | 6.40 | 20 | 101.1 | 4.84 | 24 | 73.7 |
| Central | 3.48 | 9 | 31.3 | 6.28 | 12 | 82.0 | 5.76 | 33 | 115.0 |
| East | 3.62 | 6 | 17.0 | 12.99 | 13 | 243.4 | 6.14 | 10 | 58.8 |
| North | 8.00 | 14 | 57.7 | 18.24 | 13 | 452.5 | 9.25 | 8 | 75.0 |

Source: Beef Producer Survey

Table 4.5: Average Cost Per Head to Ship Cattle To Country Auctions, The Ontario Public Stockyards and Direct-to-Packer, By Size of Operation, Southern Ontario, 1976

| (# of Head Marketed in 1976) | Country Auction | | | Ontario Public Stockyards | | | Direct-to-Packer | | |
|---|---|---|---|---|---|---|---|---|---|
| | Average Cost/ Head | Average Size of Load | Average Distance | Average Cost/ Head | Average Size of Load | Average Distance | Average Cost/ Head | Average Size of Load | Average Distance |
| | | (Head) | (Miles) | | (Head) | (Miles) | | (Head) | (Miles) |
| 1 - 50 | $3.38 | 11 | 29.6 | $10.79 | 15 | 152.7 | $6.79 | 24 | 131.7 |
| 50 - 100 | 3.40 | 13 | 32.4 | N.A. | N.A. | N.A. | 5.01 | 30 | 125.0 |
| 100 - 300 | 2.34 | 20 | 25.4 | 6.57 | 30 | 145.0 | 5.66 | 31 | 135.4 |
| 300 - 500 | 2.11 | 31 | 31.3 | 4.52 | 28 | 123.6 | 5.46 | 34 | 106.1 |
| 500 - 1000 | 2.38 | 24 | 26.8 | 5.90 | 35 | 126.8 | 5.46 | 36 | 138.3 |
| 1000+ | 1.69 | 40 | 35.0 | 3.67 | 45 | 138.8 | 4.22 | 41 | 101.7 |

Source: Beef Producer Survey

obtained from the survey were analyzed using ordinary least squares regression. Separate equations were estimated for the costs of shipping to country auctions, the terminal market and direct to packers. The general form of the equations is shown below.

$$AC = a + bL + cD \qquad (1)$$

where AC = average cost per head
L = number of head per load
D = distance to market
a,b,c = estimated parameters.

The resulting equations confirm that an inverse relationship exists between cost and size of load while a direct relationship exists between cost and distance (Table 4.6). By setting distance equal to the mean distance for each of the samples (28.7 mi. for country auction, 148.5 mi. for the terminal market and 97.1 mi. for direct), it is possible to calculate the total cost of transportation per load and the average cost per head as the size of load varies at these distances. (Table 4.7 and Figure 4.1.

Table 4.6: Linear Cost-Load and Cost-Distance Relationships Estimated for Selling Cattle by Country Auctions, Terminal Market and Direct to Packer, Ontario, 1976
(t-values in parentheses)

| Selling Method | Size of Load | Distance to Market | Intercept | $R^2$ |
|---|---|---|---|---|
| Country Auction: | -.0784<br>(5.61) | .0711<br>(9.75) | 2.15 | .73 |
| Terminal Market: | -.1001<br>(4.20) | .0277<br>(11.28) | 5.62 | .53 |
| Direct to Packer: | -.0525<br>(3.47) | .0242<br>(6.01) | 4.48 | .28[1/] |

Source: Beef Producer Survey

1/ The lower $R^2$ value for the direct to packer alternative likely results from the great diversity of responses included. Some of the observations included were for small loads shipped over short distances to local abbatoirs while others were large loads shipped over varying distances to packers. The result, particularly with respect to size of load, was two groups of extremely large or extremely small loads and, therefore, a very heterogeneous sample.

It is evident that total costs increase at a decreasing rate as load size increases for shipments to the terminal market and direct to packers, but increases and then decreases for shipments to country auctions.

Figure 4.1: Average and Total Transfer Costs for Various Load Sizes; Country Auctions, Ontario Public Stockyards and Direct to Packer, Ontario, 1976

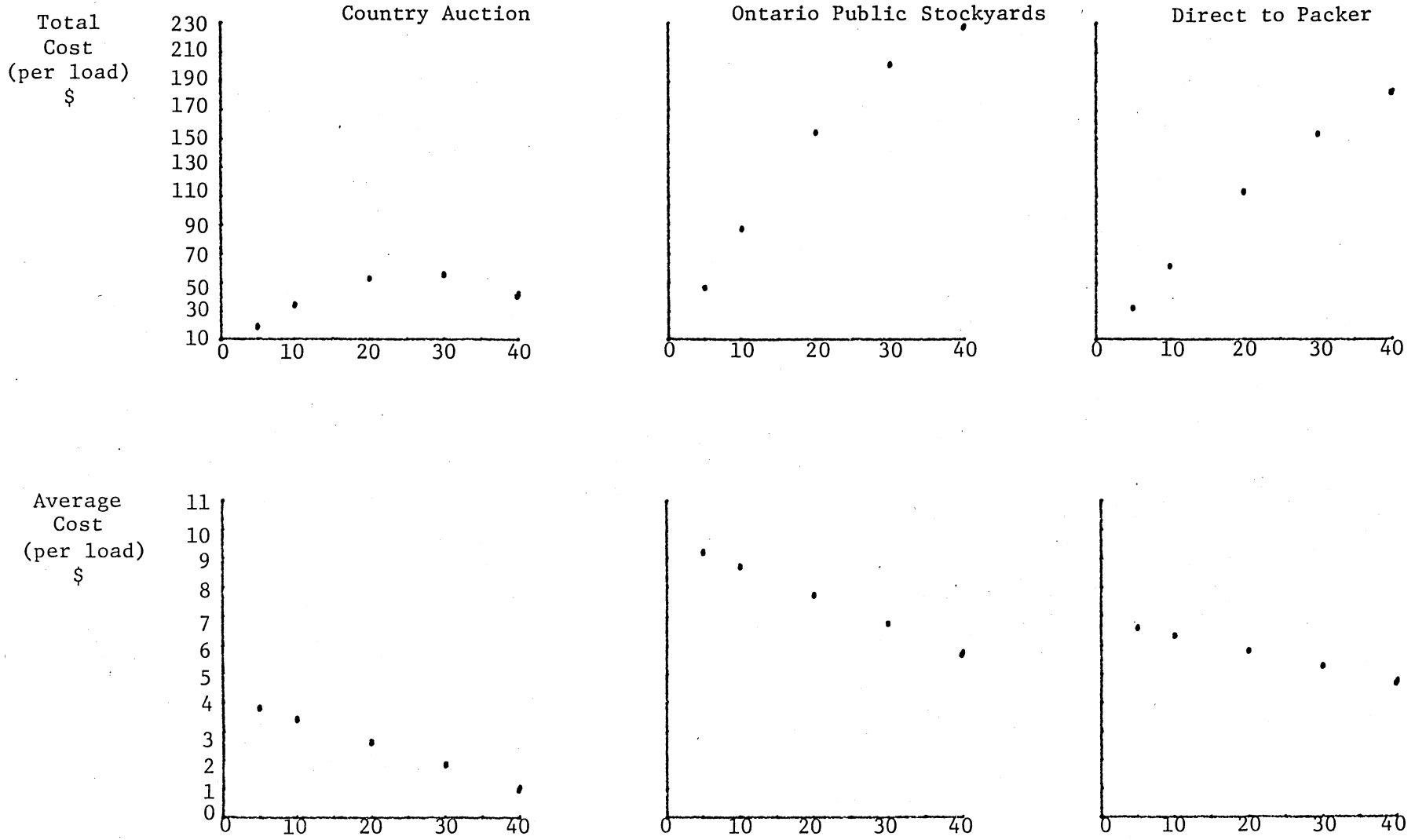

Table 4.7: Average and Total Costs for Various Load Sizes; Country Auctions, Ontario Public Stockyards and Direct-to-Packer, Ontario, 1976

| Size of Load | Country Auctions | | Ontario Public Stockyards | | Direct-to-Packer | |
|---|---|---|---|---|---|---|
| | Avg. Cost | Total Cost | Avg. Cost | Total Cost | Avg. Cost | Total Cost |
| | (Avg. Distance = 28.7 mi.) | | (Avg. Distance = 148.2 mi.) | | (Avg. Distance = 91.7 mi.) | |
| 5 | $4.15 | $20.75 | $9.23 | $ 46.15 | $6.44 | $ 32.20 |
| 10 | 3.41 | 34.10 | 8.73 | 87.30 | 6.18 | 61.80 |
| 20 | 2.62 | 52.40 | 7.73 | 154.56 | 5.65 | 113.00 |
| 30 | 1.84 | 55.20 | 6.73 | 201.81 | 5.12 | 153.60 |
| 40 | 1.05 | 42.00 | 5.73 | 229.20 | 4.60 | 184.00 |

While this result for country auctions seems at first to be unrealistic, and indeed may be related to the quality of data, it may have occurred because of the large number of producers with small operations who ship to country auctions. When cattle are shipped in small lots, truckers often stop at several farms to obtain a full load. Multiple stops means extra distances travelled per load and more driver time and work. As a result, the charges per head for a load obtained by multiple stops, are likely greater than for loads obtained at one or a few stops. If this is true, the higher costs per head for small lots of cattle would "pull" the regression line for country auctions in a manner which would cause the total cost function to be shaped as presented in Figure 4.1. This suggests that an important variable - the number of stops - has been omitted from the analysis.

These relationships can be used to obtain an idea of the effects of distance and load size on individual producers' transport costs. For example, using the equation for the terminal market, estimated transfer costs for producers shipping 10, 20 and 40 head over 40, 140 and 240 miles are presented in Table 4.8. These figures show that, at the extreme, the producer shipping 40 head, 40 miles has approximately an $8.50 per head advantage over the producer shipping 10 head 240 miles. The size of load appears to be more important than distance since a producer shipping 10 head, 40 miles has only an approximate advantage of $2.50 per head over a producer shipping 40 head, 240 miles. The reported costs indicate that the producer who ships small lots of cattle and who is located a considerable distance from the market is subject to a substantial cost disadvantage simply because of transport rates, regardless of the method by which he sells cattle.

Table 4.8: Estimated Transportation Costs for Producers Shipping Various Sizes of Load Over Various Distances to the Terminal Market

| | Distance (Miles) | | |
|---|---|---|---|
| Head | 40 | 140 | 240 |
| 10 | $5.73 | $8.50 | $11.27 |
| 20 | 4.73 | 7.50 | 10.27 |
| 40 | 2.73 | 5.49 | 8.27 |

## 4.2 Packer Costs

Costs incurred by packers have been classified by Johnson [7] and Van Egteren [12] as direct and indirect costs. Direct costs are those incurred by maintaining buyers who purchase cattle. Indirect costs include transport costs incurred in moving cattle from an intermediary (i.e. country auction or terminal market) source to the packing plant[1/] and the costs of

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1/ Naturally, transport costs are sometimes incurred for moving cattle for direct purchases depending upon whether transport costs are paid by the producer or the packer. Since, in Ontario, it appears that most producers pay transport costs for direct sales these costs were included under producer costs.

shrink incurred when packers must hold cattle over for later slaughter when short run supply fluctuations occur. Each of these costs is addressed separately below.

### 4.2.1 Purchasing Costs

A total of 14 packers were surveyed with a mailed questionnaire to obtain cost information but only seven packers responded. Furthermore some packers, who did respond, either had no records of their costs or purchased cattle through order buyers on a commission basis which did not reflect differences in the underlying costs for obtaining cattle by different methods. Thus the estimates of purchasing costs are based on a very limited sample.[1/] Despite this limitation, the survey response is the only information available on this subject.

Purchasing costs were found to be lowest for cattle purchased at the terminal market, slightly higher for country auctions and significantly higher for cattle purchased direct (Table 4.9). The difference in costs between the terminal and country auctions may be attributed to the costs of getting buyers to country auctions. The higher costs for direct purchases arises from expenses incurred in travelling to beef producers' feed lots to view cattle as they are growing or when they are offered and, in some cases, sorting them after purchase.

Table 4.9: Purchasing Costs for Cattle Purchased at Country Auctions, the Terminal Market and Direct, Ontario, 1977
($/Head)

| Country Auctions | Terminal Market | Direct |
|---|---|---|
| $1.70 | $1.45 | $3.00 |

Purchasing costs for a listing service or electronic system would consist of the fixed cost represented by an order buyer with the responsibility of viewing video tapes and making bids or bidding over a teletype. Costs per head would depend upon the number of cattle purchased by the packer. Assuming that the salary and associated costs for an order buyer are in the neighbourhood of $25,000 per year, the costs per head at various volumes would be significantly lower than for the three traditional methods of sale (Table 4.10).

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1/ It should also be noted that some responding packers who could not precisely estimate their purchasing costs could rank them from the most to least costly. These rankings were in accordance with the ranking implied by Table 4.9.

Table 4.10: Estimated Cost per Head for Purchasing Cattle by Listing Service or Electronic Auction

| Head Purchased | Cost per Head |
|---|---|
| 20,000 | $1.25 |
| 40,000 | .63 |
| 60,000 | .42 |
| 80,000 | .31 |
| 100,000 | .25 |

### 4.2.2 Packers' Transportation Costs

Packers' transportation costs were obtained from the survey of packers for cattle obtained from country auctions and from secondary data supplied by the Ontario Pork Producers Marketing Board for costs from the terminal market. For country auctions, costs from each of the five regions (South, West, Central, East, North) of Ontario as reported by responding packers were averaged. Then the average costs from each region were weighted by sales of slaughter cattle in each region (see Table 2.1) to obtain a weighted average cost for the province (Table 4.11).

Table 4.11: Transportation Costs for Cattle Shipped From Country Auctions and the Terminal Market to Packing Plants, Ontario 1977 ($/Head)

| Region | From Country Auction | From the Terminal Market |
|---|---|---|
| South | $ 6.20 | |
| West | 5.00 | |
| Central | 4.50 | |
| East | 5.00 | |
| North | 10.00 | |
| Ontario (weighted average) | 5.90 | $2.15 |

For the terminal market, the average cost of shipping hogs from the terminal market to packing plants in Toronto, Burlington and Kitchener were first multiplied by four and then a weighted average was calculated by weighting Toronto by a factor of 80 percent and Burlington-Kitchener by a factor of 20 percent. Costs for hogs were muliplied by four on the assumption that a truck typically will transport four hogs in the same space as one head of cattle. Hence it was assumed that the cost per head of cattle would be four times that of a hog. The 80%-20% factor was used for Toronto vs. Burlington-Kitchener on the assumption that 80 percent of the cattle delivered to the terminal market are slaughtered at Toronto and

the remainder at Burlington and Kitchener.

### 4.2.3 Costs of Kill and Yield Efficiency

Losses from kill and yield efficiency occur with all selling methods. However, for the reasons outlined below, they are expected to be greater for the country auction and terminal methods. Therefore, the estimated costs of kill and yield efficiency are the marginal costs associated with those two methods.

Kill efficiency refers to costs incurred because of uneven plant receipts within the week when cattle are obtained by packers from the terminal market and country auctions. It is composed of the costs of holding cattle over and the effects on in-plant slaughter costs from day to day fluctuations in supply. Packers can do little to control the flow of cattle to country auctions and the terminal but they attempt to gear kill lines to operate at an anticipated level per week. When daily deliveries are large, packers often find it necessary to hold cattle over several days until they can be slaughtered. Similarly, if the flow of cattle is less than kill capacity, the cost of slaughter per head increases substantially. Eriksen [2], for example, has shown that under utilization of capacity for a plant designed to handle 60 head per hour, increases per head costs 36 percent as utilization of capacity declines to 60 percent (Table 4.12). With purchases made by the direct, electronic or listing service methods, it is possible for the packer to schedule deliveries to the plant in order to minimize these costs because the packer, by communicating with the producer, can arrange for cattle to be delivered as required for the kill line.

Table 4.12: Percentage Change in Total In-Plant Kill Cost Per Head, of a 60-Head Per Hour Capacity Plant at Various Levels of Operation

| Utilization Role (%) | % Added Cost per Head Due to Under Utilization |
|---|---|
| 100 | 0 |
| 90 | 4 |
| 80 | 12 |
| 70 | 21 |
| 60 | 36 |

Source: Eriksen [2].

Very little information is available in Ontario to assist in assessing in-plant kill costs. However, Johnson estimated the cost at $1.35 per head in 1971. Johnson's costs were updated to 1977 for the current study to $1.71 for both country auction and the terminal market.

Yield efficiency refers to losses incurred due to increased tissue

shrink and bruising associated with obtaining cattle from country auctions and the terminal market. While some shrink and bruising occurs with all selling methods, they are hypothesized to be greater for auctions and the terminal markets, because of the necessity of an extra unloading and loading, handling cattle through sales rings and the additional time required in moving them to the kill floor. Again, no information is available to estimate the costs of yield efficiency in Ontario. However, Johnson [ 7 , pp. 37-38] included yield losses of 7.92 lbs. and 8.71 lbs. per head for terminal and country auctions respectively. These figures were adopted from Frederick [3] who developed them from six years of data supplied by a meat packer at Lincoln, Nebraska.

Using these figures and the 1977 average price of $44.78/cwt. for steers, the cost of yield loss for the terminal market and country auctions is $3.55 and $3.90 per head, respectively.

# 5.0 INTERMEDIARY COSTS

This section contains the costs associated with each market intermediary represented by the selling methods analyzed. Costs are presented in the following order: country auction costs, listing service, electronic and terminal methods. No intermediary costs are incurred for direct to packer sales.

## 5.1 Country Auction Costs

As with transportation costs, the costs of market intermediaries depend upon capacity and the percentage utilized in current operations. Furthermore, many intermediaries such as country auctions and the terminal market, are multi-product firms in the sense that they handle other livestock (feeder cattle, feeder pigs, sheep and lambs, horses) in addition to slaughter cattle. In order to avoid the problems created by these factors the following procedure is used to analyze country auction costs:

1. Country auction capacity were based on animal units (AU), where 1 animal unit = 1 slaughter beef animal, 4 weaner pigs, etc. In this way costs are spread over all products marketed.

2. Three sizes of auction including 500, 1500 and 2500 animal units per day with total annual capacities of 9,240, 27,720 and 46,200 animal units, respectively, were analyzed.

3. Costs were based on an economic engineering study of country auctions in West Virginia by Kuehn [ 8 ]. Technical coefficients from the West Virginia study were used to obtain input requirements. Costs were then calculated by using Ontario prices for each input in 1977.

4. After the costs were calculated, the results were cross-checked with a large country auction in Southern Ontario to test their validity. The calculations are similar to this auction's actual costs.

### 5.1.1 Labour Costs

Labour costs include those for yard and ring personnel, secretarial, bookkeeping personnel and auctioneers, and weighing. No costs are included for a manager since most managers are also owners or part owners of country auctions. Hence, in the final analysis, a return to management and capital is calculated for the purpose of comparing selling methods. Labour costs per head are reduced significantly as the auction capacity increases (Table 5.1).

### 5.1.2 Capital Costs

Estimates were developed for capital costs including land, buildings, office equipment and interest (Table 5.2). In all cases,

Table 5.1: Labour Costs Estimated for Three Sizes of Country Auctions, Ontario, 1977

| Type of Labour | Weekly Costs for Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. | Annual Costs for Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. |
|---|---|---|---|---|---|---|
| Yard and Ring Labour: | | | | | | |
| Hours Req'd/Week | 74.4 | 191.9 | 267.9 | | | |
| Cost @ $4.00/hr. | $297.60 | $767.60 | $1071.60 | $15,475.20 | $39,915.20 | $55,723.20 |
| Secretarial Time: | | | | | | |
| Hours Req'd/Week | 16 | 20 | 24 | | | |
| Cost @ $3.75/hr. | 60.00 | 75.00 | 90.00 | 3,120.00 | 3,900.00 | 4,680.00 |
| Bookkeping Time: | | | | | | |
| Hours Req'd/Week | 8 | 18 | 20 | | | |
| Cost @ $4.75/hr. | 38.00 | 85.50 | 90.00 | 1,976.00 | 4,446.00 | 4,940.00 |
| Auctioneers: | | | | | | |
| Cost | 100.00 | 150.00 | 300.00 | 5,200.00 | 7,800.00 | 15,600.00 |
| Weighing: | | | | | | |
| Cost/Head | .24 | .18 | .15 | 2,217.60 | 4,989.60 | 6,930.00 |
| Total Annual Cost of Labour | | | | $27,988.80 | $61,050.80 | $87,923.20 |
| Cost of Labour per Head (A.U.) | | | | $3.03 | $2.20 | $1.90 |

Table 5.2: Capital Costs Calculated for Three Sizes of Country Auction, Ontario, 1977

| Type of Capital | Initial Costs or Input Requirements for Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. | Annual Capital Costs for Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. |
|---|---|---|---|---|---|---|
| Buildings: | | | | | | |
| Initial Cost | $61,997.27 | $139,502.74 | $215,869.97 | | | |
| Annual Depreciation @ 4% | | | | $2,479.89 | $ 5,580.11 | $ 8,634.80 |
| Repairs and Maintenance @1.9% | | | | 1,177.95 | 2,650.55 | 4,101.53 |
| Interest @ 10% of 1/2 of Initial Cost | | | | 3,099.86 | 6,975.14 | 10,793.50 |
| Office Equipment: | | | | | | |
| Initial Cost | 3,500.00 | 3,500.00 | 3,500.00 | | | |
| Annual Depreciation @ 8% | | | | 280.00 | 280.00 | 280.00 |
| Land: | | | | | | |
| Land Required | 25 Ac. | 25 Ac. | 30 Ac. | | | |
| Interest @ 10% of Land Value @ $200/Ac. | | | | 500.00 | 500.00 | 600.00 |
| Total Capital Cost: | | | | $7,537.70 | $15,985.80 | $24,409.83 |
| Capital Cost/Head (A.U.) | | | | $.816 | $.577 | $.528 |

capital is valued at its initial costs: not at its opportunity cost (i.e. its value in the best alternative use). If opportunity cost had been used, capital costs would have been higher - particularly for land.

For this study, it was assumed that auctions were established in 1961 and that buildings are depreciated over 25 years at 4 percent per year. Initial investment costs for 1961 were taken from the West Virginia study and adjusted for the U.S./Canadian exchange rate in 1961. In addition to depreciation, repairs and maintenance were calculated at 1.9 percent of the original value and annual interest costs were calculated at 10 percent of one-half the original value.

Office equipment was assumed to have been purchased in 1971 at a uniform cost of $3500 for each size of auction. The initial value is depreciated at 8 percent per year.

Land is assumed to have a value of $200/ac. (1961 costs) and interest is charged against land at 10 percent of the total value.

### 5.1.3 Operating Costs

Operating costs include the costs of utilities and other factors involved in operating the business. These include interest on (Table 5.3) accounts receivable. An agreement reached in 1977 between the Ontario Stockyards Association and meat packers stipulates that packers will settle with country auctions within seven days of purchase. Auctions pay producers at the time of sale, thus necessitating that auctions carry accounts receivable until packers settle. On the assumption that all packers do not use the entire seven days, country auction costs of accounts receivable are calculated for five days. For 1977 interest costs were calculated based on the average price of steers in Ontario of $44.84/cst. and an interest rate of 9 3/4 percent.

### 5.1.4 Total Annual Costs

When total costs are calculated on a per head basis, substantial economies of size exist for larger country auctions (Table 5.4).[1/] Total annual costs for the largest auction at $4.34 per head are 29 percent lower than for the smallest auction. If it is assumed that country auctions have as a target a 15 percent return to capital and management, the figures

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1/ Kuehn noted in his study that, for a number of reasons, his cost estimates appeared to underestimate actual costs for the smaller auctions in West Virginia. This is also likely the case in Ontario. While the data show that economies of scale exist, and that costs of smaller auctions are higher than larger ones, some of the smaller auctions in Ontario set commissions at 3% of the value of cattle sold. At current prices in the range of $65-$68/cwt., the commission cost of a 1050 lb. steer would be around $21 per head.

Table 5.3: Operating Costs Estimated for Three Sizes of Country Auctions, Ontario, 1977

| Operating Cost | Annual Cost for Country Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. |
|---|---|---|---|
| Telephone | $ 960.61 | $ 2,714.35 | $ 4,468.09 |
| Heat and Hydro | 1,360.18 | 2,501.51 | 3,279.24 |
| Losses (Incl. Bad Debts) | 1,529.64 | 3,279.55 | 9,836.60 |
| Advertising (Mkt. News Service) | 1,950.48 | 4,366.04 | 7,494.90 |
| Straw and Hay | 1,611.09 | 4,833.26 | 8,055.44 |
| Transport and Gasoline | 966.22 | 2,190.39 | 3,649.24 |
| Miscellaneous Costs | 4,568.52 | 11,082.74 | 18,471.92 |
| Taxes | 796.81 | 1,790.81 | 2,783.45 |
| Insurance and Bonding | 1,108.00 | 2,388.00 | 3,671.00 |
| Interest on Accounts Receivable | 5,821.20 | 17,463.60 | 29,106.00 |
| Total Operating Costs | $20,672.75 | $52,610.25 | $90,815.88 |
| Operating Cost/Head (A.U.) | $2.24 | $1.90 | $1.97 |

Table 5.4: Total Annual Costs Estimated for Three Sizes of Country Auctions, Ontario, 1977

| Cost Category | Total Annual Costs For Country Auctions With Annual Capacity of: 9,240 A.U. | 27,720 A.U. | 46,200 A.U. |
|---|---|---|---|
| Labour | $27,988.80 | $ 61,050.80 | $ 87,923.20 |
| Capital Costs | 7,537.70 | 15,985.80 | 24,409.83 |
| Operating Costs | 20,672.75 | 52,610.25 | 90,815.88 |
| Total Annual Costs | $56,199.25 | $129,646.85 | $202,518.91 |
| Cost/Head (A.U.) | $6.08 | $4.68 | $4.38 |
| Cost + 15% Return to Capital and Management | $6.99 | $5.38 | $5.04 |

included at the bottom of the table represent the necessary charges per animal unit which would be assessed as yardage and commission fees.

### 5.1.5 Country Auction Costs and the Cattle Cycle

While the foregoing reflects costs to country auctions in 1977 assuming the auctions operate at full capacity, an important consideration relates to costs in the future when cattle numbers are expected to decline cyclically as a result of breeding herd liquidation from 1975 through 1978. A cyclical decline in cattle population would mean that country auctions, even if they maintain a constant share of total marketings, may be in a situation in which fixed costs per head would increase since fewer slaughter cattle and cows as well as fewer feeder cattle would be marketed.[1/]

In order to provide a rough estimate of the effects of declining slaughter on country auction costs, capital and operating costs were assumed to be fixed and labour costs are variable. Total costs and total costs plus 15 percent return on investment were recalculated assuming capacity use ranging from 60 to 90 percent. This is a very rough assumption in that labour costs are not likely to be strictly variable and operating costs are not likely to be strictly fixed. Also, no account is taken for inflation. However, the results provide some indication of the relationship. Under the assumption used, costs per head would increase by as much as 40 percent if country auctions operated at 60 percent of capacity (Table 5.5).

## 5.2 Terminal Market Costs

Costs for the terminal market are represented in this study by the tariffs (yardage) and commissions currently charged by the Ontario Public Stockyards (OPS). This was done because OPS personnel declined to provide information which allowed a cost analysis to be performed. Furthermore, unlike the case of country auctions, no secondary information is available to construct an economic engineering study. This is particularly difficult because of the services required of the public stockyards under federal legislation.

At the terminal market, tariff and commission charges vary with the size of lot producers sell. The schedule and resulting marketing costs are presented in Table 5.6. As with the other selling methods, costs were estimated assuming various volumes. Current charges were assumed to reflect costs and a reasonable return on investment for commission houses at the current level of operation. (The stockyard itself is a non-profit corporation which attempts to establish tariffs at a level which just covers costs). Second, it was assumed that reduced volumes would affect per unit costs in the same proportion as the largest country auctions (see Table 5.5) discussed previously.

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1/ In Ontario at the present time some of the decline in cattle numbers may be offset by an increase in feeder pig sales.

Table 5.5: Total Costs Per Head and Costs Plus 15% Return on Investment for Country Auctions at 60, 70, 80, 90 and 100% of Capacity

| | Cost per Head for Country Auctions With Capacity of: | | | Cost Plus 15% Per Head For Country Auctions With Capacity of: | | |
|---|---|---|---|---|---|---|
| % of Capacity | 9,240 A.U. | 27,720 A.U. | 46,200 A.U. | 9,240 A.U. | 27,720 A.U. | 46,200 A.U. |
| 100 | 6.08 | 4.68 | 4.38 | 6.99 | 5.38 | 5.04 |
| 90 | 6.42 | 4.95 | 4.67 | 7.38 | 5.69 | 5.37 |
| 80 | 6.85 | 5.30 | 5.00 | 7.88 | 6.10 | 5.75 |
| 70 | 7.37 | 5.74 | 5.47 | 8.48 | 6.60 | 6.29 |
| 60 | 8.12 | 6.33 | 6.12 | 9.34 | 7.28 | 7.04 |

Table 5.6: Tariff and Commission Charges at the Ontario Public Stockyards, 1977

| | Number of Head | | | |
|---|---|---|---|---|
| | 1 | 2-6 | 7-20 | 21 or more |
| | (Dollars Per Head) | | | |
| Tariff | $1.80 | $1.80 | $1.80 | $1.65 |
| Commission | 3.50 | 2.75 | 2.50 | 2.15 |
| Total Charges | $5.30 | $4.55 | $4.30 | $3.80 |

Total charges were calculated at 10 percent intervals from 60-100 percent of current capacity (Table 5.7).

Table 5.7: Estimated Marketing Charges per Head at the Terminal Market at 60, 70, 80, 90 and 100 Percent of Current Capacity

| % of Current Capacity | Number of Head 1 | 2-6 | 7-20 | 21 or more |
|---|---|---|---|---|
| | (Dollars per Head) | | | |
| 100 | $5.30 | $4.55 | $4.30 | $3.80 |
| 90 | 5.63 | 4.83 | 4.62 | 4.04 |
| 80 | 6.05 | 5.20 | 4.97 | 4.34 |
| 70 | 6.60 | 5.66 | 5.42 | 4.73 |
| 60 | 7.32 | 6.28 | 6.02 | 5.25 |

## 5.3 Listing Service Costs

As with country auctions, the costs for a hypothetical listing service were calculated using the economic engineering approach. Many of the technical coefficients used to determine resource requirements were obtained from the Ontario Beef Exchange Ltd. (OBEX), and costs were then calculated using current (1977) input prices. It must be emphasized, however, that the costs presented here were not obtained from OBEX and that there are substantial differences in the specifications of the listing service designed here and that of OBEX.

The listing service designed for this study is assumed to have a selling capacity of 3800 head per week or 197,000 head per year. Capacity in this case is established by the video-tape units. The capacity for one unit is about 1900 head per week.[1/] Listing service costs include labour,

1/ There is no technical reason to limit capacity to this level. Preliminary investigation indicated that fairly large economies of size occur in moving from one to two video tape units, but few economies result thereafter. Hence the analysis was carried out for the two unit operation.

capital and operating costs (Table 5.8). Labour costs include the salaries of: a manager, office manager, three bookkeepers, two salesmen and two t.v. crews (a cameraman and driver for each crew).

Capital costs include leasing rates for two four-wheel drive vehicles, two video tape units, and ownership costs for office equipment. Leasing rates were used rather than ownership since lease rates were available from firms supplying this equipment and leasing is likely the most economic mode of operation. Leasing rates for vehicles include maintenance and insurance. The rate for video equipment includes the cost of tapes.

Operating costs include those items listed in Table 5.8. Most items are self explanatory. Telephone charges include an assumption of 4 INWATTS and 3 OUTWATTS lines at $250/month plus one regular line at $250/month. Transportation costs assume 20,000 miles per year each for the sales personnel and manager at $.18 per mile, and 40,000 miles for each video tape unit at $.25 per mile. The weighing charge of $.25 per head is rather arbitrary. In their early operations, OBEX weighed most of the cattle they handled at the Ontario Public Stockyards for which they were charged the full tariff (yardage) of $1.65 per head. On the other hand, an independent firm has provided the authors an estimate for a truck scale, constructed in the Toronto area at $47,000. Assuming a useful life of 20 years, annual interest at 10 percent charged on half the capital cost and interest on owned land costing $10,000, the total annual cost would be of $5700 or about $.03 per head. The figure of $.25 was chosen arbitrarily as a reasonable service charge.

The resulting costs are presented in Table 5.8. By treating losses, office supplies, bank charges and weighing charges as variable costs, it is possible to estimate costs at 10 percent capacity intervals from 60 to 100 percent as was done for country auctions. These costs are also presented in Table 5.8. At 60 percent of capacity, per head costs are 45 percent greater than at 100 percent of capacity.

## 5.3 Electronic Auction Costs

The hypothetical electronic auction system described by this study is capable of handling a large number of cattle. In the producer survey conducted for this study 67 percent of the responding producers shipped cattle in loads of 10 head or more, the minimum load size allowed on the teletype. The average size of load was 24 head and the percentage of the cattle shipped by responding producers in loads of 10 or more was 93 percent. Thus it would appear to be a safe assumption that 70 percent of the cattle shipped in Ontario are shipped in loads of 10 or more. This would suggest a capacity, given 1977 marketings, of about 840,000 cattle for an electronic auction.

Would the electronic auction be able to handle this many cattle? Currently, the Ontario Pork Producers Marketing Board indicates that a sale, including listing, decrements on a tape and confirmation of the sale takes 50 seconds to complete. The average time for a transaction would be

Table 5.8: Estimated Costs for a Listing Service, Ontario, 1977 (Capacity 197,600 head)

| | - Annual Cost - Percent of Capacity | | | | |
|---|---|---|---|---|---|
| | 100 | 90 | 80 | 70 | 60 |
| Labour Costs: | $148,000 | | | | |
| Capital Costs: | | | | | |
| 4-W.D. vehicles (2 @ $292/month) | 7,008 | | | | |
| Video-tape equipment (2 @ $2950/month) | 70,800 | | | | |
| Office Equipment ($10,000 @ 8% deprec.) | 800 | | | | |
| Operating Costs: | | | | | |
| Office Rent | 4,000 | | | | |
| Telephone | 24,000 | | | | |
| Bonding | 200 | | | | |
| Advertising | 8,000 | | | | |
| Transportation Costs | 27,600 | | | | |
| Losses (Incl. Bad Debts @ .08/head) | 15,800 | 14,227.20 | 12,646.40 | 11,065.60 | 9,484.80 |
| Office Supplies (@ .10/head) | 19,760 | 17,784.00 | 15,808.00 | 13,832.00 | 11,856.00 |
| Bank Charges (@ .25/head) | 49,400 | 44,460.00 | 39,520.00 | 34,580.00 | 29,640.00 |
| Weighing Charges (@ .25/head) | 49,400 | 44,460.00 | 39,520.00 | 34,580.00 | 29,640.00 |
| Total Cost | $424,768 | $411,339.20 | $397,902.40 | $384,465.60 | $371,028.80 |
| Cost Per Head | $2.15 | $2.31 | $2.52 | $2.78 | $3.13 |
| Cost + 15% Per Head | $2.47 | $2.66 | $2.90 | $3.20 | $3.60 |

somewhat less. The total number of 8 hour days required to sell 840,000 head assuming average lot sizes of 15, 25 and 40 head (an average of 40 head is not impossible when one considers that some producers offer cattle in lots of more than one truck load), and assuming average transaction times for a sale of 45 seconds, 1 minute and 2 minuts are presented in Table 5.9.

Table 5.9: Number of 8 Hour Days Required to Market 840,000 Head of Cattle By Electronic Auction If Average Transaction Time Required per Sale is:

| Average Size of Lot (Head) | # of Transactions | 45 Seconds | 1 Minute | 2 Minutes |
|---|---|---|---|---|
| 15 | 56,000 | 88 | 117 | 233 |
| 25 | 33,600 | 53 | 70 | 140 |
| 40 | 21,000 | 33 | 44 | 88 |

Quite clearly, the system is capable of handling 840,000 head or any other volume foreseeable in Ontario in the future.

The technical equipment required for this system includes a master controller, a price generator (which transmits offering prices via the master controller to buying stations), 18 printing devices at buyers' plants and individual circuits to each plant.

Estimated costs for the system compare favourably with traditional selling methods (Table 5.10). Labor is the major cost of the system. These costs were estimated on the basis of the Ontario Pork Producers Marketing Board (OPPMB) costs. During 1977, the OPPMB employed over 50 people. For this study system, the number of employees was set at 30 because: a) the number of cattle marketed is not as great as the number of hogs and b) the OPPMB is engaged in a number of activities beyond simply selling hogs which are not envisioned for the cattle sales agency.

The system is designed such that it can easily interface with a computer. If this interface were established it would be possible to reduce much of the manual work done by the OPPMB staff (recording sales, price reporting, billing, cheque writing, etc.). Although the costs of such a system were not investigated in depth, it would appear that both labour and office supply costs could be reduced by it.

Depreciation on the electronic system and office equipment are capital costs. These are "ball park" rates quoted by Bell Canada (see correspondence included in Appendix III) assume that the selling system is located at Keele and St. Clair in Toronto. It should be noted that the system can handle more buyers than are included here. The system designed by Bell Canada can accommodate up to 26 buying stations. Costs for additional buying stations would be $100/month for each printer, a once

Table 5.10: Estimated Costs For an Electronic "Teletype" Selling System

| Component | - Annual Cost - Percent of Capacity 100 | 90 | 80 | 70 | 60 |
|---|---|---|---|---|---|
| Labour Costs: | | | | | |
| (30 employees @ $205/week plus 15% personnel costs) | $367,770 | | | | |
| Capital Costs: | | | | | |
| Teletype Equipment Price Generator 18 Printers Individual Circuits | 79,745 | | | | |
| Annual Cost of Installation (@ 6.7% depreciation) | 250 | | | | |
| Depreciation on Office Equipment | 20,000 | | | | |
| Operating Costs: | | | | | |
| Office Rent | 25,000 | | | | |
| Telephone Service | 60,600 | | | | |
| Office Supplies (@ .10/head) | 84,000 | 75,600 | 67,200 | 58,800 | 50,400 |
| Losses (Incl. Bad Debts @ .08/Head) | 67,200 | 60,480 | 53,760 | 47,040 | 40,320 |
| Bank Charges @ .25/head | 210,000 | 189,000 | 168,000 | 147,000 | 126,000 |
| Total | $914,565 | $878,445 | $842,325 | $806,205 | $770,085 |
| Cost Per Head | $1.09 | $1.16 | $1.25 | $1.37 | $1.53 |
| Cost + 15% | $1.25 | $1.33 | $1.44 | $1.57 | $1.76 |

only service and installation charge of $115 ($50 for the printer and $65 for the circuits) and a monthly charge for circuits depending upon the buyer's location. The monthly rate quotes range from $5.80 for buyers located near the selling point to $450 for packers located as far away as Ottawa (see Appendix). If more than 26 buying stations were necessary, a larger master controller would be required at a somewhat higher cost.

Operating costs include rent, telephone, office supplies, losses and bank charges. Rent was estimated at one half the rate of the OPPMB since the estimated system would require fewer employees. Furthermore, the OPPMB owns a computer which requires a substantial amount of space. The remaining costs are at the same rate as those for the listing service. No weighing charge is included since most cattle would be sold on a carcass weight and grade basis, thus negating the need for weighing. Even if a substantial number of cattle were weighed, the costs of a scale (as indicated in section 5.3) would be negligible for the number of cattle this system could handle.

The estimated total cost of the system designed for 840,000 head of cattle is $914,565. In 1977, the total costs reported by the Ontario Pork Producers Marketing Board for management, settlement and sales activities (net of marketing yard expenses) was $1,009,751 for 2.63 million hogs. The major difference in costs between the two systems are the additional labour costs of the OPPMB.

As with the other systems, total and per unit costs were calculated at 10 percent intervals from 60-100 percent of capacity (Table 5.10). In this case, office supplies, losses and bank charges were treated as variable and the remaining costs as fixed. Estimated costs per head range from $1.00 at full capacity to about $1.55 at 60 percent of capacity. Costs for less than full capacity are probably slightly overstated using these assumptions because both the number of employees and the number of telephone lines could be reduced.

# 6.0 COST COMPARISONS FOR ALTERNATIVE METHODS

This section contains cost comparisons for the alternative selling methods analyzed. The comparisons are provided for both the 1977 base period and also a future period with assumptions regarding cattle slaughter and rates of inflation. Finally, because of the relationships discussed previously with respect to transportation costs and producer's marketing volumes, the costs are presented with appropriate allowances for producers delivering cattle in varying sizes of lots.

## 6.1 Cost Comparisons for Base Period

In calculating total costs for the base period, producers' transport costs were calculated for load sizes of 10, 20 and 40 head. These are obtained by using the transport cost equations presented in section 4.0 and by setting the distance to market at the means of the samples for country auctions, terminal market and direct to packer sales (see Table 4.7). For the listing service and electronic auction, transport costs were calculated using the direct to packer equation.

Intermediary costs for country auctions were represented by the average cost at full capacity of the three sizes of auction analyzed in section 5.0 plus 15 percent for return to management and capital (see Table 5.4). For the terminal market, current commission and tariff charges for the appropriate size of lot were used (see Table 5.7). For the listing service and electronic auctions, calculated average costs at full capacity (i.e. 197,600 head for the listing service) plus 15 percent return to capital are used (see Tables 5.8 and 5.10).

Packers' costs are taken from section 4.0. Purchasing costs for the listing service and electronic auction are those calculated in Table 4.10 assuming the packer buyer purchases 60,000 head per year.

Estimated total costs for country auctions and the terminal markets are from 240 to 300 percent greater than those for the direct, listing service and electronic auction methods (Table 6.1). These large differences occur because of: 1) the relatively large intermediary costs for country auctions and the terminal market; 2) the additional transfer costs incurred in moving cattle from country auctions and the terminal to packers' plants, and 3) losses attributed to yield and kill efficiency.

It is interesting to note that both the listing service and the electronic auction are marginally less costly than the direct method, despite the fact that no intermediary costs are incurred in direct marketing. This result obtains because the higher estimated cost of purchasing for the direct method more than offsets the intermediary costs.

## 6.2 Cost Comparisons for a Future Period (1981)

With an expected substantial decline in future cattle slaughter and continuing inflation, it may be useful to speculate about costs of each

Table 6.1: Comparative Marketing Costs for Alternative Selling Methods, Ontario 1977 ($/Head)

| Cost | Country Auction | | | Terminal Market | | | Direct | | |
|---|---|---|---|---|---|---|---|---|---|
| | 10 Head | 20 Head | 40 Head | 10 Head | 20 Head | 40 Head | 10 Head | 20 Head | 40 Head |
| Producer Transport. | $ 3.41 | $ 2.62 | $ 1.05 | $ 8.73 | $ 7.73 | $ 5.73 | $6.18 | $5.65 | $4.60 |
| Intermediary: | | 5.80 | | 4.30 | 4.30 | 3.80 | | | |
| Packer: | | | | | | | | | |
| Purchasing | | 1.70 | | | 1.45 | | | 3.00 | |
| Transport | | 5.90 | | | 2.15 | | | | |
| Kill Efficiency | | 1.71 | | | 1.71 | | | | |
| Yield Efficiency | | 3.90 | | | 3.55 | | | | |
| Total Cost/Head | $22.42 | $21.73 | $20.16 | $21.89 | $20.89 | $18.39 | $9.18 | $8.65 | $7.60 |

| Cost | Listing Service | | | Electronic Auction | | |
|---|---|---|---|---|---|---|
| | 10 Head | 20 Head | 40 Head | 10 Head | 20 Head | 40 Head |
| Producer Transport. | $6.18 | $5.65 | $4.60 | $6.18 | $5.65 | $4.60 |
| Intermediary: | | 2.47 | | | 1.25 | |
| Packer: | | | | | | |
| Purchasing | | .42 | | | .42 | |
| Total Cost/Head | $9.07 | $8.54 | $7.49 | $7.85 | $7.32 | $6.27 |

selling method in the future. To accomplish this, intermediary costs plus 15 percent for return to capital (except for the terminal market) at 60, 70, 80, 90 and 100 percent of capacity (see Tables 5.5, 5.7, 5.8 and 5.10) are used in the analysis. These and the producer (at a lot size of 20 head) and packer costs from Table 6.1 are combined assuming an 8 percent annual rate of inflation over four years. At a compound rate of 8 percent per year over four years, inflation would increase costs by 36 percent.

Obviously, this is an arbitrary manner to assess the effects of inflation and, at best, it provides only a rough estimate. Adjusting all costs by 8 percent annually implies that inflation will affect each component equally. Furthermore, costs associated with kill and yield efficiency depend upon cattle prices. With a price inelastic and expanding demand for beef, one would expect prices to increase more, on a percentage basis, than supply decreases during a cyclical decline in cattle slaughter. For these reasons, the reader should be aware that the projected costs provide only a very gross estimate of future selling costs.

The resulting costs at various levels of intermediary capacity are presented in Table 6.2. To simplify the presentation, costs are calculated only for producers shipping 20 head of cattle. Given the assumptions used in the calculations, these figures suggest that the total costs of marketing cattle by country auctions or the terminal market could be roughly $20 per head greater than for the other three alternatives by 1981. It may be well to reiterate that the economic costs for country auctions and the terminal market may be understated here since the calculations for country auctions are based on the original costs of capital while those for the listing service and electronic systems are based on current capital costs. It is quite likely that tariff charges for the terminal market are also calculated using original cost. If the opportunity costs of capital were used, these costs for country auctions and the terminal market would be higher.

Table 6.2: Comparative Costs for Alternative Selling Methods at Various Levels of Intermediary Capacity and an 8% Rate of Inflation Over Four Years

| | Country Auction | Terminal Market | Direct | Listing Service | Electronic Auction |
|---|---|---|---|---|---|
| Producer and Packer Costs | $21.53 | $22.56 | $11.76 | $ 8.26 | $ 8.26 |
| Intermediary Costs: | | | | | |
| 100% | 7.89 | 5.85 | | 3.29 | 1.70 |
| 90% | 8.36 | 6.28 | | 3.55 | 1.81 |
| 80% | 8.95 | 6.76 | | 3.85 | 1.96 |
| 70% | 9.68 | 7.37 | | 4.24 | 2.14 |
| 60% | 10.73 | 8.19 | | 4.77 | 2.40 |
| Total Costs: | | | | | |
| 100% | 29.42 | 28.41 | 11.76 | 11.55 | 9.96 |
| 90% | 29.89 | 28.84 | | 11.81 | 10.07 |
| 80% | 30.48 | 29.32 | | 12.11 | 10.22 |
| 70% | 31.21 | 30.29 | | 12.50 | 10.40 |
| 60% | 32.26 | 30.75 | | 13.03 | 10.66 |

# 7.0 SUMMARY AND IMPLICATIONS

This study has been concerned with the costs of five alternative methods for selling cattle - country auctions, terminal market, direct, a listing service and an electronic auction. In this section the results of the study to this point are summarized, limitations of the analysis are discussed and implications with respect to pricing efficiency are presented.

## 7.1 Summary of Cost Analysis

1. Producers with smaller operations tend to sell cattle by country auction or the terminal market.

2. Producers with larger operations tend to sell direct or by the terminal.

3. Producers in Western and Central Ontario tend to ship to the terminal market.

4. Producers in Central, Eastern and Northern Ontario make more frequent use of country auctions.

5. The majority of producers who ship direct are located in Southern, Western and Eastern Ontario.

6. Producers with large operations tend to make the most use of the flexibility offered by the current marketing system in the sense of selling cattle by more than one alternative.

7. Producers' costs per head for shipping cattle, as reported in the survey, increase as a function of distance to market, and decrease as a function of the number of head shipped. As a result, producers who ship small lots of cattle and who are located long distances from markets are subject to relatively large transportation costs.

8. On average, producers reported transportation costs were highest for cattle sold through the terminal market, second highest for cattle sold direct and lowest for cattle sold through country auctions. At the same time, distances to market for each selling method varied in a similar order to the transport costs - so that much of the cost differences were due to distance.

9. Transportation costs for the listing service and electronic auction were assumed to be the same as those for direct selling.

10. Packer costs were categorized as direct (purchasing) and indirect (transportation, kill efficiency and yield efficiency). Purchasing costs were determined for country auctions, terminal market and direct selling by a survey of Ontario packers. They were highest for the direct method ($3.00/head), second highest for country auctions ($1.70/head) and lowest for the terminal market ($1.45/head). Estimated purchasing costs for a listing service and electronic auction depend upon the number of head

purchased per year, but for purchases ranging from 20,000 - 100,000 head per year, the estimated costs were lower than for any of the existing selling methods - i.e. $1.25/head at 20,000 per year and $.25/head at 100,000 per year.

11. Packer transport costs were estimated only for country auctions and the terminal market since the remaining selling methods assume shipments direct to packer, which are included as producer costs. The estimated transport cost from country auctions to packing plants was $5.90 per head while from the terminal market to packing plants, it was $2.15. When producer and packer transport costs are summed, total transport costs are greatest for the terminal market, followed by country auctions, and finally by the remaining alternatives in which cattle are shipped directly from the feed lot to the packing plant.

12. Kill efficiency refers to the costs of holding cattle over before slaughter and/or the costs to packers of operating kill lines at less than their short run capacity. Yield efficiency refers to the costs of shrink and bruising. While all selling methods result in such costs, the premise is that they are greater for cattle sold through country auctions and the terminal markets because; 1) packers have no control over deliveries from these sources and, therefore, cannot schedule deliveries to correspond with killing capacity, and 2) the country auction and terminal methods require more handling, stress and time during the marketing process. Kill efficiency was estimated to be $1.71 per head and yield efficiency at 7.92 and 8.71 pounds per head for the terminal and country auctions, respectively.

13. Intermediary costs are the costs and profits of country auctions, the terminal market, a listing service and an electronic auction. Costs were synthesized for three sizes of country auction. The results indicated that there are substantial economies of size associated with country auctions. Total costs, based on 1977 conditions ranged from $6.08/head for auctions with the smallest capacity, to $4.38/head for auctions with the largest capacity - a difference of 28 percent.

14. Terminal market charges were represented in the study by the current tariff and commission rates charged by the Ontario Public Stockyards because no information upon which to base a cost analysis could be obtained. These charges vary with the size of the lot shipped from $5.30/head for lots of one head to $3.80/head for lots of 21 or more.

15. Costs for a hypothetical listing service which would sell cattle using a video-tape system with an annual capacity of 197,600 head were estimated to be $2.15 per head.

16. Costs for an electronic teletype auction with an annual capacity of 840,000 head were estimated to be $1.09 per head.

17. In view of the expected reduction in cattle slaughter over the next few years, costs for all intermediaries were calculated on a per head basis at 10 percent intervals for throughput varying from 60-100 percent of capacity. At 60 percent of capacity, per head costs were estimated to

be from 38-44 percent greater than at capacity.

18. Total costs of the five alternative selling methods were compared for a 1977 base period and a future period assuming reduced cattle supplies and an 8 percent per year inflation rate over four years. For the base period, the estimates showed that total marketing costs were highest for country auctions, followed in order by the terminal market, direct sales, listing service and electronic auction. Country auction and terminal method costs were estimated to be from $13-$15 per head higher than the remaining three alternatives. The major reasons for these differences are: 1) higher total transportation costs; 2) higher intermediary costs and; 3) higher costs of kill and yield efficiency for country auctions and the terminal method.

19. When costs were adjusted for inflation and reductions in the level of cattle slaughter, the major impact was to increase the costs of the country auction and terminal methods relative to the remaining three alternatives so that the differences were in excess of $20 per head.

## 7.2 Limitations of the Study

A limitation of the study was the quality of survey data used in the analysis. Survey data were used to estimate producer transport costs and packer purchasing costs. In both cases, the samples upon which the analysis was based was small relative to the potential population. The 325 observations upon which producer transport costs were based is a reasonably large number of observations, though small in the relative sense. Regardless of the sample size the reported producers' costs appeared to be reasonable and consistent with those of the Ontario Pork Producers Marketing Board and responding packers.

Packers purchasing costs were averaged from an exceedingly small sample (seven responding packers of which few could provide precise estimates of purchasing costs). Furthermore, given the extremely large range of size in Ontario packing houses, one would expect purchasing costs to vary with volume. The sample was too small to provide a reasonable approximation of this cost-volume relationship. While the relative ranking of the purchasing costs presented here appear to be consistent with the logic of the situation, the level of costs should be viewed with skepticism.

A further limitation is the estimated costs of kill and yield efficiency for country auctions and the terminal market. The estimates are based on Frederick's [3] study which employed data supplied by a Lincoln, Nebraska packing plant. A number of studies have been conducted on shrink; but all have been concerned with in-transit shrink. Studies were not found which addressed the question of shrink and bruising from alternative selling methods other than Frederick's. McCoy [10] has indicated that the complex factors affecting shrink include: time in transit; distance hauled; degree of fill; weather conditions; weighing conditions; sex; weight; type of feed fed; mode of transportation; preconditioning; stress; and handling procedures. He also indicates that the major causes of bruising and crippling include: overcrowding; trampling; striking

animals with clubs, etc.; kicking, prodding and horning; and slipping.

For two reasons, these factors lead to the hypothesis that yields for cattle sold by country auction and the terminal market would be lower than those shipped directly to packers. First, the cattle are off loaded, penned, moved through an auction ring, re-penned and loaded back on to trucks resulting in more time and stress in getting them to the packing house, and subjecting them to more risk of bruising. Second, available evidence indicates that cattle sold by country auction and the terminal market are held over for substantially longer periods of time than cattle sold direct. This evidence comes from a study by Huff [ 6 ] who followed several lots of cattle through from purchase to kill at the Ontario Public Stockyards, three Ontario country auctions, cattle sold direct on a live-weight basis and cattle sold direct on a rail grade basis during the summer of 1975 (Table 7.1).

Huff's figures show that over 60 percent of the lots shipped by the two categories of direct sales were slaughtered within one day of purchase, while only 18.1 percent and 14.0 percent, respectively, of the lots sold through the public stockyards and country auctions were slaughtered within one day. While these data support the hypothesis that the costs of yield and kill efficiency are higher for country auctions and the terminal market, it is not possible to conclude that the costs estimated here are representative for Ontario conditions since they are based on estimates for Nebraska.

## 7.3 Implications

The study demonstrates that substantial economic savings are associated with the direct, listing service and electronic selling methods relative to the country auction or terminal methods. The study indicates that if a substantial number of cattle were sold in Ontario by these methods savings of several million dollars would result. Such savings would likely be reflected in higher prices paid to producers and/or lower prices paid by consumers. Two questions remain: what are the structural implications of each method with respect to pricing efficiency and what secondary considerations and impacts might each have? These questions will be addressed below.

### 7.3.1 Implications for Pricing Efficiency

Pricing efficiency can only be evaluated on the basis of the extent to which the structural characteristics of each selling method approach the characteristics of perfect competition. The required characteristics of perfect competition include:

1. All buyers must have equal access to all sellers and vice versa.
2. All buyers and sellers have access to current market prices.
3. Buyers and sellers must have equal bargaining position.
4. No buyer or seller should be able to artificially influence price by restricting supply or demand.

Table 7.1: Number of Days from Purchase to Slaughter

| Days to Kill | Ontario Public Stockyards | | Ontario Country Auctions | | Live Direct | | Rail Grade Direct | |
|---|---|---|---|---|---|---|---|---|
| | Lots Killed | % (Cumulative %) | Lots Killed | % (Cumulative %) | Lots Killed | % (Cumulative %) | Lots Killed | % (Cumulative %) |
| 0 | 10 | 4.9 (4.9) | 0 | - (0) | 5 | 12.2 (12.2) | 46 | 25.1 (25.1) |
| 1 | 27 | 13.2 (18.1) | 6 | 14.0 (14.0) | 10 | 24.4 (36.6) | 75 | 41.0 (66.1) |
| 2 | 18 | 8.8 (26.9) | 0 | - (14.0) | 16 | 39.0 (75.6) | 53 | 29.0 (95.1) |
| 3 | 103 | 50.2 (77.1) | 5 | 11.6 (25.6) | 10 | 24.4 (100.0) | 9 | 4.9 (100.0) |
| 4 | 30 | 14.6 (91.7) | 29 | 67.4 (93.0) | - | - | - | - |
| 5 | 11 | 5.4 (97.1) | 3 | 7.0 (100.0) | | | | |
| 6 | 6 | 2.9 (100.0) | 0 | - | | | | |
| Total | 205 | 100 | 43 | 100 | 41 | 100 | 183 | 100 |

Source: Huff [6].

The structural characteristics of each of the five selling methods will be discussed below with respect to each of these requirements.

Equality of Access to Buyers and Sellers

Buyers must have the opportunity to bid on all lots of cattle offered in order to obtain maximum pricing efficiency. Both the electronic auction and listing service methods meet this requirement since, by design, they provide this opportunity. The terminal market also tends to meet this requirement because of its size. In the past, by handling nearly 40 percent of the cattle sold in Ontario, it would be expected to attract a large number of buyers. Its only inherent limitation in this respect is that each of the five commission firms have separate sales rings which operate simultaneously. Hence it may be difficult for a small buyer with a limited purchasing staff to have access to all rings, and therefore to all lots of cattle.

The country auction and direct methods rate lower in terms of access; however, it is difficult to generalize from individual cases. It is likely that limited numbers of buyers would be available at country auctions - particularly the small ones. The number of buyers with access to cattle sold direct depends solely on the number which individual producers choose to contact.

Access to Current Market Prices

The teletype method provides instantaneous information on each transaction to all buyers and sellers. As a result, such information can be obtained quickly for media reporting. Furthermore, if cattle were sold on a carcass weight and grade basis more access to carcass prices, which are the most important indication of value, would be available. The terminal also ranks high on this requirement, since it has enjoyed a large share of the market and it is possible for buyers who are at the auction to keep a running tab on prices. Also, the terminal market receives wide coverage by market news reporters.

The remaining methods rank lower. Again, the quality and quantity of market information generated by country auctions varies. At a large auction like that at Kitchener-Waterloo, price information is nearly as good as at the terminal market because of its size and the amount of coverage by price reporters. However, at the smaller local auctions, price reporting is generally not given wide coverage and prices at other points are generally not available. With the direct and listing service methods, transaction prices for a given lot are known only to the buyer and seller of that lot. Some additional price information is probably generated for direct sales as a result of the bargaining process between buyers and sellers. Beyond this, very little information is generated unless it is pooled voluntarily by producers who may be members of an organization such as CANFAX which is operated by the Canadian Cattlemen's Association.

Equality of Bargaining Position

Bargaining position "refers to protection or lack thereof that a particular selling method offers the producer against short-run price

declines due to local and/or temporary market disturbances" (Johnson [7]). Selling directly from the feed lot offers the greatest advantage to the producer bargaining position - whether it be by the direct, electronic auction or listing service methods. Each of these methods allows the producer to refuse bids (or place a reservation price) and re-offer cattle at a later date at very little cost.

With the terminal or country auction methods, producer's bargaining position is weaker. If the offered price is not acceptable, the producer faces the choice (and cost) of transporting cattle back to the farm or having them held over to a subsequent day (which is not possible at some country auctions since they do not sell every day). These options are costly and subject cattle to the risk of additional shrink and stress.

Influence of a Single Buyer or Seller on Prices

The ability of a single buyer or seller to influence prices by restricting supply or demand is inversely related to: a) the size of the market (and therefore the share of the market accruing to an individual participant); b) the breadth of access to buyers and sellers; c) the access of all participants to current price information; and d) the degree of equality of bargaining position. As we have seen, the electronic auction rates highly on b), c) and d). It also has the largest potential market size in that it has the potential to handle as many transactions as are foreseeable for Ontario in the future.

The terminal market and listing service methods rank next highest. Both can handle a relatively large number of transactions. The listing service ranks high in access to buyers and sellers and in bargaining position. The terminal market ranks high in access to current market information and relatively high in access to buyers and sellers.

### 7.3.2 Secondary Considerations and Implications

This study has found that an electronic auction for slaughter cattle has potential economic benefits in terms of operational efficiency and suggests that there could be additional benefits due to pricing efficiency. If such a system were to become a reality, there would likely be additional considerations in making it operational and in longer run impacts on the market place.

Operational Considerations

There are at least three operational considerations which should be addressed. First, it was stated that producers would be given the option of placing a reservation price on their offers. This raises questions as to the point at which prices are bid. They could be bid basis the farm, basis the packing plant (and, therefore, producers would have alternative reservation prices depending upon the plant location) or basis some fixed location. From an operational viewpoint, the latter would seem to be most feasible. Prices could be bid basis Kitchener or Toronto (Toronto is appealing because most of the packing plant capacity is located there; Kitchener is appealing because it has substantial plant capacity and is located closer to the cattle producing area) with fixed price differentials

for individual plants based on transport costs.

Second, there are various grade and quality considerations within grades which affect price differentials and would need to be accommodated. As one alternative, it would seem feasible to base price bids on the A1-A2 grades, at a given live or carcass weight range (perhaps cattle of "chain store" weight could form the basis) with pre-arranged price differentials for other grades, other weights within the A1-A2 grade, bruise and warble damage. These price differentials could vary over time by negotiation between the selling agency and buyers as market conditions warrant. While this process of negotiation may sound difficult, it was accomplished with success during the period when auctions were conducted on a carcass weight and grade basis at the Ontario Public Stockyards in 1977.

A third operational consideration is the description procedure suggested for the electronic system. In the survey of packers conducted for this study, packers were asked to express their attitudes concerning an electronic auction which would include this type of description. Most packers expressed reservations on the ground that it could result in problems of requiring carcasses which would not meet the specifications required for their orders if producers' descriptions were incorrect.

There are a number of considerations which relate to this issue. First, many knowledgeable cattle producers can likely judge grade and weight with little more error than buyers who buy on a live weight basis. Second, for those who can't or who deliberately mislead in their descriptions, it would seem that the system provides a strong incentive to do it correctly. Since descriptions include the owner's name, one would expect that one poor description which creates problems for the packer would result in that packer viewing subsequent offers from the producer with a rather jaundiced eye. It is likely that any windfall gains made from an initial misleading description would be paid for in the long run.

Also, in this respect the role of the sales manager for an electronic auction would be extremely important. The sales manager would need to know cattle, know the Ontario industry, and know the characteristics of cattle that packers want to purchase. These attributes would be important in the sales manager's ability to evaluate each day's offerings and in choosing the price bands within which individual lots would be offered.

While most packers expressed reservations about an electronic system because of the problem discussed above, at least one indicated that packers could adjust by conducting interpacker trading when descriptions were wrong. It is doubtful that the costs of interpacker trading would outweigh the savings associated with the system.

If the foregoing considerations are not sufficient to make the electronic system operationally feasible, then it may be necessary to add additional qualified staff to the sales agency to provide a reliable description. This would also be beneficial to the new or irregular producer about whose cattle packers know nothing or little. Of course, this would increase the operating costs of such an agency.

Packers are also concerned about the identities of small lots of cattle sold on a carcass weight and grade basis. This supposedly requires an extremely difficult and costly procedure. However, it should be overcome by establishing minimum lot sizes as has been done here.

Finally, an electronic system would be particularly well suited to selling on a carcass weight and grade basis. Some producers are reluctant to sell on this basis because of potential errors in packers' scales or potential inconsistencies among government graders. This is not surprising given that an under weight of five pounds per carcass on a carcass valued at $1.12 per pound would result in a $5.60 loss. An error of this or greater magnitude on a lot of 50 cattle would result in substantial losses to the producer and windfall gains to packers. Similarly an error in application of grade standards can be extremely costly. Given the potential benefits, in terms of both pricing and operational efficiency, of an electronic system this problem could be overcome at little cost by proper supervision by government officials.

Although it has been addressed only tangentially here, the issue of selling on a live vs. carcass weight basis is an important one. Johnson [7] cites a number of studies which indicate that substantial errors are made by packer buyers in estimating the weight, grade and yield of cattle purchased live. The Canadian beef grading system is designed to account for the value determining characteristics of the product. If more cattle were sold this way, the basis for prices would be more objective than live selling. On the grounds of equity among producers and pricing efficiency, substantial economic benefits can likely be obtained by selling cattle on a carcass weight and grade basis. The electronic system is well suited to marketing this way. Research to measure the effectiveness of packer buyers in estimating weight, grade and yield of live cattle, to evaluate the potential benefits of carcass selling, and to estimate the magnitude of graders' errors could be of considerable value to the industry in improving pricing efficiency and equity.

Additional Implications

There are a number of additional implications which could arise if a substantial proportion of the cattle in Ontario were sold by an electronic system. Producers with small operations currently shipping cattle in lots of less than 10 head would be placed at a substantial disadvantage. It has been shown in earlier sections that these producers are already at a disadvantage because of transportation and, in some cases, yardage and commission charges. These producers would be faced with one of two alternatives if a substantial proportion of the cattle were sold by electronic auction. Either they would continue to sell through local auctions or the terminal market (with increased costs because of a reduction in volume), or they would find it necessary to adjust their operations to ship cattle in more economic lots.

Second, because of the potential gains in pricing efficiency which would likely result from an electronic system, the least efficient packing firms could find it more difficult to compete for cattle. In the long run, this situation could result in a reduction in the number of such firms

and a more concentrated and less competitive market.

Finally, country auctions and the terminal market allow for the sale of "two-way cattle" - i.e. underfinished cattle which can either be slaughtered or returned to the country for further feeding. The electronic system could lead to the demise of this market alternative since it would be difficult for producers to bid on them.

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# APPENDIX 1

# BEEF PRODUCER SURVEY ON MARKETING METHODS

## Introduction

This questionnaire is identical to one sent out to producers during October. However at that time it was held up in the mail so that many producers received it at the peak of harvest season and were therefore unable to find the time to complete it.

The resulting poor response to this survey has meant that the data obtained from it may be at best, unrealistic and may lack credibility.

Therefore if you have not previously submitted a completed questionnaire please complete and return this to me by February 1st, 1978.

Robert Richards
School of Agricultural Economics and Extension Education
University of Guelph
Guelph, Ontario
N1G 2W1

## Explanation

This questionnaire has been prepared to obtain information from beef producers for a study currently being carried out by the University of Guelph with the sponsorship of the Ontario Cattlemen's Association.

The purpose of this study is to evaluate a number of alternative methods for selling slaughter cattle in Ontario.

Producer input is most important to a study such as this so please take the time to complete this questionnaire as accurately and completely as possible. Although it is not required please feel free to sign your name.

| | Office Use Only Col.# |
|---|---|
| ID No.# | 1-4 |
| Region N(0), SW(1), W(2), C(3), E(4) | 5 |
| 1) In what county/district is your farm located? _____ | 6,7 |
| 2) a) How many slaughter cattle did you sell in 1976? _____ | 8-11 |
| b) Do you consider feeding cattle to be your primary enterprise? Yes ____ (0) No ____ (1) | 12 |
| 3) During how many weeks of 1976 did you ship cattle? _____ | 13,14 |
| Since this study is concerned primarily with evaluating alternative selling methods we would like to know how you sell your slaughter cattle. | |
| 4) How were the slaughter cattle sold that you shipped during 1976? Please specify the number of head sold under each of the methods listed below. | |
| i) _____ head of cattle were sold through the Toronto Stockyards | 15-18 |
| ii) _____ head of cattle were sold through the local sales barn | 19-22 |
| iii) _____ head of cattle were sold direct-to-packer | 23-26 |

QUESTIONNAIRE, Page 2

| | Office Use Only Col.# |
|---|---|
| 5) If you sold cattle through the local sales barn in 1976 what was the distance between your farm and the sales barn where you normally sold your slaughter cattle? _____ miles | 27-29 |
| 6) a) If you sold cattle through the local sales barn in 1976 how were the majority of these cattle transported? Please Indicate<br>i) with your own truck _____ (0)<br>ii) you hired a trucker _____ (1) | 30 |
| b) If you trucked your own cattle to the sales barn in 1976 what size truck did you use? Please Indicate<br>5 Ton or Less _____ (0)<br>5-10 Ton _____ (1)<br>Over 10 Ton _____ (2) | 31 |
| c) If you hired a trucking firm to transport the majority of the cattle you sold at the local sales barn, how much were you charged on a per load basis? _____ | 32-37 |
| d) What was the average size of load that you had transported to the local sales barn during 1976? _____ | 38-40 |
| 7) What is the approximate distance from your farm to Toronto Public Stockyards? _____ miles | 41-44 |
| 8) a) If you sold slaughter cattle through the Toronto Stockyards in 1976, what did it cost you, on a per load basis to have these cattle transported to Toronto? _____ | 45-50 |
| b) What was the average size of load that you had transported to the Toronto Stockyards during 1976? _____ head | 51-54 |
| 9) a) If you sold slaughter cattle direct-to-packer during 1976, where were the packers' plants located? Please list below: _____ _____<br>_____ _____<br>_____ _____ | 55-60 |
| b) What was the average distance these cattle had to be shipped? _____ miles | 61-64 |
| c) What was the cost on a per load basis of having these cattle transported to the packers' plant? _____ | 65-70 |
| d) What was the average size of load that you had transported direct to the packers' plant during 1976? _____ head | 71-74 |

# APPENDIX 2

145 King Street West, 3 Fl.
Toronto, Ontario
M5G 1W9

**The Computer Communications Group**

Bell Canada



Dr. Larry J. Martin
Associate Professor
Dept. of Agricultural Economics
University of Guelph
Guelph, Ontario

1978 10 19

Dear Dr. Martin:

At your request, we would like to recommend the following electronic components for selling beef cattle by means of a "dutch auction system". This method with similar equipment is presently used by The Ontario Pork Producers' Marketing Board and by potato growers in New Brunswick. Until recently the same type of system was used in Manitoba for selling hogs.

The components of the system are as follows:

(1) A Master Controller
(2) A Price Generator
(3) A Printing Device
(4) Individual circuits to each buyer

THE MASTER CONTROLLER

This device looking somewhat like a mini-computer with a display panel would control up to 26 Buying Stations, support 8 level ASCII code and operate at 110 bauds. All Buying Station lamps would flash as transmission proceeds. Transmission would stop immediately on receipt of a bid and all lamps would be extinguished except that of the Buyer's circuit. Confirmation of the sale price would then take place by means of the keyboards between the selling and buying stations. This information is not printed on any other Buying machines. A broadcast message is then sent confirming the sale price but not identifying the buyer.

PRICE GENERATOR

The following three examples of price generators are substitutes for the hundreds of mylar tapes such as presently used by The Ontario Pork Producers' Marketing Board, the use of

continued....

paper or mylar tape for storage and transmitting information is gradually being replaced by other methods. Tape-using machines which Bell Canada now provides will not be manufactured after 1979. Bell Canada does not provide equipment for perforating mylar tape.

a) The most desirable price generator would be that on which start price, decrements and stop price are set-up on thumb-wheel switches. The range of start and stop price would be set-up to accommodate three digit figures and decrements in the range of one cent to ninety-nine cents.

b) The next desirable would be a micro-processor type device which would provide start, stop and decrement prices in any range. This would be set-up by the operator by means of the printer keyboard.

c) The least desirable would be to use a magnetic tape cassette recorder. This device could be considered as a direct replacement of paper tape. Tapes would have to be made up in advance from the keyboard and retained for future use.

PRINTING DEVICE

Bell Canada will have a "State of the Art" desktop keyboard send receive Teletypewriter by the end of 1979. It will operate at 110 bauds on a schedule 3A channel. A "Bid Button" such as used in the Pork Producers system would be associated with each printer.

CIRCUITS

Individual Schedule 3A, Full Duplex circuits would be provided between the Master Controller and each Buying Station.

MONTHLY RATES AND SERVICE CHARGES

| | MONTHLY | SERVICE CHARGE |
|---|---|---|
| Master Controller<br>"Ball Park" rate | $1500.00 | $1000.00 |
| A design fee of $1,000.00 would be applied for cancellation of order | | |
| Price Generator<br>Thumbwheel Type<br>"Ball Park" rate | 900.00 | 500.00 |
| A design fee of $500.00 would be applied for cancellation of order | | |

continued.....

| | MONTHLY | SERVICE CHARGE |
|---|---|---|
| Micro-processor Type<br>"Ball Park" rate | 600.00 | 500.00 |
| A design fee of $500.00 would be applied for cancellation of order | | |
| Magnetic Tape Cassette Recorder<br>Tariff rate | 90.00 | 50.00 |
| Printing Device<br>"Ball Park" rate | 100.00 | 50.00 |
| Design fee NIL | | |
| Circuits<br>Tariff rate (see attachment A) | 2355.40 | 1170.00 |

We will be pleased to help you in anyway in the development of your project. In planning ahead, we would appreciate twelve months lead time before you intend to set-up the system.

You may reach me and our Engineers by calling 416-361-3825.

Yours truly,

F. S. Saxon
Sales Representative
FS/lm
attach.

Attachment A



# UNIVERSITY OF GUELPH

## CIRCUIT COSTS

The following Schedule 3A Teletype grade full duplex circuits are measured from the south west corner of Keele Street and St. Clair Avenue West, Toronto (point to point mileage) to the following locations:-

| | MONTHLY | INSTALLATION CHARGE |
|---|---|---|
| **TORONTO** | | |
| Grace Meat Packers York Ltd<br>70 Glen Scarlett Rd<br>2/4 miles @$1.45 X 2 | $ 5.80 | $ 65.00 |
| Metropolitan Meat Packers Ltd<br>1 Glen Scarlett Rd.<br>2/4 miles @$1.45 X 2 | 5.80 | 65.00 |
| Prime Packers Ltd.<br>99 Ryding Ave.<br>3/4 miles @$1.45 X 2 | 8.70 | 65.00 |
| Canadian Dressed Meats Ltd.<br>109 Ryding Ave.<br>3/4 miles @$1.45 X 2 | 8.70 | 65.00 |
| Canada Packers Ltd.<br>2200 St. Clair Ave. W.<br>2/4 miles @$1.45 X 2 | 5.80 | 65.00 |
| Beef Terminal<br>2255 St. Clair Ave. W.<br>2/4 miles @$1.45 X 2 | 5.80 | 65.00 |
| Toronto Abattoirs Ltd.<br>2 Tecumseth<br>16/4 miles @$1.45 X 2 | 46.40 | 65.00 |
| Ontario Cattlemen's Association<br>Keele and St. Clair Ave. W.<br>Buying Machine | | |
| Circuit, same building | 4.80 | 65.00 |

Continued.....

The following circuits are measured from the Toronto Rate Centre to corresponding Rate Centres: -

| | MONTHLY | INSTALLATION CHARGE |
|---|---|---|
| Paletta Brothers Wholesale Meat Products<br>4480 South Service Road<br>Burlington | | |
| 31 miles interexchange | $ 62.00 | |
| 2 Service Point Terminals | 20.00 | $ 65.00 |
| 2 Channel Terminals | 20.00 | |
| F. W. Fearman Co. Ltd.<br>821 Appleby Line<br>Burlington | | |
| 31 miles interexchange | 62.00 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| J. M Schneider Ltd.<br>321 Courtland Ave. E.<br>Kitchener | | |
| 58 miles interexchange | 116.00 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Norstern Meat Packers<br>305 Arnold Street<br>Kitchener | | |
| 58 miles interexchange | 116.00 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Burns Foods Ltd.<br>900 Guelph Street<br>Kitchener | | |
| 58 miles interexchange | 116.00 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Dees Beef Ltd.<br>556 Speedvale Ave. W.<br>Guelph | | |
| 44 miles interexchange | 88.00 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |

continued.....

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| | MONTHLY | INSTALLATION CHARGE |
|---|---|---|
| Canadian Abattoir<br>785 York Rd.<br>Guelph | | |
| 44 miles interexchange | $ 88.00 | |
| 2 Service Point Terminals | 20.00 | $ 65.00 |
| 2 Channel Terminals | 20.00 | |
| Crabtree Meat Packers Ltd.<br>935 Moorvale<br>Ottawa | | |
| 218 miles interexchange | | |
| 100 miles @$2.00 | 200.00 | |
| 118 miles @$1.80 | 212.40 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Ottawa Beef Co. Ltd.<br>229 Lees<br>Ottawa | | |
| 218 miles interexchange | | |
| 100 miles @$2.00 | 200.00 | |
| 118 miles @$1.10 | 212.40 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Windsor Packing Company Ltd.<br>Tecumseh West<br>Windsor | | |
| 206 miles interexchange | | |
| 100 miles @$2.00 | 200.00 | |
| 106 miles @$1.80 | 190.80 | |
| 2 Service Point Terminals | 20.00 | 65.00 |
| 2 Channel Terminals | 20.00 | |
| Total Monthly Charge | $2355.40 | |
| Total Installation Charge | | $1170.00 |

145 King Street West, 3 Fl.
Toronto, Ontario
M5G 1W9

**The Computer Communications Group**

Bell Canada



Dr. L. J. Martin
Associate Professor
School of Agricultural Economics
University of Guelph
Guelph, Ontario
N1G 2W1

1978 11 02

Dear Dr. Martin:

Thank you for your letter of October 23, 1978 requesting clarification on two points in our letter of October 19, 1978. The price generator on page two under a) would have three sets of thumbwheel switches:

| | |
|---|---|
| Start Set | Five thumbwheel switches providing a start range of $000.00 to $999.99 |
| Stop Set | Five thumbwheel switches providing a stop range of $000.00 to $999.00 |
| Decrement Set | Three thumbwheel switches providing a decrement range of $0.00 to $9.99 |

In the price quotations the "Ball Park" figure of $100.00 per month is for one printer. One printer would be required for the selling station and one for each buying station.

During our telephone conversation of October 31, 1978 you asked if the Master Controller could be designed to accommodate forty buying stations. Mr. Howard Hancock agrees that this is possible but any increase in the number of stations over the original twenty-six would necessarily result in a significant increase of the monthly "Ball Park" rate of $1500.00.

It might interest you to know that we allocated the twenty-six stations in the Master Controller as follows:

| | |
|---|---|
| Identified requirement | 18 stations |
| Provided for growth | 5 stations |
| Maintenance spares | 3 stations |

In seeing a need for forty stations we would still build in additional units for growth and for maintenance.

We will look forward to receiving your "estimated coding requirements for describing the lots of cattle offered". In the meantime please let me know if I can help further.

Yours truly,

F. S. Saxon
Sales Representative
FS/dn
attach.

# APPENDIX 3

Company _____

PACKER QUESTIONNAIRE

1. In what city in Ontario is your plant located?

2. How many head of slaughter cattle did your firm purchase in the most recent calendar or fiscal year?

3. How many head of slaughter cattle did your firm purchase in the last year in each of the following ways? A rough breakdown in terms of the percentage of slaughter cattle purchased each way would be sufficient.

| | No. of head | % age of total |
|---|---|---|
| i) through the Toronto Stockyards | | |
| ii) through country auction sales | | |
| iii) direct-from-producer (liveweight) | | |
| iv) direct-from-producer (carcass basis) | | |

4. What percentage of the total number of slaughter cattle that your firm purchased in the past year were of grades?

| grade | percentage of total |
|---|---|
| A1&A2 | |
| A3&A4 | |
| B | |
| C | |
| D | |
| E | |

5. a) Does your firm's experience in purchasing slaughter cattle indicate that, exclusive of transportation costs, there do exist significant differences in the cost of purchasing (not actual prices paid) between the purchasing methods listed below?

i) buying through the Toronto Stockyards
ii) buying through country auction sales
iii) buying direct-from-producer (liveweight)
iv) buying direct-from-producer (carcass basis)

If so, please indicate what these differences are by ranking the above purchasing methods from 1 to 4 (1 is least expensive) in terms of cost.

1 _____

2 _____

3 _____

4 _____

b) Could you estimate then what it cost your firm either on a per head or a per cwt. basis to purchase slaughter cattle in the past year in each of the following ways?

| | per head | or | per cwt. |
|---|---|---|---|
| i) through the Toronto Stockyards | | | |
| ii) through country auction sales | | | |
| iii) direct-from-producer (liveweight) | | | |
| iv) direct-from-producer (carcass basis) | | | |

c) Are these differences in the cost of purchasing accounted for in your firm's pricing policy?

Yes ____

No ____

6. a) Has your experience shown that significant differences exist in the amount of shrink (decrease in liveweight), the amount of bruising and the number of condemnations that can be attributed to the way in which slaughter cattle are purchased?

Yes ____

No ____

b) If you answered YES to the above question could you estimate the losses to your firm in the past year, either on a per head or per cwt. basis that were a result of shrink, bruising and condemnations?

| losses due to | per head | or | per cwt. |
|---|---|---|---|
| shrink | | | |
| bruising | | | |
| condemnations | | | |

c) Could you estimate what percentage of the losses in each of the above categories can be attributed to each of the ways listed below that your firm purchased slaughter cattle?

| | Source | indicate percentage shrink | bruising | condemnations |
|---|---|---|---|---|
| i) | Toronto Stockyards | | | |
| ii) | country auction sales | | | |
| iii) | direct-from-producer | | | |

d) How does your firm account for these losses in its pricing policy?

i) Does your firm simply average these losses in pricing the total number of slaughter cattle it buys, regardless of source?

Yes ____

No ____

ii) When buying slaughter cattle from different sources does your firm's pricing policy take the difference in losses into account at the time of purchase?

Yes ____

No ____

7. a) If your firm purchased slaughter cattle in any or all of the regions* of Ontario listed below and was required to pay transport costs, what was the typical charge in each of the regions?

| | | per head | per cwt. |
|---|---|---|---|
| i) | Southern Ontario | | |
| ii) | Western Ontario | | |
| iii) | Eastern Ontario | | |
| iv) | Central Ontario | | |
| v) | Northern Ontario | | |

* The counties comprising each region are listed on the attached sheet.

b) Was this transport cost reflected in your firm's price at the time of purchase?

Yes _____

No _____

8. A portion of this study will be concerned with evaluating a teletype auction system for selling slaughter cattle in Ontario. Would you please comment on the following:

a) Please indicate what you feel would be the advantages and disadvantages to you, as a packer, of buying slaughter cattle through such a system.

b) If you were to purchase slaughter cattle through a teletype auction system which was organized as follows:

i) Cattle would be put on offer directly out of the feedlot. Assembly yards would not be employed - at least for large lots.

ii) The following information would be included as part of the offer: estimated grade, estimated weight, sex, breeding history and producer's name.

Would you still feel the same way about the teletype auction system as you indicated in your answer to part a) above?

9. Recently a listing service has been developed in Ontario by the Ontario Beef Exchange (OBEX). The following questions pertain to OBEX.

Have you bid on or purchased cattle through OBEX? Yes _____ No ____

10. Can you estimate your purchasing costs for cattle per head or per cwt. purchased through OBEX since the video tape concept was introduced?

11. If you are unable as yet to answer question 10, does your experience indicate that the cost of purchasing is generally less than or more than through country auctions, the Toronto Stockyards or direct from producers? (Please check).

| | More Costly | Less Costly |
|---|---|---|
| Toronto Stockyards | _____ | _____ |
| Country auctions | _____ | _____ |
| Direct | _____ | _____ |

12. With the video tape, do you feel that you can reduce purchasing costs (relative to buying direct) by spending less on inspecting cattle in the producer's feed lot?

13. What advantages and disadvantages do you feel that the OBEX system provides you as a packer?

Listing of counties in regions of Ontario

| Southern Ontario | Western Ontario | Central Ontario |
|---|---|---|
| Brant | Bruce | Durham |
| Elgin | Dufferin | Hastings |
| Essex | Grey | Muskoka |
| Haldimand | Halton | Northumberland |
| Kent | Huron | Ontario |
| Lambton | Peel | Parry Sound |
| Middlesex | Perth | Peterborough |
| Niagara | Simcoe | Prince Edward |
| Norfolk | Waterloo | Victoria |
| Oxford | Wellington | York |
| Wentworth | | |

| Eastern Ontario | Northern Ontario |
|---|---|
| Carleton | Algoma |
| Dundas | Cochrane |
| Frontenac | Kenora |
| Glengarry | Manitoulin |
| Grenville | Nipissing |
| Lanark | Rainy River |
| Leeds | Sudbury |
| Lennox & Addington | Thunder Bay |
| Prescott | Timiskaming |
| Renfrew | |
| Russell | |
| Stormont | |