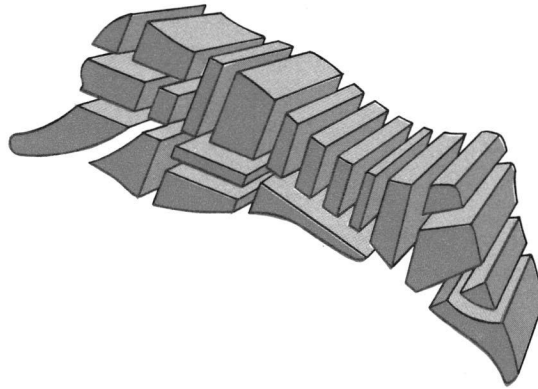




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**COMMISSION OF INQUIRY INTO THE
MARKETING OF BEEF AND VEAL**

**FARM TO RETAIL PRICE SPREADS
FOR BEEF IN CANADA**

Research Report No. 2
by
Daniel Ricard

Ottawa
February 1976

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N O T E

The following research report was prepared at the request of the Commission of Inquiry into the Marketing of Beef and Veal to assist it in fulfilling its mandate. The analysis and conclusions contained in this report are the responsibility of the author(s) and do not necessarily reflect the views of the Commission.

Foreword

This study provides a comprehensive estimation and evaluation of price spreads for beef during the 1973-75 period. Food retailers in 10 urban centres co-operated in providing information on retail prices and carcass cutout weights.

David Clarke and Mark Spearin on the Commission staff provided information and assistance in the estimation of the spreads. Ruth Goddard, Raymonde Valiquet and Maria Smith were responsible for the preparation of this report for publication.

Ottawa
February 1976

H. Bruce Huff
Research Director

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1. INTRODUCTION

A principal part of the Commission's mandate was related to the question of whether "prices being paid by consumers for beef and veal seem to be high in relation to producer returns and may not fully reflect price variations at the producer level".¹ Coincidental with this concern were other important and related questions. How quickly do retailers, packers and wholesalers respond to changes in prices at the farm level? Do the price spreads between retailers and farmers differ by region? Do price spreads differ by quality of beef?²

To examine these questions, this research project was designed specifically to estimate the farm-wholesale and the wholesale-retail price spreads for all grades of beef and veal for several cities in Canada. Subsequent to the estimation of price spreads, there was an investigation as to the reasons for the short run variations in the level of these price spreads.

What are Price Spreads?

The price spread for beef is the difference between the price per unit at one level of the system and the price of an equivalent quantity of beef at another level of the system. It is critical in the computation of equivalent quantities that yields, shrink and waste be completely and accurately taken into account. For instance, a 1,000 lb. live steer may yield 570 lb. of carcass in Canada and 428 lb. of retail cuts. Of the 572 lb. loss, about 427 lb. represent by-products salvaged for other uses. The remaining 145 lb. is accounted for by shrink, waste and bones incurred in converting the carcass into cuts. Therefore, 2.3 lb. in this instance is the farm equivalent of 1.0 lb. at retail and 1.7 lb. is the live animal equivalent of the 1.0 lb. of carcass. By taking these equivalent quantities into account, the farm-retail price spread thus purports to measure the charges for assembling, transporting, processing and distributing activities that occur between the point of first sale of the live animal and the consumer purchase of beef at retail. Each activity involves costs for labour, energy and capital. These costs plus profits earned by marketing firms are represented in the price spread.

It should be emphasized that price spreads and industry margins are not the same. Gross margins relate to firms buying and selling beef and represent the difference between dollars paid (product purchases) and dollars received (product sales). Price spreads are normally greater than

¹ Press release, Office of Prime Minister, Jan. 7, 1975.

² Terms of Reference of the Commission, Order in Council PC 1975-1, dated January 6, 1975.

gross margins for any single marketing agency, since spreads encompass the margin of several firms. Gross margins include costs that a packer or a retailer has for labour, materials, other direct costs and overhead, plus any net profit. They may exclude some costs included in the price spread such as transportation or other marketing services performed by businesses other than packers or retailers (e.g. wholesalers, brokers). Price spreads are estimated for a specific quality of beef and are based on an average price at the two relevant market levels. Margins are based on actual prices of purchases and sales. Price spreads assume that the beef is sold in carcass proportions, whereas margins represent all beef handled by a firm, regardless of grade and form in which it was sold (carcass, primal, etc.). Spreads are also estimated on a "standard yield" pertaining to each particular grade while margins may represent cutting yields for a mix of other grades.

Scope of the Study

In this study, the primary concentration was on providing complete and accurate estimates of the weekly live-wholesale and wholesale-retail price spreads that have occurred between January 1973 and July 1975. Secondly, there was an evaluation of those spreads by identifying the factors that affected their short-run variations. Finally, there was an examination and explanation of significant differences between price spreads for different regions, grades and sexes.

The two-and-a-half-year period under study was one of the most volatile for the beef industry in more than two decades. Therefore, if price spreads have behaved satisfactorily during this period, it is an indication that the industry adjusts well.

Very limited analysis has been performed in estimating and evaluating the very short-term price spreads. These short-term analyses are essential in improving our understanding of the price-setting mechanism and conduct of firms in different markets.

Between the live and wholesale carcass levels of the beef market, price spreads were estimated for three centres: Toronto, Calgary and Winnipeg. These markets are regionally representative centres which have public stockyards with the heaviest marketings. Consequently, weekly published price data for all grades are nearly complete. Between the carcass and retail levels of the beef market there was an estimation of the price spreads for the same centres: Calgary, Winnipeg, Toronto, as well as Vancouver and Montreal. By using confidential price and carcass cutout information provided to the Commission by retailers, it was possible to reconstitute the retail cuts into a carcass and obtain the retail value of that carcass. This involved using the weekly retail prices for beef cuts aggregated by their proportionate weight of the carcass. These data were obtained from most large food chain stores in those cities identified above.

Limitations of the Analysis

The most important limitations in this analysis refer, of course, to problems of measurement and evaluation. Most of the data used to measure the live-wholesale spread were obtained from the Canada Livestock and Meat Trade Report published by Agriculture Canada. The accuracy and representativeness of these prices is not known. The procedure used by Agriculture Canada to obtain these prices is described in detail in Appendix 1.

Particular problems were found for veal and for B and C grade cattle. Dressing percentages, definitions and market weights for slaughter calves differ substantially between centres in Canada. As a result, regional comparisons of price spreads are impossible. Live cattle assumed to grade B and C are lumped together as "common" for price reporting at public stockyards. The extremely broad price range means that average prices are not very representative and the average can change markedly by the mix of cattle included.

To estimate farm to wholesale price spreads it was necessary to establish a by-product value for a carcass from a series of by-products prices for the cities of Toronto, Calgary and Winnipeg. The basic methodology used in setting up the by-product values from a carcass is in Chapter 2, while the complete set of assumptions are in Appendix 1. The main assumption used was that by-products prices are Toronto-based, that is Western meat packers would receive the Toronto price minus the cost of freight for their sale of by-products. However, should there develop a strong local demand for a particular by-product in a given week, the price received by packers for the sale of that by-product could be higher than the Toronto less freight price. Prices for by-products are not publicly reported and meat packing firms do not maintain individual item price records.

Retail prices were obtained directly from major food chain stores and independents. Many of these stores keep few records of their past retail prices; most often, their records go back for only a year. Also, since prices submitted to the Commission were "suggested retail prices", it is not known if these prices were the actual selling prices at these stores.

In order to calculate wholesale to retail price spreads, prices of all retail cuts are required plus prices of all bones and fat and other items that, taken together, constitute a carcass. Bones and fat are not usually marketed at retail but sold to renderers for further processing. Once again, most stores keep poor records of the prices of items sold to renderers and often their records are nonexistent. Some retailers have cutting tests that include only the carcass cuts sold at retail and exclude the percentages of fat and bones in the carcass. These shortcomings may accumulate thereby making a store-by-store comparison of the wholesale to retail price spread not as precise as desired.

All the necessary benchmarks to this study such as carcass yields, list of beef by-products, list of retail cuts plus their appropriate cutting tests were obtained from industry estimates and/or from assumptions verified by industry groups. The accuracy of the study depends in large measure on the reliability of this information.

Outline of Study

The study is divided into six chapters. The second chapter contains a review of the procedures and methodology used in the calculation of price spreads for the January 1973 to June 1975 period. Chapter 3 presents a discussion of the estimated weekly farm-to-wholesale price spreads for beef and veal for Toronto, Calgary and Winnipeg. In the same chapter, there is a comparison between the Canadian and American short-run and long-run farm to wholesale price spreads. Chapter 4 furnishes an evaluation of the important variables affecting price spreads, using econometric techniques. Chapter 5 presents a discussion of the estimated weekly wholesale-to-retail price spreads for five major Canadian metropolitan centres: Vancouver, Calgary, Winnipeg and Montreal and Toronto. A Canadian-American comparison of the retailer spreads is presented along with that of the farmer's share of the retail price in the same chapter. Chapter 6 presents an evaluation of the wholesale to retail price spreads using econometric techniques.

2. PROCEDURES FOR CALCULATING PRICE SPREADS³

Farm-to-Wholesale Price Spreads

This price spread refers to price differences for equivalent amounts of product between the point of first sale for slaughter cattle (public stockyards) and the wholesale market for carcasses (sales to large retailers). In this study all prices refer to carcass equivalent quantities and are expressed in dollars per cwt. The formula used to measure this spread is:

$$\text{Farm-Wholesale Price Spread} = \text{Carcass Price} + \frac{\text{By-Product Price}}{\text{yield}} - \frac{\text{live price}}{\text{yield}}$$

The carcass prices used in the study were obtained from Agriculture Canada's Canada Livestock and Meat Trade Report for grades A1 to A4 steers and heifers, D2 cows and veal. B and C grade steer carcass prices were obtained from C.M. Reynolds Weekly Newsletter for Montreal. Prices for B and C grade steer carcasses in other centres were derived by deducting the relevant freight costs to Montreal.

A weekly by-product series was constructed by the Commission using prices for the following items:

	<u>ITEMS</u>	<u>WEIGHTS</u> (lb.)
<u>Prices from</u> <u>REYNOLDS Weekly</u> <u>Newsletters</u>	Edible Tallow	(14.0)
	Plasma	(9.1)
	Tongues #2	(3.5)
	Cheek and headmeat	(4.0)
	Livers 8/13	(7.5)
	Livers 13 up	(7.0)
	Kidneys	(2.1)
	Hearts	(4.4)
	Oxtails export	(1.5)
	Tripe scalded	(14.0)
<u>Prices from</u> <u>NATIONAL PROVISIONER</u> ⁴	Lips, scalded	(0.8)
	50% meat and bone	
	meal, bags	(40.8)
	80% blood meal, bags	(3.6)
	Tallow #1	(63.5)
<u>Prices from</u> <u>McNeillie and Company</u> <u>Hide Statistics</u>	Hides	(65.0)
	Total	<u>241.6</u>

³ Detailed procedures on method of collection of prices, and compilation of spreads in both Canada and the U.S. is in Appendix 1.

⁴ These are Chicago-based prices.

The numbers in parentheses represent the weight of the by-product from a 1,000 lb. steer. These weights are devised from a survey undertaken by the Meat Packers Council of their members.

The by-product value series was estimated for Toronto, Calgary and Winnipeg. Industry sources recommended the most representative hide combinations for each city. For fancy meats, i.e. the offal items, reported by the Reynolds letters, only Toronto-based prices were available. In order to calculate their Winnipeg and Calgary equivalent, information was obtained from industry sources as to the typical mode of shipment and size of load in order to take into account the freight differential. All offal items whose prices originate from National Provisioner are Chicago-based prices and similarly the freight differentials were taken into account. All these assumptions are specified in Appendix 1.

The value of by-products applies to a representative 1,000 lb. steer. In order to use this value in the calculation of price spreads for heifers and cows, it was necessary to adjust them according to the different carcass weights of cows and heifers. It was assumed that a heifer carcass weighs 85 percent of that of a steer and that cows weigh 75 percent of a steer.⁵ Thus, the by-product series were adjusted by those percentages.

The yields or dressing percentages by grades and by province⁶ were obtained by the Commission from a survey of meat packers. Table 1 shows the packer estimations of dressing percentages for 1974.

All prices of live animals for grades A1 through A4 of steers and heifers, D2 cows, common steers and for veal are for sales at public stockyards and have been obtained through the Canada Livestock and Meat Trade Report.

Since there is a one-week lag between the live price and the carcass price,⁷ price spreads sometimes increased when live prices were falling, simply because carcass prices did not adjust sufficiently that week.

Farm-to-wholesale price spreads were calculated for Toronto, Winnipeg and Calgary. These centres were regionally representative and sufficiently large to provide complete data for most series.

⁵ Based on calculations of T.G. MacAulay, Agriculture Canada.

⁶ The survey covered most federally inspected plants of moderate size.

⁷ In the calculation of the price spread, there is a one-week lag between prices in the two levels of the market.

Table 1: Dressing Percentages of Live Cattle, by Grades, Sex and Region, 1974

		Alberta	Saskatchewan	Manitoba	Ontario
		(percent)			
STEERS	A1	57.0	55.3	57.0	57.6
	A2	57.2	56.0	57.6	57.6
	A3	57.5	56.5	58.2	58.3
	A4	57.8	57	59.1	58.7
	B	55.4	54	55.1	55.4
	C	53.7	53	54.3	53.6
HEIFERS	A1	54.8	53.7	54.3	55.7
	A2	55.1	54	54.9	55.8
	A3	55.3	54.5	55.8	56.5
	A4	55.7	55.0	56.7	57.0
	B	53.3	52.0	52.6	53.5
	C	52.0	51.0	51.9	51.6
COWS	D1/2	50.0	48.5	50.7	51.3

Source: Commission Survey

Wholesale to Retail Price Spreads

In order to calculate the wholesale-retail price spread, the following formula was used:

$$\text{Wholesale-Retail Price Spread} = \frac{(\text{Retail Price})}{\text{Yield}} - (\text{Carcass Price})$$

The yield in this case is the retail cutout or the percentage of retail cuts obtainable from a carcass. These estimates were obtained directly from retailers. There are by-products (e.g. bones and fat) originating at the retail level which are not marketed at retail stores but sold to renderers. Retail stores differed on reporting fat and bone items in their cut-out yields. The effect of this is explained in Chapter 4. When calculating the wholesale-retail spread, only A1 steer carcass prices were used.

To obtain retail prices, the Commission requested from the large retailers in 10 metropolitan centres across Canada, the names of their retail cuts, the yield or weight of each retail cut and all by-products and the price of these cuts for the first 22 weeks of 1975 and the first week of each month in 1973 and 1974. These prices and weights were aggregated to produce an average retail price expressed in carcass equivalent value.

Wholesale-to-retail price spreads were estimated for Montreal, Toronto, Winnipeg, Calgary and Vancouver.

3. FARM-TO-WHOLESALE PRICE SPREADS

This chapter presents the estimated values for the first set of price spreads, the live-to-wholesale price spread, for live grades of steers, four grades of heifers, D2 cows and veal, for three major centres: Toronto, Calgary, Winnipeg. Also, there are estimates of the U.S. live-to-wholesale price spread. Graphs have been provided for each of these showing the weekly live price, carcass price plus by-product value and the price spread. All prices are in carcass equivalent values and are for the period January 1, 1973 to July 1, 1975.

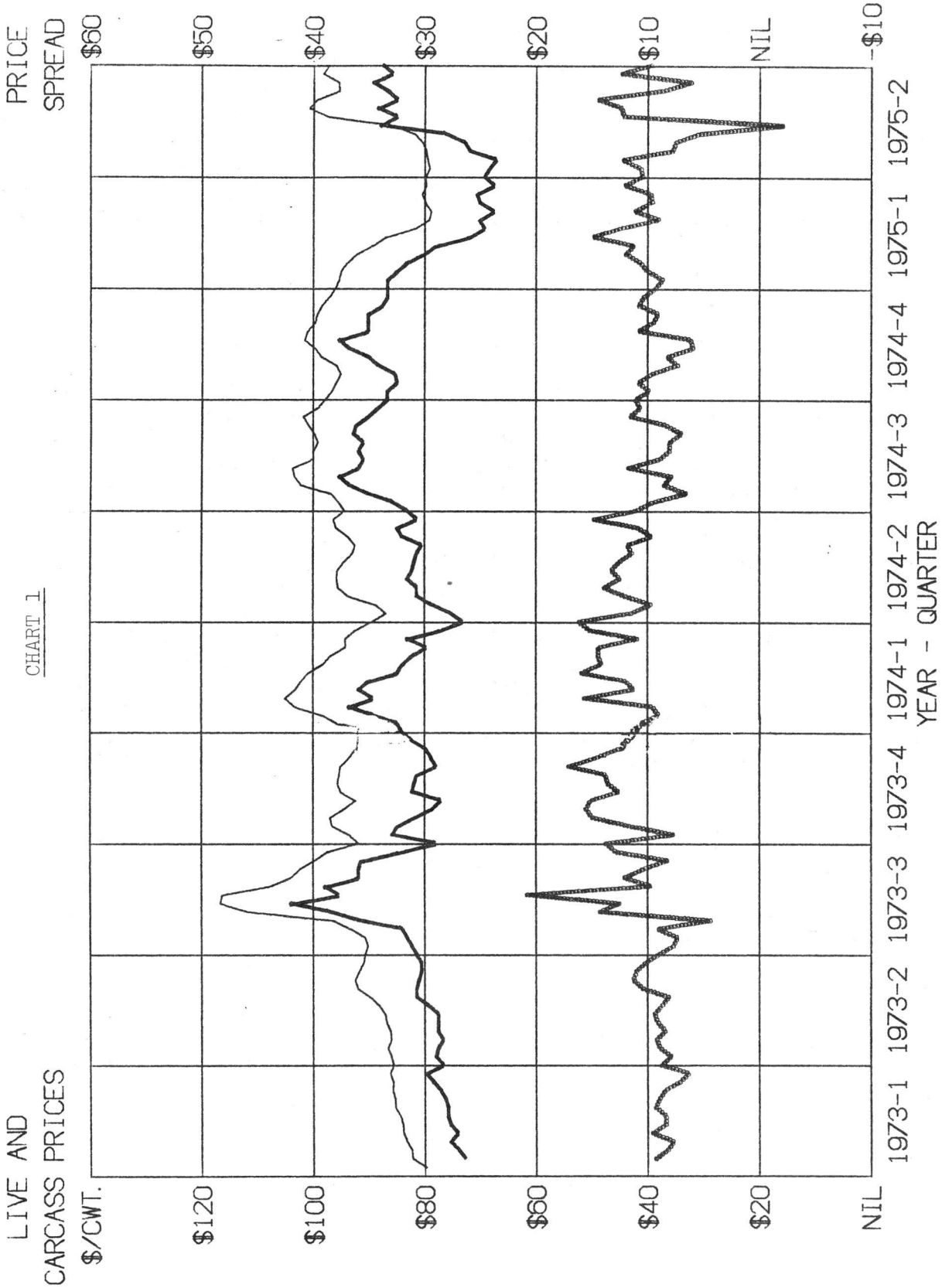
A1 Steers

Price spreads for A1 steers in Toronto fluctuate about a mean of \$10.46/cwt. (Chart 1). During the first two quarters of 1973, price spreads were relatively constant, but averaged only \$8.62/cwt., well below the average for the two and a half year period. The spread suddenly increased in August 1973, continued at a high level until the end of the second quarter of 1974. In fact, the spreads averaged \$12.15/cwt., well above the average for the entire 1973-75 period. Then, from the third quarter of 1974 up to the second quarter of 1975, the mean spread decreased to \$9.29/cwt. What emerges from the cursory evaluation is that there was no pronounced upward or downward trend throughout the entire period but there was a high price spread for a period of one year.

There has been a number of factors influencing the beef market during the past two and a half years which have caused the irregularities mentioned above. Price spreads shot up suddenly during the summer of 1973 due to a multitude of factors. The main factor was the U.S. retail price ceiling and its associated effects. The impact of the announced removal of the American beef price freeze for September was that U.S. beef producers, anticipating a sharp price increase at the end of the price freeze, started withholding cattle from the American market. As a result of this action, consumption of beef in the U.S. dropped sharply as there was an actual shortage of beef at the retail level. Since imported beef was not subject to price controls, Americans shipped live cattle to Canada for slaughter and imported Canadian beef into the U.S. This means of circumventing the price ceilings caused an accelerating increase in exports of beef to the U.S.; it caused the live Canadian price to rise sharply and the Canadian carcass prices even more. Fearing the uncontrolled affect would severely penalize Canadian consumers, on August 13, the Canadian government instituted export controls on cattle, beef, veal, swine and pork. Prices declined immediately. However, the carcass prices dropped less than live prices and consequently, the live carcass price spread remained quite high during August 1973. Price spreads during the fourth quarter of 1973 and the first quarter of 1974 were above average. During this period live cattle imports were at record levels and obviously these had more impact on live than carcass prices.

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A1 STEERS IN TORONTO

1973 - 1975



The last irregularity happened in early May 1975, when there was a sudden upward increase in live prices from \$76.38/cwt. (carcass equivalent) to \$88.10/cwt. in one week. There was such immense upward pressure in the carcass market that the Montreal price was not set until the following week and it took a full two weeks in order for the carcass price to catch up with the live price.

The price spreads for A1 steers in Calgary⁸ exhibited the same temporal patterns as Toronto. However, the price spread in Toronto was generally higher by \$2.00/cwt. There were a few periods where the price spread in Toronto was appreciably higher, such as the second and fourth quarters of 1973, the second quarters of 1974 and of 1975.

The price spreads for A1 steers in Winnipeg also followed much the same pattern as in Toronto. However, the spread in Winnipeg was generally at a lower level (\$1.51/cwt.) than Toronto except for some periods during late 1974 and early 1975. On average, price spreads were higher in Winnipeg than Calgary, but occasionally, the Calgary price spread was larger.

Why are there larger spreads in Toronto than in the western centres? One reason is that by-products prices in Toronto are higher than those in the West. Hides constitute the major proportion of the total value of by-products and because hides in the west are likely to be branded or otherwise damaged, packers receive a lower price for them. It is also possible that there are more competitive forces in Alberta which restrain any increase in the carcass price spread. Estimates of regional excess capacity show much higher levels in Alberta than Ontario.⁹ Therefore, packers may be more competitive to maintain kill levels in Alberta. Western meat packers claim that the new freight rate structure in 1975 makes it even more profitable than before to ship live animals east to have them slaughtered than to ship carcasses. This study was not able to document any evidence to validate this position.¹⁰

⁸ Charts for Calgary and Winnipeg are in Appendix 2.

⁹ Food Prices Review Board, Meat Processing Capacity, August 1975.

¹⁰ In statistical tests undertaken by the Commission, it was found that only in the case of A1 heifers in Calgary, were the lowering of the price spreads in 1975 statistically linked with the increased freight rates that occurred during that period. (See Appendix 4)

A2 Steers

Price spreads for A2 steers in Toronto were virtually the same as for A1 steers (Chart 2). This is not surprising as there is only a very slight quality difference between the two animals, live prices are generally quoted the same and they generally have the same dressing percentages. The price spreads for A2 were just a shade lower in August 1973 and in the last quarter of 1974.

The spreads for A2 steers in Calgary were identical to those that existed for A1 steers in that city. In Winnipeg, however, the price spreads for A2 steers were a shade higher than they were for A1 because of a higher dressing percentage.

A3 Steers

The price spreads for A3 steers in Toronto generally behaved the same as A1 steers (Chart 3). On average, the price spreads for A3 steers were lower by \$1.58/cwt. than for A1 steers, with the greatest difference occurring in the last half of 1974 and the first quarter of 1975.

Price spreads for A3 steers in Calgary were only very slightly higher than for A1 steers. Price spreads for A3 steers in Winnipeg were generally higher than for A1 steers, averaging \$0.86/cwt. larger for the period. The differences were highest during the third quarter of 1974 and in May and June of 1975.

The spreads for A3 steers in Toronto were higher than the ones in Calgary and Winnipeg except for the period from the third quarter of 1974 to the first quarter of 1975. In fact, during this period, the spreads were generally higher in Winnipeg than in either of the two other cities. Near the end of the second quarter of 1975, the higher spreads in Winnipeg could be explained by an appreciably lower price for live A3 steers than was the case for Toronto.

A4 Steers

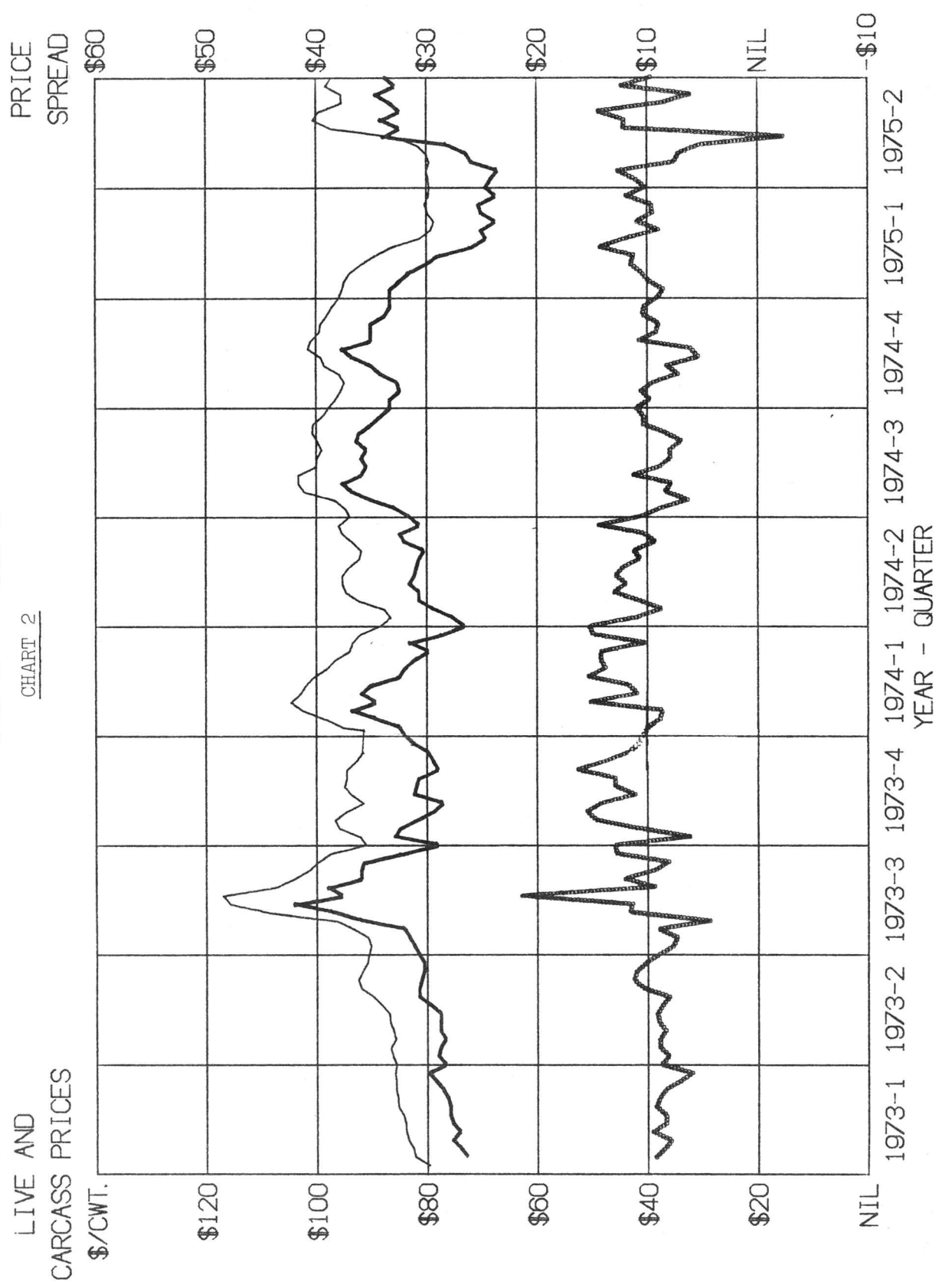
The carcass market for A4 steers in Toronto is very thin and for many weeks there were no quotes, especially during the third quarter of 1973 and the first quarter of 1974. The price spreads for A4 steers were consistently lower than for A1, especially since the third quarter of 1973, with a few rare occurrences where they were equal (Chart 4). The main reason why the price spreads were lower was due to the fact that carcass plus by-product prices for A4 steers in Toronto are much lower than their A1 counterpart.

Similarly, in Calgary, there were a number of weeks for which there were no quotes for carcasses, especially in the second and third quarter of 1974 and two separate weeks in the first quarter of 1975. In contrast to Toronto, the price spreads for A4 in Calgary were almost always a little higher than for A1 steers with no perceptible change in this trend. The reason for this higher spread would seem to emanate from a much lower live price for A4 steers than for A1 steers.

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 STEERS IN TORONTO

1973 - 1975

CHART 2



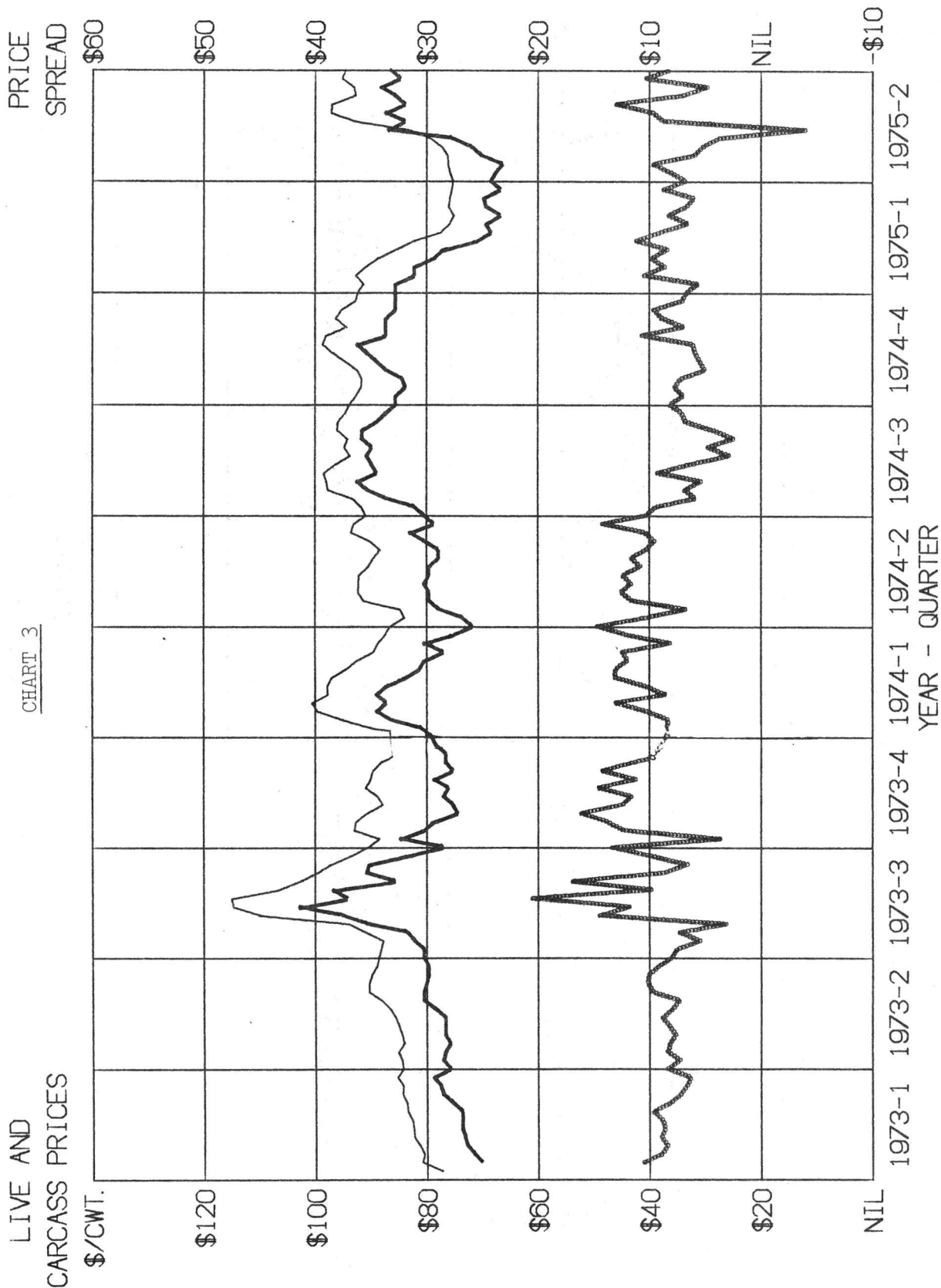
— PRICE OF A2 STEER CARCASSES AND BY-PRODUCTS
 — PRICE OF A2 STEERS, LIVE
 — PRICE SPREAD

DRESSING PERCENTAGE = 57.6%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 STEERS IN TORONTO

1973 - 1975

CHART 3



— PRICE OF A3 STEER CARCASSES AND BY-PRODUCTS

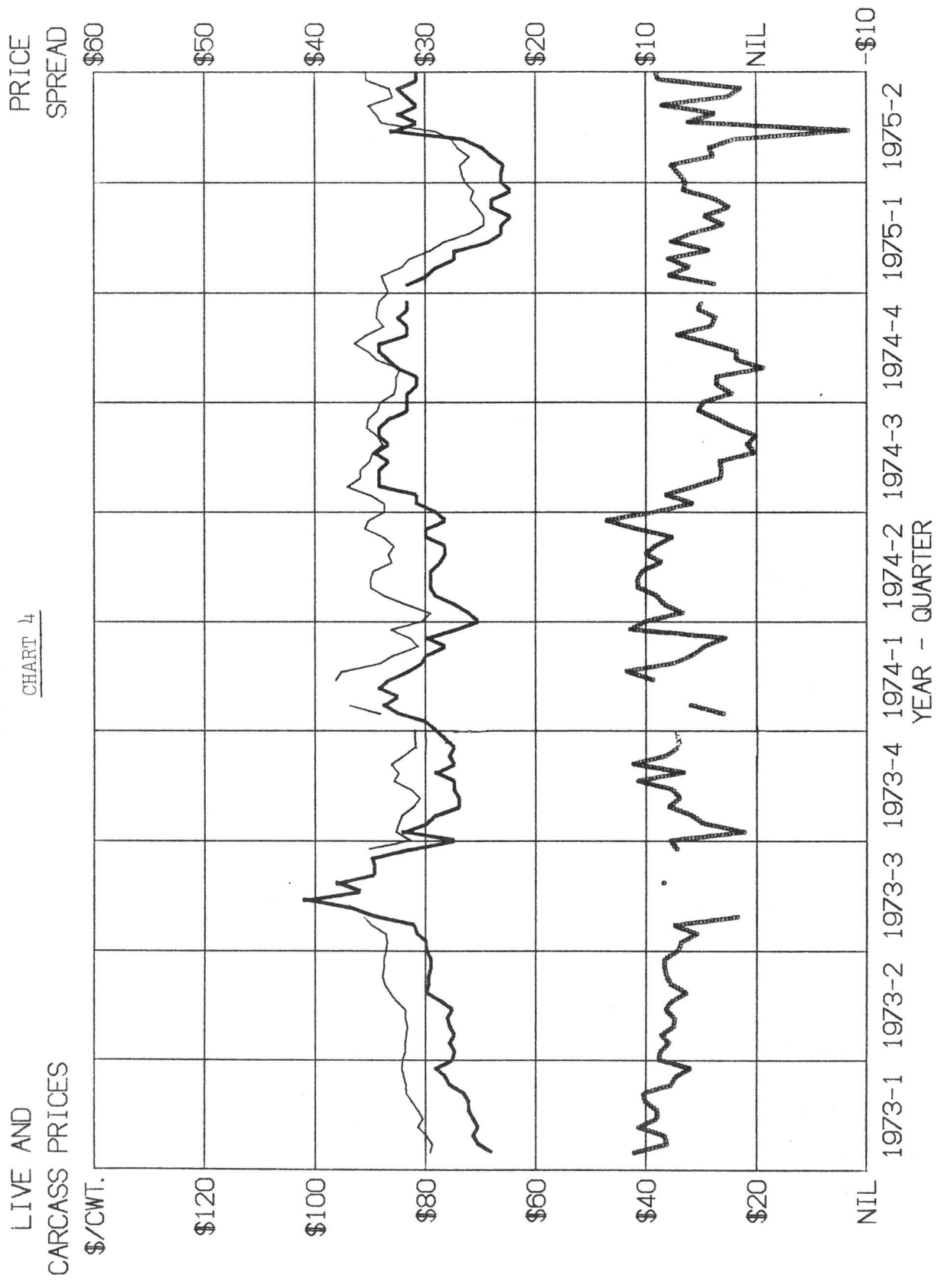
— PRICE OF A3 STEERS, LIVE

— PRICE SPREAD

DRESSING PERCENTAGE = 58.3%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A4 STEERS IN TORONTO

1973 - 1975



— PRICE OF A4 STEER CARCASSES AND BY-PRODUCTS

— PRICE OF A4 STEERS, LIVE

— PRICE SPREAD

DRESSING PERCENTAGE = 58.7%

Price spreads for A4 steers in Winnipeg could not be examined because price quotes for the carcass market were not consistent enough to create viable time series. There was virtually no carcass market for A4 steers in Winnipeg.

During the first two quarters of 1973, the difference in the size of the spreads between Toronto and Calgary were very small. Since then, the spread in Calgary has been appreciably higher. However, during the second quarter of 1975, the rift narrowed considerably.

The average price spreads in Toronto declined consistently from A1 steers to A4 steers. In contrast, they increased slightly from A1 to A4 steers in the Calgary and Winnipeg markets.

A1 Heifers

The market for heifers is different than that for steers, thereby creating different price spreads. Price spreads for A1 heifers in Toronto were generally higher than for steers by \$2.12/cwt.¹¹ but both share the same "irregularities" that have already been explained for A1 steers (Chart 5).

From the first quarter of 1973 up to the end of the second quarter of 1974, the higher spreads for A1 heifers over A1 steers in Toronto are due mostly to lower live heifer prices as there are few differences between the carcass prices. However, starting near the third quarter of 1974, both carcass and live prices for heifers fell appreciably and increased the price spreads for A1 heifers relative to A1 steers.

The price spreads in Toronto were generally above those in Calgary, especially during the second and third quarters of 1973. A sudden drop in live prices while carcass prices remained high during the second quarter of 1974, created a record high price spread in Calgary.

Price spreads for A1 heifers in Winnipeg were smaller than in Toronto for 1973 and the first two quarters of 1974. Subsequently, they increased and were above Toronto until the end of the first quarter of 1975.

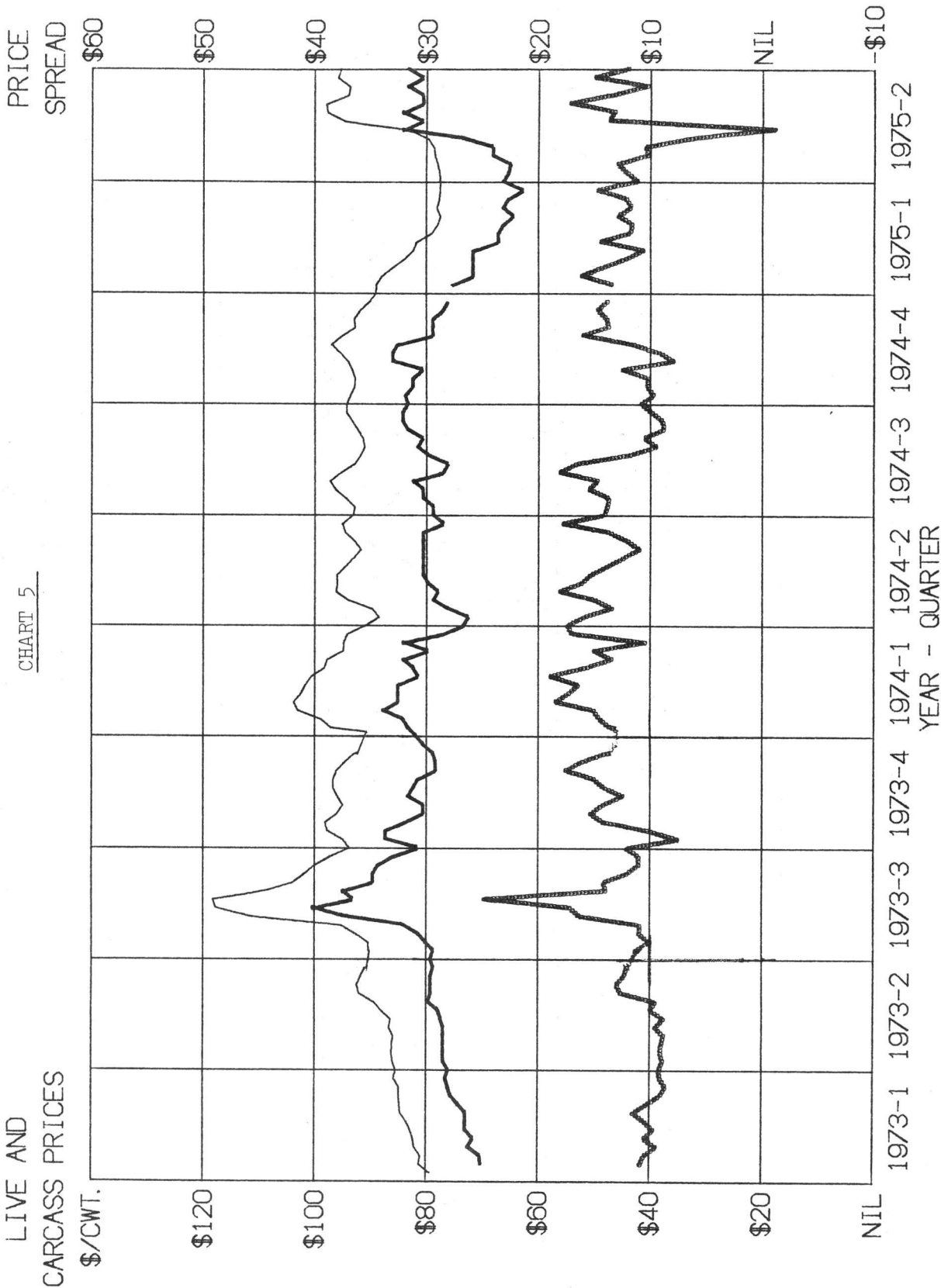
A2 Heifers

The price spreads for A2 heifers in Toronto were almost identical to that of A1 (Chart 6). The same situation generally existed

¹¹ This difference may be partly explained by the fact that the live price includes a substantial percentage of light-weight heifers, while the reported carcass price refers to a specific weight range.

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A1 HEIFERS IN TORONTO

1973 - 1975



PRICE OF A1 HEIFER CARCASSES AND BY-PRODUCTS

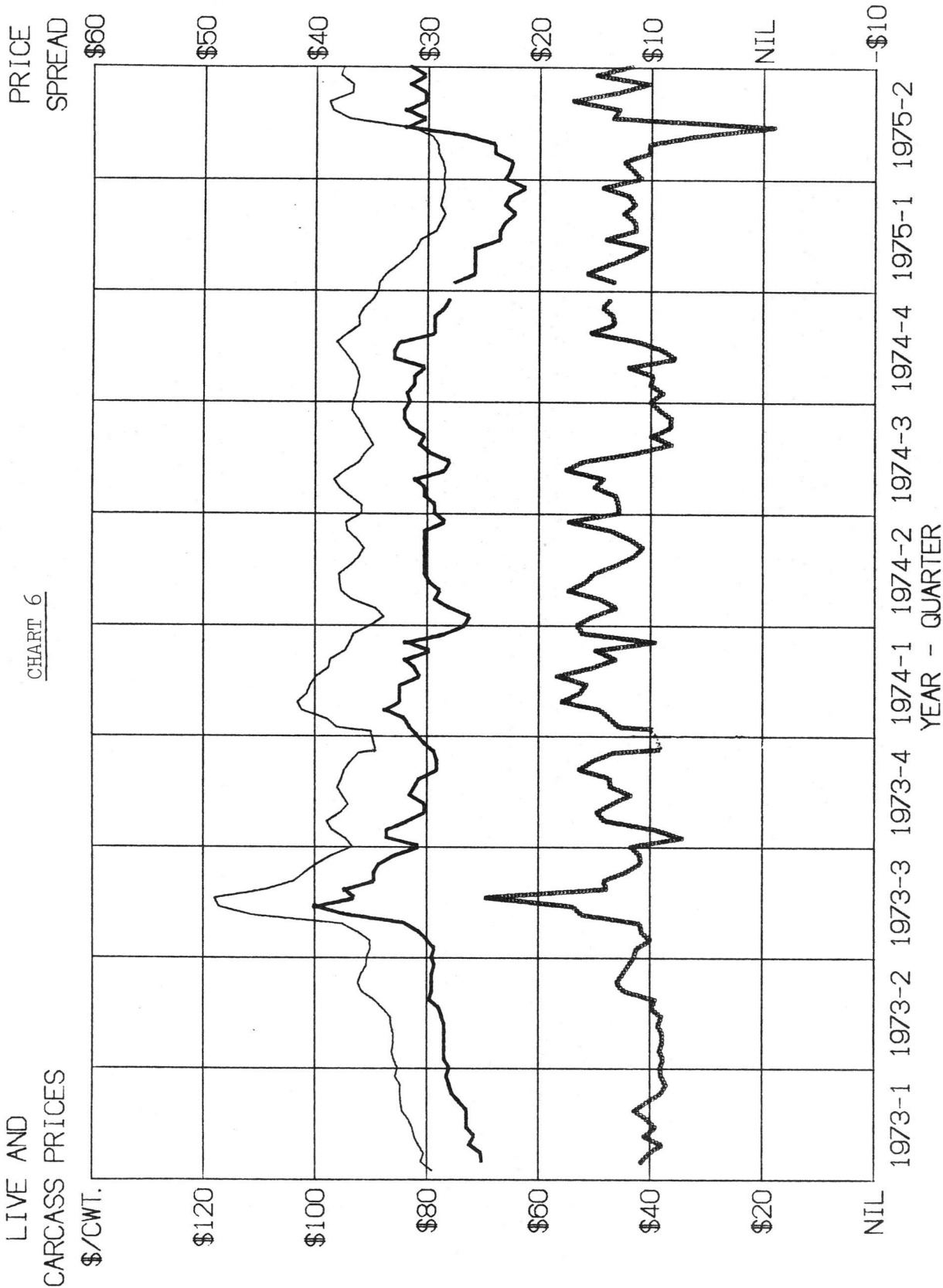
PRICE OF A1 HEIFERS, LIVE

PRICE SPREAD

DRESSING PERCENTAGE = 55.7%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 HEIFERS IN TORONTO

1973 - 1975



for Calgary and Winnipeg, except for a few periods when there was a lower carcass price for A2 heifers. The price spreads for A2 heifers in Calgary remained, on the whole, smaller than Toronto. A sharp drop in live prices in Calgary during the middle quarter of 1974 was responsible for a great increase in the Calgary spreads. The Winnipeg market for A2 heifers was nearly identical to that of A1 heifers.

A3 Heifers

By and large, the price spread for A3 heifers in Toronto follows the weekly pattern for the price spreads for A1 heifers, but it is generally smaller (Chart 7). The rift between the two was most obvious during the last half of the third quarter of 1974 and early 1975.

The spread in Calgary for A3 heifers follows the A1 heifer spread more closely than was the case in Toronto. The number of differences seem to be evenly divided between a higher or lower spread than A1 heifers.

In the Winnipeg market, the price spread for A3 heifers was substantially higher than for A1 heifers during the second to fourth quarters of 1974, because of low live prices for A3 heifers. The differences with Toronto described for the A1 heifers are even more pronounced for A3 heifers.

The spreads for A3 heifers, in Toronto, were larger than in Calgary, except again for the mid 1974 period. A comparison of price spreads for A3 heifers in Winnipeg with Toronto repeated a pattern of lower than Toronto for the first half and generally higher during the last of the period.

A4 Heifers

There were many weeks in the last half of 1973 for which there were no prices quoted for the A4 carcass market in Toronto. The price spreads for A4 heifers in Toronto were on the whole, smaller than the spread for A1 heifers (Chart 8). There were occurrences, however, where the spreads for A4 were higher such as in the first quarter of 1973, the third quarter and the last week of 1974.

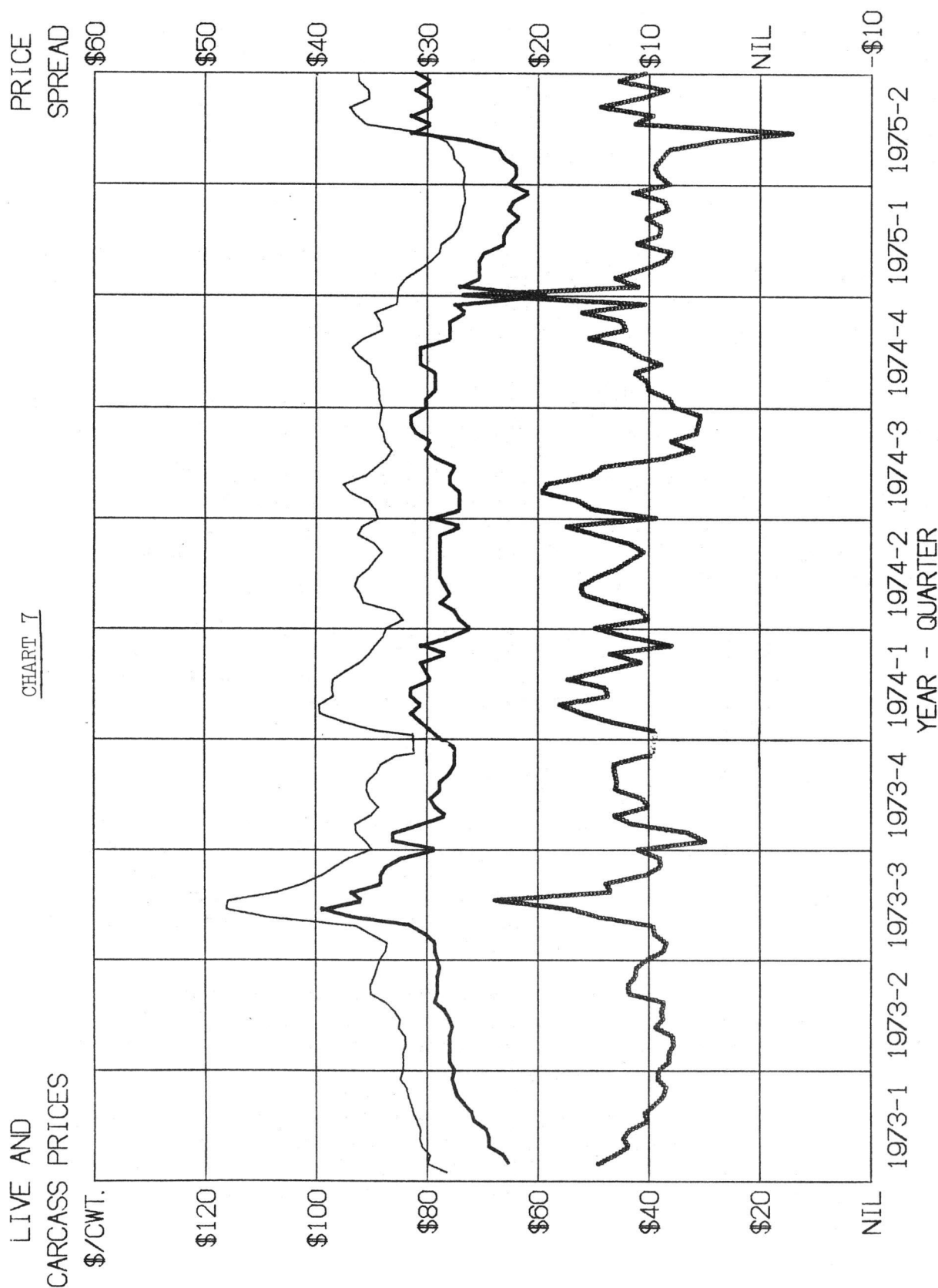
In Calgary, the opposite situation exists where the price spreads for A4 heifers were generally higher than that of A1. The weekly fluctuations, however, were much the same. There were no consistent price quotes for A4 heifers in Winnipeg.

A comparison between price spreads for A4 heifers in Calgary and in Toronto showed that the price spreads were frequently higher in Calgary, especially in the fourth quarter of 1973, the first third and the first half of the fourth quarter of 1974 and a few weeks in the second quarter of 1975.

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 HEIFERS IN TORONTO

1973 - 1975

CHART 7



— PRICE OF A3 HEIFER CARCASSES AND BY-PRODUCTS

- - - PRICE OF A3 HEIFERS, LIVE

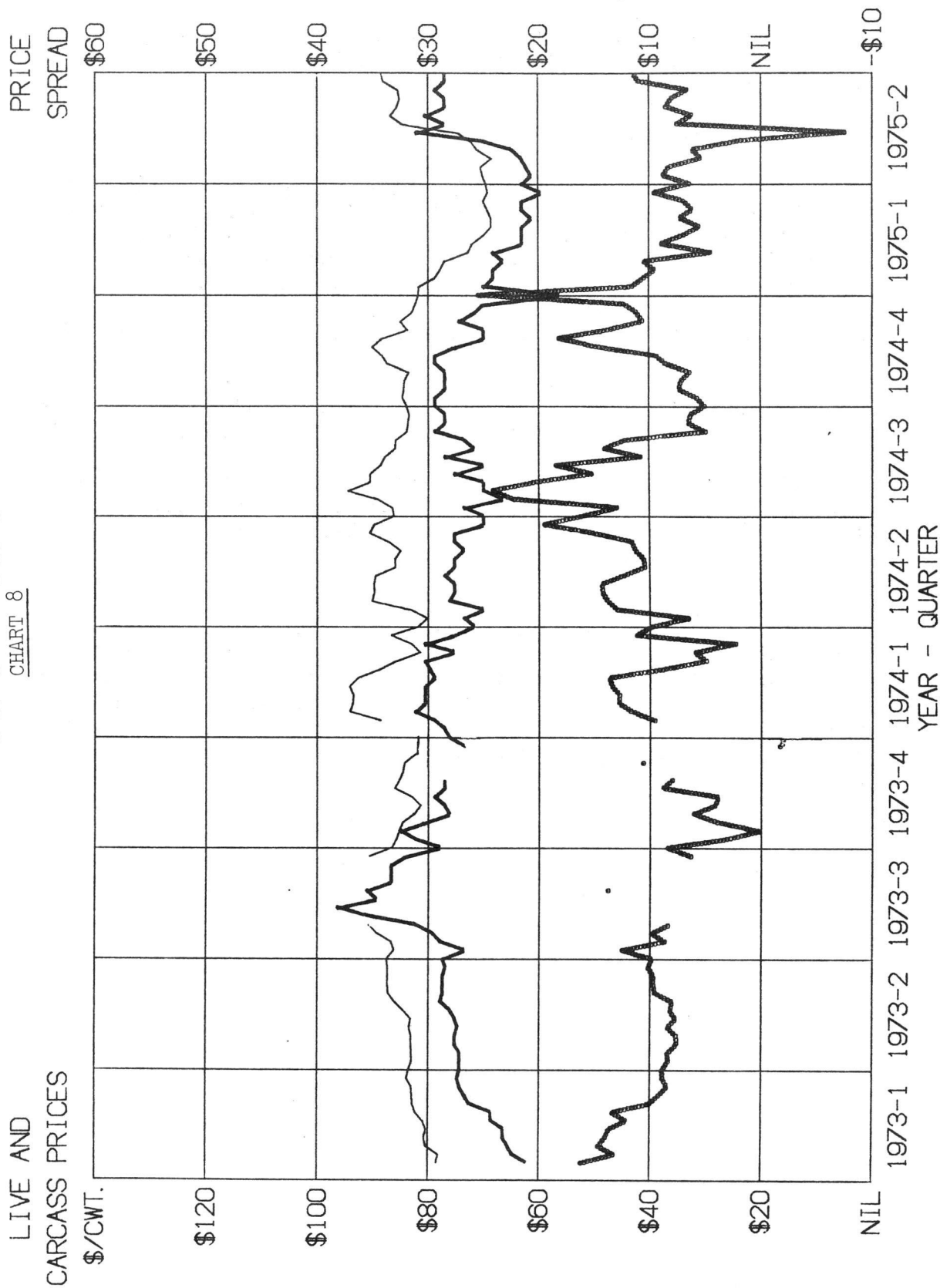
... PRICE SPREAD

DRESSING PERCENTAGE = 56.5%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A4 HEIFERS IN TORONTO

1973 - 1975

CHART 8



DRESSING PERCENTAGE = 57.0%

Once again, the price spreads in Toronto consistently narrowed from A1 heifers to A4 heifers, while increasing in the Calgary and Winnipeg markets.

Common Steers

The live prices in the Canada Livestock and Meat Trade Report are not differentiated for grades B and C, but are grouped as "common". Carcass prices are in the Reynolds letters for Montreal. Regional estimates of B and C grade carcass prices were made for Toronto, Winnipeg and Calgary by deducting freight costs to Montreal. These two prices were weighted by the respective quantities of inspected slaughter of B and C carcasses in each province, to obtain a "common" grade carcass price.

It is apparent that the poor quality data and the assumptions required to produce the price spread are inadequate to generate a reliable price spread. The price spread for common steers in Toronto varies from -\$11 to \$18 /cwt. and, on average, is about one half that of A1 steers. Similarly, attempts to estimate price spreads of common steers for Calgary and Winnipeg result in equally unsatisfactory results.

D2 Cows

The market for D2 cows is different than that for steers or heifers. Generally, price spreads for D2 cows in Toronto are higher than for A1 steers (Chart 9). This difference widened especially during the last three quarters of 1974. During the first quarter of 1975, the D2 spreads remained around \$12 or \$13/cwt. but in the second quarter, the spreads became higher once again.

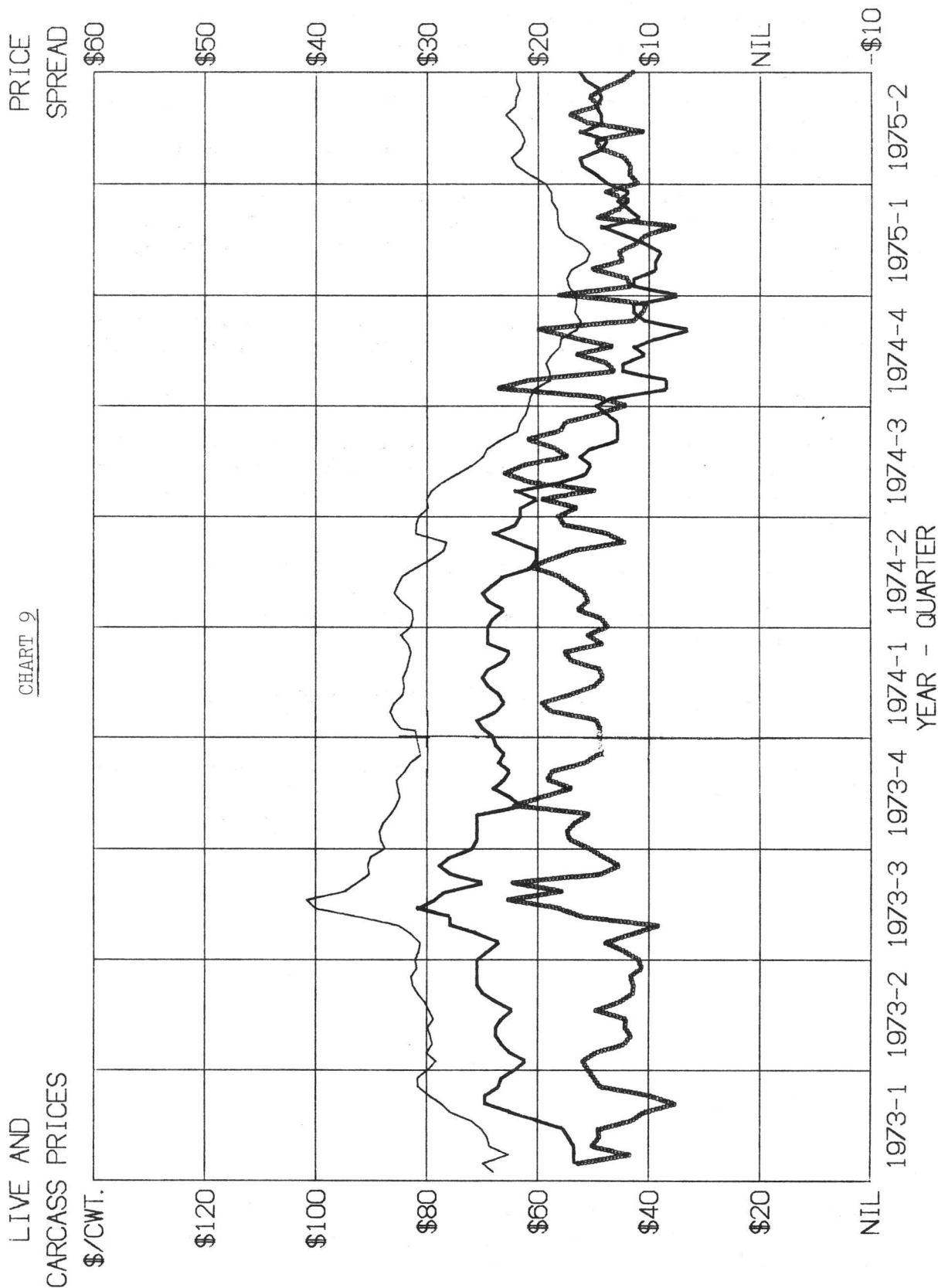
There were low prices for live cattle and carcass from the third quarter of 1974 until the first quarter of 1975, when both prices started increasing. This change in the price level did not have much impact on the level or variation in the price spreads. Spreads decreased somewhat during the last quarter of 1974 and increased slightly during the second quarter of 1975.

The price spreads for D2 cows in Calgary remained, most of the time, much lower than in Toronto. Only during early 1975 were they near the same level. In Winnipeg, there were not enough D2 carcass prices reported to estimate a price spread.

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR D2 COWS IN TORONTO

1973 - 1975

CHART 9



DRESSING PERCENTAGE = 51.3%

Veal

The definition of veal changes from market to market. Slaughter calves may be bob calves, white vealers or grassers and they are of different weights and quality but each one may be defined slightly differently in reporting veal prices since there is no national standard of live price reporting by grade for veal in Canada. This is the primary reason why price spreads for veal vary enormously from one market to another. It seems, however, that the market reporters even within a market are not consistent between live and dressed definitions of veal so it is impossible to obtain an approximate weekly live to wholesale price spread for veal in four cities in Canada: Montreal, Toronto, Winnipeg and Edmonton.

The estimations of price spreads for veal excluded by-product values and were simply the difference between the carcass price and the live price converted into its carcass equivalent. All dressing percentages used were industry estimates and refer to a chilled carcass, hide off.

The Toronto mean price spread for veal was \$31.72/cwt. excluding by-products. Adding by-products values to the carcass price would further increase the already large price spread. The price spread for veal is three times that of A1 steers in Toronto.

At the other extreme, the estimated price spread for veal in Winnipeg was -\$10.32/cwt. and in Edmonton it was \$12.23/cwt. Obviously, the published live and carcass data are clearly inadequate to obtain price spread estimates.

Explanation of the Differences Between the Mean Price Spreads by Grades

Table 2 shows the mean price spreads by grades, sex and city. In the Toronto market, the mean spread became smaller as one moved from an A1 to an A4 for both steers and heifers. On the other hand, in the Calgary and Winnipeg markets, the mean spreads went up from A1 to A4 steer.

These differences could be explained by the very nature of the markets themselves or by a consistent error in price reporting. This last explanation would seem to explain much of the low spread for A3 and A4 steers and heifers in Toronto. The Canada Livestock and Meat Trade Report shows that market reporters in Toronto always attribute to A3 and A4 steers and heifers the same price ranges that have been given to Grades A1 and A2. This in turn implies a smaller price spread for these grades. It has been found that packers in Ontario are selling A4 steer carcasses below their experimentally determined values.¹² The same result is found in Alberta but to a lesser degree.

¹² Commission of Inquiry into the Marketing of Beef. Performance Appraisal of the Canadian Beef Carcass Market - Research Report No. 4 (Information Canada, February 1976)

Table 2: Means Weekly Live-to-Wholesale Price Spreads
by Grades, Sex and City, January 1973 to June 1975.

	<u>Toronto</u>	<u>Calgary</u>	<u>Winnipeg</u>
	(\$/cwt.)		
A1 steers	10.63	8.46	9.10
A2 steers	10.29	8.22	9.85
A3 steers	8.98	8.66	9.89
A4 steers	5.09	9.38	a
A1 heifers	11.77	8.86	10.51
A2 heifers	11.48	8.77	10.83
A3 heifers	9.85	9.78	11.79
A4 heifers	9.02	10.69	a
D2 cows	12.27	5.79	a
U.S. Choice	10.25		

a. Insufficient data

Source: Commission Estimates and U.S.D.A. Marketing and Transportation Situation

It was also found that the Ontario packers are receiving less considering the freight differentials than their Alberta counterparts for A4 carcasses, especially in 1974 and 1975. For A3 steer carcasses, the same situation applies to both Ontario and Alberta, but to a lesser degree.

It should be emphasized that in 1974, grades A3 and A4 represented only 7.1 percent of inspected carcasses slaughtered in Ontario as opposed to 13.3 percent in Alberta and 8.7 percent in Manitoba.

All markets reveal a higher mean spread for A1 heifers than for A1 steers. This may be due to a proportionately higher cost of processing heifers than steers. Since processing costs are relatively constant per head regardless of carcass weight, these costs will be a higher proportion of the value for heifers particularly when they have a much smaller weight. In fact, their mean weight represents 77 percent of the mean steer weight in 1975. It may be that packers must remain competitive in the steer markets while they may tend to be less competitive in other markets.

Table 2 also shows price spreads for D2 cows by city. The very high spread for D2 cows in Toronto could be explained by the thinness of that market. In 1974, D2 cows represented only 1.7 percent of federally and provincially inspected carcasses in Ontario as opposed to 4.2 percent in Alberta and 5.3 percent in Manitoba.

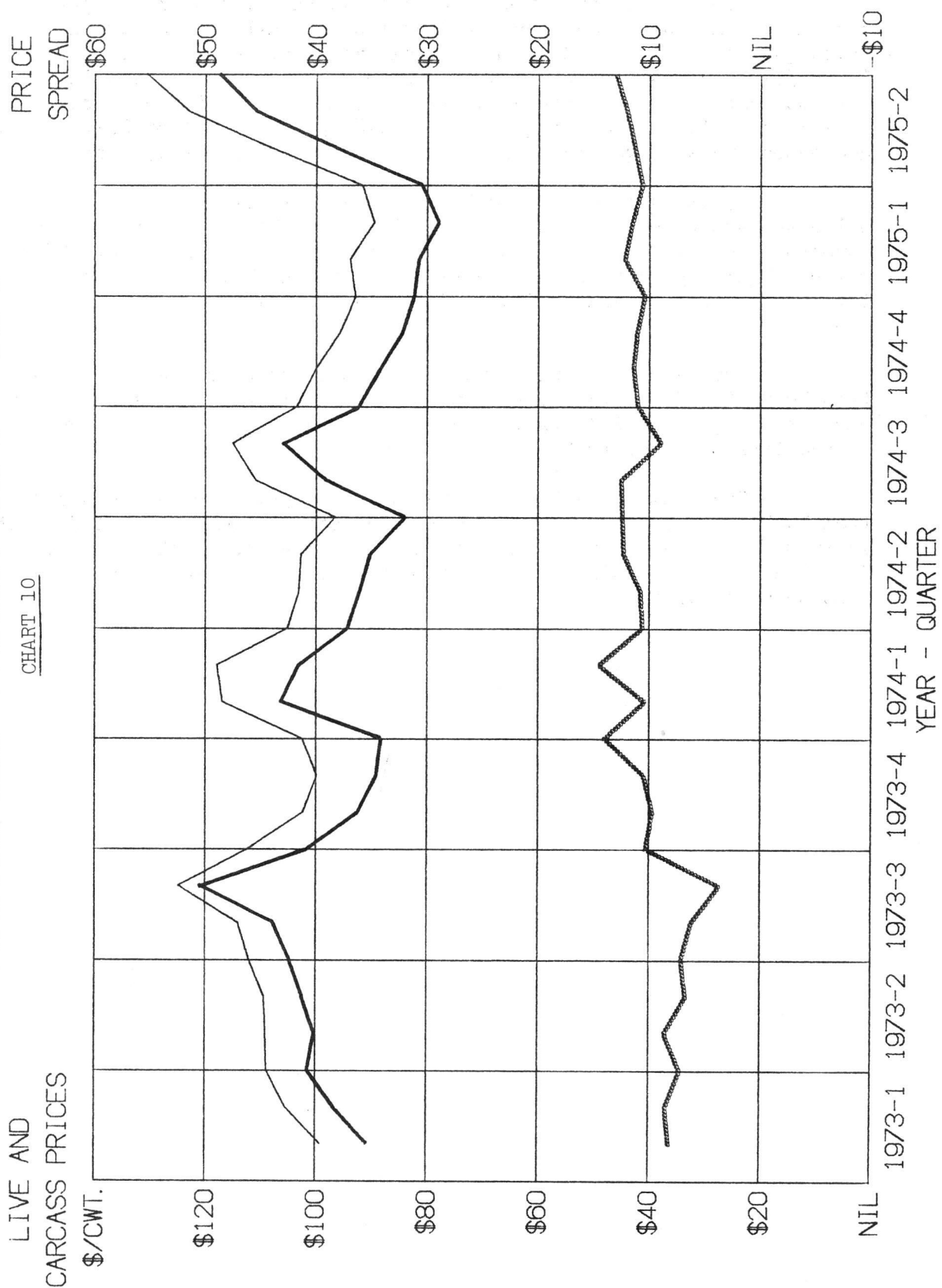
The U.S. Live-to-Wholesale Price Spread

In its mandate, the Commission was asked to report on the "reasonableness" of price spreads. One method of assessing this "reasonableness" is to compare it with the U.S. price spreads.¹³

Chart 10 shows the monthly farm to carcass price spread in the U.S.A. for Choice beef from January 1973 to June 1975. By comparing these results with those of A1 steers in Toronto, it can be seen that, on the whole, the level and variations were very similar. The mean American farm to carcass spread was \$10.25/cwt. The first two quarters of 1973 showed similar spreads with a smaller decrease in the U.S. near the end of the second quarter. The third quarter of 1973 showed a marked difference in the spreads due to the U.S. price ceilings. While Canada was experiencing a recordbreaking high, the U.S. was having the lowest price spread in the study period.

¹³ The methodology used in the two countries has been compared in Appendix 1.

MONTHLY FARM - CARCASS PRICE SPREAD IN THE UNITED STATES (CHOICE BEEF PRICES) 1973 - 1975



— CARCASS VALUE AND BY-PRODUCTS
 — GROSS FARM VALUE
 PRICE SPREAD

DRESSING PERCENTAGE = 60.3%

The rest of the study period shows that the American price spread has increased considerably from its record-breaking low in the third quarter of 1973 and has nearly always remained higher than \$10.00/cwt. ever since, whereas the price spread for A1 steers in Toronto, after a considerable increase throughout the third quarter of 1973 up till the second quarter of 1974 up to a level of \$12.15/cwt., decreased and averaged \$9.29/cwt. for the rest of the study period.

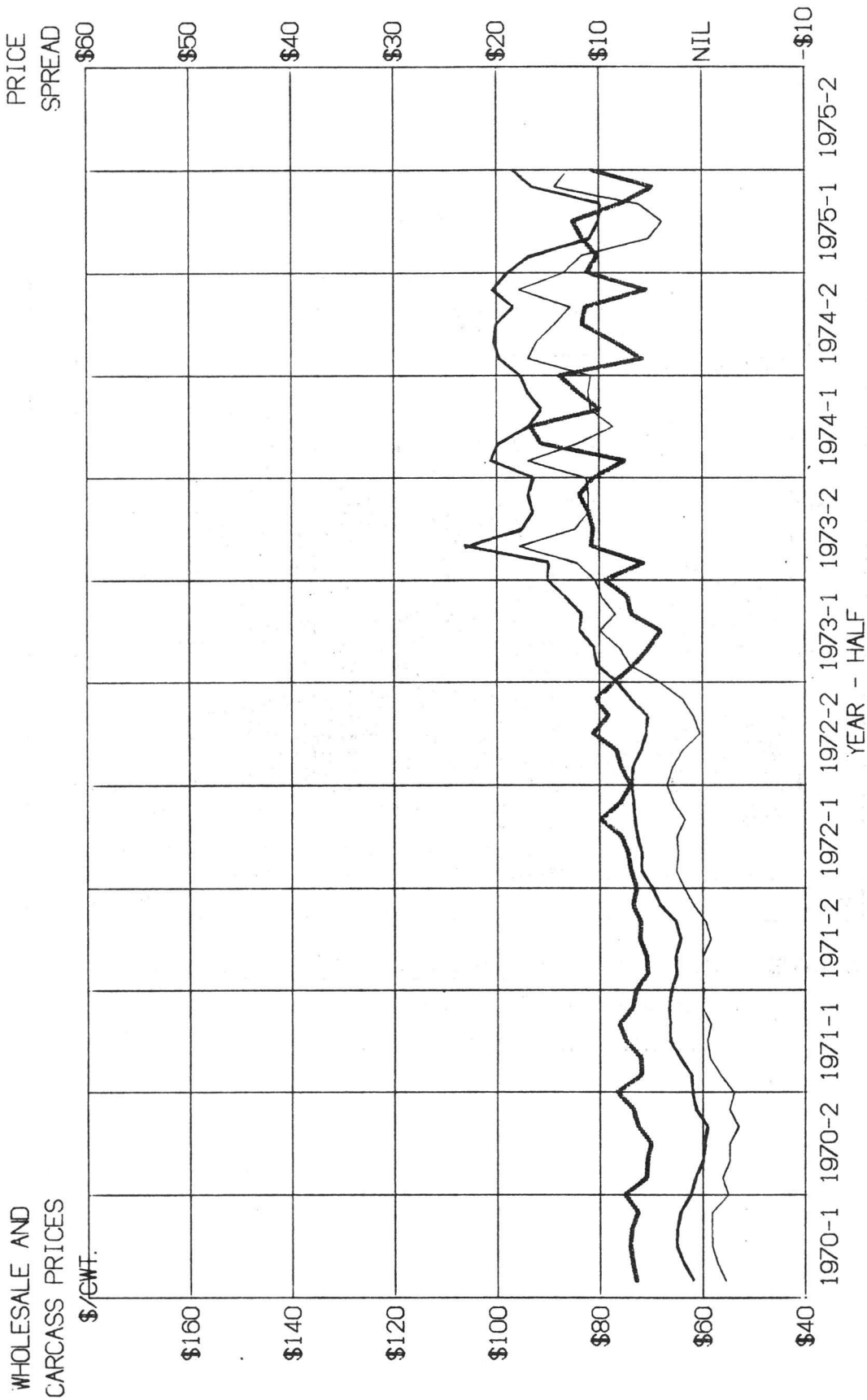
By visually comparing the level and variations of the U.S. price spreads with Calgary, the variations were less similar than for Toronto. The U.S. price spreads were higher than Calgary by \$1.95/cwt. while Calgary spreads were markedly higher during the third quarter of 1973. Most of 1974 and 1975 showed similar but higher spreads in the U.S..

Chart 11 shows the live to wholesale price spread in Canada from 1970-75. The price spread has increased slightly since the early part of the period (1970-71). The peak period, however, was observed in the first half of 1974.

Chart 12 shows the farm to wholesale price spread in the U.S. from 1965 to 1975. The spread remained constant from 1965 to 1972, but in 1973 it increased by a large amount, and remained at that plateau. This increase was similar in magnitude but occurred more quickly than that seen in Canada.

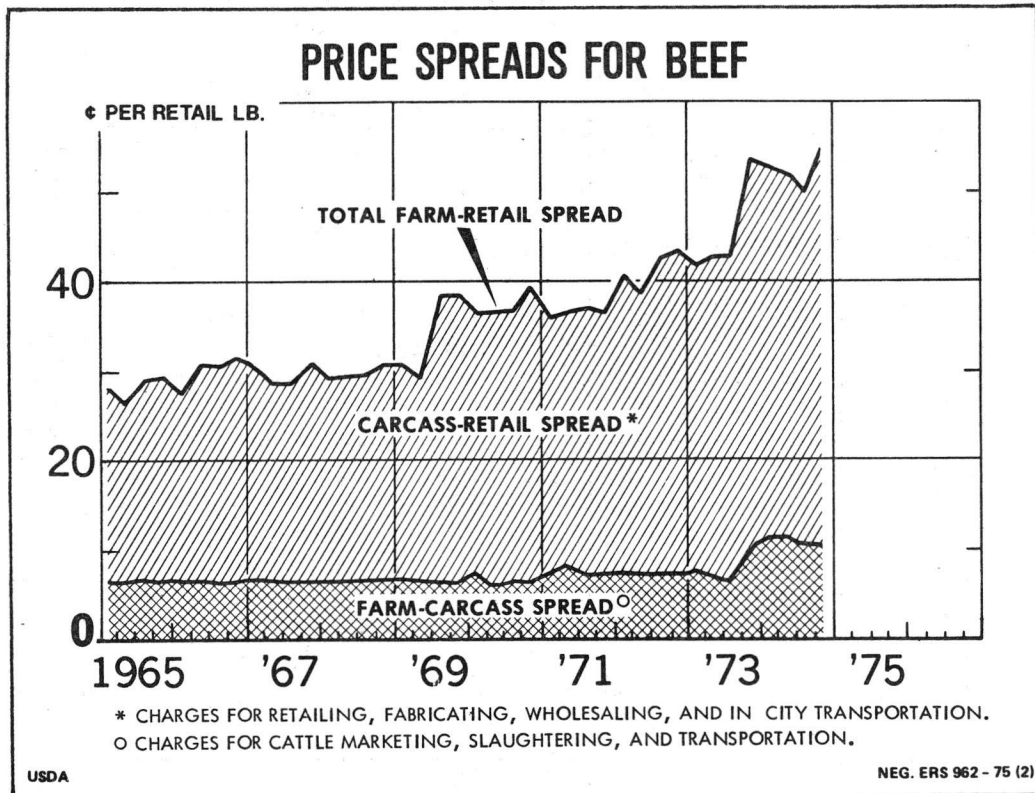
MONTHLY LIVE TO WHOLESALE PRICE SPREAD FOR A1 STEERS IN TORONTO • 1970 - 1975

CHART 11



SOURCES: FIGURES PROVIDED BY AGRICULTURE CANADA
 • N.B. THE BY-PRODUCT PRICES USED IN ESTIMATING THE WHOLESALE PRICE DOES NOT TAKE INTO ACCOUNT THE FREIGHT DIFFERENTIAL BETWEEN CHICAGO AND TORONTO FOR SUCH ITEMS AS TALLOW, MEAT, BONE MEAL, AND BLOOD MEAL.

CHART 12



SOURCE: Marketing and Transportation Situation,
February 1975. U.S.D.A.
Economic Research Service

4. EVALUATION OF LIVE TO WHOLESALE PRICE SPREADS

This chapter extends the analysis of price spreads by assessing the forces affecting price spreads and estimating their magnitudes. The first part of the chapter is devoted to a discussion of possible factors and their expected influence, while the latter part provides a statistical analysis to quantify the effect of those factors.

Price spreads are composed of three prices: live cattle, by-products and carcass. A change in any one of these without the corresponding change in the others would affect the price spread. The packer is faced with timing problems. For example, live cattle are purchased one week with the expectation of a certain carcass or by-products price the following week. This may not be realized, and hence the live price may have been too high or too low. Moreover, a change in one of these prices may not be fully reflected in the other prices quickly enough to maintain a constant margin. Consequently, by examining the week-to-week change in each price (i.e. first difference in prices), it is possible to determine whether a change in that price is immediately reflected in other prices to maintain a constant margin. From the information gathered about the method of operation of the carcass market, it would appear that changes in the by-products prices are not quickly reflected in the buying and, to a lesser extent, selling decisions of meat packers. It would also seem that changes in the carcass prices would not be reflected in changes in live prices until the following week. Live price changes, however, should be reflected in carcass selling prices very quickly. Consequently, change in the live prices should not affect margins as much as carcass prices.

Because of the high fixed cost structure of meat packers, slaughter volume considerations would appear to have a significant effect on spreads. First, as volumes of cattle available increased in the short run, packer costs might increase slightly as it could necessitate payment of overtime. If this was the case, the packers would be less willing to purchase any additional cattle and thus, the live price would decline more than the carcass price and price spreads would increase. Conversely, as cattle supplies declined and packers were faced with a committed labour force, they would bid aggressively against each other to obtain cattle to maintain their kill levels. Thus, live prices should be bid up higher than carcass prices. Consequently, price spreads should be directly related to the level of cattle slaughter.

Imports of the slaughter cattle from the U.S. should have a similar impact on price spreads as the quantity of Canadian cattle slaughter. If, however, the imports of U.S. cattle have a strikingly different level of impact than a similar volume of Canadian cattle, this would indicate some anomalies in the import market which would require further analysis.

Government policies relating to trade are likely to be important to price spreads. As seen in the charts, in the period prior to the introduction of export controls in August 1973, price spreads were considerably higher. Since this situation was unique and unlikely to be repeated, it was believed this period, week ending July 28 to August 5, 1973, should be separated from all other weeks in the analysis. This can be handled by a binary or dummy variable giving it a value of one during those five weeks and zero otherwise. Similarly, the Canadian government trade restraints on U.S. beef imports through its D.E.S. certification requirements (in April 1974) and subsequently its quotas (August 1974) may have had an effect on price spreads. This effect on price spreads should be opposite to those observed for imports. This trade restraint can also be incorporated using a binary variable with a value of one for the free trade period and zero for the restricted trade period.

It is believed that the above-described factors do not have a complete impact immediately on price spreads, that is there is a slow adjustment or a lagged effect which carries over into subsequent weeks. To incorporate this lagged effect, a typical formulation of a geometrically declining lag was used. This was introduced into the functional relationships by using a single period lagged dependent variable.

To examine the impact of competitive relationships between levels of the marketing system, it is proposed that level of price spreads at the wholesale-to-retail level be included as an explanatory variable. If those spreads are low, retailers could apply pressure and force a reduction in the farm-to-wholesale price spreads. The implications of the estimated coefficient of the variable will be important in assessing the pricing practices of retailers. This could possibly have a one period lag in its effect.

To assess the increase in costs to packers through increased wages, prices of supplies, cost of credit, etc., a time trend could be introduced. A positive coefficient could simply be a reflection of increased processing costs. The charts in the previous chapter, however, do not show any discernible trends.

The variables described above were included in a functional relationship for Grades A1 through A4 of steers and heifers and D2 cows in Toronto, Calgary, and Winnipeg. Weekly price data were used for the same 131-week period as described in the previous charts. The statistical estimation technique used was ordinary least squares in the Massager program. The results of the estimation are shown in Table 3 for Toronto and in Appendix 3 for Winnipeg and Calgary. The coefficients are shown with t-values below in brackets with significant variables being underlined.

The variables used explained 65 percent of the week-to-week variation in price spreads for A1 steers in Toronto. For other categories, the coefficients of determination ranged from 0.36 for A4 steers

Table 3: Regressions Coefficients on the Live to Wholesale Price Spreads, by Grade, Toronto

Price Spread	K	PL	PW	BYPR	PS _{LW t-1}	Gov 1	Gov 2	Q	US	IM	Trend Q	GR A	PS _{WR-1}	R2	D-W
A1 steers	3.63 (3.03)	0.36 (6.61)	0.01 (0.14)	0.62 (2.19)	0.41 (6.00)	-0.50 (-0.70)	2.07 (2.47)	0.14 (3.04)	0.01 (1.25)	0.09 (1.12)	0.01 (1.25)	0.09 (1.12)	0.04 (1.21)	0.65	1.80
A2 steers	4.58 (4.74)	0.34 (7.62)	-0.06 (-0.99)	0.73 (2.88)	0.39 (6.55)	-0.63 (-1.04)	1.64 (2.29)	0.10 (2.53)	0.01 (1.34)	0.07 (0.93)	0.01 (1.34)	0.07 (0.93)		0.65	1.79
A3 steers	3.25 (2.61)	0.36 (6.48)	0.05 (0.68)	0.36 (1.10)	0.46 (5.87)	-0.15 (-0.20)	2.07 (2.23)	-0.010 (1.90)	-0.01 (1.63)	0.11 (1.27)	-0.01 (1.63)	0.11 (1.27)		0.62	1.47
A4 steers	-5.16 (-0.59)	0.95 (6.70)	-0.75 (1.28)	-0.90 (-0.29)	0.14 (2.06)	13.40 (2.41)	8.95 (0.88)	0.38 (1.10)	-0.17 (2.66)	0.90 (1.42)	-0.17 (2.66)	0.90 (1.42)		0.36	1.77
A1 heifers	6.92 (3.35)	0.93 (24.42)	-0.03 (-0.29)	0.61 (1.01)	0.11 (3.08)	-0.55 (-0.42)	3.68 (2.50)	0.10 (1.17)	0.02 (1.58)	0.08 (0.54)	0.02 (1.58)	0.08 (0.54)		0.85	1.22
A2 heifers	5.91 (3.14)	0.95 (27.41)	-0.27 (-2.25)	0.95 (1.72)	0.10 (2.98)	0.94 (-0.80)	4.30 (3.23)	0.03 (0.46)	0.02 (1.60)	0.18 (1.31)	0.02 (1.60)	0.18 (1.31)		0.88	1.23
A3 heifers	5.22 (3.16)	0.42 (6.47)	0.30 (3.01)	0.22 (0.46)	0.55 (8.34)	0.54 (0.52)	1.54 (1.25)	0.03 (0.38)	-0.008 (-0.07)	-0.08 (-0.75)	-0.008 (-0.07)	-0.08 (-0.75)		0.58	1.67
A4 heifers	4.25 (0.77)	0.60 (10.80)	0.63 (8.42)	1.72 (0.75)	0.49 (7.35)	3.39 (0.94)	-2.85 (-0.41)	0.08 (0.34)	-0.04 (-0.96)	0.07 (0.19)	-0.04 (-0.96)	0.07 (0.19)		0.60	1.27
D2 cows	8.79 (5.84)	0.40 (6.07)	-0.28 (-2.06)	0.31 (0.72)	0.23 (2.98)	3.08 (3.28)	2.25 (2.15)	0.22 (3.67)	-0.02 (-1.97)	-0.003 (-0.03)	-0.02 (-1.97)	-0.003 (-0.03)		0.43	1.34

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See Appendix 3, page 79 for definitions of variables.

to 0.88 for A2 heifers. For regressions using weekly data, these are reasonably high explanatory levels. Statistical tests indicated that there were no severe common statistical estimation problems¹⁴ lending more confidence to the results.

In contrast to expectations, the week-to-week price change (first difference) in the live price was positive and significant in all markets and for each category. These coefficients are, respectively, for Toronto, Calgary, and Winnipeg, 0.36, 0.13, and 0.23. This means that a \$1.00/cwt. increase in the live prices from the previous week is associated with a \$0.36/cwt. increase in Toronto price spread, a \$0.13/cwt. increase in the Calgary price spread, and a \$0.23/cwt. increase in that for Winnipeg.

These results imply that whenever packers were subjected to a \$1.00/cwt. change in the live price from the previous week, they would not only adjust to this increase but over-compensate by changing the carcass price even more. Supplementary tests were made in order to find out if packers adjusted their price spreads more quickly when live or carcass prices went up or went down. These tests will be reported later in the chapter.

It should be noticed that the regression coefficients are quite high for some of the smaller categories such as A⁴ steers and heifers. This might be accounted for by less accurate price reporting or the thinness of their markets, as suggested in Chapter 3. For example, A⁴ steers in Toronto account for only 1.6 percent of beef carcasses graded. Also prices paid within a single day for lots of cattle of the same grade and category could vary by as much as \$6.00/cwt. (carcass equivalent).¹⁵ This implies that packers are often unable to verify their own carcass costs. The markets for A¹ steers are larger and the regression coefficients of live prices can be interpreted with more confidence.

¹⁴ Tests for multicollinearity and autocorrelation showed that the standard assumptions in ordinary least squares were not strongly violated, thereby producing unbiased, minimum variance coefficients for most cases: however, regression runs for A¹ and A² heifers in Toronto and Calgary and A³ heifers in Calgary showed a strong degree of multicollinearity between the first difference in live prices and the dependent variable.

¹⁵ Commission of Inquiry into the Marketing of Beef, A Comparison of Live Cattle Prices and Carcass Costs. Research report No. 3 (Information Canada, Ottawa).

In Toronto, the week-to-week change (first difference) in carcass prices was found to be significant only in a few cases. Some of these coefficients were negative in contrast to expectation. Size of the coefficient was minimal however. In several cases (e.g. heifers and cows) the coefficient was positive, but it was not generally large. These results indicate that Packers were able to react to the week-to-week changes in carcass prices so that price spreads remained constant. In Calgary, more coefficients were significant, all were positive as expected and their size was substantially larger. In Winnipeg, significant positive coefficients were obtained for steers.

Week-to-week changes in the by-products prices were significant only for A1 and A2 steers in Toronto and A1, A2, and A3 steers, A2 heifers, and D2 cows in Calgary.

For these categories week-to-week changes in by-products prices have not been incorporated into packer buying or selling prices and therefore have had almost a corresponding equal effect. For example, the regression coefficients for by-products prices in Toronto for A1 and A2 steers were 0.63 and 0.73, respectively, implying a dollar change in by-product prices would cause a corresponding \$0.63/cwt. change in price spreads for A1 steers in Toronto. In Calgary the coefficients were smaller but still substantial for A1, A2, and A3 steers. Thus, packers, as expected, incorporated changes in by-product prices less quickly than live and particularly carcass prices. By-products prices did not seem to have any effect on the price spreads on other categories or grades.

The lagged price spread was highly significant in all centres. For A1 steers in all three markets, the results imply, on the average, an adjustment to an equilibrium level of about 50 percent in the following week, 25 percent in the second week and 13 percent in the third week.¹⁶ Thus the complete adjustment or long-run effect of each independent variable is approximately twice the immediate or short-run effect.

The level of U.S. imports is positively related to price spreads in all markets. An increase in the imports of 1,000-head of U.S. cattle is associated with a \$0.14/cwt. increase in price spreads for A1 steers in Toronto, a \$0.12/cwt. increase in Calgary, and \$0.10/cwt. in Winnipeg. While this variable is significant in some of the major categories, its economic value is small.

The period in which free trade existed was found to be not significantly different than the restricted trade period in its effect on price spreads for the major categories in all three markets. Only for

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These values were obtained through subtracting the coefficient of the lagged price variable from unity and raising to the first, second and third power for lags of one, two and three weeks.

some categories, such as A4 steers in Toronto, A3 heifers in Calgary, D2 cows, and the heifer markets in Winnipeg did the variable prove to be significant. In each of these cases, however, it had a large economic value as high as \$13.40/cwt. for A4 steers in Toronto.

The period prior to the introduction of export controls in August 1973 was significantly different from the rest of the periods for the major categories in Toronto and Calgary but only for A3 steers in Winnipeg. This period was associated with an extraordinary spread of \$2.07/cwt. in Toronto and \$1.92/cwt. in Calgary for A1 steers. The lack of significance on the Winnipeg market could probably be the result of its isolation from the U.S. market.

The slaughter volume variable was not significant in any of the major categories. Only for heifers in Calgary was it significant and even then, its economic value was very small.

The trend variable was not significant in any of the major categories in Toronto and Calgary. There was found to be a sizeable decrease in the spread of \$0.17/cwt. for A4 steers and \$0.20/cwt. for D2 cows in Toronto. The results for Winnipeg are quite different, however. It was found that the A1 through A3 steer categories had increased their spreads by an average of \$0.02/cwt. a week from 1973 to 1975, thus increasing their total spread since then by \$2.60/cwt. These markets are the only ones for which there was found to be an upward trend in the price spreads.

The effect of the wholesale-to-retail price spread was only tested for the Toronto market. It was not significant and very small. That would imply that a squeeze in the price spreads at the retail level does not bring pressure on price spreads at the farm to wholesale level.

A supplementary test was run in order to find out if packers increased or decreased their spreads at the same rate when live or carcass prices increased as when they decreased. Once again, regional differences were significant. In Toronto, it was found that packers would increase their price spreads by \$0.27/cwt. when live prices went up by \$1.00/cwt. whereas they would increase it by \$0.53/cwt. when live prices went down \$1.00/cwt. However, these packers were found to increase their spreads by \$0.19/cwt. when carcass prices went up \$1.00/cwt. and decrease their spreads by \$0.44/cwt. when carcass prices went down \$1.00/cwt. Thus, packers in Toronto would appear to be in a very favourable position whenever live prices fall in Toronto and in a very unfavourable position whenever carcass prices go down.

In Calgary and Winnipeg, the packers' response to an increase in live or carcass prices did not appear to be statistically different from their response to a decrease in those prices.

By using the dummy variable with actual price levels instead of first differences, it was found that there was practically no difference in the spreads when live prices were high or low, and none at all in the case of carcass prices. This would imply that packers do not respond to a price level as such. They will respond much more to a week-to-week change in prices.

Other variations of the above regressions have been estimated with less satisfactory results. The national slaughter levels were substituted for the provincial levels. Seasonality was also tested by using monthly dummy variables.

In summary, it was noted that weekly changes in by-products prices were significant factors influencing the fluctuations of price spreads of the major categories in Toronto and Calgary. The weekly changes in live prices were also important for these categories in the same cities. The quantity of U.S. cattle imported proved significant in Toronto and Calgary but its economic value was small. All three cities exhibited a lagged reaction as the price spread lagged one week proved to be significant in every market with the exception of A3 heifers in Calgary. Week-to-week changes in carcass prices were not found to play a major influence on the price spreads. The quantity of provincial cattle slaughtered was also not significant.

Calgary and Toronto shared much the same set of significant variables. Winnipeg differed from these two cities in that weekly changes in the carcass prices and the period of import restrictions both proved statistically significant. It is questionable however, as to the economic significance of the quota period. The Winnipeg market does not generally trade fed beef with the U.S. Hence while the April 1974 - June 1975 period was statistically significant, there may be other factors which caused this to occur, happening at the same time as the imposition of import controls by the Canadian government. The first difference in carcass prices also proved statistically significant in Winnipeg. This could be due to a slow adjustment by packers to the fluctuations in live prices.

Meat packers' price spreads are affected by three price variables -- live, carcass and by-product. This study was designed to evaluate how well packers adjusted to price changes so that spreads remained constant. The results show generally that carcass price changes are easily taken into account while by-product prices are virtually ignored on a weekly basis.

5. WHOLESALE-TO-RETAIL PRICE SPREADS

This chapter presents the wholesale-to-retail price spreads for 15 grocery chain firms in five Canadian cities. A weighted average price spread is also calculated for each city. Data were made available to the Commission for the retail prices and cutout yields of all retail cuts for each of these firms. With this information, the average weighted price of beef at retail for each firm was calculated. The wholesale carcass price used was the wholesale price for A1 steers in each city.

Retail price data are monthly for 1973-74 and weekly for 1975. Also, the 1973-74 data represent prices for the first weeks of each month and not a monthly average.

Some retailer firms could not provide data for earlier parts of the study but with one exception, all of them provided data since May 1974.

Table 4 presents the price spreads for each firm in Montreal, Toronto and Winnipeg for three periods: May 1974 to May 1975, May 1974 to December 1974 and January 1975 to May 1975. Separating the May 1974 to May 1975 period into two sub-periods, it was shown which stores had increased or decreased their mean spreads in the first five months of 1975 over the last seven months of 1974. In Montreal, two firms increased their spreads in 1975, one by 11.3 percent, and the other by 2.1 percent. A third firm's spread has remained virtually unchanged.

In Toronto, big increases were made by two firms whereas three firms showed a decrease. In Winnipeg, both firms decreased their spreads.

Price spreads in Table 4 show a large variation, for example between the high of \$36.33/cwt. and the low of \$13.20/cwt. in Toronto. While much of this is the result of retail price differences, some of it may be attributable to differences between firms in the method of reporting retail cut-outs. Some firms bought only boxed beef and cut-outs reflected only those cuts received at the store. While average retail prices of these firms were higher, the price spreads were approximately the same. In these cases, the buying price referred to a trimmed carcass with the value of bones, fat and lower valued cuts not received subtracted at cost from the carcass.

Table 4: Wholesale to Retail Price Spreads for Beef in Major
Centres in Canada and the U.S.

	May 1974 to May 1975	May to December 1974	January to May 1975
	(\$/cwt.)		
<u>Montreal</u>			
Firm A	17.78	16.20	18.03
Firm B	n.a.	n.a.	22.10
Firm C	25.21	24.67	25.20
Firm D	32.13	32.98	32.22
wt. average	19.62		
<u>Toronto</u>			
Firm A	13.20	13.23	12.54
Firm B	17.03	16.31	17.44
Firm C	19.19	20.30	16.68
Firm D	24.32	22.83	27.00
Firm E	36.33	36.21	36.55
Firm F	18.66	16.78	20.97
Firm G	22.80	23.55	22.10
wt. average	18.09		
<u>Winnipeg</u>			
Firm A	26.01	26.66	25.25
Firm B	31.51	32.07	29.88
<u>U.S.</u>	40.35	41.37	38.72

Source: Commission Estimates

Wholesale-to-Retail Price Spreads in Montreal

The weighted average retail prices and wholesale-to-retail price spreads for three firms in Montreal is shown in Chart 13. The average price spread for Montreal for May 1974 to May 1975 was \$19.62/cwt. Price spreads in the first quarter of 1975 were considerably higher than average while the converse was the case in the second quarter of 1975. Chart 13 shows the individual wholesale-to-retail price spreads for three firms in Montreal during May 1974 to May 1975 and four firms during January to May 1975. During 1974 there was considerable difference in the level of these spreads between firms but fluctuations followed somewhat similar patterns. In 1975, price spreads were very erratic and were at very different levels in the first and second quarter of the year. With the exception of the high level firm, spreads were at about the same level for each firm during the first quarter and for all firms in the second quarter. The rise in spreads in the first quarter of 1975 is the impact of stable retail prices with a sharp decline in wholesale prices. The very sharp decline in the spread near the end of the period is similar to one observed at the farm-to-wholesale level. This is the result of the steep rise in wholesale prices while retail prices rose much more slowly. These two periods illustrate the levelling used at retail in both a declining and a rising market.

Wholesale-to-Retail Price Spreads in Toronto

The weighted average retail price and wholesale-to-retail price spread for seven firms in Toronto is shown in Chart 14. The average spread is much more uniform in Toronto during 1975 than in Montreal.

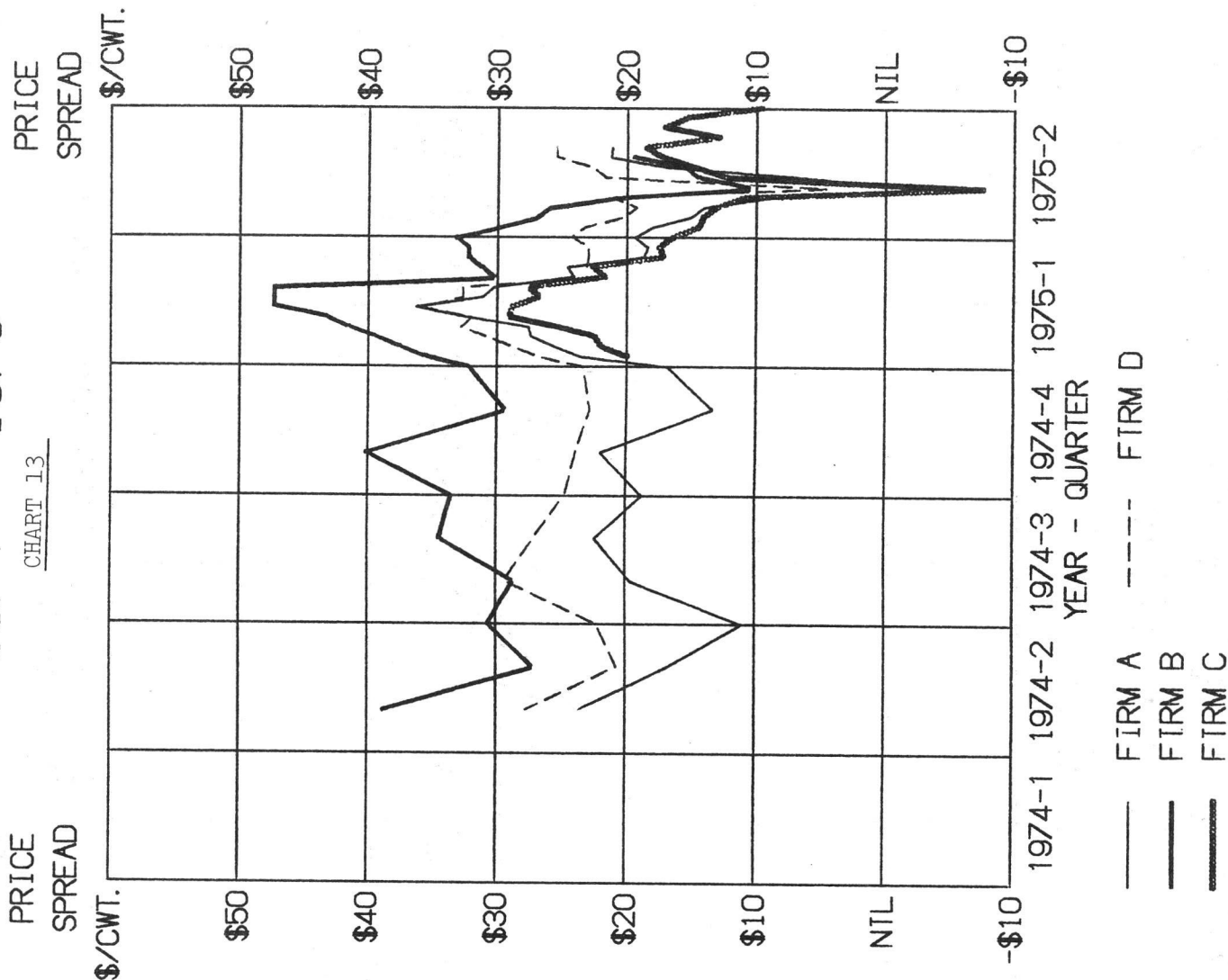
Charts 14 and 15 show price spreads for seven firms in Toronto for the 1973-75 period. During 1973, spreads were generally quite stable with the exception of the August period when wholesale prices rose sharply. In only one or two cases did retail prices not decline in the fourth quarter as Canadian wholesale prices retreated.

In 1974, most firms' spreads were relatively high in the first two quarters. The third quarter was relatively low. The November-December period, however, was unusual. In a falling wholesale market, almost all retailers prices rose to give sharply higher spreads. The following month during rising wholesale prices, retail prices were down to give sharply lower spreads.

In 1975, wholesale prices fell sharply during the first quarter. Only three of the seven firms' retail prices followed the wholesale to maintain their normal spreads. One firm slowly lowered prices while two others maintained almost constant retail prices and thus considerably higher margins. During the sharp rise in prices in May 1975, retailer spreads were low for a short period. Neither the rise in wholesale prices nor the decline in spreads were as dramatic as in Montreal.

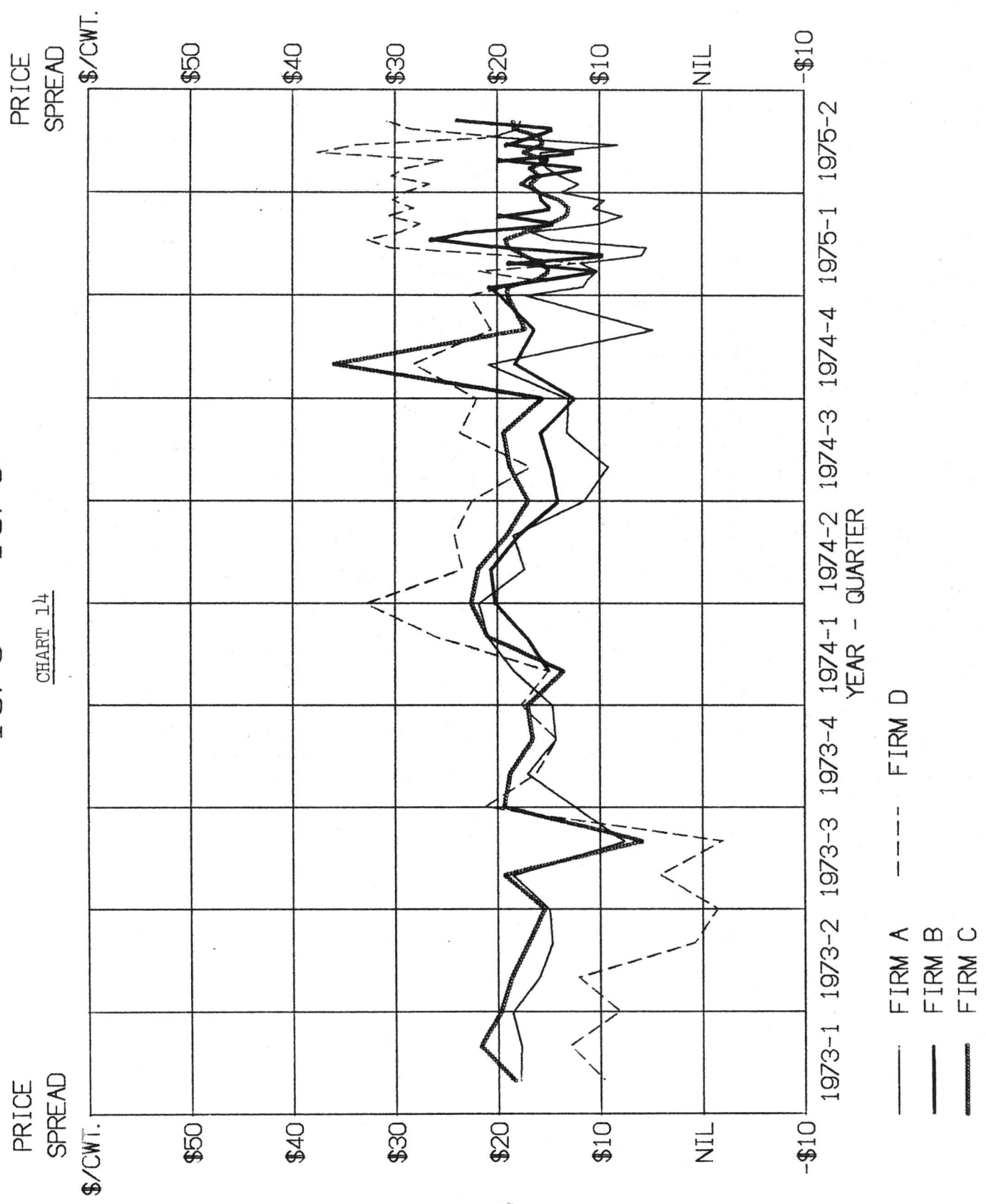
WHOLESALE TO RETAIL PRICE SPREADS IN MONTREAL

1974 - 1975

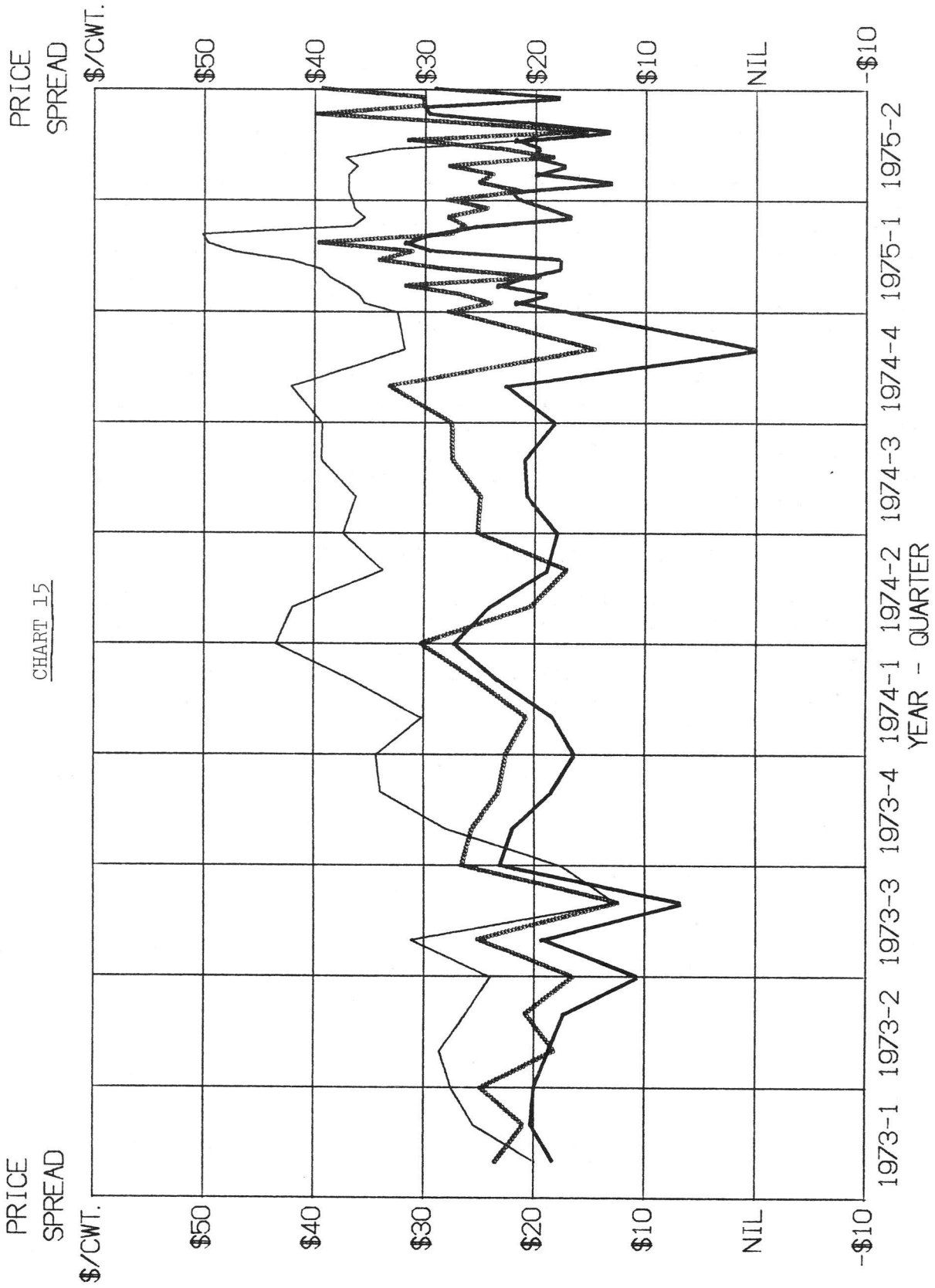


WHOLESALE TO RETAIL PRICE SPREADS IN TORONTO 1973 - 1975

CHART 14



WHOLESALE TO RETAIL PRICE SPREADS IN TORONTO 1973 - 1975



Wholesale-to-Retail Price Spreads in Winnipeg

Chart 16 shows price spreads for two firms in Winnipeg. Firm A in Winnipeg adjusted to price increases in August 1973 much more quickly than firms in Toronto or Montreal. Wholesale prices however, did not rise as much. For Firm A, its spread rose through most of 1973. In 1974 there was a gradual decline during the first three quarters. The fourth quarter for both firms in Winnipeg was similar to that observed for Toronto: a sharp rise in spreads followed by a sharp decline. In 1975, retail prices followed the wholesale price decline and spreads stayed at about the 1973-74 average level.

From the weekly price data, it is apparent that retail firms do not set prices to maintain constant weekly spreads. Price spreads in 1975 varied considerably from week to week for some firms as much as \$40/cwt. over a three-month period. This variation can be partly attributed to levelling by retailers or simply a slow reaction to wholesale price changes.

The U.S. Wholesale-to-Retail Price Spread

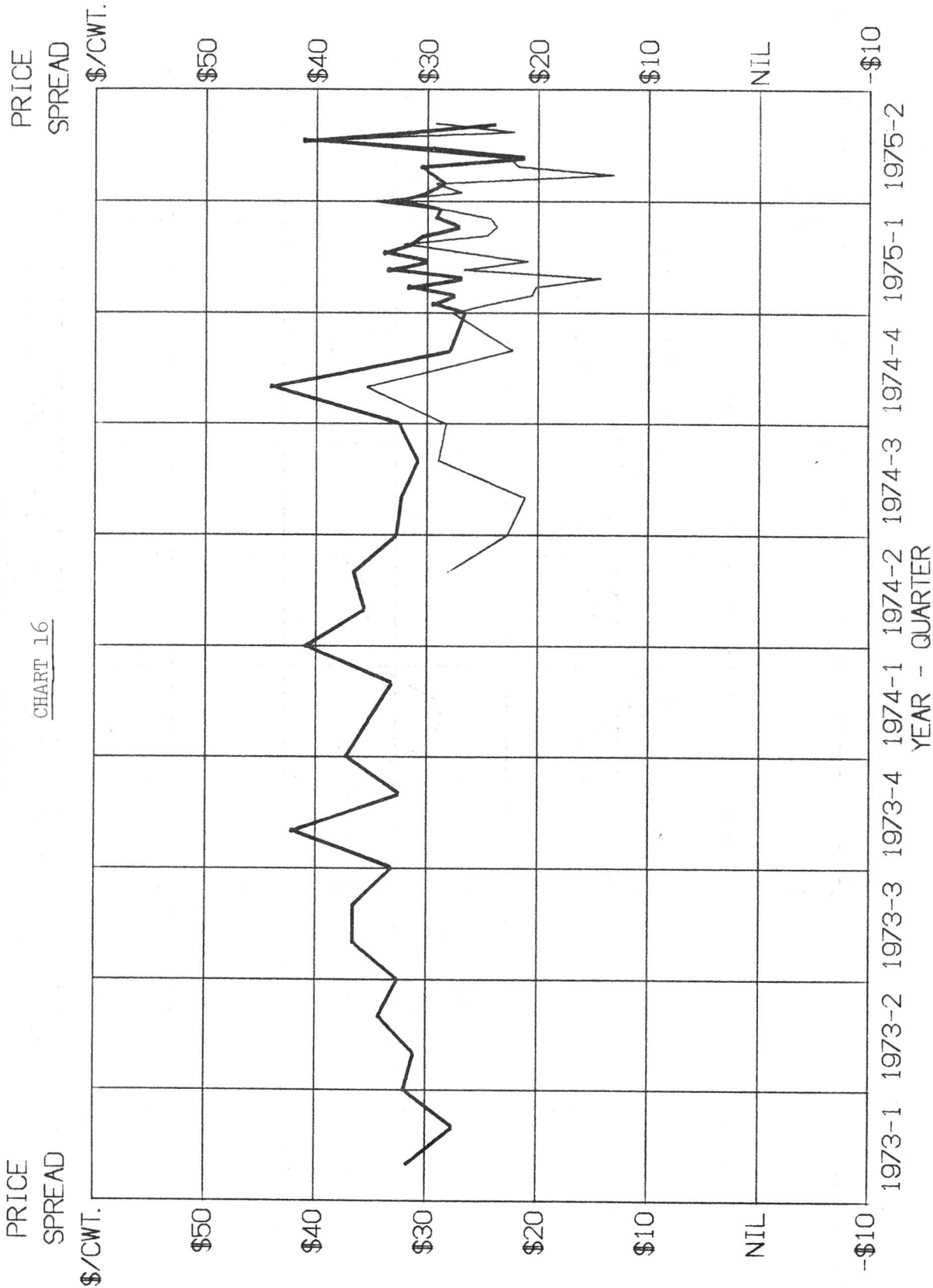
Chart 17 shows the U.S. retail price spread, on a monthly basis, from January 1973 to May 1975. The increasing price spreads observed during periods of a falling carcass market, occurred because the carcass price declined more quickly than the retail price. The U.S. price spread appears more stable than the Canadian price spreads. Most important, however, is that this chart and Table 4 show that the wholesale-to-retail spread in the U.S. has been considerably higher than for any Canadian firm since May 1974. From May 1974 to May 1975, the U.S. spread was \$40.35/cwt. Thus, the Canadian price spreads are certainly much below the U.S. carcass-to-retail spread for that period.

A long-run price wholesale-to-retail spread was impossible to obtain for Canada because Statistics Canada collects only retail prices for six representative cuts and only a few by-products. For a reliable estimate of price spread, the method used in this study estimated the average retail price by obtaining the prices and the cut-out weights from all the cuts that constitute a carcass at retail is necessary.

However, this study did estimate the weighted regional average carcass-to-retail price spread from May 1974 to May 1975 for Montreal and Toronto. The results for each firm and for each city are shown in Table 4. In Toronto, the mean spread for that period was \$18.09/cwt. and in Montreal it was \$19.62/cwt.

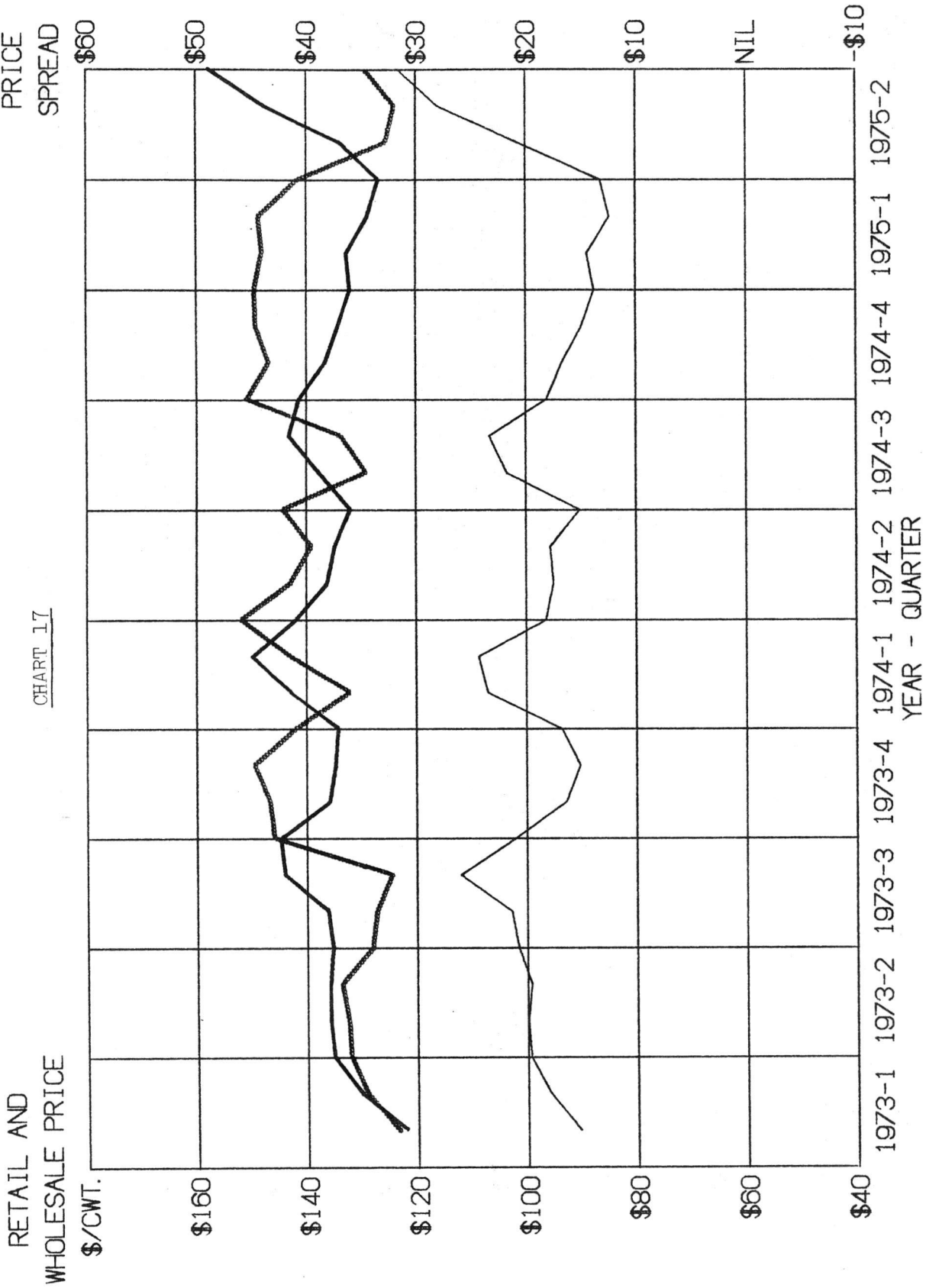
WHOLESALE TO RETAIL PRICE SPREADS IN WINNIPEG 1973 - 1975

CHART 16



MONTHLY WHOLESALE TO RETAIL PRICE SPREADS FOR CHOICE STEERS IN THE UNITED STATES

1973 - 1975



Farmers Share of the Retail Dollar

Chart 12 above shows the U.S. farm-to-carass and carcass-to-retail price spreads. The U.S. carcass-to-retail spread has doubled from 1965 to 1975. Even though it is impossible to estimate the Canadian equivalent for this period, at least during 1974-75 the average carcass-to-retail spread in Toronto and Montreal was half the value of that in the U.S. Consequently, the Canadian farmer's share of the retail price is higher by 10 percentage points than the U.S. Table 5 shows the Canadian farmer's share of the retail dollar based on the live price of A1 steers and the average retail price in Toronto. Also shown is the Canadian farmer's share based on the live price of A1 heifers and the average retail price in Toronto. The table also includes the U.S. farmer's share of the retail price based on choice beef.

During the 17-month period January 1974 to May 1975, the farmer received 72.8 percent of the retail dollar for A3 steers in Toronto. For heifers, the farmer's share was 66.1 percent during this period, partly reflecting the lower yields and higher processing costs for lighter weight cattle. The U.S. farmer's share for choice steer was considerably lower at 62.2 percent of the retail price. Thus the Canadian market appears to be performing the wholesaling and particularly the retailing function more efficiently.

An important implication of these data is that they are averages. These farmers' share averages vary substantially between quarters (from 69 to 75 percent). Even more important, however, is the variability in prices for the same grade of live cattle on the same market day. Another Commission study found that many lots of cattle of the same grade varied over \$6./cwt. from the highest to lowest price.¹⁷ This variation causes similar large changes in the farmers share received by individual producers, creating not only considerable uncertainty but many cases of sizeable discrepancies between the producer and retail prices.

Another aspect of these data is that the producer price is taken at the point of first sale, in this case, the terminal markets. If costs between the farm gate and point of first sale were included, then the farmers share would decrease by 2.2 percent to 70.6 percent for A1 steers in Toronto. This assumes a selling charge of \$6. per head and a transportation cost from the farm gate to market of \$7 per head for a 1000 pound steer.

¹⁷ Commission of Inquiry into the Marketing of Beef. Research Report No. 3. A Comparison of Live Price and Carcass Costs. (Ottawa, Information Canada, February 1976).

Table 5: Canadian-U.S. Comparison of the Farmer's Share

	Canadian farmer's share in Toronto based on A1 steers	Canadian farmer's share based on A1 heifers	American farmer's share based on Choice beef
	(percent)		
1974-1	68.8	66.1	63.7
1974-2	71.8	68.7	61.0
1974-3	77.2	67.9	64.7
1974-4	75.2	61.9	59.0
1975-1	70.9	64.5	58.3
Mean share (January 1974 - May 1975)	72.8	66.1	62.2

Source: Commission Estimates and USDA. Marketing and Trade Situation

6. EVALUATION OF WHOLESALE-TO-RETAIL PRICE SPREADS

The chapter is a report of the analysis of the major factors affecting the level and variability of wholesale to retail price spreads. There are a number of questions which this analysis proposes to answer. Are retailers motivated to adjust their prices to maintain constant spreads? How prevalent is the practice of price levelling? How strongly are margins influenced by competitors' pricing? Have retailers costs increased, requiring a higher margin?

Multiple regression equations were used, one for each firm, to examine the factors affecting the individual firms price spreads. Thus, price spreads data were regressed against retailers purchase price (wholesale carcass price), retailers selling price, and competitor's selling price. A time variable was used to test whether significant trends in price spreads had occurred during the period under study. To test whether price spreads were significantly different in various times of the year, monthly binary or dummy variables were used. It was also decided to test whether the level of advertising was related to the level of price spreads.

The regression program used was an ordinary least squares routine from Massager package. The periods varied by the data supplied to the Commission from the retail firm. For Toronto, the data used were monthly values (prices in the first week of each month) for the 29-month period January 1973 to May 1975. For Calgary and Vancouver, data were monthly values from September 1973 and January 1974 respectively. For Montreal and Winnipeg, weekly data were used for the first 22 weeks of 1975.

The statistical estimation results were not as good as those obtained for the farm-to-wholesale equations. In part, the retail data were not as accurate and there were fewer observations. The best results were obtained for the Toronto market because the data series for these firms was the most complete. In Toronto it was found that an increase of the carcass price of \$1.00/cwt. from the previous period would decrease the price spread of firm A by \$0.52/cwt., firm C by \$0.55/cwt., firm F by \$0.76/cwt. and firm G by \$0.68/cwt. The change in the carcass price did not seem to affect firms B, D and E. The above same retailers were affected by the change in the retail prices. An increase of the retail price of \$1.00/cwt. was found to increase the price spread of firm A by \$0.49/cwt., firm C by \$0.59/cwt., firm F by \$0.43/cwt. and Firm G by \$0.49/cwt. Thus, four of the seven retailers did not adjust their retail prices quickly to maintain a constant margin. These results are shown in Table 6.

Table 6: Estimated Coefficients for Regressions on the Wholesale to Retail Price Spreads, by City and Firm¹

Dependent variables		Independent variables				Beef Ads	Total Advertising	R ²	RB ²	F ratio	D.W.
K	Pcarc	Pret	Pcomp	t							
MONTREAL											
1) Firm A	28.87 (4.69)	-.13 (-.39)	-.50 (-.99)		-.90 (-3.18)	-.76 (-.98)	.08 (1.07)	.65	.36	2.27	1.67
2) Firm B	22.48 (4.07)	-.34 (-1.19)	-.26 (-.82)	-.37 (-.79)	-.51 (-1.91)	.43 (.46)	.03 (.63)	.70	.40	2.34	1.68
3) Firm C	27.98 (5.87)	-.05 (-.25)	-.03 (-.12)	-.33 (1.01)	-.29 (-1.36)	-.62 (-1.41)	.05 (1.16)	.6	.29	1.82	1.74
TORONTO											
1) Firm A	17.14 (5.86)	-.52 (-2.97)	.49 (3.94)		-.13 (-1.59)			.77	.52	3.12	1.18
2) Firm B	21.07 (3.76)	-.44 (-1.15)	-.07 (-1.06)	.18 (1.19)	-.14 (-.71)			.92	.33	1.57	2.19
3) Firm C	10.36 (3.35)	-.18 (-1.10)	.30 (1.60)	-.02 (-.12)	.36 (3.03)			.92	.68	3.84	.84
4) Firm D	14.98 (5.05)	-.55 (-3.06)	.59 (3.33)	.21 (1.05)	.06 (.69)			.82	.60	3.71	.80
5) Firm E	16.49 (5.50)	-.76 (-4.31)	.43 (2.39)	-.09 (-.48)	.07 (.91)			.88	.73	5.89	.95
6. Firm F	36.29 (16.60)	-.68 (-4.82)	.48 (3.98)	.14 (.98)	.37 (5.88)			.95	.88	13.88	1.63
7) Firm G	19.88 (3.67)	-.61 (-1.82)	.63 (1.65)	-.30 (1.00)	.64 (3.93)			.75	.43	2.36	.63
WINNIPEG											
1) Firm A	18.34 (4.83)	-.61 (2.28)	.25 (1.18)	.39 (1.57)	.37 (.44)			.68	.47	3.19	1.39
2) Firm B	26.72 (15.92)	-.10 (-.58)	.67 (6.18)	-.16 (-1.77)	.79 (2.16)			.84	.74	7.98	2.02
CALGARY											
1) Firm A	29.41 (5.20)	-.44 (-1.42)	.37 (1.73)		-.25 (-1.16)			.86	.47	2.22	1.89
VANCOUVER											
1) Firm A	57.85 (6.20)	-.81 (-2.43)	.54 (2.87)		-.86 (-2.71)			.99	.80	5.27	2.97

Firm A was selected as the representative firm and their retail prices were used to represent the competitor's price for all the other retailers. In every case, however, it was found to be not significant. This result is consistent with other research of the Commission, which shows on a weekly basis, prices of competitors do not greatly influence a consumer's decision to shop at a particular place. It is based more on the convenience, location and quality of the merchandise offered and that the store's own beef prices influence consumers selections.¹⁸ In any case, the retailers' statements that the competitors' price was the most important variable affecting their pricing policy could not be supported by the results shown in Toronto.

A trend variable had also been inserted in the regression in order to find out if the price spread had consistently increased or decreased during the period under study. It was found that three firms in Toronto (firms D, E and G) had shown an increase of \$0.36/cwt., \$0.64/cwt. and \$0.37/cwt. respectively for each month for which there was data available.

The monthly binary variables did not prove generally to be statistically significant. Only firm D had three months for which the spread proved to be statistically significant from the average. In this case, March, April and October represented an increase of \$12.83/cwt., \$9.01/cwt. and \$6.74/cwt. respectively over January. The only other stores for which monthly dummies proved to be significant were firms C and G. In both cases, the month of October represented an increase of \$7.28/cwt. and \$7.38/cwt. respectively over January.

For the regressions estimated for firms in Calgary the independent variables used were significant. In Vancouver, however, it was found that an increase of the carcass price of \$1.00/cwt. would decrease the spread by \$0.81/cwt. from the previous period, while an increase of the retail price of \$1.00/cwt. would increase the spread by \$0.54/cwt. from the previous period. For the Vancouver firm it was found that there had also been a regular decrease of the price spread of \$0.86/cwt. for every month since January 1974.

In Winnipeg, firm A was found to have a decrease of its spread from the previous week by \$0.61/cwt. whenever the carcass price increased by \$1.00/cwt. However, there was no proven statistical

¹⁸ Commission of Inquiry into the Marketing of Beef, An Economic Analysis of Beef Pricing and Newspaper Advertising in Toronto. Research Report No. 5. (Information Canada, Ottawa, February 1976).

relationship between the change in price spread and the retail price. Firm B, however, increased its spread \$0.67/cwt. from the previous week whenever the retail price went up \$1.00/cwt. Also the trend variable proved to be significant and showed a regular increase of \$0.79/cwt. of the price spread each week. Finally, the price spread for May showed a seasonal decrease of \$13.42/cwt. below that of January.

In Montreal, for three firms tested it was found, on a weekly basis, that neither the carcass and retail prices nor competitor's prices influenced the price spread. The trend variable was shown to be significant but negative for firm A. In that case, the spread decreased by a value of \$0.90/cwt. each week.

There was no evidence of seasonal variation in price spreads for any of the three stores. Also, neither the number of beef ads nor the total advertising variables were found to have any significant affect on price spreads.

In summary, the quality of the data did not permit results of the same degree of validity as for the farm-to-wholesale spread. However, one interesting result was that three firms in Toronto proved able to maintain a consistent price spread, when faced with changing carcass or retail prices. Other stores were found to have statistically significant increases or decreases of their price spreads when wholesale or retail prices changed. In Toronto, three firms were found to have regular increases of their spreads. In Winnipeg, one firm experienced an increase of its spread in 1975 while in Montreal, one firm showed a decrease of its spread during the same period.

Appendix 1

A COMPARISON OF THE METHODOLOGY USED TO OBTAIN LIVE PRICES
AND BY-PRODUCTS: CANADA AND THE U.S.

In Canada, live cattle prices are publicly collected only at the nine terminal markets: Calgary, Lethbridge, Edmonton, Regina, Saskatoon, Prince Albert, Winnipeg, Toronto and Montreal. Prices are recorded on each market day by a reporter from Agriculture Canada. There is a large volume of slaughter cattle sales at the Toronto and Calgary markets but the Lethbridge market is virtually defunct. While the federally supervised markets account for approximately a quarter of all slaughter cattle marketings, the Lethbridge and certain other terminal markets market a small number of some grades of cattle, creating concern as to representativeness of prices reported and possible manipulation by buyers.

The reporters from Agriculture Canada obtain price and quantity information by having access to all weigh tickets giving lots of cattle sold, their price, weight and sex. In order to report prices for the various grades of these cattle, the reporter using his trade contacts, knowledge of the market and the weigh tickets, undertakes to grade the animals according to various arbitrary price ranges. For example, he may decide that on this particular day, average A1 and A2 steers must have sold between \$48 and \$51/cwt. However, he has no sure way of knowing how many A1 and A2 steers were actually sold within that range of prices, nor is he even sure of how many A1 or A2 steers were actually sold at any price. He can only speculate based on his knowledge of the business.

The market reporters report "bulk of sales". For example, the A1 and A2 steers which were sold within that arbitrary price range should represent 80 percent of the total A1 and A2 steers sold on that day. There are problems connected with this effort. The market reporter can never be sure if he has obtained 80 percent of all sales of A1 and A2 steers. Also the range for common steers (B and C) is extremely wide, on occasion \$20-\$30/cwt. Cattle prices are not classified by weight ranges. Also even for a particular category, the dressing percentage may vary substantially, causing considerable dispersion in the live prices.

The estimated average and the weekly price range is published in the Canada Livestock and Meat Trade Report by Agriculture Canada. Weighted averages of weekly prices are published as monthly averages and similarly annual averages are obtained.

In the U.S., packers in 1974 bought only 11.9 percent of their cattle through terminal markets.¹ Terminal markets are reported by the Federal and Federal State Livestock Market News Service. The Market News Service also reports prices for auction markets and direct sales and live prices are specified by weight groupings. Reports are made for a combination of grades, however, most sales occur in the Good, and some Choice in 900-1,100 lb. range.

The American live prices series are a weighted average of Choice grades in seven markets which represent 85 percent of the price, plus the California (direct marketings) which represent the other 15 percent. The seven markets for the U.S. are: Kansas City, Omaha, St. Louis, Sioux City, Sioux Falls, South St. Joseph and South St. Paul. The procedures used in computing the average live prices in the U.S. are now under revision.

Prices for by-products in Canada have not been reported publicly in a comprehensive manner so that the total value of by-products from a carcass could be monitored. The Canadian Cattlemen's Association does have a weekly series which includes seven types of by-products and Statistics Canada also published monthly prices of certain by-products. A comprehensive weekly price series has now been devised by the Commission and Agriculture Canada. The following assumptions were incorporated in constructing the by-product value series.

The same by-products for beef are used from city to city. The only variations would lie in the price-quality relationship for hides which varies from city to city.

Using information obtained by the Commission from industry sources, the following types of hides were used for each city:

Calgary	50 percent branded steer hides 50 percent branded cow hides
Winnipeg	30 percent branded steer hides 30 percent branded cow hides 20 percent heavy native steer hides 20 percent heavy native cow hides
Toronto	100 percent light native steer hides

¹ December 27, 1974 issue of the Packers and Stockyard Résumé Statistical Issue.

All fancy meats and hides have their base price in Toronto. In order to compute the average weekly by-products price in Calgary and Winnipeg, the freight differential was taken into account from these cities to Toronto. These freight rates for fancy meats and hides are multiplied by their respective weights for a live animal and the product is subtracted from the average weekly by-products price in Toronto.

Tallow, tankage and bone meal have their base price in Chicago. Freight differentials were calculated from Calgary, Winnipeg and Toronto to Chicago. These freight rates have been multiplied by their respective weights on a live animal and subtracted from the average by-products price in Toronto.

All beef by-products were assumed to move by rail. In order to calculate differentials between city to city, representative freight rates according to specific carload sizes were used. It was assumed that fancy meats to travel in carloads of 40,000 lb. and tallow, bone-meal and tankage leave Canada in carloads of 40,000 lb. From the border, it was only possible to obtain rates on carloads of 60,000 lb. going to Chicago. It was also assumed that hides travel to Toronto in carloads of 80,000 lb.

In the U.S., by-products prices are published again by Market News. Prices are given on a carlot basis, FOB the packer. In order to compute an average weekly by-products price series, only the following by-products are incorporated by USDA.

Estimated yield of selected by-products from a 1,000 lb. steer (U.S.)

<u>ITEM</u>	<u>Weights</u> (lb.)
Hide (butt branded steer) ¹	70.0
Edible fat	12.9
Inedible fat (fancy bleachable)	3.5
Liver (gall off - selected)	8.6
Lungs	6.1
Tongue #2 ¹	3.6
Heart	3.8
Tripe	5.8
Cheek meat	3.2
Head meat	.9
Lips (unscalded)	1.1
Spleen (melts)	1.4
Meat and bone scraps (tankage 50%) ¹	<u>43.0</u>
Total	197.0

¹ On August 23, 1975, some changes were made in the hide and offal value computations by Market News. The hide weight was changed from 70 lb. to 64 lb. They changed from pricing #2 tongues to #1 tongues, and the meat and bone scraps weights were changed from 43.0 to 40.0 lb.

The total weight of those by-products equals 197.0 lb. (sic) whereas our Canadian series totals 241.6 lb. The difference between the Canadian and American totals is due most probably to the different way of dressing the animal. U.S. carcasses are left with more internal fat, especially around the heart. They also leave in the kidneys. This difference is noted for example in the levels of inedible tallows (i.e. in Canada it is 63.5 lb. while in the U.S. it is 35.0 lb. or a difference of 28.5 lb.). In terms of dollar differences, the U.S. by-products value was set at \$35.90 for a 1,000 lb. steer on the week ending June 21, 1975 whereas in Toronto it was \$43.18/head.

The USDA uses by-product values in their price spreads the following way:

1. The Chicago Choice steer 6-700 lb. Choice Yield Grade 3 carcass price is multiplied by 0.62 (the U.S. dressing percentage) to convert it to live weight price. (e.g. On the week ending June 21, 1975, the Chicago carcass was worth \$87.33. By multiplying this price by the live carcass conversion factor, the value is \$54.14 live weight.)
2. The carcass price on a liveweight basis from 1. above and the hide and offal from Market News are added together to produce a total live value of the animal. (e.g. \$54.14 plus \$3.59 = \$57.73.)
3. A ratio of the by-product value over the total value in 2. above is computed. This gives the ratio of the value of by-products to the total value of items sold from the slaughtered animal. (e.g. $\$3.59 \div \$57.75 = 6.2$ percent.)
4. The gross farm-gate value on a retail weight basis is obtained from live cattle price, minus farmer marketing costs, times the 2.28 live to retail conversion factor is then multiplied by the ratio in 3. above and the by-product value is obtained. (e.g. $\$121.11 \times .062 = \7.51 per 100 lb. retail weight or \$3.29 per 100 lb. live weight.)
5. The net farm value is the gross farm value minus the by-product value from 4. above. (e.g. $\$121.11 - \$7.51 = \$113.60$ per 100 lb. sold at retail.)

Even though there is a \$0.73/cwt. difference in the American and Canadian values of by-products at the live level (\$4.32 - \$3.59), this difference becomes much smaller once these live prices are expressed in their carcass equivalents. The American by-products price in its carcass equivalent was \$7.51, as seen above, whereas the Canadian by-products price in its carcass equivalent would be \$7.49 (\$4.32 ÷ 57.6%) in Toronto. The reason for this smaller difference at the carcass level is due to the fact that the American dressing percentages are higher than their Canadian counterparts because, as previously mentioned, U.S. carcasses are left with the kidney and with more internal fat.

Also the major difference between by-products values at the Toronto and Chicago markets are the freight costs. There is practically no quality differential between the two by-products, mix.

Since by-products values are comparable between the U.S. and Canada, there remains to use comparable live and carcass prices in order to establish comparable farm to wholesale price spreads.

A Comparison of the Methodology Used to Obtain Wholesale Carcass Prices: Canada and the U.S.

Wholesale carcass prices are reported by the Markets Information Section of Agriculture Canada, weekly, for seven regions in Canada for nine grades. These prices are Monday-Thursday sales by packing plants to retailers.¹ Twenty-nine major packing plants are surveyed by mailed questionnaires. These firms are asked to provide minimum, maximum and average prices received for their sales of various grades of steers and heifers and D2 cows in the seven marketing areas.

These 29 packing plants are members of the Meat Packers Council. They are distributed geographically in the following manner: three in B.C., seven in Alberta, four in Saskatchewan, three in Manitoba, six in Ontario, two in Quebec and four in the Maritimes.

It should be noted, however, that MIS does not verify the figures it receives from these packers with retailers (or wholesalers) who have bought the carcasses. Also, since the Montreal area prices are an average of retailer and wholesaler prices, these prices should not be directly comparable with prices emanating from the other six marketing areas.

¹ The Montreal area prices are an average of prices to retailers and wholesalers.

In the U.S., wholesale prices are reported in 11 marketing areas: the East Coast, Chicago, the Midwest, the Amarillo area, Los Angeles, Denver, San Antonio, Houston, Fort Worth, San Francisco and the Portland-Seattle area. Weekly prices for the first five markets are reported in the Market News for 28 quality and yield grade combinations.

The U.S.D.A. reports prices from both buyers and sellers of dressed beef. They obtain prices sold by packers and the ones paid for by wholesalers or retailers. There is a frequent check on prices with this method. Prices are gathered by the U.S.D.A. on a daily basis by telephone. In the case of certain big retailers or wholesalers, this may necessitate calling them two or three times a day. Information is then obtained by weight groups, yield grades and quality grades. The average of daily quotations is reported weekly in the Market News.

The carcass value prices used in the Canadian-American comparison of price spreads is a weighted average of the Chicago market (presumably representative of all the U.S.) and the West Coast Market (Seattle, Portland and San Francisco). This average is computed by adding to the weekly wholesale Chicago price a transportation differential of \$1.05 per carcass which is supposed to come up to a new price which is representative of the American market minus the West Coast. Wholesale carcass Chicago prices are on an average carlot and less than carlot basis. A weighted average is taken of the two in order to determine the Chicago price. We then combine the Chicago price with the West Coast price on a 85.6 percent Chicago - 14.4 percent West Coast basis. This combination then becomes the average weekly wholesale carcass price in the U.S. This procedure is under revision by the U.S.D.A. For our purpose though, all our American price series have been computed according to the methodology which has been summarized.

A Comparison of the Methodology Used to Obtain Retail Prices: Canada and the U.S.A.

In Canada there have been no regularly published retail prices of beef for all the retail cuts that constitute the beef carcass. The Food Prices Review Board gathered retail prices on an occasional basis. Statistics Canada has collected prices of selected retail cuts of beef for the construction of the Consumer Price Index. In the week of the first Friday of each month, Statistics Canada employees in 34 cities visit all major chain and independent stores and obtain prices of seven retail cuts: sirloin steak, round steak, prime rib roast, blade roast, stewing beef, hamburger meat and beef liver.

Charles Ambler and Associates is a private firm which gathers statistics on many food and non-food items sold in Toronto by the five biggest retailers: A&P, Dominion, Loblaw's, Steinberg's and Food City. Each week they report 17 cuts of roasts, 33 cuts of steaks and 31 types of ground beef and offal. By taking standard retail cuts and their respective weights, one is able to reconstitute the retail value of a carcass of beef. This survey is only available in Toronto.

In the U.S., retail prices are provided by two different sources and the statistics they provide have now been combined to provide a revised procedure. Under the old method, prices were obtained from the Bureau of Labour Statistics which collected prices on the first Tuesday, Wednesday and Thursday of the month. Under the revised procedure B.L.S. prices are combined with prices obtained by the Market Economics Division through a sample of 40 co-operating retail chain divisions throughout the U.S. Regular and special prices are obtained weekly from each chain division. Beef prices used are for the Choice grade.

The U.S.D.A. divides those 40 divisions into four regions. Inside each region, the regional price is obtained by averaging prices within the region. The national price is obtained by weighting the regions according to population.

In order to use B.L.S. prices of retail cuts in this revised procedure, the U.S.D.A. converts the price of each individual cut into a monthly average regular and specials included-price. The Marketing Economics Division survey of regular prices are obtained by averaging out all prices for cuts for which there were no specials. The specials-included prices represent an average of special prices for stores where the cut was on special plus regular prices for stores where the cut was not on special. It is assumed that B.L.S. prices reflect about two thirds of the specials. One third of the difference between regular and specials-included prices in the M.E.D. survey is subtracted from the B.L.S. published price to obtain the specials-included prices and two thirds of the difference is added to obtain the regular price of the cut. These two prices are then adjusted to a monthly average using the difference in prices obtained through the M.E.D. retail survey prices for the week B.L.S. prices are collected and the average for the month.

Retail prices are collected for 29 individual beef cuts in the M.E.D. survey. The prices of the seven cuts collected by B.L.S. are then used (as adjusted above) in place of these cuts in the M.E.D. survey. This enables the computation of a composite of all regular prices and of a composite of all specials-included prices. The difference between the regular composite and specials-included composite is the price effect of specials, i.e. the change in the average price of beef due to specials without allowing for changes in the relative quantities of the cuts sold due to the specials.

To obtain the total effect of specials, one has to take into account the volume of movement of a particular cut when the price of that cut is on special. From a special study undertaken by the U.S.D.A., they were able to compute, from the data collected, a regular composite, a specials-included composite and a volume-weighted composite price. The difference between specials-included and volume-weighted composite prices is the volume effect of specials, i.e., the change in the average price of beef sold due to the changes in the proportion of cuts sold when some are specialied. Data taken from this survey indicated that the volume effect is 0.65 times as large as the price effect for beef.

If we recapitulate, we can say that by subtracting the specials-included composite from the regular composite we can obtain the price effect. The price effect for beef is then multiplied by 0.65 to obtain the volume effects. The summation of the price and volume effects is then subtracted from the regular composite price to obtain the weighted composite U.S. retail price.

Appendix 2

Charts of Farm to Wholesale

Price Spreads

for

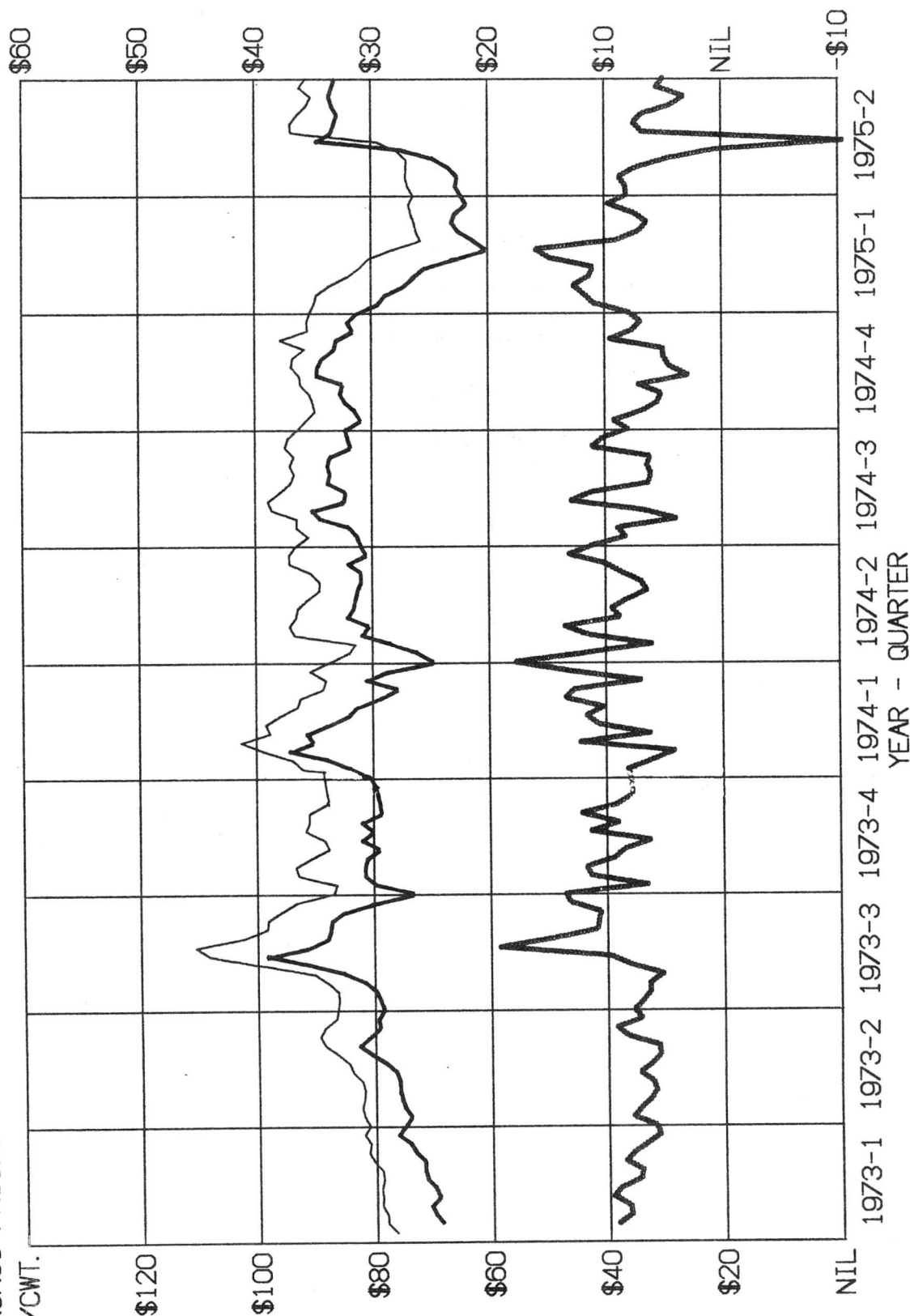
Calgary and Winnipeg

1973 - 1975

PRICE
SPREAD

LIVE AND CARCASS PRICES

CHART 18



PRICE OF A1 STEER CARCASSES AND BY-PRODUCTS

PRICE OF A1 STEERS, LIVE

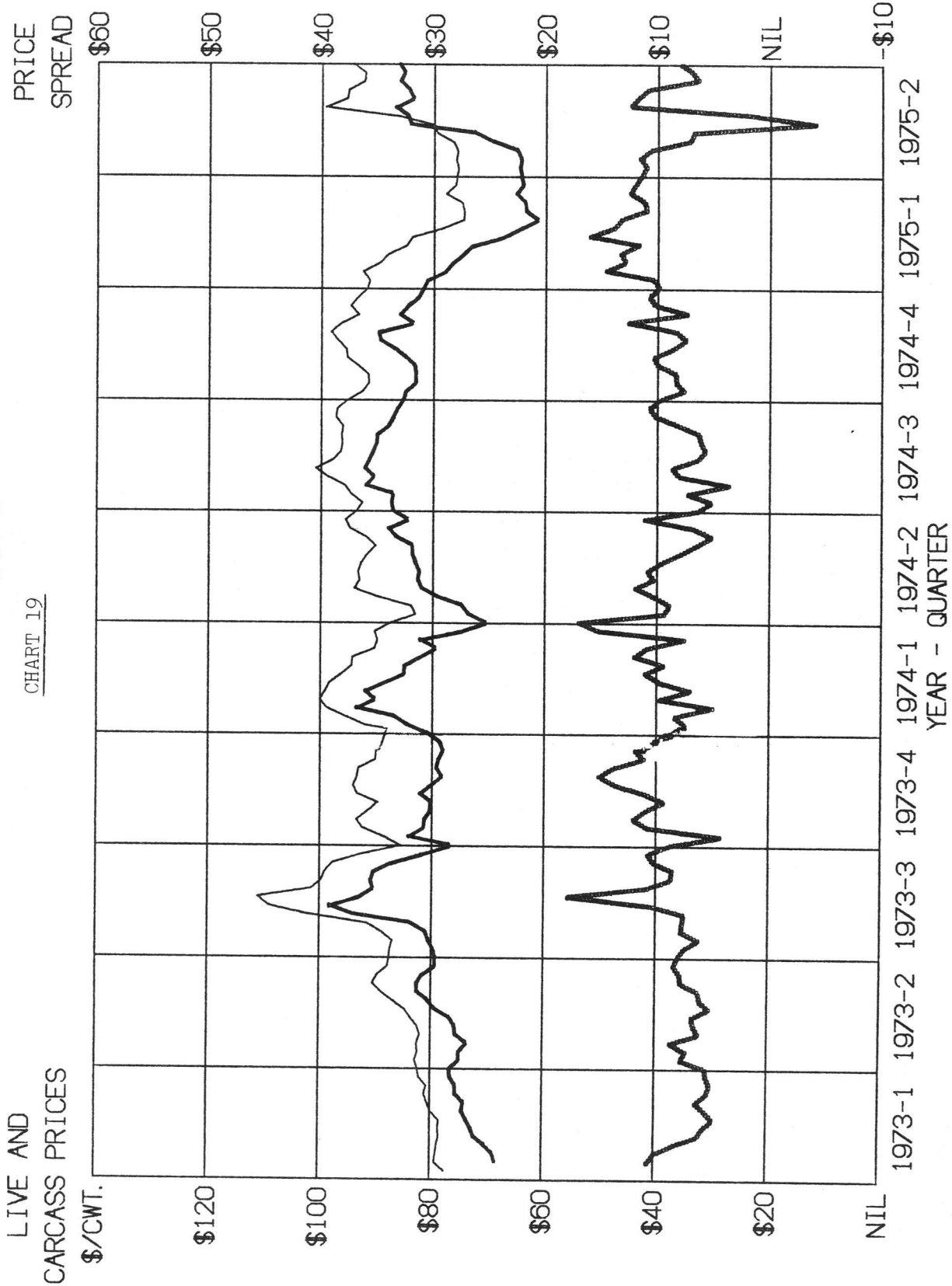
PRICE SPREAD

DRESSING PERCENTAGE = 57.0%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A1 STEERS IN WINNIPEG

1973 - 1975

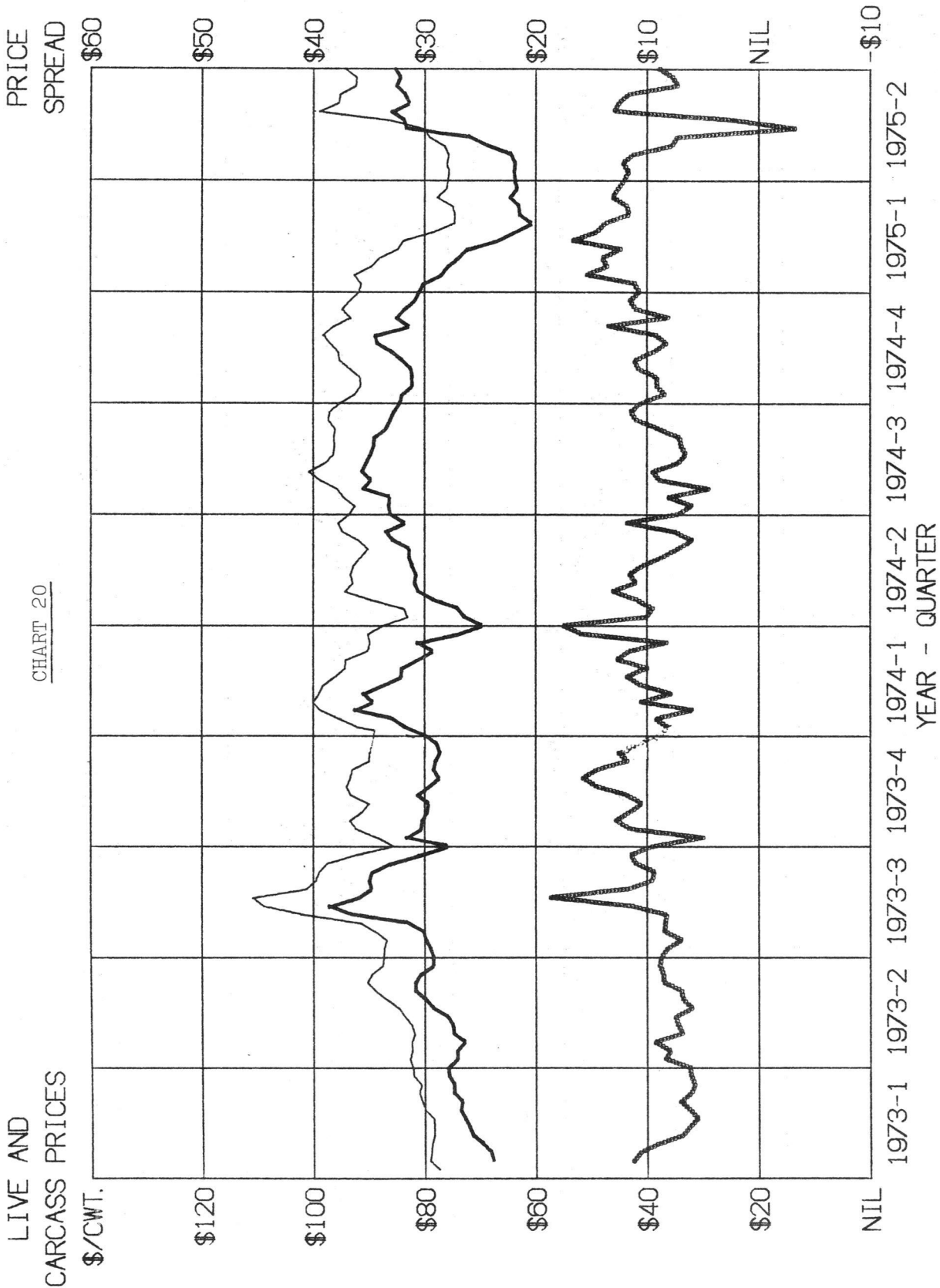
CHART 19



DRESSING PERCENTAGE = 57.0%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 STEERS IN WINNIPEG

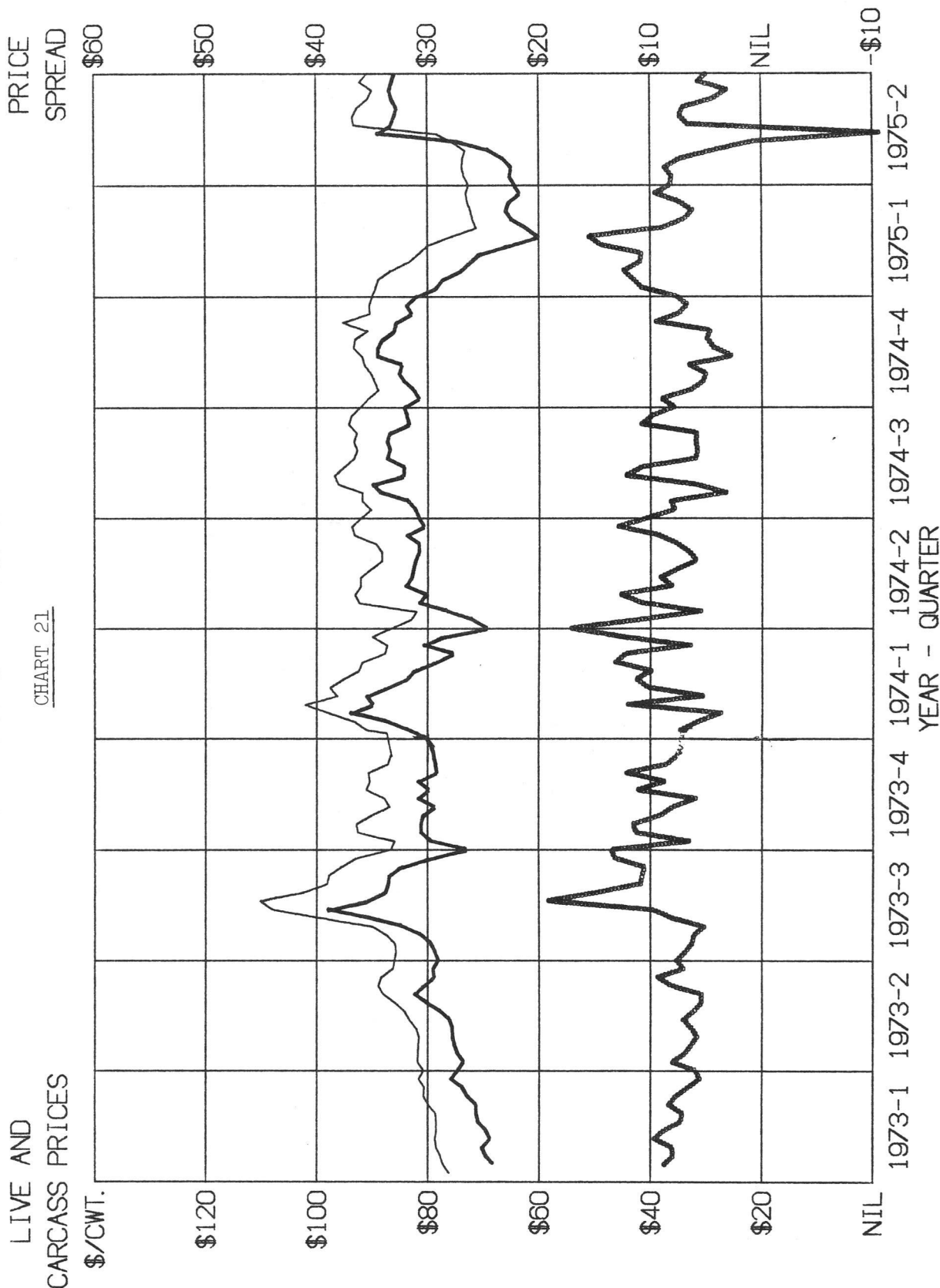
1973 - 1975



WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 STEERS IN CALGARY

1973 - 1975

CHART 21



— PRICE OF A2 STEER CARCASSES AND BY-PRODUCTS

— PRICE OF A2 STEERS, LIVE

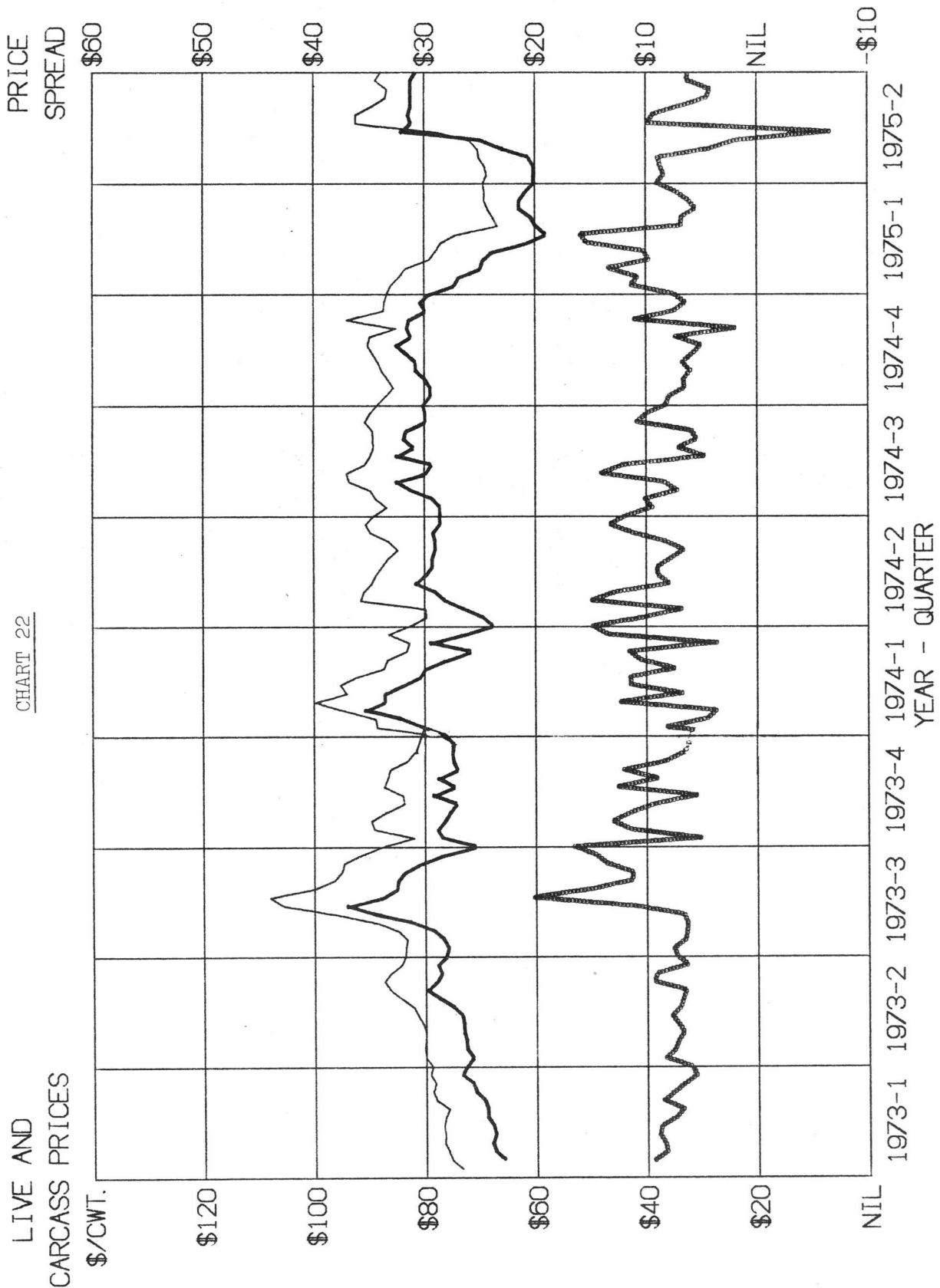
- - - PRICE SPREAD

DRESSING PERCENTAGE = 57.2%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 STEERS IN CALGARY

1973 - 1975

CHART 22



PRICE OF A3 STEER CARCASSES AND BY-PRODUCTS

PRICE OF A3 STEERS, LIVE

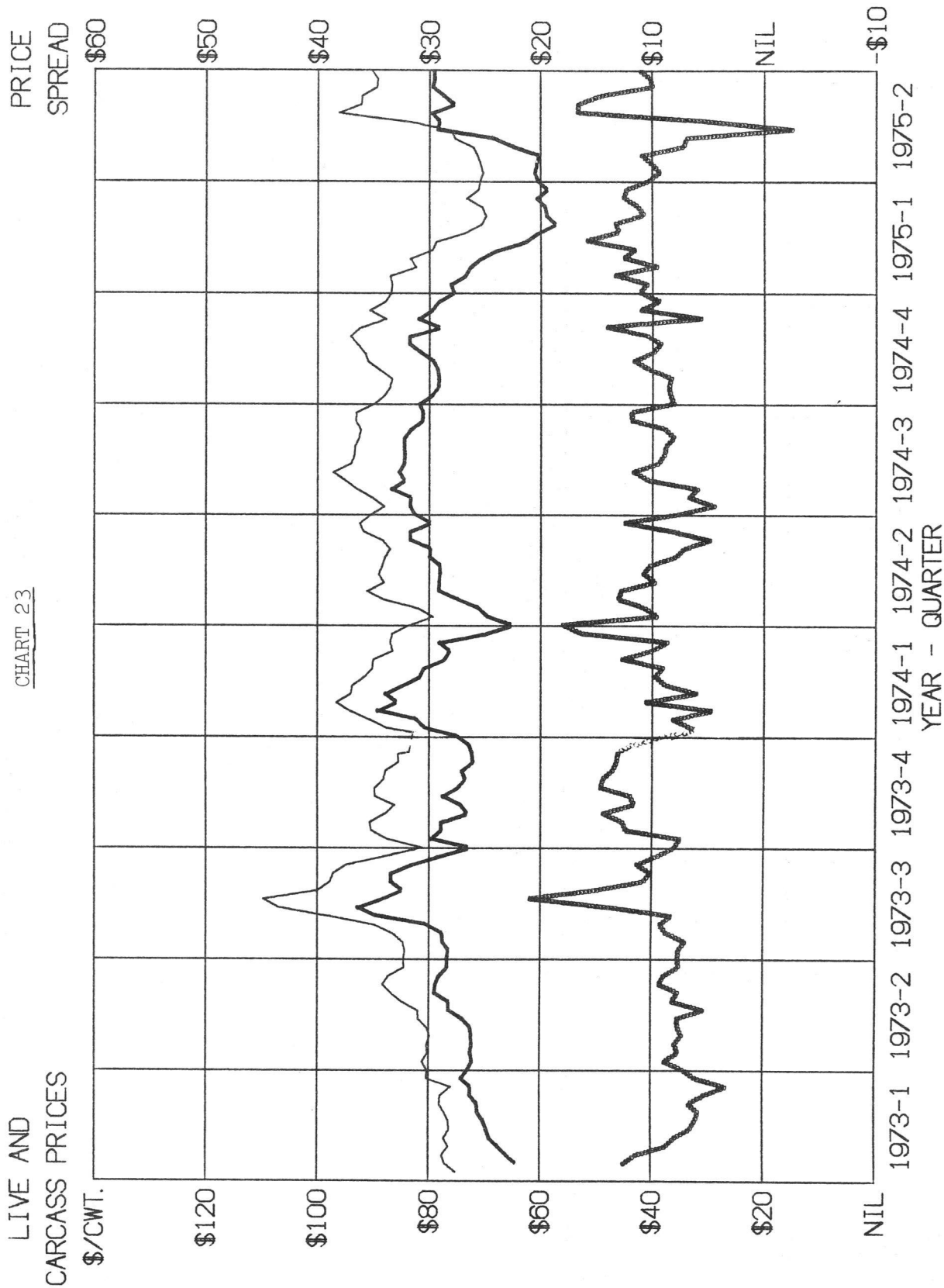
PRICE SPREAD

DRESSING PERCENTAGE = 57.5%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 STEERS IN WINNIPEG

1973 - 1975

CHART 23



— PRICE OF A3 STEER CARCASSES AND BY-PRODUCTS

— PRICE OF A3 STEERS, LIVE

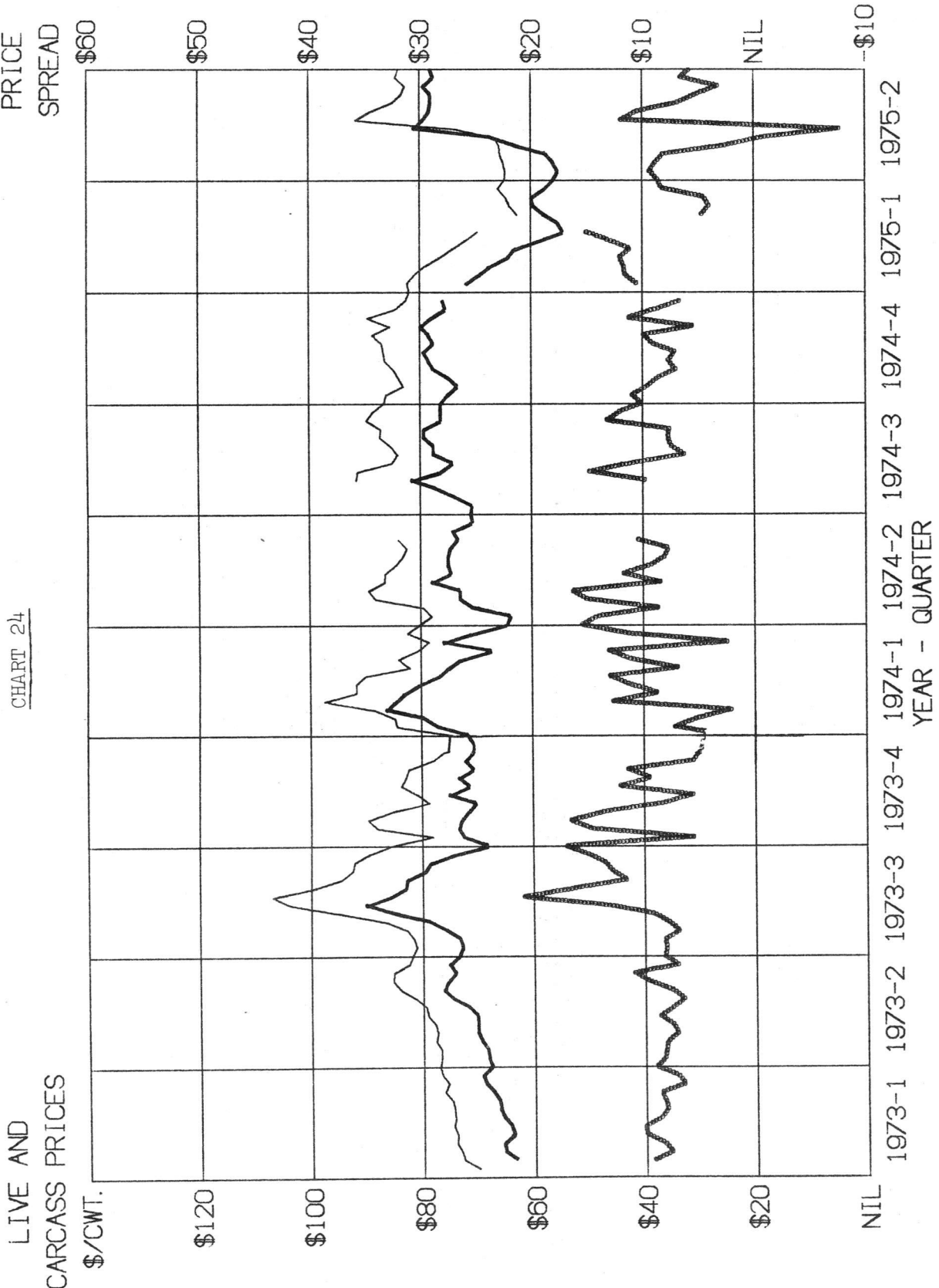
— PRICE SPREAD

DRESSING PERCENTAGE = 58.2%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A4 STEERS IN CALGARY

1973 - 1975

CHART 24

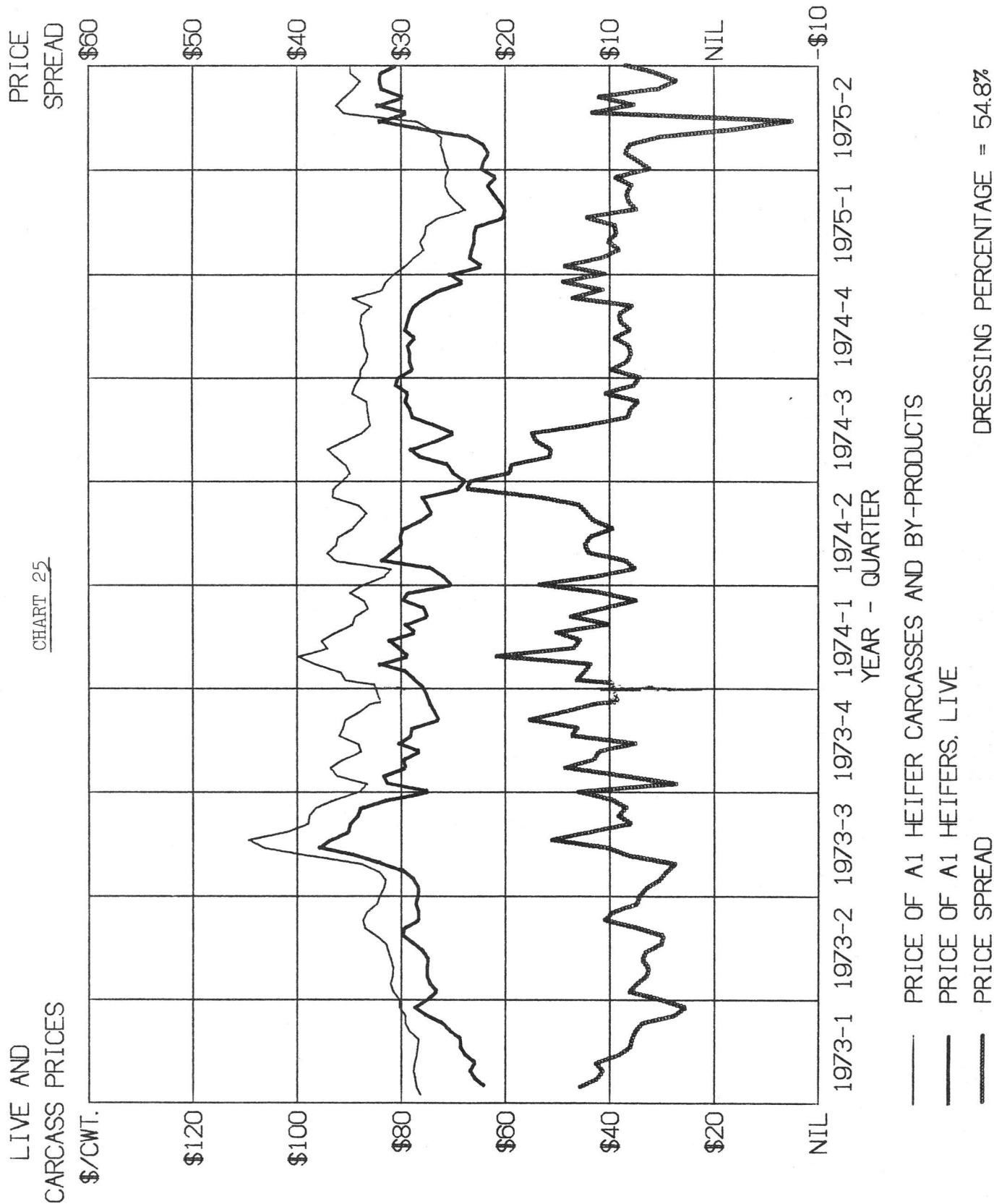


DRESSING PERCENTAGE = 57.8%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A1 HEIFERS IN CALGARY

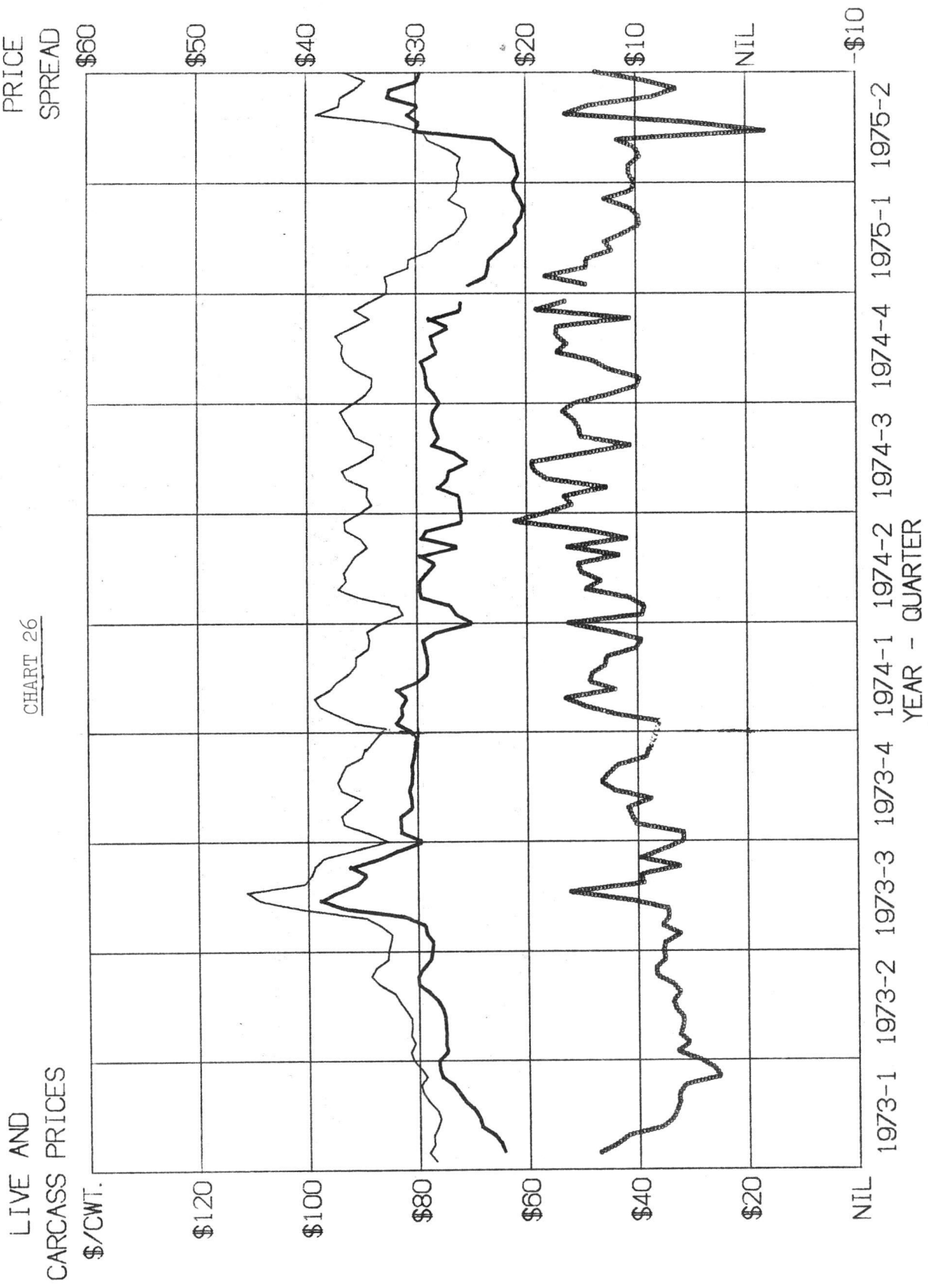
1973 - 1975

CHART 25



WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A1 HEIFERS IN WINNIPEG

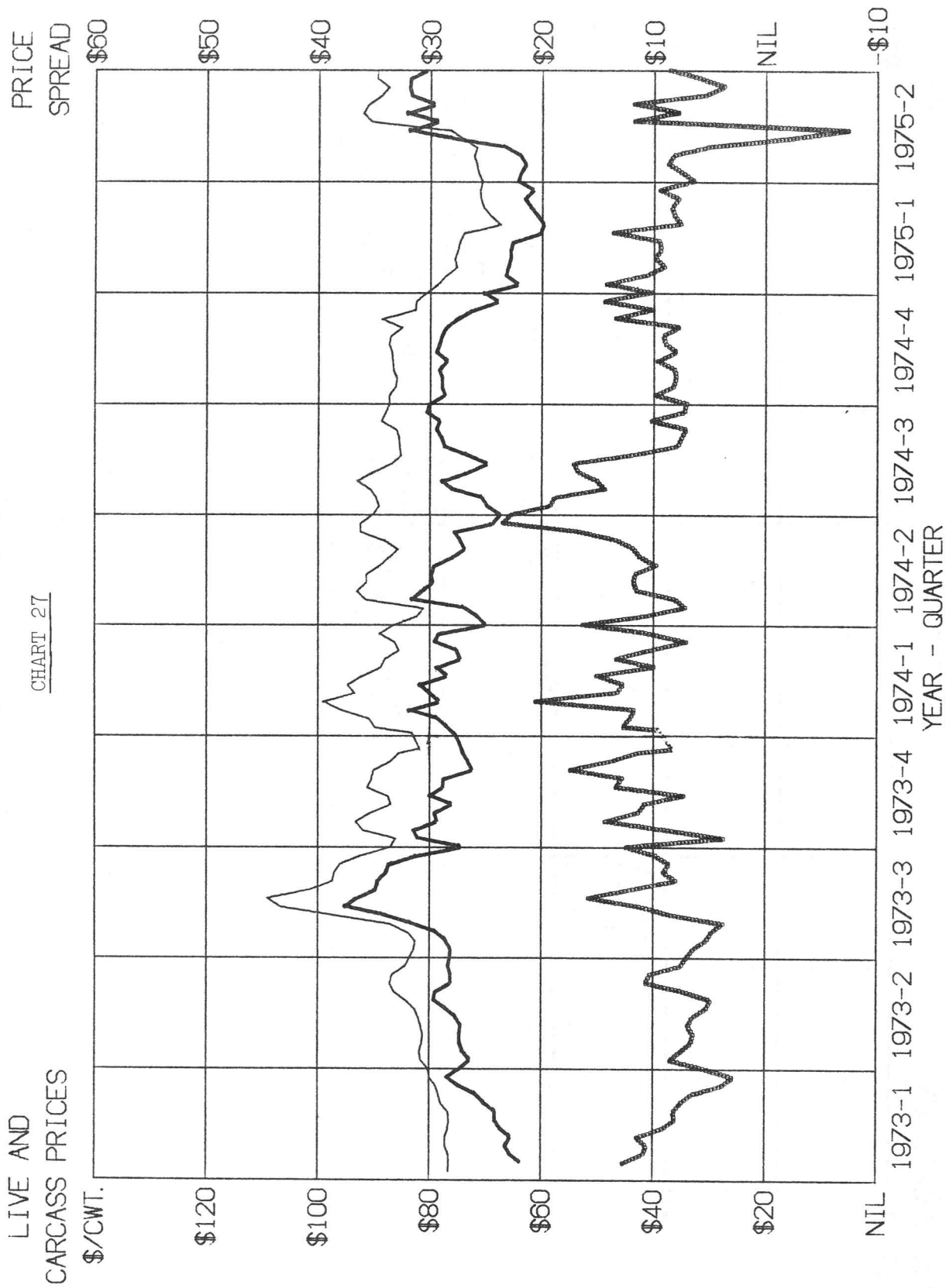
1973 - 1975



WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 HEIFERS IN CALGARY

1973 - 1975

CHART 27

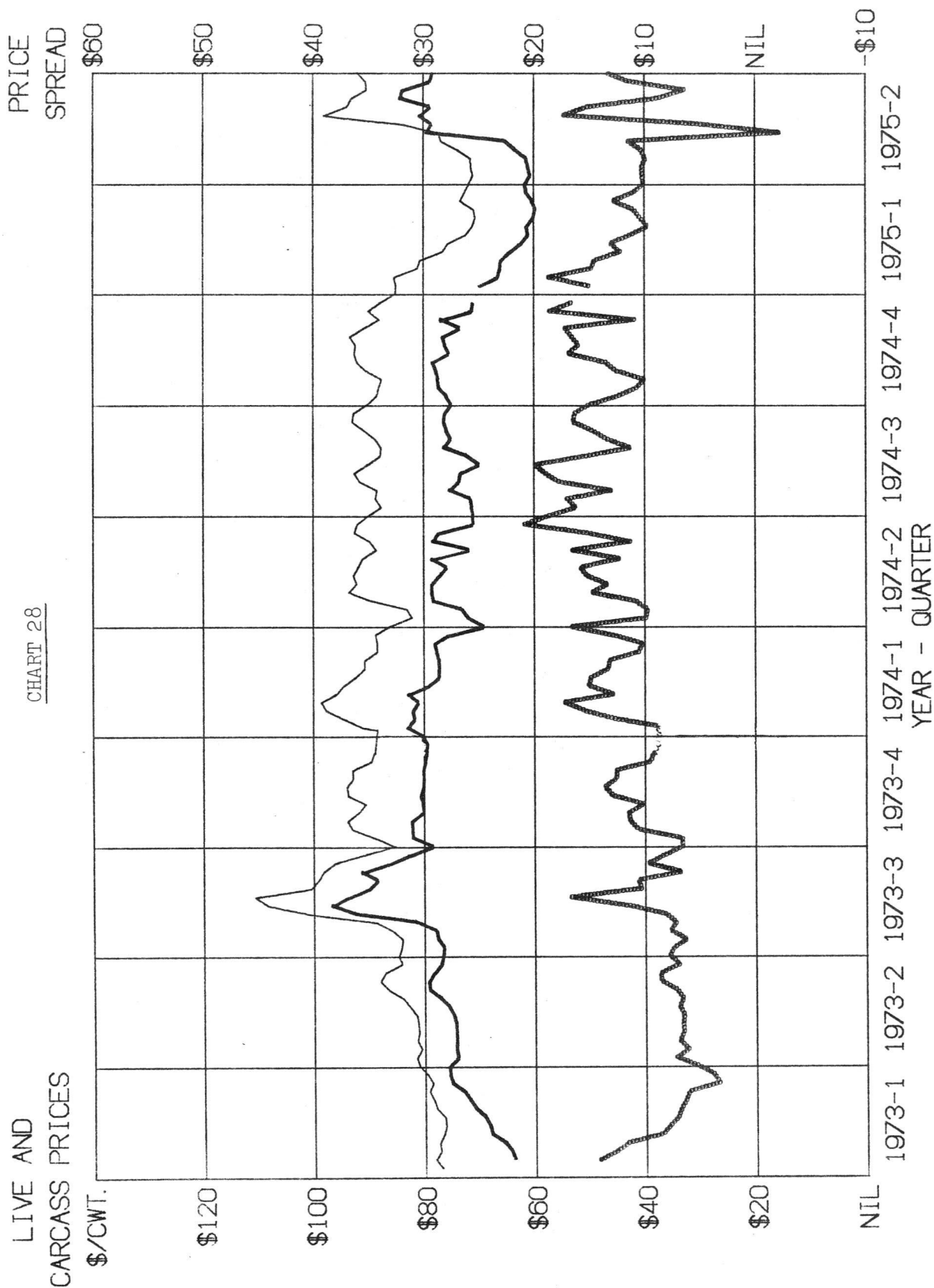


— PRICE OF A2 HEIFER CARCASSES AND BY-PRODUCTS
 — PRICE OF A2 HEIFERS, LIVE
 ... PRICE SPREAD

DRESSING PERCENTAGE = 55.1%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A2 HEIFERS IN WINNIPEG

1973 - 1975



— PRICE OF A2 HEIFER CARCASSES AND BY-PRODUCTS

— PRICE OF A2 HEIFERS, LIVE

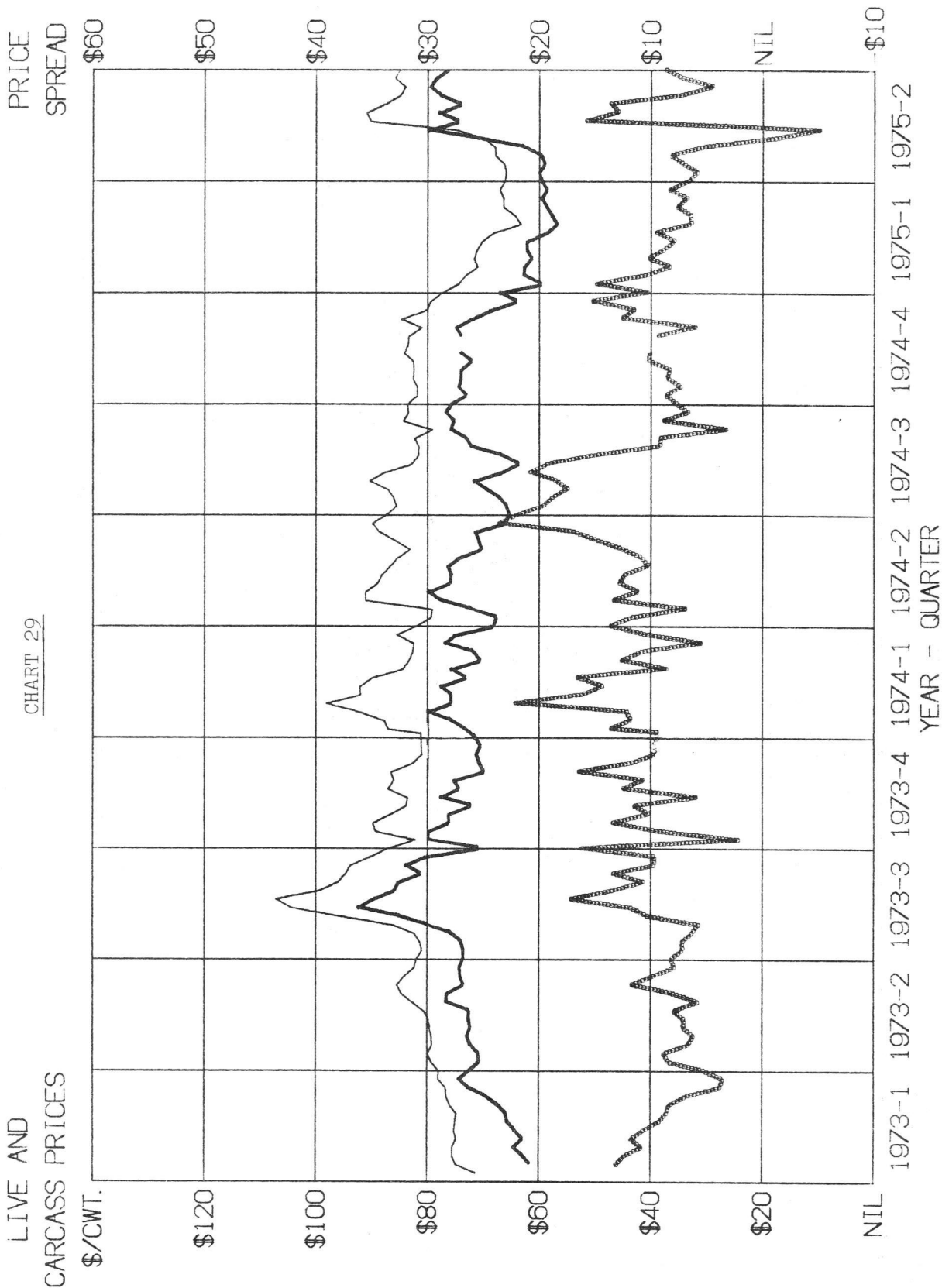
— PRICE SPREAD

DRESSING PERCENTAGE = 54.9%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 HEIFERS IN CALGARY

1973 - 1975

CHART 29

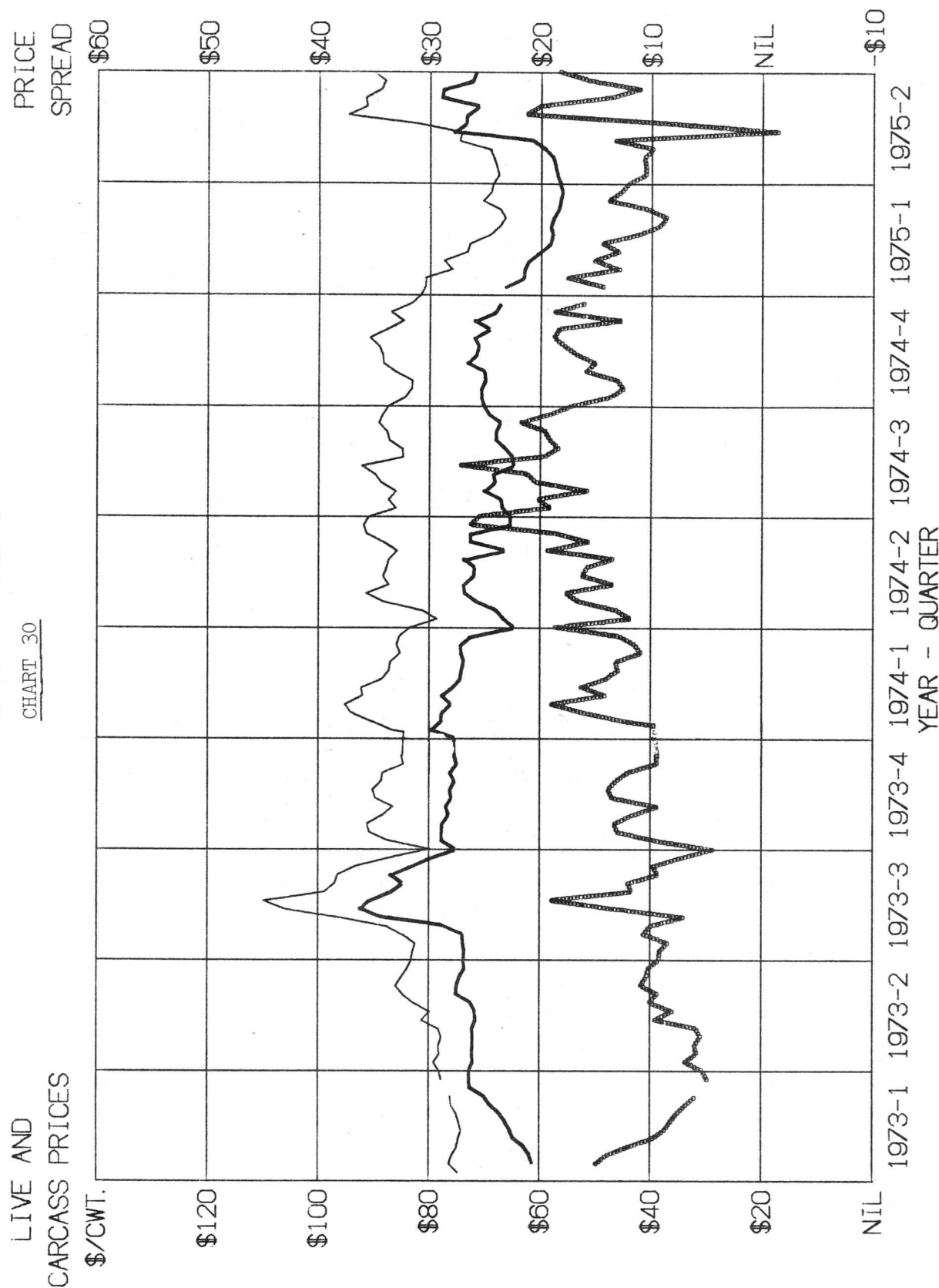


DRESSING PERCENTAGE = 55.3%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A3 HEIFERS IN WINNIPEG

1973 - 1975

CHART 30



— PRICE OF A3 HEIFER CARCASSES AND BY-PRODUCTS

- - - PRICE OF A3 HEIFERS, LIVE

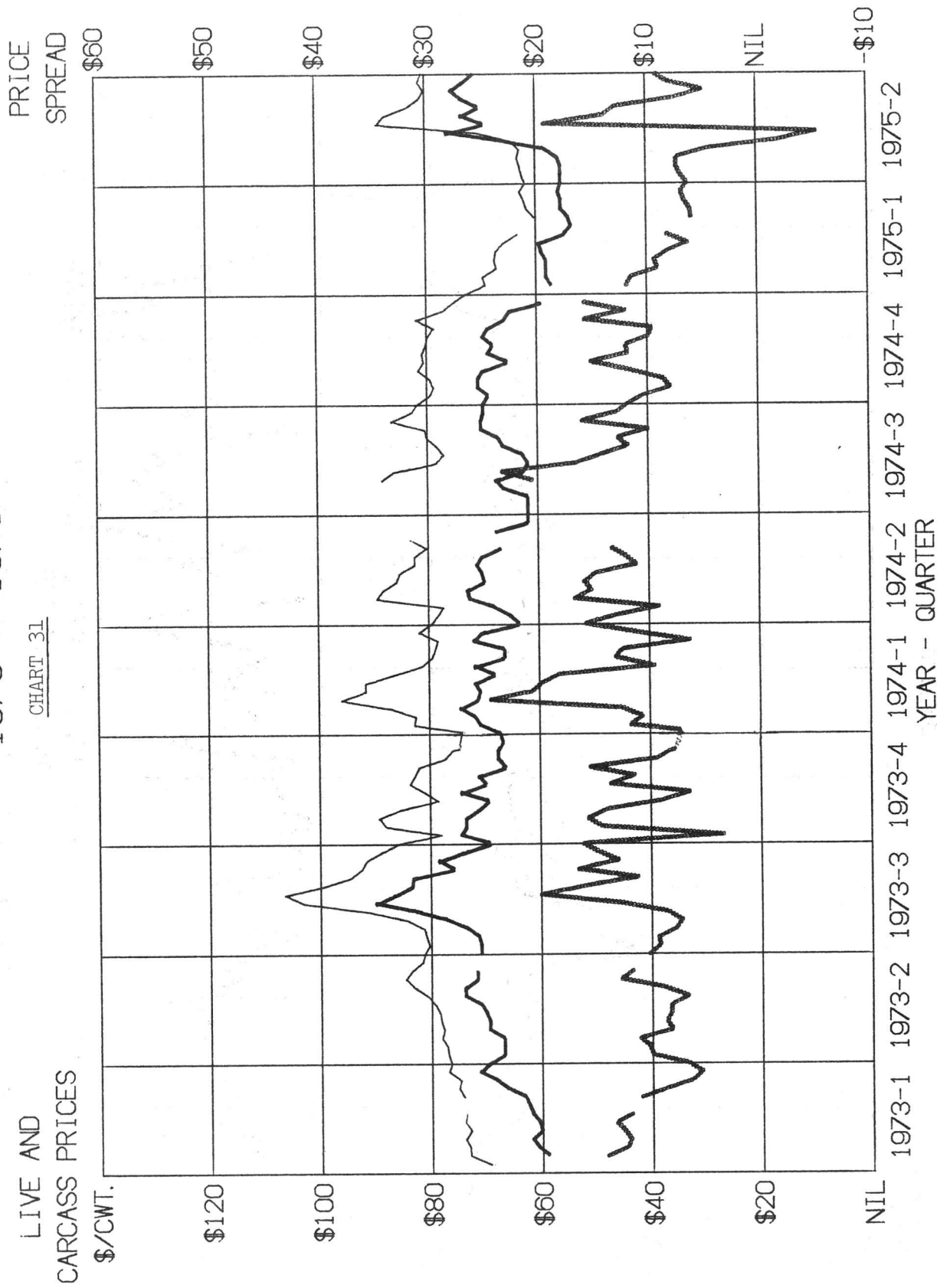
..... PRICE SPREAD

DRESSING PERCENTAGE = 55.8%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR A4 HEIFERS IN CALGARY

1973 - 1975

CHART 31

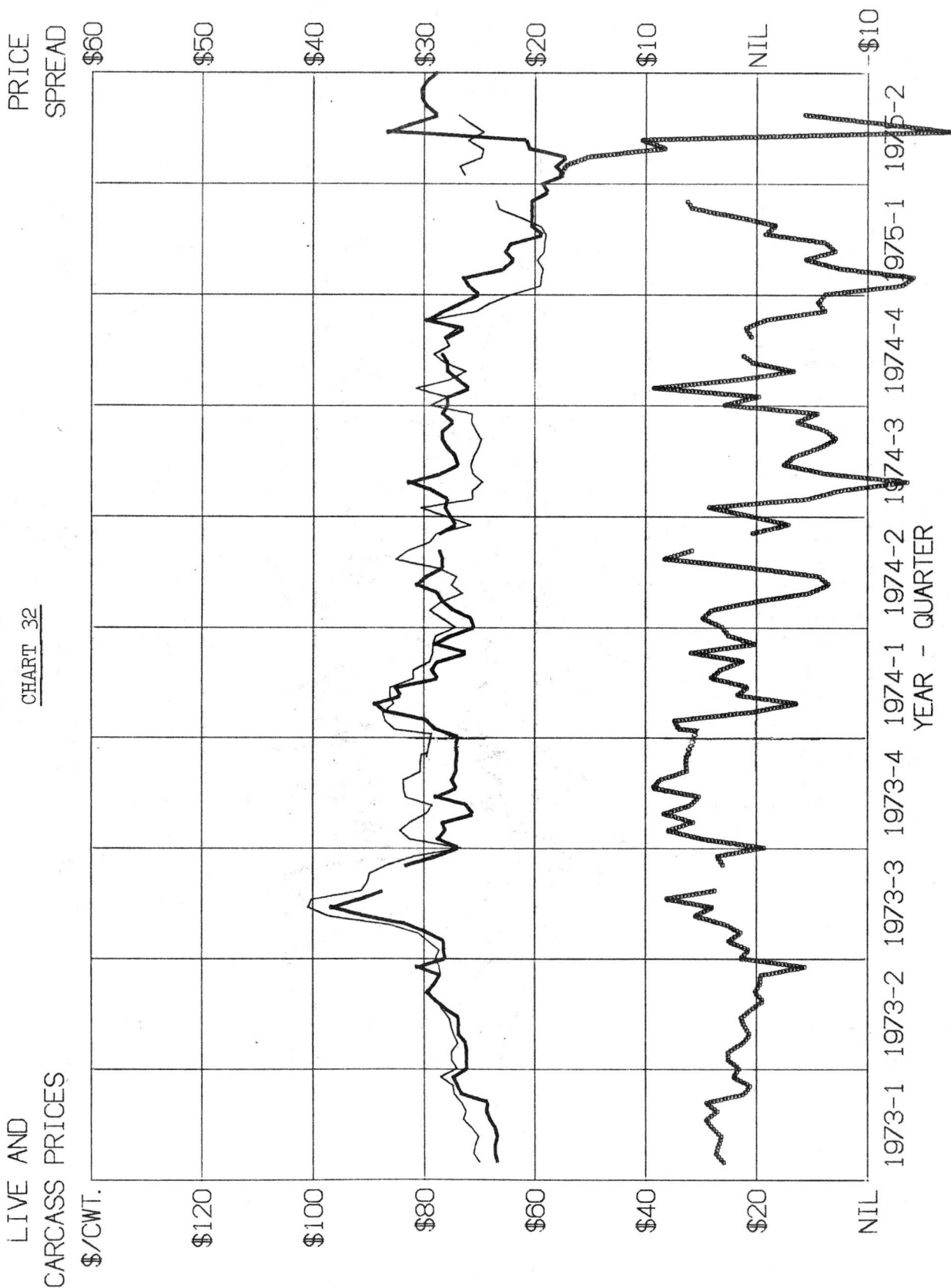


- PRICE OF A4 HEIFER CARCASSES AND BY-PRODUCTS
- PRICE OF A4 HEIFERS, LIVE
- PRICE SPREAD

DRESSING PERCENTAGE = 55.7%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR COMMON STEERS IN CALGARY

1973 - 1975

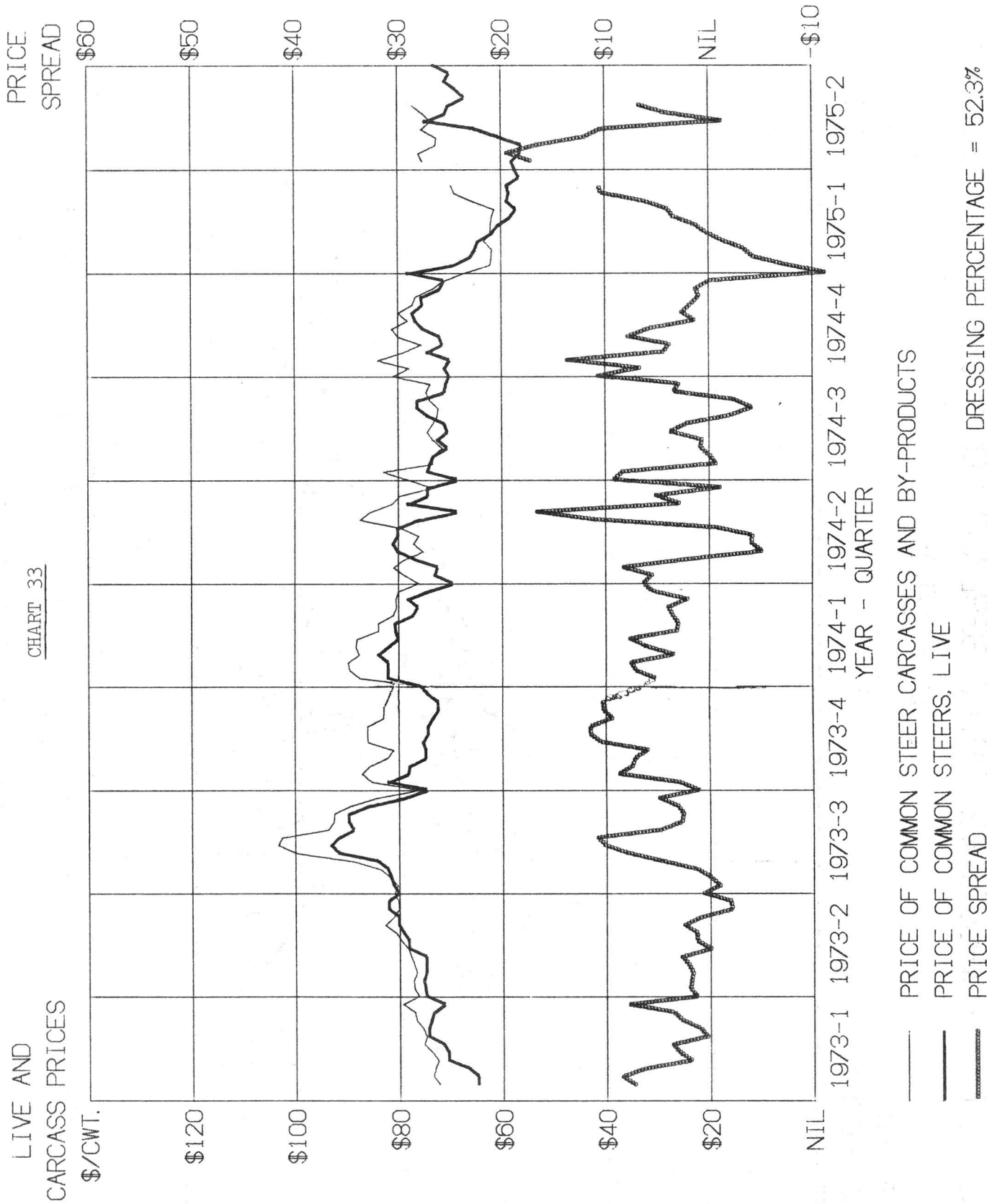


DRESSING PERCENTAGE = 52.7%

WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR COMMON STEERS IN WINNIPEG

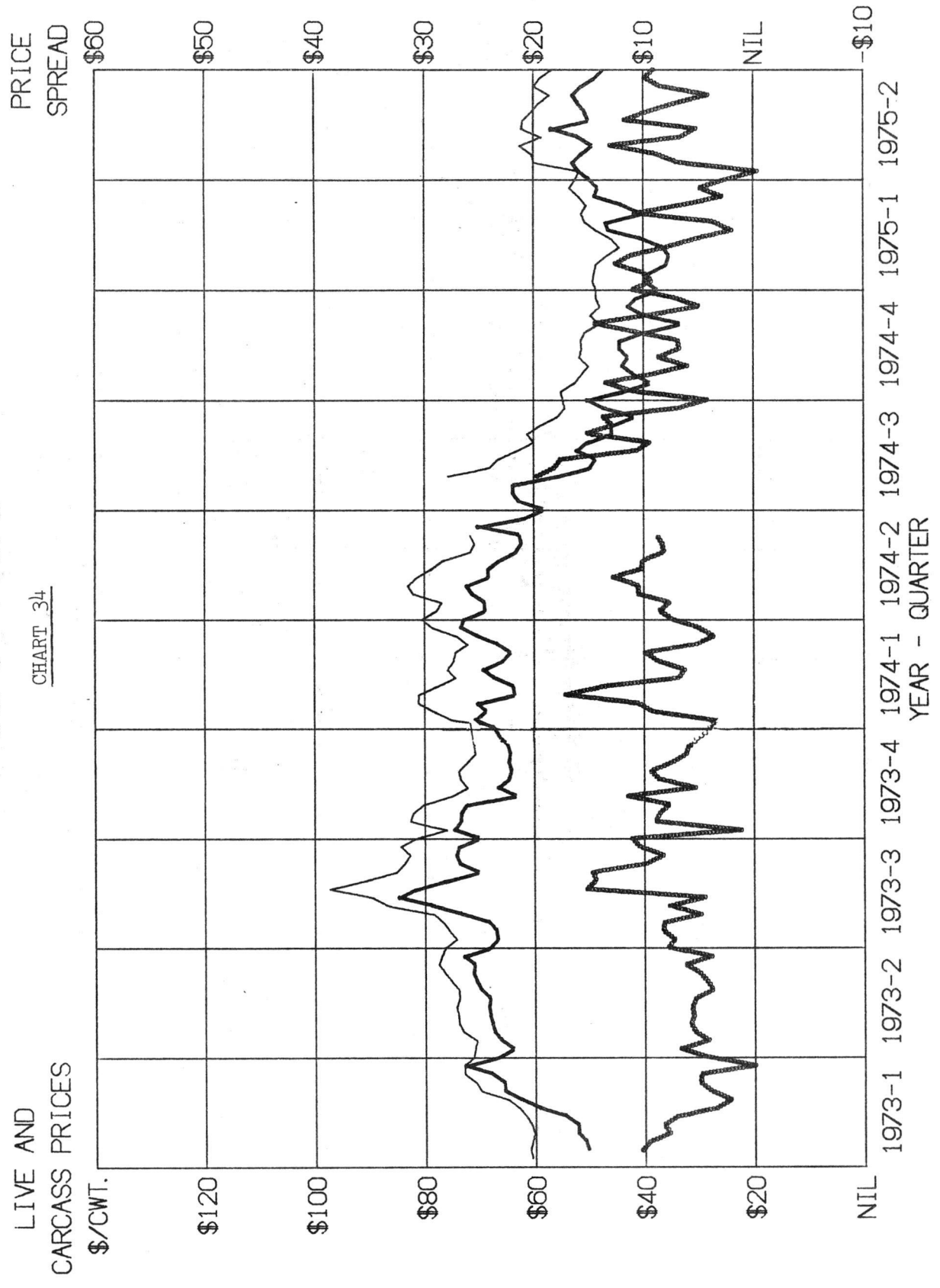
1973 - 1975

CHART 33



WEEKLY LIVE - WHOLESALE PRICE SPREADS FOR D2 COWS IN CALGARY

1973 - 1975



PRICE OF D1 COW CARCASSES AND BY-PRODUCTS

PRICE OF D1 COWS, LIVE

PRICE SPREAD

DRESSING PERCENTAGE = 50.0%

Appendix 3

Econometric Estimates of
Price Spreads in
Calgary and Winnipeg

Definitions of the variables used:

PS_t	the live-wholesale carcass price spread for A1 steers in each city. The carcass price is being defined as the sum of the price of carcass and the price of by-products in each city.
K	constant term
Q_t	quantity of A1 through A4 carcasses graded in each province.
PL	level of first differences in the live prices for A1 steers in each city.
PW	level of first differences in the wholesale carcass price for A1 steers in each province.
BYPR	level of first differences in the price of by-products for each city.
Q U.S. IM	quantity of cattle imported from the U.S.
Gov 1	dummy variable used to measure the impact of import quotas set by the Canadian government in April 1974. It is one for the period January 1973 to April 1974, zero otherwise.
Gov 2	dummy variable used to measure the impact of increased importing and exporting of cattle to the U.S. along with the impact of export controls on beef set by the Canadian government in August of 1973. It is one for the 3 week period prior to August 11 and zero otherwise.
PS_{LW-1}	the live-wholesale carcass price spread for A1 steers in each city, lagged a week.
PS_{WR-t-1}	the carcass-retail price spread in Toronto with Dominion used as the representative retail price.
TREND	is a time trend with the first week having a value of one and the last week have a value of 131.
<u>N.B.</u>	1) All price used in these regressions have been converted into their carcass equivalents. All prices are in units of \$/cwt. of carcass.

- 2) Live prices, carcass prices and the quantities of carcasses graded come from the Canada Livestock and Meat Trade Report, Agriculture Canada. Retail prices were obtained through the Charles Ambler and Associates Pricing Survey. By-products prices were estimated at the Commission. The quantity of cattle imported from the U.S. was provided by Agriculture Canada.
- 3) The quantity of carcasses graded and the quantity of cattle imported are in units of a thousand.

TABLE 7. Estimated Coefficients for Farm to Wholesale Price Spreads in WINNIPEG AND CALGARY

Dependent variables		Independent variables																
		k	PL	PW	BYPR	PS _{LW}	t-1	Gov 1	Gov 2	Q	US	IM	Trend	Q	GR	A	R2	D-W
<u>Winnipeg</u>																		
1.	PS _{LW} t	Al steers	3.63 (2.65)	0.23 (3.32)	0.22 (2.82)	0.54 (1.57)	0.45 (6.28)	-0.77 (-0.93)	1.48 (1.54)	0.10 (1.95)	0.02 (2.41)	-0.00004 (-0.17)		.53				1.77
2.	A2 steers	4.04 (2.94)	0.23 (3.31)	0.22 (2.85)	0.54 (1.59)	0.46 (6.40)	-0.69 (-0.84)	1.49 (1.57)	0.11 (2.04)	0.02 (2.37)	-0.00004 (-0.21)		.54					1.78
3.	A3 steers	4.61 (3.30)	0.23 (3.43)	0.32 (4.47)	0.58 (1.68)	0.46 (7.03)	-0.28 (-0.34)	2.38 (2.43)	0.15 (2.78)	0.02 (2.24)	-0.0003 (-0.84)		.61					1.76
4.	Al heifers	9.90 (3.85)	0.91 (21.05)	0.07 (0.59)	0.73 (1.09)	0.15 (3.71)	5.08 (3.42)	0.56 (0.35)	0.22 (2.33)	0.001 (0.07)	-0.0009 (-1.86)		.83					1.14
5.	A2 heifers	10.25 (4.01)	0.91 (21.06)	0.05 (0.47)	0.67 (0.99)	0.16 (3.79)	4.76 (3.23)	0.72 (0.46)	0.23 (2.46)	0.002 (0.11)	-0.0009 (-1.88)		.83					1.13
6.	A3 heifers	16.89 (3.71)	0.66 (9.45)	0.51 (7.93)	1.64 (1.28)	0.40 (5.83)	7.12 (2.53)	0.53 (0.18)	0.38 (2.18)	0.002 (0.06)	-0.003 (-3.20)		.65					1.59

TABLE 7 (continued)

Dependent variables		Independent variables													
	k	PL	PW	BYPR	PS _{LW}	Gov 1	Gov 2	Q	US	IM	Trend	Q	GR A	R2	D-W
<u>Calgary</u>															
1.	A1 steers	4.28 (4.01)	0.13 (2.47)	0.07 (1.09)	0.46 (2.57)	0.55 (7.53)	1.06 (1.40)	1.92 (2.20)	0.12 (2.45)	-0.01 (-1.42)	-0.00003 (-0.56)				.54
2.	A2 steers	4.21 (4.04)	0.13 (2.40)	0.07 (1.12)	0.46 (2.63)	0.53 (7.05)	0.97 (1.31)	2.13 (2.47)	0.12 (2.45)	-0.01 (-1.42)	-0.00001 (-0.35)				.53
3.	A3 steers	5.33 (4.86)	0.11 (2.18)	0.19 (3.42)	0.53 (2.95)	0.52 (7.10)	1.38 (1.81)	2.07 (2.39)	0.12 (2.60)	-0.01 (-1.71)	-0.00006 (-1.28)				.55
4.	A4 steers	14.69 (4.26)	0.86 (13.54)	0.46 (8.72)	-0.06 (-0.11)	0.32 (6.01)	3.38 (1.47)	2.12 (0.89)	0.30 (2.21)	-0.05 (-1.72)	-0.0004 (-2.47)				.72
5.	A1 heifers	7.23 (5.06)	0.25 (3.86)	0.24 (2.99)	0.48 (1.88)	0.67 (12.00)	1.83 (1.91)	-0.17 (-0.16)	0.15 (2.45)	-0.01 (-0.87)	-0.0003 (-4.06)				.68
6.	A2 heifers	7.32 (5.16)	0.25 (3.80)	0.24 (3.17)	0.52 (2.02)	0.66 (11.40)	1.78 (1.89)	-0.02 (-0.02)	0.14 (2.41)	-0.01 (-0.84)	-0.0003 (-4.09)				.67
7.	A3 heifers	17.80 (7.72)	0.84 (17.60)	0.14 (1.16)	0.17 (0.38)	-0.08 (1.63)	3.40 (2.04)	1.34 (0.71)	0.17 (1.65)	-0.02 (-0.98)	-0.00006 (-4.74)				.76
8.	A4 heifers	26.80 (4.55)	0.42 (7.09)	0.46 (5.67)	0.18 (0.18)	0.26 (3.47)	4.94 (1.27)	0.67 (0.17)	0.22 (0.97)	-0.03 (-0.63)	-0.001 (-3.47)				.43
9.	D2 cows	5.24 (3.45)	0.17 (2.40)	0.28 (3.77)	0.71 (2.35)	0.27 (3.38)	2.84 (2.62)	1.18 (1.00)	0.09 (1.40)	-0.006 (-0.44)	-0.0001 (-1.46)				.35

1 t values are in brackets

2 numbers which have been underlined are significant at the 5 percent level

NB. It should be noted that in every single regression run, there is a high (0.85 on the average) correlation between the trend variable and the government dummy #1.

See the following page for definitions of terms.

APPENDIX 4

THE EFFECT OF THE JANUARY 1, 1975 FREIGHT RATE INCREASE
ON PRICE SPREADS

On January 1, 1975, freight rates in Canada on live cattle and dressed beef increased by a flat 20 percent. The last increase which had occurred on April 2, 1972 had represented only a 3.9 percent increase, thus making the 1975 increase much more significant. Since packers must pay freight when shipping live cattle or dressed beef, it was expected that, as of January 1975, Western packers would receive a significantly smaller amount for their sale of cattle and/or carcasses.

One would expect the freight rate increase to be also responsible for lowering the live-to-wholesale price spread by a bigger absolute amount and in fact, this is what happened. As an example, during the first week of 1975, live prices in Calgary for A1 steers were quoted at \$45.00/cwt. (or \$78.95/cwt., carcass equivalent). Carcass and by-products prices totaled \$89.79/cwt., thus creating a spread of \$10.84/cwt. By reducing both prices by 20 percent, the live price fell to \$63.16/cwt. and the carcass and by-products price to \$71.83, thus creating a spread of \$8.67/cwt.¹

In order to find out if the freight rate increases were responsible for a permanent shift in the means and variances of the Western live to wholesale price spreads, it was decided to run a T-test on the 1973-74 period versus the 1975 period for A1 steers and heifers in Calgary and Winnipeg. It was also decided to accept these shifts as structural if the T-tests were proven significant at the 5 percent level. For this purpose, Table A.4-1 shows the relevant statistics.

The means of the live to wholesale price spreads for A1 steers in Calgary were \$8.58/cwt. for the 1973-74 period and \$7.24/cwt. for 1975. Since the variances for these periods appeared to be very different, a F-test was run in order to measure their statistical significance. Their difference was shown to be statistically different at less than the 1 percent level, which meant that we now had to use a T-test which took these separate

¹ This assumes that by-products prices themselves were not affected by any freight increase. This is not the case. As of January 1, 1975, freight rates on fancy meats, hides, tallow, bone meal and blood meal also went up, thus also contributing to a smaller absolute price spread between the live and wholesale prices.

variances into account. The last column of Table A.4-1 shows the two-tailed probability test which corresponds to the relevant T-test under analysis. Since the sign is positive and corresponds to what was to be expected, a one-tail probability test is obtained by dividing the two-tail probability figure (0.193) in two. The result shows that the T-test is only significant at the 10 percent level, which is higher than the 5 percent criteria that was postulated earlier. Thus, one would have to reject the interpretation which claims that the smaller spread observed in 1975 is due to a permanent structural shift.

The means of the live to wholesale price spreads for A1 heifers in Calgary was \$9.25/cwt. for the 1973-74 period and \$6.72/cwt. for 1975. Even though the means were quite different, the variances seemed pretty much the same and a F-test confirmed the fact that there was no statistical difference among the variances. Thus the appropriate T-test was one which used a pooled variance estimate. By dividing the two-tailed probability figure in two, it would seem that the T-test was significant at the 1 percent level. It is thus safe to say that the difference among the means for the two periods represents a structural shift and that the lowering of the price spreads since early 1975 is statistically linked with the increased freight rates that occurred during that period.

In Winnipeg the mean of the price spreads for both A1 steers and heifers were higher in 1975 than in 1973-74. This result being the opposite of what one would expect, could have signified that the Winnipeg market was more geared to local consumption than the Calgary market. In fact, an increase in freight rates may have discouraged packers to sell in other Canadian cities and forced them to increase their local sales. If this increase in local sales were reflected in a higher mean price spread for 1975, we would then want to know of the increase if the mean spread was statistically linked to the increase in freight rates. For example, the mean spreads for A1 steers in 1973-74 was \$8.65/cwt. and \$9.91/cwt. in 1975. One would then have to expect a negative sign on the T-test. The F-test showed that the variances were statistically independent. The sign of the T-test in the separate variance column proved to be negative and significant only at the 10 percent level. It was thus rejected.

On the heifer market in Winnipeg, the mean spread for 1973-74 was \$9.83/cwt. and \$10.05/cwt. for 1975. This small difference only proved to be significant at the 40 percent level. It was thus also rejected.

In summary, the freight rate increase of 20 percent in January, 1975 was found to be statistically linked to a lowering of the live to wholesale price spread only on the Al heifer market in Calgary. The Winnipeg market would seem to have remained unperturbed throughout.

Table 8: Comparison of Farm to Wholesale Price Spreads for 1973-74 Compared with 1975 for Al Steers and Heifers in Calgary and Winnipeg.

	# of Cases	Mean	Standard Deviation	F Value	2-tail Probability	Pooled Variance		Separate Variance	
						T Value	2-tail Probability	T Value	2-tail Probability
<u>Price Spread for Al Steers, Calgary</u>									
1973-74	101	\$8.578	3.907						
1975	27	\$7.244	4.991	2.95	0.000	1.79	0.076	1.33	0.193
<u>Price Spread for Al Heifers, Calgary</u>									
1973-74	101	\$9.246	4.177						
1975	27	\$6.724	4.353	1.09	0.744	2.76	0.007	2.70	0.010
<u>Price Spread for Al Steers, Winnipeg</u>									
1973-74	101	\$8.649	2.690						
1975	27	\$9.912	4.283	2.54	0.001	-1.89	0.061	-1.46	0.155
<u>Price Spread for Al Heifers, Winnipeg</u>									
1973-74	100	\$9.832	4.317						
1975	27	\$10.045	3.076	1.24	0.539	-0.23	0.861	-0.25	0.806

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