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**PRESENTATION BY THE
MANITOBA RED MEAT FORUM TO
THE WDO STEERING COMMITTEE**

Presentation by

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June 20, 1991

TO: Members of Red Meat Forum & WDO Steering Committee

FROM: R.M.A. Loyns, Acting Chair, Coordinating Committee, Red Meat Forum

SUBJECT: Results of Literature/Research Review

MEMORANDUM

Attached please find a copy of our review of literature and research requested at the April 30, 1991 meeting of the WDO Steering Committee. Also please find an updated version of our research proposal reflecting our presentation at that meeting.

We have summarized the material in an annotated bibliography which will be complete with covers. This document is intended for general distribution and requests for additional copies, in reasonable numbers, will be accommodated. Ted Haney has been included among the authors because of his significant contribution in gathering and providing us with the material.

The review was a useful exercise and some of the findings have already been incorporated into our revised study plans. In some cases only an executive summary and/or conclusions were available for review; therefore, a copy of the full report will be required.

Please recognize the tight time constraints for this review. We initiated the review process on May 9, and received the first package of material from Ted Haney on May 15. In order to meet the June 27, 1991 deadline, we effectively had only one month to complete the task.

I am unable to attend the meeting in Saskatoon so Merle Faminow will assume my responsibilities for that occasion.

Finally, I have attached a brief response to a number of items in the "Steering Committee Notes of April 30, 1991."

Comments on April 30, 1991 Meeting Notes

1. p. 2 A total of \$478,500 is available as per contract. The view of the Red Meat Forum is that some degree of matching funds, in dollar contribution, or in kind, would be appropriate to the expanded structure and focus of the project. WDO indicated at the April 30, 1991 meeting that additional funding may be available if required to expand the scope of the research or to meet unforeseen requirements.
2. p. 2 The contract incorporates general terms of reference of the studies in Appendix A and Consultants in Appendix B. The Red Meat Forum and researchers, within the terms and conditions of the contract, are pleased to cooperate with the Steering Committee. In addition to seeking advice on the overall studies in the June 27, 1991 meeting, we are also asking for specific advice at this early stage of planning on two aspects of the Strategic Options. We expect to make similar requests for advice throughout the work program.
3. p.4 There appears to be a discrepancy between the Steering Committee and the contract in regards to completion date of the work. In review of the late start, it would be infeasible to move the completion date forward to December 1991. Progress reporting will update the Steering Committee on progress of the studies. Upon agreement for initiating the work plan, we will be pleased to consider requests for particular information by December 1991.
4. p. 4 Comments on the individual study components will be addressed in our presentation at the Saskatoon meeting.
5. p. 4 In the area of genetic effects of carcass quality, this topic will be referred to the Steering Committee for advice on what work is required and how it is to be accomplished. Please see the Strategy Options section.
6. p. 5 The literature and research review has largely been completed and the results are attached.

**PRESENTATION BY THE
MANITOBA RED MEAT FORUM
TO
THE WDO STEERING COMMITTEE**

Presented by:

Dr. M.D. Faminow

on behalf of the Red Meat Forum

Saskatoon

June 27, 1991

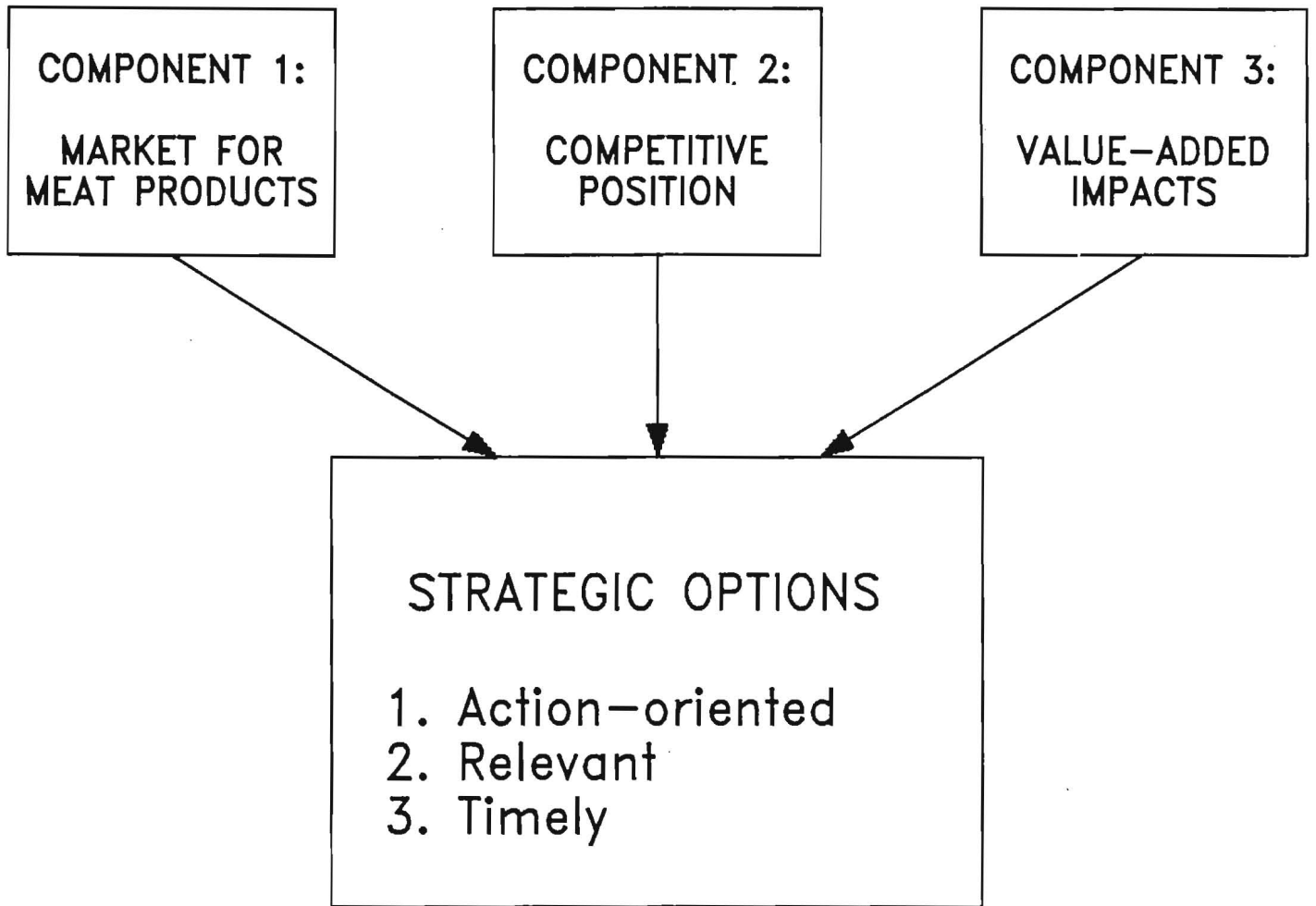


Figure 1: Development of a Policy-Relevant Action-Oriented Document

**WORK PROGRAM
RED MEAT FORUM
(Revised June 20, 1991)**

Statement of Problem: Development and performance of Western Canadian red meat industry.

Objective: To produce a long-range strategy and action plan to enhance the red meats section in the four western provinces.

Background

The red meat industry in Western Canada has experienced a variety of shocks and traumas over the past two decades. The loss of cattle finishing and processing has been most acute in Manitoba, although concern has been expressed in other western provinces as well. This combination of events brought a group of people together in 1989 to address the dismal performance in the Manitoba red meat industry. All sectors of the red meat industry in Manitoba were represented: industry producer groups, feed companies, meat processors, government officials, and academics. The focus of this industry group has been: **what can be done to do to enhance livestock and meats output in Manitoba and the other western provinces?**

As a consequence of the broad common interest in this problem area, the Manitoba Red Meat Forum was institutionalized in 1990 to consolidate efforts and pursue funding for a comprehensive study. After close to three years of cooperation and collaboration by two dozen industry/government/university representatives, base funding from the private sector and two provinces of \$117,500 has been established and a contract signed with WDO for an additional \$361,000 to undertake research aimed at addressing this basic question.

The process of developing the work program has gone through several phases. The objective always has been to produce a **policy relevant, action-oriented document** designed to indicate options for future development. The scope of study has been expanded to focus on the four western provinces rather than Manitoba. The Steering Committee established under the WDO contract is designed to assure this broader focus. The study has been modified to reflect a Western Canadian perspective.

The concerns that instigated the Red Meat Forum relate to two basic questions:

- 1) what factors underlie the performance of the industry?
- 2) what measures can be taken to enhance industry performance to the benefit of the western provinces?

These concerns translate into a set of policy relevant, operational questions.

- what and where is the growth potential?
- what are our competitive strengths and weaknesses?
- what is likely to be the structure and location of red meat production and processing?
- are there non-traditional or evolving opportunities in meats production or processing?
- what is the employment and value added potential?
- in the regulatory framework conducive to development?
- what are the implications for private and public investment?
- what is the role of public policy in shaping the future development of the industry?

The Red Meat Forum Proposal

These questions have been shaped into a study and work program designed to produce a comprehensive industry strategic document. The study program consists of three interlinked research projects designed to provide a base for the fourth component "Strategy Options for Red Meats in the Western Provinces".

The basic **objective** of the Red Meat Forum proposal is to develop a framework for **maximizing potential benefits from livestock production and processing in western Canada.**

The methodology as illustrated in Figure 1 is straightforward:

- 1) In terms of products, policies, competitiveness and other structural considerations determine future directions in the Red Meat sector. This step includes developing an updated information base by conducting relevant research and reviewing recent or ongoing studies and
- 2) Attempt to develop an integrated strategy for enhancing development to the year 2000.

Subsequent to the April 30 meeting in Winnipeg, relevant literature and research has been identified (report attached.) The three base study areas remain as identified earlier, each with an expanded focus and linked into the final "Strategy Options" component. There are four sections of the proposal:

- 1) An Analysis of the Market for Meat Products in North America.
- 2) The Competitive Potential of Western Canada In North American Markets.
- 3) Value-Added Impacts in the Red Meats Sector.
- 4) The Development of Strategy Options for the Western Provinces.

The Red Meat Forum is comprised of producer, industry, government and university participants. A Coordinating Committee (membership attached) is responsible to the Forum, through the Executive, to ensure that the studies are relevant, conducted in a timely manner, and produce results consistent with the needs of the strategic planning component of the work program.

The next three sections outline the three study areas which require immediate action in terms of research. The fifth section provides an outline of considerations to be made in preparing strategic options. This section also discusses other study areas which have been identified as a result of work ongoing by the Study Team and the Red Meat Forum. These areas are presented for discussion and advice from the Steering Committee.

AN ANALYSIS OF THE MARKET FOR MEAT PRODUCTS IN THE NORTH AMERICAN MARKET

Objective: Analyze and project market potential to the year 2000.

Contribution to Strategic Plan:

Identification of target markets.

Background

The structure of the western Canadian meat processing sector has undergone and is continuing to undergo dramatic changes. Changes in industry structure, technology, and trade opportunities have altered the market environment for processors and other participants in the red meat industry, not just the meat processing sector. The role and effect of government policies and programs also influence the economic environment of the meat industry, from farm-gate to consumer. The Canada-United States Free Trade Agreement and potential agreement on a trade pact with Mexico have the potential to significantly alter trade patterns and industry structure.

To maintain and maximize the trade potential, and ultimately the value-added in the Western Canadian red meat sector, very specialized information is required. Markets for Western Canadian meat and meat products vary by province. A clear picture of the type of meat product that is in demand, the specification of these products, and the volumes required, are all critical information for development of the strategic plan.

Literature Overview

The literature reviews conducted to date would seem to corroborate the lack of the type of marketing information that has been proposed for the analysis. While a considerable amount of work has been done on the U.S. Pacific Northwest it has not been directly focused on the market demand by meat type and cut, limiting applicability. Market potential in most other large populations centers in the United States is not known.

The Study

The study will focus in developing options or answers for further evaluation at the Strategy Options portion of the overall study. The study has been designed to provide answers to the following:

What is the potential meat demand in the target market(s).

Can the western provinces regularly service these target markets?

What is required to access these markets?

Estimation of meat demand in the target market areas to the year 2000.

The following information on an individual product/cut basis is required in order to quantify the answers to the above: supply/demand balances, prices, product characteristics, by product values, specifications. In addition it is necessary to develop forecasts that are consistent with changing consumption patterns caused by ethnic, demographic, socio-economic, and lifestyle influences. The values of the various meat cuts will be netted back to each of the western provinces for direct comparison to the competitive potential analysis.

Contribution To Strategic Planning

The results obtained from the study are a prerequisite for the development of the strategy options. Without the information that will be generated from the market analysis stage of the overall study, the ability to develop a strategic plan for the red meat industry in Western Canada would not only be severely limited, it would be virtually impossible.

Budget

The total budget for this section of the study is \$179,000.

TABLE OF CONTENTS

Chapter One

The structure of the western Canadian meat processing sector for beef, pork, and lamb (1980-1990).

Chapter Two

The volume and types of meat exported from Canada.

Current U.S. and Canadian Markets for beef, pork, and lamb, by product type.

Meat deficit regions of the U.S. and Canada.

Trends and forecasts in meat consumption volumes, meat types and products.

Chapter Three

Identification of meat and meat product specifications in Canada and the U.S.

Analysis of differences and potential solutions to the existing differences.

Chapter Four

Determination of target markets.

Comparison of net values and competition.

Optimum fabricated carcass value.

Chapter Five

The development of potential market strategies by meat type, by province.

Chapter Six

Summary and Conclusions

Data Sources

United States Department of Agriculture
Agriculture Canada
Statistics Canada
Canada Meat Council
Other Industry Sources

THE COMPETITIVE POTENTIAL OF WESTERN CANADA IN THE NORTH AMERICAN MARKET

Objective: To determine the degree to which producers of livestock and livestock products in Western Canada are able to compete in the domestic, U.S. and other markets.

Contribution to Strategic Planning:

Areas where the greatest potential lies for enhancing the income from livestock in Western Canada will be identified.

Background

Western Canada is a red meat surplus area whether in animals or in finished form. Whereas much of this surplus found an outlet in the past in Eastern Canada, local production in that region plus imports from the United States have largely replaced the western product. As a result, it is necessary to seek out markets for this surplus. In order to determine whether such a course will be to the economic advantage of the region, its competitiveness in the production of animals and meat products has to be established. One view is that the greatest return will arise from the export of animals whether finished or for feeding purposes while another is that the export of meat and meat products will be most advantageous given the value-added component. Determination of the most appropriate course to adopt in the future will be influenced by existing or potential market interventions which include subsidies on the movement of grain, change in the basis for CWB pooling, continental free trade, subsidies to grain producers and subsidies to processors, and consideration of environmental issues.

Literature Review

An extensive literature review has revealed individual studies which impinge on particular aspects of production and marketing. No study presently available covers the range of products for which information on competitiveness is desired. Those which relate to this study often deal with only one facet of marketing, albeit sometimes at great depth. Practically no information on the packing industry and processing costs has appeared in the literature reviewed. An attempt to overcome this void is being made by requests for U.S. studies in this area and also by access

to studies by the Department of Industry, Trade and Technology. While not assembled to date, studies on the costs of animal production are readily available. The literature describes a variety of research techniques which have been used to analyze different problems.

Study Outline

A further literature review will precede the analysis in order to avoid any undesirable repetition of previous work in the area and identify evolving technologies. Data on product prices and volume requirements will be assembled, this drawn largely from the market analysis section of the study. Production capabilities and capacities will be reviewed. Transportation costs between markets by product will be available from the transportation project and these supplemented as required. Data on processing costs will be gleaned from U.S. and other studies with these data put in a Canadian context with the cooperation of local packers. The impact of taxation, labour rates and productivity, and also fuel costs on processing costs will be determined. Given these data, the analytical technique determined appropriate will be utilized to determine the most advantageous markets to direct cattle, hogs and sheep including their meat products taking into consideration economies associated with scale of operations. By so doing the analysis will extend beyond any known research in this area. Particular attention will be given to those markets found to hold the greatest potential for enhancing the returns from livestock and/or products. The impacts of subsidies on grain transport, changes in the basis for CWB pooling, subsidies to grain producers and subsidies to processors as well as continental free trade will be assessed. The analysis is expected to benefit greatly from the input of members of the advisory committee and also from that of the members of the Steering Committee.

Contribution to Strategic Planning

The information gleaned from this section of the study will provide essential empirical evidence with which to guide the formation of strategy options. The areas where the greatest potential lies for enhancing the income from livestock in Western Canada will be identified. In the process, the combination of products and shipments yielding the maximum return will be indicated. Areas where minor reductions in cost will enable greater market penetration will be determined. Furthermore, the additional rapport which is expected to be engendered between the

various participants in the industry in the data collection phase is expected to be a distinct advantage when formulating a strategic plan for the livestock industry in Western Canada to the year 2000 and beyond. In the process, restraints on achieving the maximum potential and the most effective means for overcoming these restraints will become apparent.

Budget

The total budget for this section of the overall study is \$121,000.

TABLE OF CONTENTS

Chapter One

Introduction and Background

Chapter Two

Survey of Market Interventions

Chapter Three

Research Procedure

1. Assessment of Alternative Techniques
2. Technique Adopted

Chapter Four

Assembly of Data for Analysis

1. Production capabilities or capacities
2. Production and processing costs taking into consideration economies of sale and/or technology
3. Transportation costs for livestock and products between markets

Chapter Five

Analysis

1. Most profitable combination of sales of livestock and products
2. Alternative combinations

Chapter Six

Assessment of Competitive Position

1. Under Existing conditions
2. Under Alternative Subsidy Arrangements on Grain
3. Under Subsidies Applied to the Livestock Industry

Chapter Seven

Use of Results of Analysis as Guides for Development of Market Strategy

VALUE-ADDED IMPACTS IN THE RED MEAT SECTOR

Objective: To compare and contrast the direct and indirect impacts of the red meat production and processing sectors on the Western Canadian economy.

Contribution to Strategic Planning:

Allow evaluation of potential and employment from alternative options.

Background

A complex chain of processing and marketing firm activities links livestock production to final meat consumption. Major activities in this chain include animal slaughter, carcass processing, product distribution and consumer retailing. The firms involved in this process generate substantial employment and income for Western Canadians. The meat and poultry products industry is the largest food industry in Canada, accounting for 18.1 percent of the total value-added in food processing (Barkman). In the prairie provinces, the meat and meat products industry alone (excluding poultry) accounts for 30.9 percent of total value-added!

An increase in the output of the Western Canadian red meat industry can be expected to create substantial benefits to the regional economy, generating employment and income. These impacts can be measured by tracing both the direct impacts of the increased sales on the red meat processing industry and the secondary impacts that are a consequence of the direct spending working its way through the regional economy. The rationale behind encouraging further processing of red meat products in Western Canada is that net benefits would occur. Common methodologies to evaluate these impacts include input-output, export base and cost accounting (benefit-cost). All these methodologies involve assumptions and limitations; however, intersectoral impacts and linkages that create direct and indirect effects, along with their resulting overall impact, can be best evaluated using input-output analysis.

Literature Review

A huge literature describes regional impact analysis. Three general methodologies-- input-output, export base, cost accounting/benefit-cost-- are widely used. In an authoritative survey of the techniques commonly used in regional analysis, Richardson (p. 179) states: "Input-output

analysis is given top billing because of its wide range of applications to spatial problems." Further (p. 184), "In spite of their obvious limitations ... regional input-output models have compensating advantages"

A report by Thomassin and Andison describes the input-output model maintained by Agriculture Canada. Kulshrestha and Yap have developed an input-output model for the prairie region. At the University of Manitoba, Coyle is currently utilizing an input-output model for Manitoba to evaluate the economic impact of economic transfers to Indian reserves.

Study Outline

The purpose of this study is to determine the direct and indirect impacts of red meat production and processing sectors on the Western Canadian economy. The analysis will measure the additional economic impacts generated by red meat processing relative to basic production of livestock and grain. Specific components of the study will focus on comparing and contrasting the economic impact of: (1) changed grain production; (2) changed live animal production; (3) changed live animal production and meat processing; (4) sensitivity analysis of scenarios (1) - (3) under conditions reflecting historical levels and ranges.

Contribution to Strategic Planning

Given that the western region of Canada has limited options for industrial diversification it is critical that the potential benefits of prospective value-added expansion be explored. Due to the region's resource availability and historical performance, red meat processing is an obvious candidate for consideration. Combined with the results of the competitiveness research, the value-added study will assist in evaluating the potential private and social profitability of expanding the red meat sector. Potential income and employment from expansion of the red meat production and processing industry are important components in the development of a strategic development plan for Western Canada.

Budget

The total budget for this section of the study is \$44,500.

TABLE OF CONTENTS

Chapter One

Introduction and background

Chapter Two

Regional impact analysis

1. Methods
2. Interpretation of Results

Chapter Three

Structure of The Input-output Model

1. Overview of Model Structure
2. Adaption to the Red meat Sector

Chapter Four

Economic Impacts and Multipliers

1. Baseline Analysis
2. Changed Grain Production
3. Changed Live Animal Production
4. Changed Live Animal Production & Processing
5. Sensitivity Analysis

Chapter Five

Assessment of Economic Impacts

Chapter Six

Use of Results as a Guide to Development of Market Strategy

REFERENCES

- Barkman, P. "Some Measures of the Size and Significance of the Agri-Food Sector, Canada and the Provinces." Food Market Commentary 12 (October, 1990): 23-30.
- Kulshrestha, S.N. and M.T. Yap. The Prairie Regional Input-Output and Employment Model. Regina, Prairie Farm Rehabilitation Administration. August, 1985.
- Richardson, Harry W. Regional Economics. University of Illinois Press. Urbana. 1979.
- Thomassin, P. and A. Andison. Agriculture Canada's Input-Output Model, Part 1. Agriculture Canada, Policy Branch. Ottawa, 1987.

THE DEVELOPMENT OF STRATEGY OPTIONS FOR THE WESTERN PROVINCES

Objective: To develop a set of strategic options designed to address constraints faced by the red meats industry in Western Canada.

Contribution to strategic planning:

To develop a set of action-oriented strategies for the red meats industry in Western Canada.

Background

The findings of the three specific sections must be incorporated into the production, marketing and regulatory environment that exists in Western Canada. Focus will be placed on identifying the market potential in Canada and the United States, allowing the full development of viable strategic options. Constraints to the development of a healthy red meats industry in Western Canada will be identified and options presented.

Literature Review

The attached "Annotated Bibliography" summarizes the results from a large cross-section of studies completed in Canada and the United States. It is evident from a perusal of these studies that a comprehensive review of the problems currently faced by the red meats industry in Western Canada is not available. In particular, the three serious gaps in the literature will be addressed.

1. The need to analyze the range of market options to Western Canadian producers and processors. The study will complement available studies by expanding discussion past a treatment of specific production centres and consumption points.
2. The study will provide a comprehensive review of the competitive position of producers and processors in Western Canada, relative to competitors.
3. The study will provide a broadbased review of the value-added potential in the four western provinces.

Study Outline

The purpose of the Strategy Options research is to develop a set of options for private and public decision making which will lead to a healthy and vigorous red meat industry in Western Canada.

The attached figure (Figure 2) summarizes the structure of this component of the study. Each of the three study components (Market for Meat Products, Competitive Position, and Value-Added Impacts) links into the strategic planning module. Strategic planning implies developing a workable, action-oriented plan for the Western Canadian red meats industry based on the industry environment, constraints and opportunities. Strategic options for traditional and non-traditional meats will be developed with seven central themes:

1. target markets,
2. production strategies
3. financial requirements,
4. price discovery mechanisms,
5. risk and uncertainty,
6. infrastructure, and
7. public policy and regulation.

The Steering Committee has suggested that the study component called "genetic tracking" in the original submission be revised to include research ongoing at other locations. A number of these participants have already been contacted. We suggest that a review of on-going research be conducted to determine coordination needs, under the theme of "production strategies". In addition, "other identified issues" of the red meat industry (specifically by-products, exotic meats, highly processed meat products, natural or organic products and ethnic demand) may also require attention and will be identified during the course of the study. Suggestion from the Steering Committee would be welcome on these issues.

Budget

The total budget for this section is \$134,000.

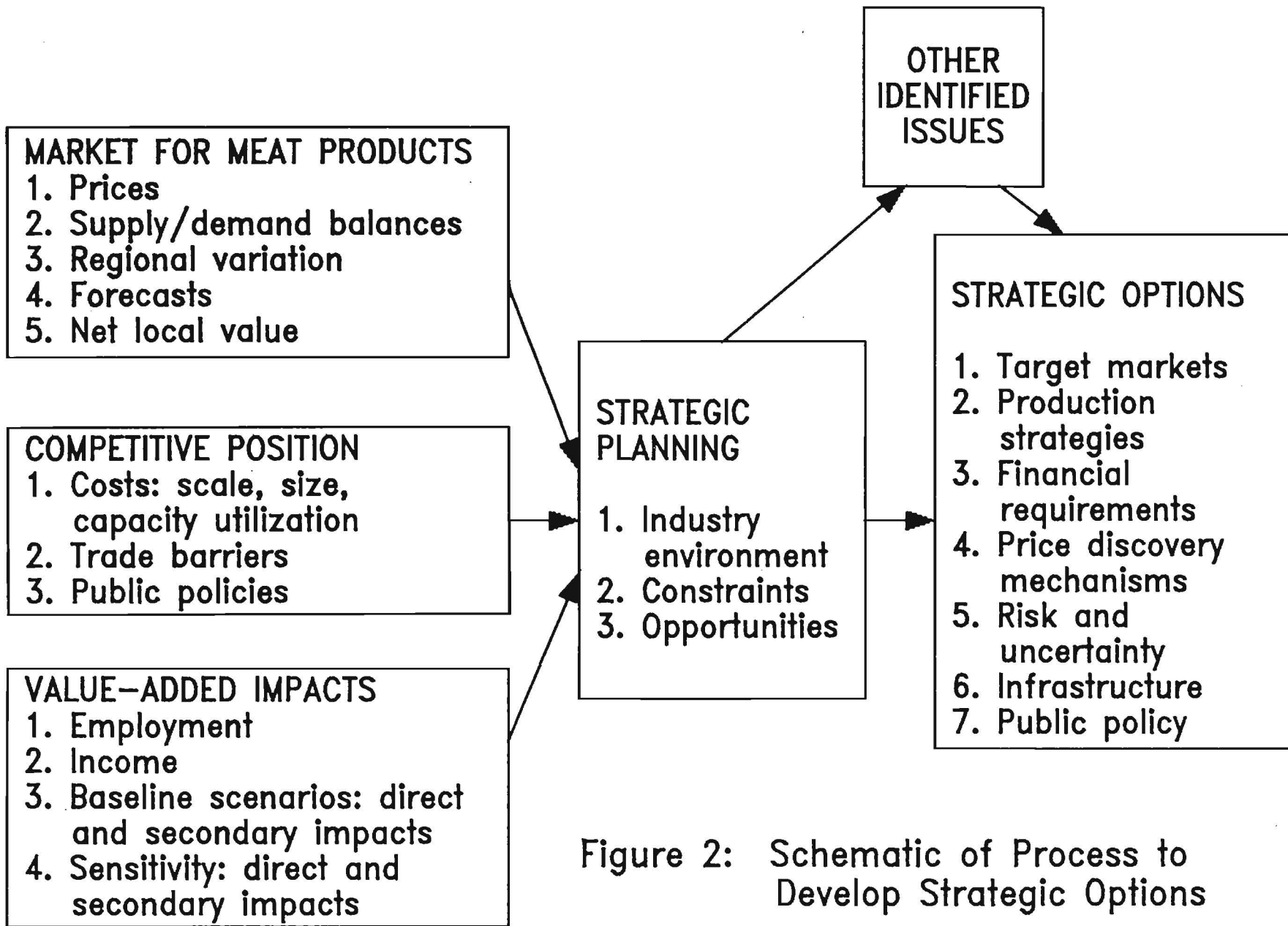


Figure 2: Schematic of Process to Develop Strategic Options

APPENDIX

**RED MEAT FORUM
COORDINATING COMMITTEE**

Chair Dr. J.A. MacMillan (on leave)
Dr. R.M.A. Loyns, Acting Chair

Ron Enns	United Grain Growers
Randy Eros	Sheep Producers
Ms. Barb Isman	Cargill
Doug McLaren	Cattle Producers
Weldon Newton	Manitoba Pork
Al Wensel	Burns Meats

Summary of
Recent Literature and Research
Related to
The Western Canadian Red Meat Industry

Conducted for
The Manitoba Red Meat Forum

by:
M.D. Faminow
T. Haney
M. Kraut
R.M.A. Loyns
S. Spak
A.G. Wilson

June 20, 1991

The literature search and review of research was conducted for the Manitoba Red Meat Forum at the request of the Steering Committee and WDO.

Over eighty documents and studies were reviewed; this includes materials provided and those assembled by the reviewers. In some cases only the summaries and/or conclusions were available, and in these cases we were unable to assess the methodology or data used.

This review encompasses the most up-to-date information available on the red meat industry in Western Canada. We are therefore publishing it in this form to make it available for distribution. As well, the studies where relevant, will be incorporated into subsequent research and work of the Red Meat Forum.

June 20, 1991

TRADE

Agriculture Canada, An Analysis of Canadian Beef Imports from the United States, January 1988.

This report deals with province of entry and origin of beef imports into Canada. Such imports are also recorded by product and origin. The major flows are identified as being received by Ontario, British Columbia, Quebec and Alberta. Manufacturing beef originated mainly in New Zealand, Australia and Europe. The volume of this beef imported reached 54,748 tonnes in 1986. This is in contrast to the 19,246 tonnes of high quality beef imported from the U.S. However, imports of U.S. beef are increasing over time and are concentrated in the higher valued cuts. Much of this beef is non-graded but is similar in quality to Canadian beef.

This study identifies present sources of beef imports, information directly useful to the study.

Agriculture Canada, Canadian Beef Imports from the United States, 1987, December 1988.

This statistical report indicates a relative change in the imports of beef from the United States between Canadian provinces. Ontario is the largest importer, accounting for 58 percent of the total with Quebec and British Columbia also being major recipients. A large share of this beef was supplied by the states of Iowa, Kansas, Missouri and Nebraska. Boneless loins and hips made up the majority of the shipments. Washington and Oregon supplied beef to British Columbia. A large share of the boneless carcasses imported came from the South Atlantic states, Ontario receiving 98 percent of these. There was no indication provided as to how much of the beef imported fell into the "no roll" or ungraded category.

This report draws attention to the current import flow of beef into Canada and therefore is useful as background to the study.

Agriculture Canada, Meat and Livestock Export Flows from Canada to the United States, 1987.

This examination of trends in flows of livestock and meat exports from Canada to the U.S. was in response to concerns with the increase in provincial top-loading programs, which have shifted production patterns in Canada, and concerns over the method of payment under the W.G.T.A. This report recognized the increased north to south export flows for livestock and meat to the U.S. for the period 1976-86, and the pattern that emerged is one in which proximity to market (transport cost) plays a very important role in determining competitiveness.

Alberta Cattle Commission, A Study of the Impact of Regulatory Costs on the Competitive Position of Alberta's Red Meat Industry under the Free Trade Agreement, 1989.

This report examined the prospects for Alberta's red meat industry under a free trade agreement, which could give easier and more secure access to the large consuming areas of the Pacific northwest. In particular, the study team looked at the major sources of regulatory cost facing the Alberta industry vis-a-vis that of the U.S. and the rest of Canada.

The most significant regulations impacting on the production and processing sectors were those concerning labour, environment and land use, and transportation. In most cases, the costs associated with complying with these regulations were determined to be higher than those facing the U.S. industry; recent changes in transport regulations had improved Alberta's competitive position to some extent.

The study recommends that future legislative activity take into account the impact on Alberta's competitive position in the U.S. market.

Alberta Agriculture, Market Development, Potential Markets for Alberta's Red Meat, 1983.

The purpose of this study was to assess the potential international markets for Alberta's beef and pork. Of the ten markets studied, California/Hawaii and the Pacific Northwest were ranked highest in terms of volumes imported, ease of access and time required for profitable sales. Alberta's beef packing industry was found to be overbuilt but efficient despite lack of throughput and high labour rates. The industry was reluctant to implement market segmentation

and product differentiation strategies and relied heavily on the lucrative Montreal market. Although able to compete in the California/Hawaii and Pacific Northwest markets, Alberta's access to these markets is limited because of political considerations. California/Hawaii and the Pacific Northwest are also production deficit in pork, and represent a similar marketing opportunity for Alberta pork producers.

In addition to providing some good background information, this study underscores the importance of political manoeuvring in accessing new markets.

Alberta Trade Policy Secretariat, The Western Canadian Livestock and Red Meats Sector and Multilateral Trade Negotiations. (Western Provinces Position Paper 1989).

With over 80 percent of the breeding herd and two thirds of steer and heifer slaughter located on the prairies, livestock are a major source of income, while at the same time the prairies are recognized as leaders in genetics, artificial insemination and embryo transfer. Since production exceeds consumption, it is an export oriented region which must remain competitive to be able to share in the world market. Interprovincial barriers reduce the ability to compete in this market. Prices in Canada largely reflect those in the U.S. market, linkages of prices being accentuated by the Free Trade Agreement and elimination of non-tariff barriers. The Agreement necessitates discipline in any application of subsidies. While exports of embryos and semen are possible to many countries, exports of live cattle are limited by transportation costs to the United States and northern South America. The greatest potential for a future market for beef is Japan. Other countries in the far east also hold forth the prospect of being markets for livestock and red meats.

This report provides an outline of the views of the provincial governments with respect to the livestock industry and in particular cattle. In this respect a useful guide is provided to the study.

Bruce, C.J., and W.A. Kerr, "A Proposed Arbitration Mechanism to Ensure Free Trade in Livestock Products," Canadian Journal of Agricultural Economics. Vol. 34, pp. 347-360.

This article was written pre-CUSTA. The theme of the article was that the issue of non-tariff barriers to trade in livestock and products between Canada and the United States had to be addressed. In this respect, the article was prophetic. Non-tariff barriers could be formal such as quotas, disguised as impediments instituted for health reasons such as drugs used in production, or in the form of packaging requirements. Import regulations could be changed without prior notification to the exporter. Inspection procedures could also create a barrier to trade (how true in the present environment!). Another category of non-tariff barriers are those related to structure such as the completion of complex import forms. Inspection procedures can also become a non-tariff barrier (as indeed they have). The authors propose a disparate settlement mechanism in the form of a commission to hear complaints and make rapid judgements. Both importers and exporters would be members of the commission who would appoint arbitrators.

The problem of non-tariff barriers and their resolution remains with us even with dispute settlement mechanisms in place. This article serves to emphasize the problems which can arise in trade.

Chris Mills Consulting, Red Meat and Livestock Trade Issues Facing Alberta. May 1985.

This study reported on the availability of export markets for red meat and indicated the trade policies which were required to access such markets. While the livestock industry was vital to Alberta, the output of red meat was of little import to a world largely in a surplus position. From the point of view of the industry access to the U.S. market was of greatest significance, Canada being deemed to benefit if agriculture was brought within the purview of G.A.T.T. Existing impediments to trade in red meat between the two countries were quotas, inspection problems and the countervail on pork said to arise from more liberal government support programs in Canada. Such impediments should be removed (the CUSTA attempted to do that). The researcher recommended price support and inspection become equalized between the two countries and any quotas or tariffs removed. There should be a joint agreement on drug licensing

while health protection procedures should be more regionalized to improve efficiency while maintaining the national standard.

This report provides interesting background to the study in as much as procedures were proposed, some of which have been adopted, to enhance trade. Difficulties, however, continue to be evident.

Gillis, K.G. et al, "The Prospects for Export of Primal Beef Cuts to California," Canadian Journal of Agricultural Economics. Vol. 33, pp. 171-194.

The differences between American and Canadian meat marketing systems which include grading and cutting specifications are spelled out. These differences affect the competitiveness of Canadian meat products in the U.S., carcass values cut out values tending to be different. Three scenarios were considered, one being to sell each primal cut in the market which yields the highest price. If Canada is to maximize revenue from carcasses, some primals should be sold in Canada and others in the United States. By following such a course, aggregate revenue from beef could be increased substantially, this being verified by use of an econometric model. The researchers concluded that there is the potential to export primal cuts to California but such exports will not come easily. The differential between primal prices switches from negative to positive and positive to negative over time, the desirability of sales to California being affected by the exchange rate. Risk is attached to development of the California market.

This article serves to emphasize the complexities attached to export of meat to the United States. It therefore serves as background to the present study.

Kerr, W.A., "The Canada-United States Free Trade Agreement and the Livestock Sector: The Second Stage Negotiations," Canadian Journal of Agricultural Economics. Vol. 36, pp. 895-903.

This article reviews existing provisions of the CUSTA and identifies areas for further negotiation which include dispute settlement for dumping and countervail cases, regulatory harmonization, particularly with respect to grading, and scheduling of tariff reduction. In so far as grading is conceived, the options appeared to be the granting of equivalence between grades in both countries, establishment of a new harmonized grading standard, abandonment by either

country of its current grading system and acceptance of the grading system of the other country or adoption of reciprocal grading. Kerr argues that reciprocal grading is the most feasible alternative.

Differences in the grading systems of the two countries have a major impact on trade in meat. The effect of these differences has been largely avoided by the U.S. since their shipments into Canada are largely "no-roll". Grades therefore have a major influence on potential exports of Canadian meat products.

Kerr, W.A., Trade Barriers and Western Canadian Livestock Industry, Working Paper, Department of Economics, University of Calgary, 1986.

This assessment of the impacts of free trade on the Western hog and beef industries centered mainly on non-tariff barriers and U.S. agricultural subsidies, however, tariffs, Canadian subsidies and domestic institutions were also examined. Tariffs are low enough that they do not present a significant barrier to trade. Of particular concern is the negative effect of short term supply interruptions on the development of market opportunities in the United States. Canadian firms appear to be unwilling to expend resources required to develop market channels in the U.S. and tend to conduct business on a small-lot basis, responding to market opportunities, which are intermittent. Costs associated with delays in meeting border crossing regulations, or refusals of individual lots present a risk problem for Canadian suppliers and ultimately undermine the reliability of Canadian supplies as perceived by U.S. purchasers. This study clearly states that the removal of tariff and some non-tariff barriers will not likely result in significant increases in Canadian exports of pork and beef.

A mechanism or arbitration procedure is required that can effectively deal with non-tariff measures applied during the post-agreement period. In addition, there is a need to harmonize existing and future health, consumer production (grading, labelling, etc.) and transport regulations. Much work has to be done to disentangle the web of subsidies and price supports that exist from state to state and, similarly, from province to province. Of particular concern are those intermittent U.S. subsidies that are activated by price "triggers" related to market conditions.

Depending on the elasticity of supply and price responsiveness to imports in the U.S., the removal of tariff and some non-tariff barriers could increase revenues for the Western Canada

livestock industry from 1 percent to 8 percent. Furthermore, if health regulations on the import of live cattle into Canada were streamlined, this improved access to cheaper U.S. feeder stock would obviously reduce the price for feeder animals. The danger in abandoning health regulations is the diminished export opportunities should Canada lose its disease-free status.

Of particular concern is the location of processing plants within Canada to maximize value-added and employment activity. A non-abrogation clause in the liberalized trade agreement, accompanied by harmonization of grading standards, health inspection standards and labelling regulations are mentioned as a means to discourage Canadian and U.S. firms building on the U.S. side. Western Canadian firms' access to new markets could be improved with the deregulation of the Canadian trucking industry. Deregulation would likely decrease costs associated with the backhaul of commodities and ultimately result in a more efficient transport system.

This study is important because it suggests that there are many impediments to trade in meat and meat products, other than tariffs.

Peat Marwick Consulting Group, A Study to Assess the Impact on the Canadian Market of Ungraded, Non-Manufacturing Beef. Final Report. June 1989.

This report deals with the movements of live cattle and beef between Canada and the United States, there being large exports of live cattle from Canada and substantial imports of beef from the United States. Live animal exports arise primarily from the prairies whereas beef imports were usually directed to Ontario, Quebec, British Columbia and to a lesser extent Alberta. One of the causes for this trade is said to reside in the slaughter mix of the two countries where a larger proportion of the cattle slaughtered in Canada as compared to the United States are cows and bulls providing manufacturing beef whereas a greater proportion of U.S. slaughter is composed of finished animals. This depresses prices for cows and bulls in Canada which as a result are attracted to the U.S. Conversely, the proportionately larger share of finished animals slaughtered in the United States depresses prices, the finished product being attracted to Canada. Another factor affecting trade is the lower price differential between fronts and hinds in the U.S. as compared to Canada which stimulates shipments of hind quarter cuts to Canada. Most of the U.S. beef imported by Canada is ungraded - "no roll" - such ungraded beef satisfying

a larger share of U.S. consumers because of its lower fat content as compared to U.S. Prime and Choice. The quality of the imported ungraded beef is deemed to be good, importers tending to buy according to particular characteristics from selected U.S. packing houses. The trade in live animals and beef appears little affected by exchange rates.

The extent of the cross border trade raises the question of why it persists over time. The researchers argue that the price differentials which give rise to trade between the two countries primarily arise from large high throughput packing houses in the U.S. which have lower production costs than their Canadian counterparts and the manufacturing/finished beef ratio in the two countries which results in a narrower front/head price relationship in the U.S. The U.S. ungraded beef has been equally acceptable to Canadian consumers as the local graded product.

This study provides valuable insights into the reasons for the price relationships which give rise to trade between the two countries.

Raphael, Andrew J., Overview of Export Markets, 1991.

This report examined international market conditions for Canadian beef and found that CUSTA, and the increased penetration of U.S. beef into Quebec, forces Canada to focus its marketing efforts in a north/south direction. The market potential appears to be in the upper scale, deli product and restaurant trade; Canadian beef can be promoted as a healthy, lean product, especially in California. Success hinges on reciprocal grading standards, transportation rates, exchange rates and funding of market development assistance. Concern was expressed that government funding could be seen as an unfair trade subsidy despite some evidence that the U.S. Meat Export Federation has provided U.S. packers with assistance in accessing Canadian markets.

Most of all, given Canada's precarious relationship with Quebec, this study points out that it may seem reasonable to consider Quebec as an export market at some time in the future.

Rous, David C. Market Development Strategies for Alberta Beef in the Western U.S. Market, Alberta Agriculture, 1987.

The purpose of this study was to examine marketing strategies for the export of Alberta beef into the Pacific Northwest and California. Although there were some opportunities for carcass beef, boxed beef for the retail trade represented highest potential provided that it could be graded Choice but the market was very competitive. U.S. clients were not familiar with Alberta beef and felt that Alberta packers were neither knowledgeable nor interested in the U.S. beef market.

This study identifies the problem of lack of Canadian presence in the U.S. retail meat trade.

Wahl, T. et al., "Dynamic Adjustment in the Japanese Livestock Industry Under Beef Import Liberalization," American Journal of Agricultural Economics. Vol. 73, No. 1, pp. 118-132.

The researchers analyze the adjustment which will arise in Japanese livestock markets as a result of the 1988 Beef Market Access Agreement and alternatively that which would arise given complete liberalization of Japanese import policies, both over the 1988-1997 period. The researchers use dynamic simulation analysis to obtain their results. Under complete liberalization, Japanese imports of beef are projected to rise to over 1.6 million tonnes in 1991 and to 2 million tonnes by 1997. Under the Beef Access Agreement beef imports are expected to increase up to level allowed by quota each year and to reach 1.2 million tonnes by 1997. The dairy herd will decline significantly as dairy steer carcass prices fall. The local beef herd is also expected to fall by up to 15 percent by 1991. The hog and chicken industries will be little affected, the former due to the variable levy imposed and the latter due to the low price elasticities with other meats. The authors caution that their results should be considered as indicators of the direction of change rather than absolute values.

The Beef Market Access Agreement holds forth the prospect of being advantageous to prairie producers. Penetration of the market will nonetheless require a carefully developed strategy.

MARKET DEMAND AND CONSUMPTION

Actionable Market Research, A Qualitative Evaluation of Consumer Attitudes Towards the QUALITY of Fresh Beef, 1987.

This report gauged Canadian supermarket shoppers' perceptions of fresh beef. Although perceptions can be ill-founded, they do nevertheless form the basis for buying decisions. The results are summarized as follows: most shoppers perceived Canadian beef superior to its U.S. equivalent and, although not sure of the source, liked to think they were buying domestic product; people who shopped at independent butchers were more positive about quality aspects of beef than supermarket shoppers, some supermarket shoppers thought that beef quality had declined over the years; although shoppers considered themselves good judges of beef quality, the results did not support this, many used irrelevant and often incorrect criteria when choosing beef; most shoppers were poorly informed with respect to the production and slaughter of cattle (and therefore unnecessarily fearful about the purity of fresh beef); certain respondents were not aware of the term marbling, some perceived it as negative and selected product with minimal marbling, and, when informed of the positive aspects of marbling, were only interested if it was not too expensive or fatty; shoppers were poorly informed on the process and benefits of beef aging and were not prepared to pay a premium for optimally aged beef; although "naturally aged" beef was considered a marketing ploy and "mechanical tenderizing" was not always perceived in a positive light, reactions to samples of needle tenderized meat were favourable; reactions to pre-marinated meat was generally negative because of overall appearance and concerns with healthfulness and quality of the product; interest in "All Natural" beef declined once the 30% price premium was revealed; vacuum packing of beef was applauded for its practicality, however, the effect on colour, even after an explanation was offered, was difficult to accept; consumer confidence could be increased by branding fresh meat but it should be done by the packer rather than the retailer; once informed on the idea of single muscle cutting, reaction was favourable in that some were even prepared to pay a slight premium for single muscle cutting; most respondents were happy with the "trim level" of the meat; products judged to be of "poor quality" at time of purchase, were preferred in cooked samples and confirmed that consumers were poor judges of raw beef; and it appears that consumers are ready for some new beef products but

preferably those of a less processed nature.

This research demonstrates the care required in proper survey design and how consumers' perceptions can be ill-founded. Equally important is the interpretation of survey results.

Actionable Market Research, A Qualitative Evaluation of End-User Use of, and Attitudes Towards BEEF in the FAFH Segment, prepared for The Beef Information Centre, 1988.

This research, which looked at the use of beef in the restaurant trade, provided the following conclusions: Canadian beef is perceived to be inferior to U.S. beef by some restaurateurs, particularly prestigious establishments; research participants were not particularly knowledgeable about beef, the industry should probably consider stronger product source identification for FAFH products especially since cheaper oceanic beef is finding its way into the industry; many restaurants do not have the expertise, time, or space to explore more avant-garde forms of presenting beef; the beef industry should develop pre-treated products such as marinated, tenderized, and pre-formed finger foods; and beef menu presentations may have to be industry driven because of low creativity levels in the food service industry and because restaurateurs tend to be reactive rather than pro-active, i.e., they monitor sales and other restaurants and adjust their menus accordingly.

This sector is important because it identifies the shortcomings of the HRI sector and what can be done to improve beef marketability.

Agriculture Canada, Canadian Meat Demand, Working paper, 1987.

This paper examined changes in meat consumption patterns and determined that relative prices of the major meat groups had changed between 1963 and 1983. Furthermore, health concerns, demographic changes and development of new tastes affected meat demand during this period. New products and merchandising for poultry surpassed that for beef and pork. In terms of modelling consumer demand, structural change did not occur in beef demand but it did occur for pork in that consumer demand for pork is now less sensitive to retail price changes. There was some evidence of structural changes in demand for the individual components of beef, but these changes were offset by opposite changes in other components.

This research successfully illustrates that demand analysis for beef should be carried out for the individual components of beef, using systems equations rather than single ad hoc equations.

A.H. Beswick and Associates, A Study of the Potential for Further Processing and Marketing of Processed Pork Product for the Domestic and USA Market, Working Paper, for Agriculture Canada, Policy Branch, 1989.

Given that 88 percent of U.S. annual imports of processed pork is high quality deli hams and logs of slicing ham (130,000 tonnes), this paper examined Canada's competitive position in this large market. The opportunity exists for Canadian processors to access this lucrative market since Canada is in a surplus pork position. Furthermore, Canada could be price and quality competitive in niche markets for selected processed pork but this would require capital investment in European style processing equipment. Costs for such facilities are estimated at \$3 million for equipment and \$6 million for a stand alone plant. This study clearly defines U.S. market opportunities for pork and pork products, and establishes the cost requirements to access this market.

Alberta Agriculture, Quebec Beef Market Consumer Study: Conclusions, Strategic Issues and Recommendations, prepared by FOUG, 1990.

Alberta's best market for its beef is Quebec but increasingly more U.S. "no-roll" beef is entering this lucrative market. This research attempted to determine consumer perceptions of Alberta beef and to formulate a long-term market strategy. The Quebec consumers want fresh and tender beef; there is no fear of red meat. The consumers also want information; if unsure, they are less likely to pay a premium for quality. Quebec consumers like the idea of a branded product because they want guarantees and to be able to trust somebody. The dilemma for Alberta producers is that identifying Alberta beef in the Quebec market would likely lead to short-term losses for them and short-term gains for the Quebec producers. Most Quebec consumers believe that the beef they eat is their own.

This study is important because, in the longer run, identifying Alberta Beef in the Quebec market could be beneficial if combined with an effective educational and information program.

Branson, Robert E. et al, Consumer Evaluation of Leanness of Beef: A National Test, Research Report, Texas Agricultural Market Research and Development Centre, 1984.

This research was initiated because previous studies offered contrasting conclusions: consumers rate higher those steaks with higher marbling; and there is little or no preference for steak with higher marbling. On the basis of a 4 city, 1000 respondent survey, these are the results: overall rating of beef steaks increased with increase in grade level; expert laboratory panelists rated steaks similarly to household panelists; 20-25 percent of household panelists were equally satisfied with leaner U.S. Good and U.S. Choice, suggesting a marketing opportunity to establish two lines of beef (lean and marbled); light and medium users of beef responded more to marbling than did heavy users; higher income beef consumers responded more favourably to beef marbling than others; and some 40 percent of panelists expressed concern over ingestion of animal fats but continue to consume beef.

Along with some general information on consumer preference, this research points out the possibility of establishing two lines of beef - lean and marbled.

Branson, R. et al, "Marketing Implications from the National Consumer Beef Study", 1986, Western Journal of Agricultural Economics. Vol. 11, No. 1, pp. 82-91.

This article reports on a large consumer preference study encompassing a large number of consumers. Panel testing of marbling levels in beef appears to confirm the relationship between beef palatability and levels of marbling in loin steaks. A significant consumer market exists for lean beef. The changes in consumer preferences suggest that a name brand lean beef be introduced in retail food chains. Such a change may develop from a structural change in the beef-marketing system. The authors argue that either existing packers will abandon a commodity approach to marketing and adopt brand promotion and advertising or else a further process stage of marketing will arise and fulfil that role.

This article indicates how demand reflects consumers' desires and how returns can be maximized by accommodating such desires even though subject to the influence of advertising. It is of interest to the study that existing grades are not consistent with such desires.

Buse, Rueben C., The Economics of Meat Demand, 1989.

A revised beef grading system implemented in 1972 encouraged Canadian production of leaner beef by providing a premium price for the product, and by lowering finishing costs. However, public awareness of the increased nutritional benefits of lean beef is limited. The U.S. beef grading system is more flexible - it allows for range of products from no-roll lean beef to marbled beef for the HRI trade. Canadian lean beef, although suitable for certain niche markets (California), is not generally acceptable for the U.S. market and even the Canadian HRI market.

This study suggests that Canada may have gone too lean in beef production.

Con, L. et al., "An Analysis of the Use of Grades and Housebrand Labels in the Retail Beef Market", Western Journal of Agricultural Economics. Vol. 15, No. 2, pp. 245-253.

This article deals with two major criticisms of the U.S.D.A. grading system, that U.S.D.A. grade quality depends on fat content in a way that does not correspond to the tastes of low-fat preference consumers and that the lack of a significant difference between the Choice and Select grades has encouraged retailers to adopt housebrand-label beef. The U.S. grading system is therefore not as much used in retail beef marketing as previously and consumers appear confused concerning grades and labels. Consumers have a problem in that they are unable to visually distinguish internal fat in beef well enough to make purchases consistent with their preferences. Consumers desiring low fat beef may use lower price as an indicator of leanness since price is usually positively correlated with internal fat content. The authors suggest that U.S.D.A. adopt a fat content scale and supplement this with recommendations on cooking methods and information on nutrition as a means to assist consumers when making purchases. They argue that consumers would benefit while an incentive would be given to producers to develop and market leaner beef.

Sophisticated econometric methods were used to determine consumer's desires which are for leaner cuts. As a result of the Canadian grading system, prairie producers are in a position to provide just such a product.

Copps, O. Jr., "Utilizing Scanner Data to Estimate Retail Demand Functions for Meat Products," American Journal of Agricultural Economics. Vol. 71, No. 3, pp. 750-760.

Traditional analysis of consumer demand using panels and surveys is very expensive and therefore cannot be continuous. A viable alternative is the use of scanner data which the author contends holds great promise for developing insights from both the theoretical and applied research standpoints. He suggests scanner data may be the ultimate data source for demand analysis at the retail level.

The author collected data from a retail food firm of 33 to 39 stores in Houston over an 18 months period. The data were limited to sales of meat products, steak, ground beef, roast beef, chicken, pork chops, ham and pork loin as derived using the universal product codes and aggregated on a weekly basis. From the data it was possible to determine the price elasticities of the respective meats and the cross elasticities between them. Seasonality could also be measured. In addition, the impact of store advertising could be demonstrated. Indeed, the information provided from the analysis could enable store managers to anticipate the level of sales. Shortcomings of this analysis are lack of consideration of other than meat prices, non-measurement of non-price effects or the actions of competitors and a narrow spectrum of incomes amongst purchasers. Many of these could be overcome.

This form of analysis could be useful when assessing the most appropriate means of presentation of Canadian meat in stores, particularly in out of country locations.

Dahlgran, R., "Changing Meat Structure in the United States: Evidence from a Price Flexibility Analysis," North Central Journal of Agricultural Economics. Vol. 10, No. 1, pp. 165-176.

Using price flexibility analysis the author found that red meat demands have become more variable over time and cross elasticities for beef, pork and chicken have increased in absolute value. He argues that chicken has become a closer substitute for beef and pork in the post 1973 period. The increased demand variability will cause adjustments to be made in red meat production, processing and retailing in an attempt to reduce the price risk when marketing red meats. This increased variability is evidence of a structural change in consumers' demands for

meat in 1973.

The structural change in the demand for meat which occurred is of interest to the present study. It may have provided a degree of impetus for the consolidation which has occurred in the industry in recent years.

Eales, J. and L. Unnevehi, "Demand for Beef and Chicken Products: Separability and Structural Change," American Journal of Agricultural Economics. Vol. 70, No. 3, pp. 520-532.

The authors used two AIDS (almost ideal demand systems) models to illustrate the structural changes which occurred in the aggregate meat market and between beef and chicken parts. Cross-price substitution between beef and chicken is between hamburger and whole birds. Over the 1965-85 period, demand for chicken parts increased by 6.4 percent and decrease for beef table cuts by 3.5 percent. The change in beef demand occurred largely after 1974. The change between the meat products was attributed to convenience. The chicken industry is said to have influenced the structural change in demand by marketing new products. By inference, beef producers (packers) will have to do likewise if the former position of beef versus chicken is to be regained.

This article is of interest as background to the study.

Heien, D. and G. Pompelli, "The Demand for Beef Products: Cross-Section Estimation of Demographic and Economic Effects," Western Journal of Agricultural Economics, Vol. 13, No. 1, pp. 37-44.

The purpose of this analysis was to identify the major demographic factors responsible for the changing beef market shares of steak, roasts and ground beef. In the process, elasticities of demand for each of the cuts were determined. Data from the 1977 Household Food Consumption Survey was subject to AIDS (almost ideal demand system) analysis. Over 95 percent of consumer expenditures for beef are made for these three cuts. The most significant demographic effects arose from household size, region, tenancy and ethnic origin. Occupation, urbanization or the sex of the shopper had little effect. The authors suggest that their results could serve as a guide to innovations in beef merchandising. Demand for steak and ground beef

is inelastic while elastic for roasts. The lower demand for roasts in relation to steak and ground beef is related to household size and the ethnic factor.

The results of this analysis are of interest to the beef industry as well as to the current study since they point to where any increase in the demand lies for individual cuts.

Hicks, Ralph, Consumer Food Trends for the 1990s, for Agriculture Canada, Food Development Division, 1988.

Canada's population is aging, a new ethnic mix is evolving, and increased female participation in the workforce suggest that consumption patterns are changing but not necessarily increasing. As real incomes increase, the food-service industry has expanded and scratch cooking is in decline.

Consumers demand freshness, healthiness, new varieties, attractiveness, shorter meal preparation time - they are increasingly concerned about food safety and the environment. Firms involved in the food sector will face fierce competition in the next decade and success will depend on their ability to innovate, and to anticipate and satisfy consumer demand.

This study provides good background information on consumer trends developing in food consumption.

Hoyes, D. et al., "Testing Restrictions on a Model of Japanese Meat Demand," American Journal of Agricultural Economics. Vol. 72, No. 3, pp. 556-566.

This article provides tests for three hypothesis regarding consumer demand for meat in Japan. These hypothesis are: the separability of demand for meat and for fish, the perfect substitutability of local and import quality beef and the net substitutability of meats. While the means of testing these hypothesis will be of interest to mathematicians, the acceptance or rejection of each of these hypothesis is relevant to those who would market meat in Japan. Japanese consumers spend almost as much on fish as on all other meats combined. The analysis indicates that the markets for fish and other meats are essentially different.

Beef from different breeds is not perfectly substitutable, i.e., in other words, imported beef is not considered the same as local beef. The only consistent complementarity evident is between chicken and import quality beef and pork. The results indicate there is minimal substitutability

in the eyes of the consumer amongst the different meats. The specificity of Japanese meat demand therefore presents a challenge to anyone attempting to export to that country.

Moschini, G and K. Meilke, "Modelling the Pattern of Structural Change in U.S. Meat Demand," American Journal of Agricultural Economics. Vol. 71, No. 3, pp. 253-261.

This research was designed to test the presence of a structural change in meat demand in the United States. The analysis indicates that patterns of meat consumption over the last 20 years cannot be fully explained by the dynamics of pricing and income. Structural change was found to be based against beef, neutral for pork and in favour of chicken and fish. Dietary concerns are considered one source of this change.

While the relative increase in consumption of poultry and the relative decline in the consumption of beef have been well documented elsewhere, the impact of structural change in demand for beef must be taken into account by those wishing to expand sales of this commodity particularly in countries such as Canada and the United States.

Thurman, W., "The Poultry Market: Demand Stability and Industry Structure," American Journal of Agricultural Economics, Vol. 69, No. 1, pp. 30-37.

The author used ordinary least squares (OLS) and two stage least squares (2SLS) in his analysis of annual data for 1955-1981 with respect to the U.S. poultry market to establish the demand for poultry meat. He concluded as a result of his analysis that the poultry industry was competitive, had constant returns to scale and faced elastic factor supplies. There was an outward shift in the demand for poultry meat in recent years, whereas pork and poultry meat had formerly been substitutes they had now become independent goods. He also found that the price of poultry meat was predetermined by the costs of production and that quantity was determined by demand.

This study is of interest in as much as pork and poultry meat are found to be independent goods.

Wahl, Thomas I. et al, Analyzing Seasonality of U.S. Meat Demand by Using Disaggregated Weekly Data.

This paper analyzed wholesale prices and quantities of primal (or subprimal) cuts of beef, pork and chicken. Researchers felt that seasonal variation could be captured more effectively using wholesale prices because retailers often absorb seasonal variation in supply and demand to avoid changes in retail meat prices. Chicken consumption is greatest in the first six months of the year and results indicate a preference for beef over chicken during barbecue season. Ground beef should be separated from beef in demand analysis because it tends to be consumed at fast-food restaurants whose business suffers during barbecue season. Pork expenditures peak in the fall except for pork bellies and ground pork. Estimates of the Almost Ideal Demand System support the argument that meats (beef, pork and chicken) should not be treated as homogeneous commodities. For instance, own-price elasticity of more expensive cuts of beef is less than that of cheaper cuts of beef; this happens to a lesser extent with pork and chicken.

This research is important because it deals with the complex nature of demand analysis for meat products, whether on an aggregate or disaggregated basis.

PRODUCTION AND SUPPLY

Agriculture Canada, Structural Change in the Livestock Sector, Working Paper 4/88.

This review of data obtained through the 1986 Census of Agriculture indicates significant structural changes occurred between 1981, the previous census, and 1986. This was particularly so in the case of the hog industry. Farms were specializing in hog production and further integration of farrowing and finishing operations was apparent. In so far as cattle were concerned, while animal numbers appeared stable there was further specialization in both cow/calf operations and in feedlots. Animal production efficiency increased over the five year period which allowed greater output to be achieved from a stable basic herd.

This report is of interest to the study since it indicates the concentration of animal production in fewer hands and this is associated with higher productivity. There exists the potential for lower unit costs of production.

Agriculture Canada, Development of the Agri-food Sector in British Columbia, 1986.

The British Columbia beef industry represented 13 percent of total provincial farm cash receipts in 1984, a significant decline from 18 percent in 1971. The industry is advantaged by low cost rangelands for grazing but disadvantaged by the higher cost of feed grains that have to be shipped in from Alberta. The beef industry in British Columbia is characterized by the following: average herd size is larger in B.C. than in the rest of Canada but there remain many small scale operations, which represent a production management constraint; there is a general lack of information on the performance of the B.C. beef industry; and, beef grade yields are relatively low because of the larger proportion of cows and underfinished cattle slaughtered.

This study indicates that potential development opportunities include extending current grazing areas and intensifying existing ones, possible relocation of some beef production and processing in order to cut transport costs to market, and the production of heavier livestock.

Agriculture Canada, Capacity and Competitiveness of the Western Canadian Red Meat Slaughtering Industry, September 1987.

As of April 1987, there were 30 federally inspected slaughtering plants in Western Canada with a one shift five day a week operation capable of slaughtering 40,000 head of cattle and 128,000 hogs. Utilization of cattle facilities averaged 90 percent in 1986 and that of hog facilities 66 percent. A limited number of animals were also slaughtered in provincially inspected plants. Ample capacity existed to slaughter all the cattle and pigs produced in Western Canada. challenges to the slaughtering industry were economies of scale, wage rates and production per unit of labour. Most cattle slaughtering plants had slower line rates than those in the U.S. with costs therefore being higher. Large hog plants are believed to have costs similar to those in the U.S. Because of line rates, it was estimated costs per head were \$4.00 to \$6.00 higher than in the U.S. A large scale Canadian plant would not be able to match U.S. costs unless operating at optimum capacity without the need to raise prices to attract animals from further afield. Investment in a large scale plant has to take into consideration economies of scale, wage rates, production per hour of labour, the supply of animals and the demand for meat.

This report is one of a limited number which provide insights into slaughter economics and is therefore valuable to the study.

A.H. Beswick and Associates, An Evaluation of the Capability and Capacity of the Canadian Hog Pork Industry, 1990.

This study examined the Canadian hog/pork industry and found a 25 percent production surplus over domestic consumption. Pork slaughter and processing facilities were underutilized by 20 percent and capacity could be increased without major capital investment by improving production and operational efficiencies. Because 80 percent of Canadian exports of pork are to the U.S., this continued dependence on the U.S. market should be reduced.

This study suggests that Canada would have to be prepared to face vigorous competition from U.S. and EEC in the non-traditional off-shore markets.

Alberta Agriculture, Alberta Wheat Pool, Impact of a Change to a Pay the Producer Method of Payment on Alberta's Grain and Livestock Sectors, September 1989.

While the secondary author has questioned the veracity of the results largely on the basis of the econometric research techniques adopted, these results remain of significant interest. The trends found evident should be respected. Estimates are made of the changes which would have occurred between 1978 and 1988 should the pay the producer method payment have been in effect during the period. With respect to livestock, the cow herd was expected to increase by 12 percent or 125,000 head. Feeder cattle inventories would have increased by 23 percent or 185,200 head. Calf feeding would have become attractive. Feeder imports from Saskatchewan would have increased by 9 percent or 14,800 head. Hog numbers would have changed little over the period, in the 5-10 percent range or about 4-6 thousand head. If the pay the producer method of payment had been in effect over the period, the increase in producer incomes from the sale of additional livestock would have been substantial though not equally distributed around the province, the principal recipients being calf producers who would have received an increase of 12 percent or 88 million in annual gross income and feedlot operators who would have experienced an annual increase in gross revenue of \$330 million.

This report identifies the increase in incomes to livestock producers which would occur if the method of payment were to change. It is thus a useful reference if determining the impact of pay the producer in the current study.

Alberta Cattle Commission, Alberta Pork Producer's Development Corporation, The Alberta Sheep and Wool Commission, Preparing for Change - A Study of the Impact of Regulatory Costs on the Competitive Position of Alberta's Red Meat Industry Under the Free Trade Agreement, 1989.

This group recognized that the key to the competitive position of the Alberta industry in the U.S. market is the regulatory environment in which the local industry operates relative to that in the U.S. The Alberta industry sells 60 percent of its production outside the province. While the industry was developed to serve the domestic market, the situation is changing rapidly as the need for access to and competitiveness in the U.S. market increases. Under the Free Trade Agreement, distinctions between the two markets will gradually disappear. While to date the pork and beef cattle industries have been able to compete in the North American market,

regulations and labour costs adversely affect competitiveness in processed products. The group identified labour legislation as the greatest impediment to the development of a stable processing industry. Future legislation should be viewed in the light of how it affected competitiveness. Labour costs should be brought in line with those in the U.S., simple and clearer regulations should be applied with respect to the environment, costs of truck transportation should be minimized and inspection and packaging regulations applied which will maximize export competitiveness.

This study spells out some government actions which are perceived to affect adversely export competitiveness and therefore provides useful background for the study.

Bobst, B. and J. Davis, "Beef Cow Numbers, Crop Acreage and Crop Policy," American Journal of Agricultural Economics. Vol. 69, No. 4, pp. 771-776.

The authors of this article illustrate that land use shifts between cropland and pasture affect the size of beef-cow inventories because economical cow-calf enterprises are pasture based. Using U.S. data, they estimate that for a one million acre change in harvested cropland, the basic cow herd would change inversely by 36.6 thousand head. Crop policies which encourage conversion to pasture would stimulate rebuilding of the beef herd with an attendant increase in the beef supply. In fact, curtailment of the expansion phase of the cattle cycle at the time (1987) was said due to the large acreages switched from pasture into cropland in the 1980s.

This article is of particular interest to the study where a change in the method of payment may in the intermediate and long run result in a significant shift from crop to livestock production in particular areas of the prairies. This article indicates that such a shift would have a substantial effect on the cattle herd.

Canada Sheep Council, The Impact of Chilled Lamb Exports on the Canadian Sheep Industry, 1987.

This report examined the implications of lamb imports into Canada. The Canadian sheep flock declined from some 3.5 million in the 1930's to .7 million in the 1980's and this decline is attributed to a decrease in per capita disappearance of lamb, lower retail prices, the labour intensiveness of the industry, lack of consumer awareness, and increased import pressures.

Canadian sheep production is concentrated in Ontario, Quebec and Alberta and provides 76 percent of domestic fresh lamb consumption. In 1986, New Zealand provided 90 percent of the total Canadian frozen lamb imports while Australia and the U.S. provided 90 percent of chilled carcass imports. Demand for lamb is increasing with population growth and there is a slight per capita increase in consumption; however, there has been virtually no supply response in Canada. Canada is only 40 percent self-sufficient in lamb but Alberta is a surplus producer and markets its excess supply in eastern Canada which is the most important market for lamb in Canada. Canadian lamb is perceived to be of excellent quality, and milder and fresher than the imports, especially those from Australia.

Although there is limited research material available on the sheep industry, this report adequately identifies areas requiring attention.

Dawson, Dau and Associates, A Review of the Past and Current State of the Alberta Beef Processing Industry and Implications for the Future, for Alberta Agriculture, 1984.

Alberta depends on out-of-province markets for beef and, since 1970, has increased beef cow herd and slaughter. In cattle production, where feed represents 55 to 60 percent of finishing costs, Alberta appears to be somewhat at a disadvantage because of transportation and trade policies. Prospects for beef processors depend on availability of slaughter cattle, industry processing capacity and input costs, particularly labour rates, and their ability to compete with the highly concentrated U.S. industry.

This study identifies Alberta's concern with transport and trade policies that have an adverse effect on its beef industry.

Equus Consulting, Into the Nineties: A Sectoral Profile and Situation Analysis of the Beef Industry of British Columbia, for the Beef Industry Development Council, 1990.

The purpose of this study was to provide the BIDC with an overview of the B.C. beef industry to facilitate policy development. The study found that producers must compete with other interest groups for rangelands but the relative abundance of forage indicate continued growth in herd size until 1993. With increased concentration in the slaughter/packing sector and discount backhaul rates to Alberta, there are increased opportunities for livestock exports, but

these higher exports are probably temporary. It is difficult for B.C. to compete with Alberta's lower feedlot operation costs and B.C. cannot match the economies of scale in the slaughter/packing sector. B.C.'s advantage is its proximity to the large Vancouver market.

In the retail and HRI sector, there is a fundamental shift as the beef industry is driven by demand forces rather than supply pressures as happened previously. Retailers are quick to respond to trends such as lean meats, value-added cuts, specialty food preparations, and value-added hot foods, but they do not initiate these changes. The HRI is sourcing more no-roll beef from the U.S. and the lack of harmonization of grading standards allows U.S. processors to sell Grade A equivalent cuts at ungraded prices.

There are few studies of the B.C. beef industry and this one provides some interesting background information on the industry.

Freeze, B. and R. Hironaka, "Effect of Form of Hay and Carcass Quality on the Economics of Concentrate: Hay Substitution in Cattle Feed Lot Diets," Western Journal of Agricultural Economics. Vol. 15, No. 2, pp. 163-174.

The authors use linear programming to determine the economic optimum feeding regime in terms of final quality of the product, such optimum representing maximum profits. The economics of hay/concentrate substitution depended largely on the price of hay (concentrate prices being relatively fixed). Cubed hay diets were found less efficient than those containing regular alfalfa hay as roughage. The optimum combination in this feeding experiment was found to be the 40:60 alfalfa hay-concentrate combination. Diets used in feed lots often lie in the 15:85 combination range since this reduces the number of days required on feed.

This is a very interesting article from the standpoint of linking feeding regimes to quality of the final product and net returns. A follow-up analysis is pending covering a wider range of hay concentrate ratios.

Harvest Foods Ltd, The Saskatchewan Lamb Industry Study, Industry and Market Characteristics, for Saskatchewan Sheep and Wool Marketing Commission.

Phase 1 examined the potential for diversifying Saskatchewan's agricultural sector with increased sheep production. Although it is difficult to determine causality, the sheep industry has been declining and several conclusions were drawn from this research: the Saskatchewan lamb industry suffers from high production costs as indicated by declining sheep numbers, declining flock size, high producer turnover, and a lack of supply. Despite Prairie Shepherds Marketing Co-op's failure to establish a local commercial market for processed lamb, there are significant market opportunities for Saskatchewan lamb, especially in out-of-province markets. The Saskatchewan lamb industry has not been cost competitive because of high production and distribution costs. Phase 2 analyzed the strengths and weaknesses of the Saskatchewan lamb industry and identified the following market opportunities: lowering costs of production and assembly in order to compete with U.S. live lamb imports to Ontario and Alberta; and, increasing farm-gate sales of lamb through promotional and marketing activities.

This research correctly identifies the problems in the Saskatchewan sheep industry and areas for improvement.

Horner, Hugh M. A Review of the Meat Industry in Alberta, for Alberta Economic Development, 1981.

Recognizing Alberta's potential for development, this review was commissioned in 1980 to look at the meat industry, past and present, and to develop a strategy for the future. It was also recognized that action in any one component without complementary action in other components would reduce the ability to reach that potential. Some recommendations for the meat processing industry were: reciprocal agreements with other provinces for meat inspections; provision of marketing assistance to local abattoirs; consumer awareness programs to promote local products from Class A abattoirs; and, identification of meats to allow international acceptance and demand for Alberta meat. The review suggested that Alberta Meats could play a key role in the processed meats industry through: financial and technical assistance for processed meat products being market tested; front-end financing of new products and their promotion; technological improvements in meat processing; research and development; and

technology transfer.

This study shows that Alberta appears to have recognized at a very early stage the need to improve the quality and increase the capacity of meat processing in the province.

Johnson, D. Gale et al, Competitive Issues in the Beef Sector: Can Beef Compete in the 1990s?, 1989.

The U.S. beef industry has changed rapidly and significantly in past quarter century, particularly in terms of concentration and merchandising methods. This study addressed questions with respect to the U.S. beef industry's ability to compete domestically and internationally given changes such as the emergence of boxed beef and new ways to price cattle, i.e., many transactions occur directly from feeder to packer.

Cattle producers were urged to use the most efficient production technology available and to exploit economies of size. The study suggested that the cost of beef was rising relative to other meats.

Policy makers were cautioned about the current levels of concentration in the meat packing industry, and the need to sustain an open international capital market. For the purpose of trade liberalization, the U.S. would have to be prepared to loosen up in the area of import quotas and voluntary export restraints. Instability in beef markets could be reduced with a shift to more market-oriented commodity programs.

This study suggested that producer organizations should initiate information and educational programs with respect to the safety and wholesomeness of beef. Producers should be made of aware of the role of futures markets in risk management and the possible introduction of a boxed beef futures market.

Kulshreshtha, Suren Economies of Size in Saskatchewan Hog Industry, 1991.

This study examined the economies of size for Saskatchewan hog producers and, based on 1988 data, found a declining cost up to \$200,000 worth of GVHP (about 2000 hogs). Costs levelled off and the absolute minimum point on the average cost curve was reached at a GVHP value of \$1 million. Researchers found that farms with hog production as a smaller proportion

of their total operation experienced diseconomies of size at a relatively lower GVHP. Other findings include: cash costs are determined more by degree of specialization rather than size of the operation; hog purchase cost declined faster on highly specialized hog farms; and feed costs declined with size of the farm, and on farrow to finish operations. Finally, in 1988 farms with farrow to finish operations experienced a relatively higher average total cost than feeder to finish operations.

This research accentuates the need for Saskatchewan hog producers to exploit economies of size in their operations.

Martin, Larry J. and Ellen W. Goddard, The Economics of Canadian Hog Stabilization Programs and U.S. Countervailing Import Duties, University of Guelph, 1987.

The objectives of this research were to determine the effects of federal and provincial stabilization programs on hog marketings in Canada, the extent of injury to U.S. producers as a result of increased Canadian marketings, and the effect of the stabilization programs on prices to Canadian packers. Of particular interest were the price elasticity of U.S. excess demand function for hogs and pork, and the supply response to Canadian stabilization programs. The analysis of supply response considered the level of payments, producers' perception of stabilization payments vis-a-vis that of regular market revenues, and the effect of the payments in reducing risk.

The study concluded that Canadian marketings did not increase significantly with the implementation of Canadian stabilization programs nor did U.S. prices, and Canadian packers did not benefit significantly from stabilization programs.

Marv Anderson and Associates, Impacts of Technological and Economic Changes on Productivity in the Alberta Beef Industry, prepared for Agriculture Canada, Regional Development Branch, Alberta, 1985.

The basic objectives of this study were to determine the rate of technological change in the Alberta beef industry, the source of this growth, expectations for the future, and government's role in those future developments. There was an average productivity gain of approximately one percent per year during the period 1960-83 and this was largely attributed to increased

capitalization of the larger beef operations in south-central Alberta, improved reproduction efficiencies, and improved health and nutrition. Along with trends anticipated until the year 2000 with respect domestic and export demand, and relative beef prices, productivity gains for that same period were estimated at .75 percent per year. This somewhat slower progress in average level of production efficiency could be partially explained by the industry structure, i.e., thousands of "part-time" operators. Breakthroughs in areas such as disease resistance through genetics; ovum transfer, sex control and twinning; improved pasture productivity; heavier weaning weights; controlling physiological appetite control; further advances in nutrition; parasite control; etc. were identified but, for the time being, existing production technology would have to be improved and utilized.

This study points out that funding for well-targeted research, as might be expected, is subject to very complex political-institutional considerations.

Mullen, J.D. et al., "Input Substitution and the Distribution of Surplus Gains from Lower U.S. Beef Processing Costs," American Journal of Agricultural Economics. Vol. 70, No. 2, pp. 245-254.

The authors used ordinary least squares (OLS) and two stage least squares (2SLS) to determine the effect of switching from boned beef to tray-ready beef upon the distribution of the additional gains which would accompany such a practice. They found that the distribution of the gain was directly related to the elasticity of supply. If no input substitution was imposed the gains were distributed 72 percent to producers, 27 percent to consumers and one percent to by-product users. A limited degree of input substitution caused the shares of the gains of the respective groups to change to 57 percent, 42 percent and one percent. In the long run, after all adjustments occurred, the producer's share of the gain fell to 9 percent, the consumers rose to 88 percent and the by-product users increased to 2 percent.

This study is of considerable interest. Technology in meat processing has not been adopted as rapidly in Canada as in the U.S. Tray-ready beef prepared in the packing plant is just now reaching retail counters in volume. Producers should recognize that preparing beef (or other meats) in the form most attractive to consumers will result in initial price gains to them but over time these will erode as the new form of product becomes the adopted norm.

N.C.A. Beef Industry Concentration/Integration Task Force, Beef in a Competitive World, 1989.

This report outlines the trends observed by the Task Force with respect to the cattle industry in the United States. The Task Force considers that the nation and beef industry are best served by a capitalistic, competitive, free market system. Concentration will continue to occur but at different speeds within the various sectors of the industry. At the packer level, concentration is considered almost at a standstill, whereas that in cow/calf operations is in full swing as both attempt to exploit the economies of scale. Feed lots are becoming fewer and larger with packer ownership of livestock on feed increasing. Complete vertical integration of production is, however, not foreseen. Pricing of live cattle are expected to be determined on the basis of value as expressed in prices for boxed beef, while the number of cattle producers is expected to decline the economies of scale arising there from are expected to enable beef to be competitively priced with pork and chicken. Beef exports are expected to increase.

The insights provided by this report will be of significant value to the study in as much as the existing trends in industry structure and efficiency are spelled out. Unless comparative trends are followed by the Canadian industry the prospects for greater penetration of the U.S. market appear slim.

Rosaasen, K.A. and Andrew Schmitz, The Saskatchewan Beef Industry: Constraints and Opportunities for Growth, Technical Paper, 1984.

Given the decline of livestock production in Saskatchewan during the previous decade, this study examined the economics of the industry. Of particular importance was the decline in cow numbers, the increase in calves shipped to Ontario and Alberta for finishing, and the high proportion of slaughtering outside the province. The cow-calf and feeding operations were found to be unprofitable and generally perceived as high-risk. To achieve economies of scale would require additional management skills. Although packing house capacity did not represent a constraint to the feeding operations, the facilities were rather obsolete in that they did not have the technology to process boxed beef.

The study concluded that there was a need to implement, and follow through, with some long-term development strategy to increase cattle and beef production in the province of Saskatchewan.

Ross, Carlyle et al, The Location of Cattle Production in Alberta, 1990.

Alberta's abundant resources support a thriving beef cattle industry. Generally speaking, cattle feeding and slaughter plants are located in southern Alberta while the cow-calf industry appears to be concentrated in northern Alberta. Southern producers seem to be more sensitive to output prices (calves, slaughter cattle) but less sensitive to barley prices than northern producers. The expansion of cattle feeding in the south can probably be attributed to fewer production options, greater risk taking, and wider feeder margins than in northern Alberta; irrigation and sugar beet production (beet tops for feed) also encourages cattle feeding.

Although transport cost savings from proximity to U.S. markets are more than offset by the increased cost of importing feed and feeder cattle from northern Alberta, the warmer and drier climate in southern Alberta is more conducive to feeder and slaughter activities than that of northern Alberta.

This report provides some useful background information on Alberta's cattle production.

Ryan, M.M. and M.H. Hawkins, Future Directions for the Alberta Sheep Industry, 1990.

This study examined the supply response for lamb, wool and cull sheep for the Alberta sheep industry using linear programming and econometric procedures. Results from both techniques suggest that lamb supply is insensitive to changes in market prices in the medium and long term, and wool and cull sheep supply is relatively stable over large price ranges. Using a Markov chain process, an examination of farm size from the early 1950's to the mid 1980's indicated a trend toward increased concentration. A minor focus of this study was demand analysis for fresh and frozen lamb in Alberta. Price was not as important a variable in determining demand for lamb as with other meats; lamb is considered a specialty meat often consumed during Easter and Christmas. Marketing strategies suggested for the sheep industry include demand expansion programs, supply management and a centralized selling agency to increase operational and pricing efficiency.

This is one of few studies on the Alberta sheep industry and it provides some good background information.

Taylor, J.S. et al, Economics of Hog Production in Saskatchewan, 1991.

Researcher examined the economics of hog production in Saskatchewan and found that in the 1988 production year, hog producers could not cover their costs of production without government assistance. Data indicated that hog farmers were more highly leveraged than other farmers in Saskatchewan. The report suggested that economies of size do exist for Saskatchewan hog producers because cost of production declined as size increased for each degree of specialization.

Townsend, Jim et al, Competitiveness of the Beef Industry in Canada and Beef Imports, Working Paper, for Agriculture Canada, Policy Branch, 1991.

This report examined the linkages between the trade in beef and the industry's competitiveness. For the last decade, Canada has been essentially a net exporter of live cattle and beef to the United States. There has been increased competition for slaughter cattle in the North American market coupled with declining cattle population and geographic shifts in livestock production. Canadian processors are having a difficult time competing with the larger scale, integrated and well established U.S. beef processors especially in the production of manufacturing beef. Successful cattle feeders have to survive on smaller margins and capture economies of size.

This research suggests that Alberta seems to be the only province with growth potential in feeder cattle production and a packing industry infrastructure with a long-term viability.

Trapp, J., "Investment and Disinvestment Principles with Nonconstant Prices and Varying Firm Size Applied to Beef Breeding Herds," American Journal of Agricultural Economics. Vol. 68, No. 3, pp. 691-703.

A sophisticated economic analysis is used to determine optimal culling and replacement rates for beef breeding herds under the operation of the cattle cycle. Financial returns are found to be greater where herd size varies inversely with peaks in the cattle cycle. Culling and replacement rates must anticipate the feeder cattle price cycle by from four to six years. The author admits that while a cyclical herd size is optimal given perfect knowledge the degree of price forecasting accuracy needed to make a cyclical strategy more profitable than a constant herd

size strategy is not known.

This article is of interest as background for the study. It confirms the merit of herd size strategies that may be followed by some successful producers.

Whipple, G. and D. Menkhaus, "Supply Response in the U.S. Sheep Industry," American Journal of Agricultural Economics. Vol. 71, No. 1, pp. 126-135.

The authors use a dynamic supply model to determine the factors affecting the supply of sheep and wool in the U.S. The sheep industry has been in a period of incipient decline since the 1950s even though wool is supported by a deficiency payment scheme. Over 90 percent of the wool used in the U.S. is exported and the imports of lamb and mutton are substantial. The research indicates that the sheep industry declined as a result of high labour costs giving rise to substitution of the less labour intensive cow-calf production for the sheep enterprise. High lamb prices had a positive effect on the size of the breeding flock, which is also directly impacted by the price of wool. The authors conclude that any reduction in the support price for wool would substantially lower the domestic output of lamb and wool over time.

This study is of interest since the same factors affect the size of the flock in Canada.

OTHER CATEGORIES

Agriculture Canada, Policy Branch, *Factors Affecting Trade Between Canada and the United States in Cattle, Calves, Beef and Veal*, Working Paper, 1987.

This paper examined U.S. cattlemen's concerns that subsidies to Canadian cattle producers allow them an advantage in the U.S. market. The U.S. producers felt that their industry's poor economic state was further exacerbated by increased imports of cattle and beef from Canada. These five major factors were recognized as contributing to the increased net exports of Canadian bovine products to the U.S. from 1976 to 1985: a more rapid rate of beef cow herd liquidation in Canada than in the U.S.; an increase in price spread for slaughter cattle between Western and Eastern Canada largely due to increased transport costs; the depreciation of the Canadian dollar (Meilke and Coleman estimated that a 10 percent decrease in the Canadian versus U.S. dollar increases exports to U.S. by 27 million pounds); increased offshore beef imports, especially EEC (for every pound of EEC beef imported to Canada, an estimated .9 pounds of beef was exported to the U.S.); and a decrease in feedgrain prices (low barley prices have reduced the incremental cost of meeting U.S. choice standards, i.e., to fatten cattle).

This study addresses some of the U.S. cattlemen's concerns that Canadian cattle producers were unfairly subsidized.

Agriculture Canada, *Seasonal Price and Marketing Variations in the Livestock Industry*. Working Paper 17/86.

This paper deals with seasonality in Canadian and American marketings and prices of cattle, hogs, lambs and chickens. Prices display patterns of the approximate increase of marketings. Prices of cattle and hogs show significant seasonality but since their production patterns are different, their seasonality is also different. Furthermore, seasonality in prices in Canada does not necessarily follow the pattern in the United States. Lamb prices are also highly seasonal reflecting the production and marketing pattern. On the other hand, prices for chicken show little seasonal variability in Canada, no doubt a reflection of the supply control exercised through marketing boards.

This paper yields insights into the variability of animal prices and outputs in both Canada

and the United States. This leads to the suggestion that opportunities exist for arbitrage in livestock products between the two countries.

Canada Sheep Council, Sheep 2001: A Strategy for the Canadian Sheep Industry, 1989.

This report examined the Canadian sheep industry in terms of what it could do to improve its position in the domestic market. Technology levels in sheep production were found to be low, particularly in flock health and nutrition. There is low priority given to sheep research and no system of communication between researchers and extension specialists. Product development and marketing are almost non-existent and there is no attempt to identify the domestic product - 70 percent of the domestic market is supplied from off-shore sources. The Canadian wool industry is seriously out-of-date.

This report points out that the national organization is under-funded and under-staffed, and cannot be expected to achieve much with such limited resources.

Canadian Agricultural Consultants, Potential Impacts of a Reciprocal Beef Grading Agreement, for Alberta Agriculture, 1987.

A Reciprocal Beef Grading Agreement with the United States could be defined as "a mutual agreement to permit the application (at the point of slaughter) of the beef grade stamps or legends of the importing country to carcasses or pieces of beef carcasses intended for export." The grade assigned to a beef carcass or cut has economic significance because it provides the consumer with an indication of value based on the ratio of lean meat to fat to bone and the relative maturity of the animal. The grading systems in Canada and the U.S. are based on a different set of criteria; the U.S. customer pays a premium for a specified minimum of marbling whereas subcutaneous fat depth is the primary determinant of yield grade under the Canadian system.

Despite the obvious differences, reciprocal beef grading is theoretically possible because of the similarities in Canadian and U.S. livestock production and feeding methods, meat production and processing, meat cut specifications, distribution infrastructure, and consumer behaviour. The conclusions of this report are presented in the following paragraphs.

Canada is a net exporter of beef and the value is lower per pound than beef imported from the United States. There are increasing imports of U.S. no-roll product for the H.R. trade similar to Canadian product, but lower in price. Based on a comparison of prices of premium Canadian and U.S. cuts, opportunities for Canadian exports are relatively limited.

Under Reciprocal Beef Grading, there would be limited net benefits to Canadian processors selling beef carcasses to the U.S. because of having to compete with the increasingly integrated operations which have lower wage rates, economies of size, strong merchandising and cattle procurement positions. Canadian processors, who face higher labour wage rates, would be disadvantaged in boxed meat because they have been slow in making the transition from carcass to cut market.

This research is quite important because most Canadian slaughtering and processing firms perceive Reciprocal Beef Grading to their detriment, citing the lower costs of U.S. no-roll beef as an example of the cost efficiency of U.S. packers.

Considine, J. et al., "The Impact of a New Grading System on the Beef Cattle Industry: The Case of Canada", Western Journal of Agricultural Economics, Vol. II, No. 2, pp. 184-194.

In an environment where reciprocal grading is being discussed between U.S. and Canada, the costs of any change to an existing grade structure are highly relevant. Considine's article must be considered a classic in terms of the determination of such costs. She found that the change in the Canadian beef grading system in 1972 gave rise to significant declines in the average value per head. Several years elapsed, 5-8, before producers were able to adjust their practices to meet the new system, initial losses of in excess of \$21.00 per head being replaced by gains in the region of \$40.00 per head after 10 years - the change in grading therefore being beneficial over time. She suggests that rather than an abrupt change as in 1972, ordinal rankings of grades should be avoided and replaced by identification of their characteristics to consumers who would select the bundle that best suits their taste.

This article is excellent as background for consideration of a grading system which might be adopted for fostering export demand.

Crow, Richard J. Economics of the U.S. Meat Industry, Agriculture Information Bulletin No. 545, Economic Research Service, 1988.

This report examined the overall economics of the meat industry including shifts in demand, production and distribution, government regulatory policies, and costs, gains and losses in the processing and production sectors. The highlights are: during the period 1963-84, consumer food expenditures dropped from 18 percent to 13.5 percent of disposable personal income, indicating a higher standard of living; retail grocery stores handle about 60 percent of U.S. beef and broiler meat and more than 80 percent of U.S. pork; there are fewer, but larger slaughter facilities which are located near livestock production canters; carcass fabrication is increasing; labour represents almost half of slaughter and process costs; and, farrow-to-finish operations produce 60 percent of U.S. hogs.

This report underscores the important changes that are occurring, not just in the market place, but especially at the producer and processor level.

Deloitte, Haskins and Sells, Retail Meat Merchandising in Canada, for the Canadian Cattlemen's Association.

This undated, but approximately ten year old report, looked at retail margins for beef, pork and chicken in Canadian and U.S. cities in order to determine why beef prices move up and down, and retailers' decisions with respect to relative prices of beef, pork and chicken. Based on weekly price data, the study revealed that beef retail margins increased more rapidly than the cost of retailing during the period 1976-81.

In 1976 beef prices were relatively lower than pork and the retail margin on beef was below the actual cost of retailing. During the next five years, retailers switched from the "heavy specialising" of beef to pork and other products, which appear to be more attractive items for retailers to feature.

This study on retail meat merchandising is of some importance because it reveals the intricacies and dynamics of the marketplace and the problems faced by beef producers.

Deloitte and Touche, Reciprocal Grading of North American Beef - Issues and Impacts, for the Canadian Meat Council, 1990.

The purpose of this research, which was undertaken in two phases, was "to determine the degree to which the ability of putting a U.S.D.A. Choice designation on Canadian beef would enhance Canada's exports". Phase I, which is a qualitative analysis of perceptions of the Canadian and U.S. beef industry participants, yielded the following results: ungraded U.S. beef is exported very successfully to central Canada where beef buyers tend to focus on price, quality, uniformity and consistency rather than country of origin; U.S. packers appear reluctant to grade to Canadian standards because of increased production problems and the relatively limited Canadian market; and, U.S. buyers are not very familiar with the Canadian product. Even though grading Canadian beef to U.S. standards would reduce resistance to Canadian products, it would not eliminate it. Phase II, which provided an empirical investigation of the ramifications of reciprocal beef grading agreement, was hindered because direct price comparisons were not possible. Canadian and U.S. industries do not cut their sub-primals to the same specifications and not all components of the primal cuts are exported. Nevertheless, the analysis yielded the following results: under a Reciprocal Beef Grading Agreement, Midwest U.S. packers would consistently improve their gross revenue position relative to selling in the domestic market; and, given the opportunity to export graded product to the U.S., Canadian packers would experience limited opportunities to increase revenues but these opportunities were also found to be inconsistent over time and across sub-primal cuts.

This study suggests that the removal of tariffs under CUSTA would have minimal effect on the opportunities arising from reciprocal trading. On the other hand, a devalued Canadian dollar would greatly increase Canadian packers' revenues from the exports of graded product to the United States. Naturally, U.S. packers' fortunes in exporting graded product to Canada would be significantly diminished by a relatively strong U.S. dollar.

Econolynx International Ltd, Marketing Opportunities for Western Canada's Pork and Beef in the Far West USA, for Agriculture Canada, Marketing and Economics Branch, 1986.

In anticipation of the changes arising from the WGTA 1984 and possible change in the method of payment, this report examined the short-term and long-term opportunities for Western Canadian cattle and hogs and derived red meats in California, Oregon and Washington. Western Canada is a cattle and beef surplus area; most slaughter cattle are shipped east but there is an opportunity to sell fat cattle in the U.S. because they can be graded U.S. Choice. Otherwise, differences in beef grading and specifications act as a deterrent to Canadian beef exports. Hog and pork shipments to Eastern Canada are not significant, however, since the imposition of a countervailing duty of 4.4 cents per pound on live hogs, pork exports to the U.S. have increased substantially. The U.S. Far West region, with a population of over 32 million in 1985, is in a net deficit position for pork and beef. Supplies are purchased mainly from the U.S. Midwest, Southwest, West North Central and Western Canada. Over the years, animal production, slaughterhouses and meat processing plants have shifted to feed surplus areas such as the U.S. Midwest.

Per capita consumption of red meat has declined and this is attributed to health concerns and a shift to poultry and fish. Projected population growth is expected to compensate for the decline in per capita consumption, and the popularity of "no-roll" leaner meat in the large California market represents an opportunity for Western Canadian beef and pork producers. Current tariffs on livestock and meat exports are minimal; grading differences between Canada and the U.S. create a problem because Canadian A1 and A2 beef cannot earn a price premium in the U.S. markets. Delays and rejections associated with border health inspections discourage buyers and sellers and erode Canada's reliability as a supplier of red meats. Transportation costs for Alberta beef shipped to the U.S. Far West are competitive but there appears to be product imbalance for domestic truckers who have some difficulty obtaining backhaul loads from California to Alberta. Because attractive prices offered in Los Angeles are not consistent, Western Canadian suppliers of beef have a problem in guaranteeing supplies at required specifications. On the other hand, pork producers are advantaged by relatively persistent "after shipping cost" positive price differentials in Southern California. Western Canada's future

prospects appear to be in meat exports rather than livestock except for sales of fat cattle to Washington. Furthermore, a practical approach would be to find the niches for the quality-conscious, high-end of this huge market for beef and pork.

This report provides useful information on market opportunities in the U.S. and factors affecting Canadian meat exports into that market.

Faminow, M. and B. Benson, "Integration of Spatial Markets," American Journal of Agricultural Economics. Vol. 72, No. 1, pp. 49-62.

The authors test for market integration using as their example hog prices in Canada over the period 1965 to 1975. This period was divided into two segments; up to July 25, 1970 and after that date. While basing point pricing was not perfect in the former period, there was evidence that prices in the four western markets were linked. In the latter period, prices in Edmonton continued to be based on Calgary. Marketing boards in the western provinces were a feature of the latter period. There appeared to be some relationship between the advent of these boards and a change in the pricing structure. However, other institutional changes occurred in the same period. The authors argue that high levels of price interdependence along with price differences between hog buying locations which reflect transportation costs are symptomatic of price collusion.

The structure of the packing industry and also the presence of or lack of export outlets can be said to influence the price relationships between the markets. Outlets for product surplus to the local market appear to have enabled prices for hogs to shift to a more provincial basis. A review of prices in the last decade would also no doubt reveal certain price relationships between regions.

Jones, S. et al., Yield Differences Between U.S. and Canadian Grades, 1986.

This report identified, on the basis of U.S. and Canadian grade specifications how a particular group of carcasses would grade. They found about 75 percent of Canada A1 carcasses qualified for the U.S. Choice grade on the basis of marbling. The proportion increased to 90 percent for A2 carcasses. On average, 29 percent of A1 carcasses meet U.S. yield grade 1, 47

percent yield grade 2 and 19 percent yield grade 3. A2 carcasses primarily fell into yield grades 2 and 3. The researchers conclude that selection of A1/A2 carcasses meeting U.S. Choice specifications would provide carcasses and primal cuts with higher lean yields than those available in the U.S. To evaluate marbling to meet U.S. specifications would require that the front quarter be dropped (now adopted as a standard procedure).

A further study by Jones identified the differences in Canadian and U.S. yields when carcasses are cut up according to plant procedures in the respective countries. This is reported on at length by Kerr in Reciprocal Grading of North American Beef. Jones' seminal work outlines matters which are of great importance to further research in the merchandising of Canadian livestock and meat in the United States.

Marsh, J.M., "The Effects of the Dairy Termination Program on Live Cattle and Wholesale Beef Prices," American Journal of Agricultural Economics. Vol. 70, No. 4, pp. 918-928.

The author of this article used distributed lags to estimate the beef price effects of the 1986-87 dairy termination program in the U.S. The program was aimed to reduce dairy surpluses by the slaughtering of nearly 900,000 dairy cows. Disposal of such a large number was found to cause a theoretical reduction of from \$1.60 to \$4.00 per hundredweight in the beef market. The extent of this reduction was reduced by one half due to the accompanying government red meat purchase program. More uniform slaughter of the cows over the 18 month disposal period would have rendered the price reductions about 34 percent less. Both cow and steer prices fell and indeed the price of feeder steers also experienced a reduction.

This article is only of peripheral interest to the current study but should have a salutary effect on anyone planning a government intervention into the dairy or beef market in Canada.

Marsh, J.M., "Effect of a Beef Grade Change on Choice and Select Slaughter Cattle Prices," North Central Journal of Agricultural Economics. Vol. 11, No. 2, July 1989.

The author of this article uses distributed lags to estimate the impact of ungraded beef (no-roll) on prices of U.S. Choice and U.S. Select grade slaughter cattle. When the U.S. Choice grade is revised to accommodate reduced marbling potential reclassification of ungraded beef

plays a major role. The results of the analysis indicates that the price premium for the U.S. Choice grade would fall while the price of U.S. Select grade animals would increase slightly. Grade modifications which emphasize leaner beef would not necessarily benefit cattle producers unless there is a compensating change in demand or a reduction in feeding costs. The author contends that any potential reduction of marketing costs arising from a grade specification changes could be offset by additional costs of implementing the new standards. On the other hand, grade changes could moderate any future decrease in the demand for beef. The difference in returns under any grade reclassification scheme have to exceed the costs even though consumers desire a modified product. No guarantees can be made that changes in grade specifications will necessarily be supported.

The method of analysis adopted in the article is not considered appropriate for the present study. The content is nonetheless of interest since it offers a parallel to the work of Considine who found a grade change to accommodate consumer desires resulted in short term pain for long term gain.

Marsh, J. and G. Brester, "Short-Term Adjustments in Yellow Sheet Carcass Prices for Red Meats," American Journal of Agricultural Economics. Vol. 67, No. 3, pp. 591-599.

The authors use a form of regression analysis to test the premise that economic variables primarily determine Yellow Sheet red meat prices. While their results indicate that such variables do account for 85 percent of the variability in the prices problems still exist. The prices are based on thin negotiated markets which may be conducive to price irregularities. They argue that if the number of negotiated market transactions continues to decline pricing efficiency could be seriously affected, particularly in the absence of viable alternatives to the existing wholesale pricing system.

This article indicates that determination of meat prices for use in the current study may be replete with problems.

Peat Marwick Consulting Group, An Investigation of the Marketing Opportunities for Product Differentiated Saskatchewan Beef, 1988.

As Canada moved toward transport deregulation, and negotiated with the U.S. for a free trade agreement, this research was undertaken to determine the marketing opportunities for product differentiated Saskatchewan beef. Western Canada's traditional and lucrative Eastern Canada markets are being eroded with U.S. no-roll beef. Although boxed beef is of growing importance in the Eastern Canada market, a significant proportion of the product still moves West to East in carcass form. Canadian packers have concentrated their efforts on the more lucrative Eastern Canada (Montreal) markets, which is diminishing over time, rather than developing opportunities in the United States.

Southern California tends toward a leaner beef product but consumers have not yet made the distinction between lean-trimmed and lean-produced beef and this may be an opportunity. On the other hand, "natural beef" is perceived to be a marketing gimmick and few consumers are prepared to pay a premium for it. Although beef produced in Western Canada is viewed favourably by Southern California respondents, there are concerns with freshness due to distance transported, and adequate inspection for wholesomeness. In order to compete in the California market, Western Canada processors would have to meet or surpass high IBP (U.S. packer) quality and consistency standards for boxed beef, competitive pricing, attractive product packaging, proper market representation (cooperative rather than confrontational) and a consistent product supply. Because of higher labour costs, lower productivity and economies of scale not realized, the Western Canada slaughter/processing industry is not cost competitive with its U.S. counterparts. Recently, the Alberta government announced grants and loan guarantees to meat processors that would enable them to compete in the U.S. market.

There appears to be excess capacity in feedlot sector and, despite government incentives such as the Saskatchewan Beef Stabilization Program, the relative profitability of the feedlot sector and apparent availability of feeder cattle, Saskatchewan farmers appear reluctant to get into feedlot operations. Naturally, Saskatchewan's economy would benefit from increased feeding, slaughtering and processing of beef cattle, and it does have the capacity to expand beef production, however, there are limited market opportunities for differentiated Saskatchewan beef

products. To compete with their U.S. counterparts, Canadian slaughter and processing plants must become more cost efficient.

This research provides some excellent background information.

Purcell, W.D., "Economies of Consolidation in the Beef Sector: Research Challenges," American Journal of Agricultural Economics. Vol. 72, No. 5, pp. 1210-1218.

Purcell in this research article outlines the change in attitude of the U.S. Department of Justice during the 1980s regarding mergers. The structure-conduct-performance paradigm which previously influenced its actions was replaced by that of contestable markets. The argument inherent in the latter was that competition arising from ease of entry and exit would prevent the earning of economic rent and therefore the degree of concentration was irrelevant. Two situations serve to place this argument in question. A market can be defined sufficiently large that concentration will be low. Ease of entry does not exist in most industry. He illustrates the change in attitude of the Department of Justice by their lack of action against mergers against packing companies. By 1987 four firms controlled box beef production. A decline in the farm-retail price spread of beef in the 1980s was attributed to greater packing plant efficiencies. However, it was noted that 20-30 percent excess capacity existed. In an effort to ensure regularity of supply IBP made an arrangement with Cactus, the world's largest beef feeder, to have cattle fed on a custom basis. Trade in carcass beef all but disappeared as boned beef took over the market. While G.A.O. argued the packing plant mergers had little effect on producer returns, other researchers cast doubt on that judgement. Ease of entry into the packing industry does not exist due to the huge facility investment required in order to be efficient and the control over distribution networks exercised by IBP, Conagra and Excel. Purcell argues that with concentration packers are using a cost-plus approach to pricing, showing a lack of progressiveness in research and development and endeavouring to capture a steady supply of animals through various contracting arrangements. Against these negative attributes of concentration must be considered the positive aspects of capture of economies of scale, the greater efficiencies arising from vertical coordination and more responsiveness to economic stimuli. Consolidation of the industry holds forth the prospect of increasing efficiency. Purcell argues that such efficiency gains should become available to the public - research being required

to determine if this is happening. Increased research is required to determine if the degree of concentration in beef packing works to the benefit of society.

The article is most useful to the current study since insights are provided both directly and indirectly through the bibliography on meat packer competition and pricing practices.

Schroeder, T.C. and A. Featherstone, "Dynamic Marketing and Retention Decisions of Cow-Calf Producers," American Journal of Agricultural Economics. Vol. 72, No. 4, pp. 1028-1039.

A discrete stochastic programming model was used in this study to incorporate the interdependencies in the dynamic and uncertain decision process of the time of sale of calves. The authors use complex mathematics to illustrate optimum retention rates for calves under alternative conditions. While few if any cow-calf producers would find the analysis of significant practical value, the attention given to risk aversion in cow-calf production is valuable. Risk aversion is said to have a significant influence on the timing of sales whether at weaning, after backgrounding or as finished animals. Hedging is the dominant forward pricing strategy in periods of high volatility.

Schroeder, T. and B. Goodwin, "Regional Fed Cattle Price Dynamics," Western Journal of Agricultural Economics. Vol. 15, No. 1, pp. 111-122.

The intertemporal price relationships amongst eleven regional slaughter cattle markets were examined. The leading price discovery locations, none of which was clearly dominant to the others, were Iowa-Southern Minnesota, Eastern Nebraska and Omaha. The western Kansas market has become more important over time as a result of shifts in regional cattle feeding and slaughtering from the Corn Belt to the southwestern plains. In the eleven markets studied regional price adjustment took from one to three weeks to complete. The larger volume markets near concentrated cattle feeding and slaughtering regions fully reacted to price changes in other markets usually within one to two weeks. Smaller volume outlying markets took two to three weeks to fully respond to the price changes. As could be expected, the larger volume markets appear to be dominant in the pricing process, other markets appearing as followers.

This article provides insights into the price relationships between markets and indicates that while price adjustment is a dynamic process, it does not occur with equal speed in all markets.

Schroeder, T. and M. Hayinga, "Short Term Vertical Market Price Interrelationships for Beef and Pork," North Central Journal of Agricultural Economics. Vol. 9, No. 1, pp. 170-180.

The authors monitored weekly prices for beef and pork at the farm, wholesale and retail levels for 1983 through 1985. Using transfer functions, they found that live and wholesale beef prices were usually determined within the same week and live pork prices led wholesale pork prices by two to three weeks. Farm beef and pork price changes led wholesale price changes by four weeks when the Granger causality analysis technique was adopted. Retail beef price changes lagged wholesale beef changes by three weeks. Retail pork price changes lagged wholesale pork price changes by three to five weeks. The authors argued that determining marketing margins on a monthly basis is not appropriate.

This article is of interest since not only does it draw attention to differences in the length of lags or leads determined by different techniques but also to the difficulties in ascertaining the underlying marketing margins over time.

Schroeder, T. et al., "Factors Affecting Feeder Cattle Price Differentials," Western Journal of Agricultural Economics. Vol. 13, No. 1, pp. 71-81.

The authors related a large number of factors to price differentials for feeder cattle using 1986 and 1987 Kansas feeder cattle auction data. Weight had a non-linear inverse impact on feeder cattle price; large, uniform lots had a significant positive effect on price. Health of the animal had the greatest impact on price. Buyers showed a strong preference as expressed in price for large framed heavily muscled animals. Animals sold in the second and third quarters of the sale received a premium to those sold during the first quarter. Prices also exhibited regional differentials. This study is said to be unique in that animals were stratified by sex and weight into four different categories yielding a more homogeneous set of feeder cattle prices and characteristics for analysis.

This article provides background useful to the present study in as much as it reveals the benefits to be derived from presentation of animals for sale in packages and qualities that appeal to buyers.

Simpson, J.R., "Beef Prices and Grading Systems: A World-Wide Perspective", World Animal Review, Vol. 50; 29-35.

This article identifies the grading and prices adopted for beef in a wide range of countries at each of the live cattle, wholesale beef carcass and consumer levels. Grading systems have as an objective the accurate reflection of value along the marketing chain. Grades reduce marketing cost by enabling trading by description. Price is supposed to provide an indication of buyers preference. As a result of A survey of 39 countries, 19 had no grades in effect for live cattle with price in most cases set by free market forces; 18 had no wholesale carcass grading system. However, prices were controlled by government in almost as many countries as those where free market forces prevailed, 25 countries had no grades at the retail level with 19 having prices effectively controlled by government. The article serves to point out the opportunities or lack of them for exporting beef to particular countries on the basis of grades and price.

United States International Trade Commission, The Competitive Position of Canadian Live Cattle and Beef in U.S. Markets, Report to the Senate Committee on Finance, 1987.

The purpose of this report was to examine the competitive position of Canadian live cattle, and beef in U.S. markets. Of specific interest was a description of the following: the U.S. and Canadian live cattle and beef industries; the markets - consumption, production, imports and exports; trade in cattle; effect of government policies on trade; government assistance programs affecting cattle production and processing; and competitive factors such as product prices and transportation. Some of the findings include: prices for cattle and beef in the U.S. and Canadian markets were similar; U.S. meatpackers have an advantage over their Canadian counterparts because of economies of scale and lower wage rates; U.S. and imported Canadian cattle and beef are closely comparable in quality other than the fact that Canadian A1 and A2 are leaner than U.S. Prime and Choice; the Canadian cattle industry has declined from 11.6 million animals in 1983 to 10.5 million animals in 1987; U.S. beef and veal consumption rose by 8 percent during

1982-86, poultry consumption rose by 18 percent and pork consumption increased by 3 percent; Canada's share of U.S. total imports of live cattle and calves declined from 49 percent in 1982 to 19 percent in 1986; Canada's share of U.S. total imports of beef and veal rose from 8 percent in 1982 to 11 percent in 1986; U.S. imports must meet or surpass health and safety standards, which most Canadian meatpackers and meatprocessors do; U.S. Government programs provide assistance to cattle and beef producers by providing for Government purchases of only U.S.-produced goods, providing export assistance, and providing domestic marketing assistance; and, Canadian cattle producers and meat processors continue to benefit from Federal and Provincial assistance, specifically the Tri-Partite Program for red meat producers.

This report provides some excellent background information on Canada's competitive position in livestock and meat exports.

Van des Sluis, E. and Dermot Hayes, "An Assessment of the 1988 Japanese Beef Market Access Agreement on Beef and Feed-Grain Markets," Review of Agricultural Economies, Vol 13, No. 1, January 1991.

The researchers determined that the access agreement will reduce U.S. feed-grain exports but the reduction will be fully offset by increased domestic demand thereby maintaining U.S. feed-grain prices. Australia cannot meet the additional demand for beef in Japan without increasing production costs. Since the U.S. has the larger beef herd and U.S. producers are able to supply high quality grain fed beef, the U.S. share of the Japanese beef market should increase. Any grass fed shipments by Australia to Japan will reduce exports to the U.S. Producers in the U.S. are therefore expected to be the chief beneficiaries of increased beef consumption in Japan.

This study is of particular interest not only for its review of the Japanese beef market and alternative sources of imports but for the research technique adopted which could be applied in the competitiveness study.

Webber, C.A. et al, A Regional Analysis of Direct Government Assistance Programs in Canada and Their Impacts on the Beef and Hogs Sectors, for Agriculture Canada, Policy Branch 1988.

There are difference in the levels of federal and provincial direct financial transfers (DFTs) to beef and hog producers between provinces. This study estimated the impact of reductions or elimination of DFT payments. Interprovincial trade movements, imports and exports, and sector earnings are affected by differing levels of DFTs to producers in different provinces. Although reluctant to see policy changes that result in reduced levels of income, producers agreed that any policies that are not trade-neutral should be changed. Assuming that the dollar a producer receives from the market is viewed the same as a dollar from a DFT, and that all producers respond similarly to all forms of DFTs, the tripartite scenario which eliminates input and output DFTs was viewed as having a minimal effect on production and consumption and was, in fact, trade neutral.

This study suggests that red meat producers can compete in a market-oriented environment and it appears likely that longer-run gains from harmonizing domestic policies should outweigh some of the shorter-run sector losses.

