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Policies Affecting the Efficiency of Beef Production in Alberta: A Supply Chain Analysis

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

Shoppers face high beef prices at the supermarket, but those prices are not a reflection of what Canadian farmers and ranchers earn from their cow-calf herds. In the past 30 years, the average beef producer's operating margin has never reached $50,000, despite the fact that the average beef farm's asset base stands at more than $2 million.

Better access to export markets, including the U.S., South Asia and North Africa, would help to remedy the producers poor returns. Export prices would need to cover production costs, the largest of which is feed for the producers' cattle herds, accounting for 77 per cent of the average ranch's cash costs.

As of July 2023, Alberta's herd consisted of 1.77 million beef and dairy cows. With demand for livestock-derived food expected to jump by 38 per cent in the next 30 years, Canadian cattle ranchers need to take advantage of this global increase through freer trade. Canadian beef can remain competitive globally if the supply chain accesses world markets beyond the U.S., especially in developing countries where consumer incomes are increasing. The industry also needs investments in research, farm extension and supply chain co-ordination from national and provincial self-funded producer groups.

Producers must look outward to global trade but be ready to capture new innovations at home. The dominant economies of scale are available to beef processors and finding savings is difficult for farmers and ranchers. However, there is potential for the supply chain to see savings from new technology, which is why investment in continuing support for ranch-level production research is necessary. Producers also need to focus on national co-ordination aimed at protecting trade access and responding to trends in consumer demand for beef.

Any new industry policies must also consider key factors that currently affect market demand and expansion including: changing consumer preferences globally, the welfare of animals raised for slaughter and the effects of greenhouse gas emissions on supply chain sustainability. As some of the output and byproducts of the grain production sector provide feed for cattle, policies meant to support the grain sector may be indirectly influencing the beef sector significantly — for good and bad.

Infrastructure required for worker safety, animal welfare improvements or improved food safety also adds to the cost of the beef supply. Protectionist trends and increased tariffs pose a threat to the supply chain because they too can create new costs. This is why access to foreign markets

is crucial for producers, along with continued investment in research, sector-wide co-ordination to support market access and reviewing crop support to ensure livestock producers are compensated if grain policy changes harm them.

Although live animals and much processed Canadian beef are exported to the U.S., fostering good trade relations in Asia and Africa is vital, given the growth in incomes and consumer demand for beef that is predicted for those regions.

Free trade is the basis of good agriculture policy and any move towards protectionist policies and higher tariffs is the biggest threat for new costs in the supply chain. Canada's beef sector requires low-cost access to foreign markets, making free trade policy the single most important policy focus for the sector.

POLICY RECOMMENDATIONS

1. Protect access to foreign markets especially the United States, South Asia and North Africa. This is dependent on the goals and options of major trading partners. Under the current U.S. president, multilateral agreements are likely the best strategy.
2. Continue to invest and explore investing more in research for beef producers and targeted processing needs.
3. Continue to support sector-wide co-ordination especially to support market access and science-based regulation.
4. Review crop support in Canada to confirm the livestock sector is not being harmed, especially in terms of land and feed costs.

INTRODUCTION

When you drive north along Alberta Provincial Highway 22 from Lundbreck to Mayerthorpe, you see cattle grazing in the foothills of the Rocky Mountains in a setting that would look familiar to a rancher from a century ago. For millennia before that, the scene would have been similar except the herbivores were bison. That ancient natural land resource and the persistent connection between grass, animal and rancher/hunter form the backbone of Alberta's beef supply chain. As of July 1, 2023, there were 1.77 million beef and dairy cows in Alberta's herd (Statistics Canada 2023a) supplying calves every year to feedlots, packing plants, meat counters and steakhouses across the world. COVID-19 recently exposed the fragility of the chain of firms that connect those grazing cattle to the customer's plate. This paper focuses on the changing costs of that supply chain, especially those affected by policy and major trends in consumer incomes and preferences.

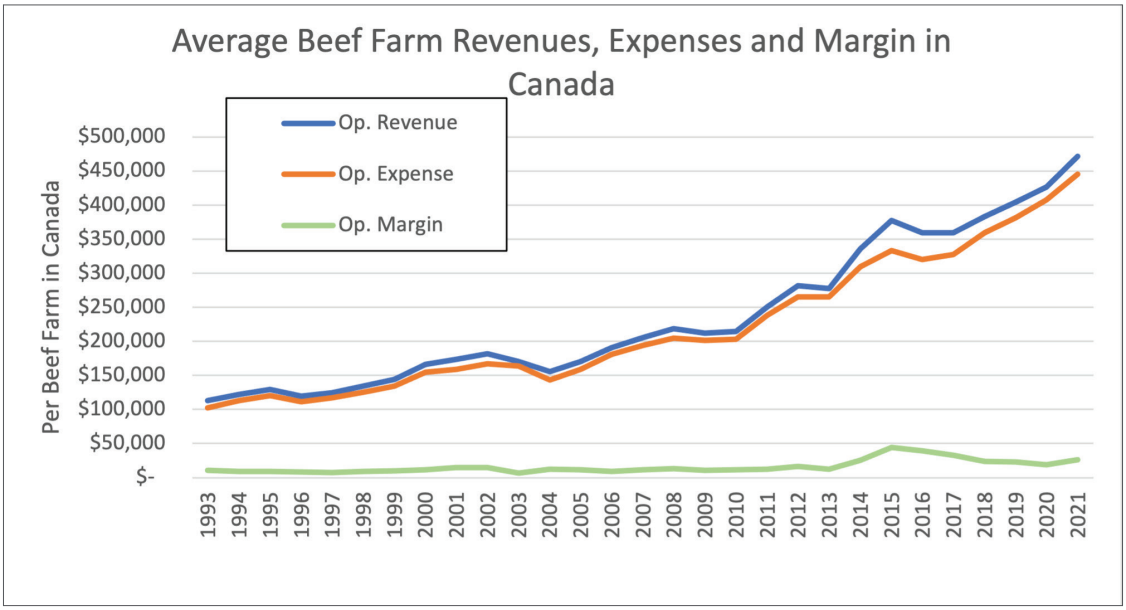
East of Highway 22, you see a landscape more influenced by major innovations in crop production, huge tractors and irrigation pivots. The futurists tell us these landscapes will be further changed by automated tractors and precision-controlled fertilizer and herbicide applications. In this paper, we will explore the differences and synergies between beef and crop supply chains. Some of the output and byproducts of the grain production sector are major feed inputs in beef production. And some of the policies meant to support the grain sector may be influencing the beef sector indirectly to a significant amount — for good and bad.

While the cow-calf sector looks very similar to the sector of the early 1900s, there have been innovations in disease control, grazing and feed management as well as all along the beef supply chain and these have led to an efficient supply of beef. This paper's goal is to review each step of the beef supply chain in Alberta to identify some key areas of research that should be considered, to explore the influence of policy on this supply chain and to identify a few recommendations that could improve the supply chain's efficiency as it relates to the costs of producing beef.

The economic role for any supply chain is to reflect the customer's evolving willingness to pay for a good — down the supply chain to every firm along the chain — so that the firms can see the potential for adding value. The final consumer must pay enough so that firms along the supply chain receive enough to cover their costs and earn enough profit to attract investment and innovation in meeting the needs of those consumers. Figure 1 shows the operating cost of beef farms in Canada from 1990 to today. Although recent returns have increased on the average beef farm, since 1993 the operating margin for the backbone of beef producers who supply the first step

of the beef supply chain have never reached $50,000 for the average beef farm (Statistics Canada 2023b). Given that the asset base of the average beef farm is now over $2 million (Statistics Canada 2023c), that is a poor return to assets and management of less than 2.5 per cent.

Figure 1. Operating Revenue, Expenses and Margin for the Average Canadian Beef Farm



Source: Statistics Canada (2023b)

In a supply chain, efficiency normally means a reduction in costs. Supply chains are constantly innovating to reduce costs in supplying current products, but they can (and should) shift if the demand for their goods are shifting. This means the supply chain is not always changing to reduce costs. Most of this paper will focus on the changing costs of this supply chain and the impact of social trends and regulation in Canada and Alberta on those costs. We will start, though, with a review of changes in demand.

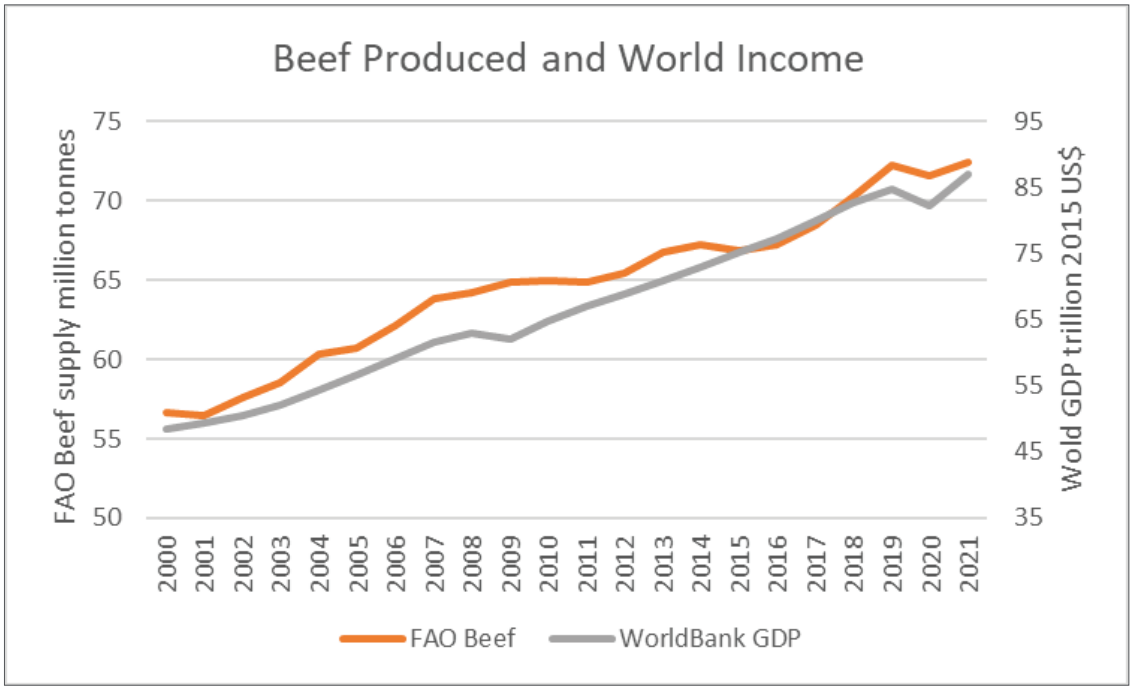
THE NATURE OF BEEF DEMAND

Before we delve into the costs of the supply of beef, we should discuss the nature of beef demand in 2023. If there are trends ahead that will require changes in the supply chain, they should be noted and factored into the discussions of the supply chain below. Three key factors regarding beef demand that are often discussed are changing preferences as incomes increase worldwide, the welfare of animals slaughtered in the beef supply chain and the supply chain's sustainability in terms of greenhouse gas emissions. All three of these factors interact with policy changes.

Figure 2 shows increasing incomes, as measured by GDP, and beef demand worldwide. Between 2000 and 2020, beef use increased by 26 per cent (FAO 2023). Increasing populations and incomes in the developing world are expected to continue to grow the total global demand for beef. In their model of livestock-derived food, Komarek et al. (2021) estimate a 38 per cent increase in global demand for livestock-derived food from 2020 to 2050. Although much has been made of a growing demand for plant-based protein, Taylor et al. (2021) found that 53 per cent of surveyed consumers in the U.S. had consumed beef at least once the previous day versus six per cent who had consumed plant-based proteins. The net effect is clear in the trends: as world income has been rising, beef consumption has been increasing. Macro-economists at the

OECD (2023) are currently forecasting a return to pre-COVID growth rates for 2024 and beyond. Although environmental concerns and regulations could hamper beef supply chains, sustainable meat production from pastures and unpalatable crop byproducts appears likely to remain a key part of the world protein supply (Smil 2014). That means beef demand overall should be steady for the predictable future. In Canada and Alberta, this means steady export demand as long as trade routes function well, absent large tariffs, and Canadian producers remain cost competitive. The clear policy implication is a support for free trade as a national goal.

Figure 2. World Beef Produced (FAO 2023) and Real GDP (2015US$)



Source: World Bank (2023)

Rising concerns about animal welfare and food safety may be more likely to have a direct impact on the beef supply chain than a shift in diet. Cow-calf ranches in Canada have not faced significant limits from policies to protect animal welfare that were not already best management practices for economic production (BCRC 2022), but animal welfare regulations have raised production costs in some countries. Citizens can support food safety regulations while pushing all of the costs onto farms. Regulations regarding food and worker safety certainly impacted the beef supply chain during COVID-19 (Rude 2020). The beef industry has been participating in the National Farm Animal Care Council which defines codes of practice for the care and handling of farm animals (NFACC 2023). While 2020 regulations from the Canada Food Inspection Agency (CFIA) have reduced the options for moving compromised animals and require records and rest stops, they may not have had a significant positive impact (and possibly negative impact) on animal welfare (Meléndez et al. 2020).

As noted above, Taylor et al. (2021) found significant and steady preference for beef in most U.S. households. There have been rising trends in an interest in vegetarianism and vegan diets, but there has also been rising interest in carnivore diets (Google Trends 2023). The relative level of

interest can be measured by Google searches for terms like “vegan diet” and “carnivore diet.” Carnivore-diet searches are recently trending up and were more than vegan and vegetarian combined (see Appendix Figure A1). When we look at major protein sources like soybeans, the largest growth in demand for the protein in these crops is for livestock. Soybeans may represent the most efficient plant source of protein (Videle 2019) but 97 per cent of the world’s soymeal goes to feed for animals (USB 2021).

To date, plant-based protein demands for humans may have had a small impact on the trends for beef demand or beef’s supply chain. However, a more widespread change in consumer preferences or democratic regulation could derail any supply chain. Given the more pronounced growth in income and general increase in livestock-derived food, the more pressing current concern for the Canadian beef sector is the growth in export demand and a competitive cost of production.

It seems strange to discuss sustainability concerns regarding the cow-calf sector, given the similarity that sector bears to the land use and meat supply that existed on the Prairies at least 6,000 years ago (HSIBJ 2010). However, methane from cow-calf operations figures heavily in the total emissions from beef production (BCRC 2023). Recent estimates of the total methane cycle amount which sinks into the soil and goes into the atmosphere, recapture about 97 per cent of methane emissions from all sources and this would be a net sink if not for fossil fuel-generated methane (Global Carbon Project 2020). Searchinger et al. (2008) estimate the net effect of burning biofuels made from converted grasslands and forests (which destroys the carbon sinks as well as reducing numerous other environmental services) would contribute more carbon to the atmosphere over 30 years than burning gasoline. However, environmental regulation, especially if it misses the complete cycle of methane or ignores lower cost options for emission reduction, could greatly increase the cost of beef production.

INTERNATIONAL PRODUCTION

Greenwood (2021) reviewed beef production in major beef producing and exporting countries. Some major differences emerge regarding the level of finishing of calves with added grain in a feedlot setting, in the dominant genetics of the cow herd and in the importance of dairy in the supply chain. With the third largest herd in the world, the U.S. produces and consumes the most beef globally (Greenwood 2021). As well as importing chilled beef from Canada and Mexico, the U.S. consumes about 88 per cent of its own beef production. New Zealand exports a remarkable 95 per cent of its beef production and at 83 per cent, it is second only to India in terms of the share of its cow herd bred for dairy production (Greenwood 2021).

New Zealand makes an interesting case study as a leading beef producer. Of the 11 countries Greenwood examined, New Zealand had the lowest level of producer support estimates (PSE) as a share of farm receipts at 0.8 per cent for 2019/2020 (OECD 2023). With no significant support to the crop or dairy sector, New Zealand’s land base has focused on dairy for export, which has provided a steady supply of beef from calves and culled dairy cattle (OECD 2023). Canada’s dairy sector is supported at 37 per cent of farm receipts and the crop sector receives significant support from the business risk-management suite within current provincial and federal policy frameworks. This adds up to a PSE share of farm receipts at around 10 per cent for Canada (OECD 2023). Except for investments in research and development, much of which is funded by check-offs from animal sales, the non-dairy part of the beef sector in Canada receives very little of the Canadian PSE.

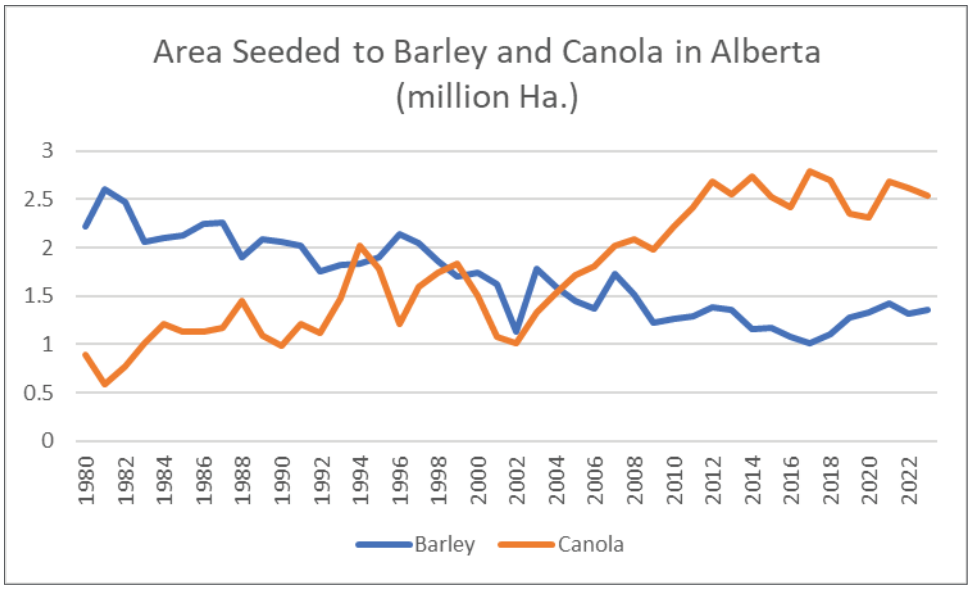
BEEF PRODUCTION COSTS IN ALBERTA

Despite the concern over carbon taxes and labour shortages in Canadian agriculture and the costs of potential food safety and animal welfare regulations, the dominant driver of costs in the Alberta beef supply chain is feeding the animals. Government of Alberta (2022) estimates of cow-calf farm costs of production show that 77 per cent of the average ranch's cash costs come from feed and pasture. For feedlots, the calves brought in are the biggest cost at 67 per cent of cash costs, but feed represents the largest non-calf cost at 20 per cent of cash costs (Manitoba Agriculture, 2023). This means that policy which influences the grain crops used for feed has been one of the biggest regulatory impacts on the Canadian beef sector. The following are a few examples of that influence. No other individual input (other than pasture and feed) represents more than four per cent of variable costs. Total veterinary medicine was less than 3.8 per cent of the average cow-calf variable costs (Government of Alberta 2022).

FEED COSTS

Barley has been the traditional feed source for feedlots in southern Alberta. Barley has lost much of its area to other crops — especially canola in Canada (see Figure 3). It remains a major crop in terms of seeded area. Agriculture and Agrifood Canada's (AAFC) August 18 supply and disposition estimates for barley still show 2.96 million hectares of land in Canada seeded to barley and AAFC reported that 52 per cent of this area is in Alberta with 38 per cent in Saskatchewan and six per cent in Manitoba (AAFC 2023). While shifting incentives from the removal of the Canadian Wheat Board and its separate Malt Barley Pool have changed the returns to barley in some areas, it is still a profitable crop for many farmers in Alberta who face cooler and shorter growing seasons and a steady demand for feed grains from the feedlot sector. The 2023 Canadian barley crop is estimated to be over nine million tonnes (Mt) supplying 5.3 Mt to domestic feed markets and 3.3 Mt to the export market (AAFC 2023).

Figure 3. Alberta Area Seeded to Barley and Canola



Source: Statistics Canada (2023d)

AAFC (2023) also reports just over 300,000 tonnes of food-use barley mainly for the malting sector. Despite the dominant place of feed demand for barley, two of Alberta's leading barley varieties in terms of area seeded — CDC Copeland (most popular in terms of area) and AAC Synergy (third most popular) — have an established market in the malting sector (Yield Alberta 2021). Malting varieties still offer barley producers some probability of making malt grades that generate windfall returns if they get adequate quality. But as noted above, only a small portion of the barley crop is traded to maltsters.

One institutional problem facing barley growers and challenging its area is the idea of an orphan crop. This is a problem if breeding requires public or private incentives but a crop like barley is small relative to dominant crops like wheat and canola. The dominant crop attracts fewer resources to breeding. Relative yields fall for the orphan and area falls if the yield growth from breeding of the orphan crop does not match growth from the dominant crops. Average wheat and canola yields in Canada from 2019 to 2023 are 40 per cent and 49 per cent higher than they were from 1995 to 1999. For barley, the yield gain was only nine per cent (Statistics Canada 2023d). Pulse crops saw a large increase in yield when farmers increased their check-off funding to the Crop Development Centre at the University of Saskatchewan (Malla and Brewin 2019).

AAFC (2023) also reported over 2.7 MT of corn imports into Canada. Livestock feeders in Manitoba and Eastern Canada have difficulty growing barley due to disease and in these areas cheap corn from the U.S. has become a regular import. Corn grown for grain is also a growing crop in southern areas of Alberta and Manitoba. AAFC (2023) also noted that the worldwide stock of barley is at a historic low, suggesting demand has been outstripping supply for several years. While good news for barley producers, it means high feeding costs for Alberta feedlots unless they can find cheaper alternatives like corn and byproducts from oilseed crushers and biofuel refineries.

One policy that could be keeping export demand steady for Canadian barley is the maximum revenue entitlement (MRE), a regulatory limit on the maximum average rate that can be charged by Canada's two major railways to move grain. Brewin et al. (2017) estimated U.S. rail movements to be 52.6 per cent higher than the MRE. This means that exporters from the Pacific Northwest must pay higher freight to buy barley in Montana and North Dakota and move it west. This effectively lowers the price for barley in Montana and North Dakota relative to markets in Alberta, Saskatchewan and Manitoba, and makes feed barley more expensive to Canadian feedlots as they compete with export buyers in Vancouver.

The support measured by the PSEs calculated by the OECD for Canada support crop production generally. Public research funds are still a major supporter of barley varietal development and pest and disease mitigation, but the major source of distortion is subsidized crop insurance programs. These programs allow crop farmers to pay lower premiums for crop yield insurance. They do not favour one crop over another. Barley is not facing a disincentive relative to wheat or canola from crop insurance. The relative drop in barley area has more to do with the rising demand for oilseeds (and the growth in canola area) worldwide than any particular farm policy. Canada does not offer subsidized production insurance to the beef sector. A margin insurance product (AgriStability) is offered to both sectors but its coverage is based on the most recent five years. Until 2023, the recent margins in the beef sector were very tight. This means the relative value of the margin insurance, at least recently, has also favoured crop production over beef. To the extent that these policies support crop production generally, they have likely lowered barley costs relative to an unsubsidized crop sector. As we can see in New Zealand, a complete

removal of farm supports could lead to more beef and dairy in Canada relative to crop production. Given the history of farm support in North America, however, a zero PSE is an unlikely scenario for Canada.

In general, the support for the crop sector should decrease the relative costs of feed grains and the byproducts of food grains and oilseeds that are added into feed rations. Policies supporting that production affect the relative supply of feed grains. However, given Canada's relative position in the world supply, this might not affect local feed prices significantly. As long as Canada remains a net exporter of grains, the world price remains the major driver of domestic prices. The one regulatory impact that might shift the domestic price is the MRE rates in rail transportation. These were not designed as a subsidy, but merely a cap that was allowed to move with real changes in cost. Nevertheless, more efficient movements in Canada versus the U.S. could be making local feed prices higher in Canada than they are in the U.S.

LAND

Land for pasture and hay is another major cost for beef production. This is yet another area where policy targeted to the crop sector can influence the beef sector. Many of the subsidized risk management program benefits mentioned above in the discussion of feed are being capitalized into farmland values in Canada. While not all pasturelands can be converted to crop land, some have been or could be. As it transitions into crop land, it rises in value and the reduction in pasture increases the value of the remaining grasslands. All of this drives up the costs of grazing cattle. This land on the margin between crop and pasture is normally less-productive land and is often prone to erosion. As well, any pastureland that is broken up and planted to crops destroys a carbon sink.

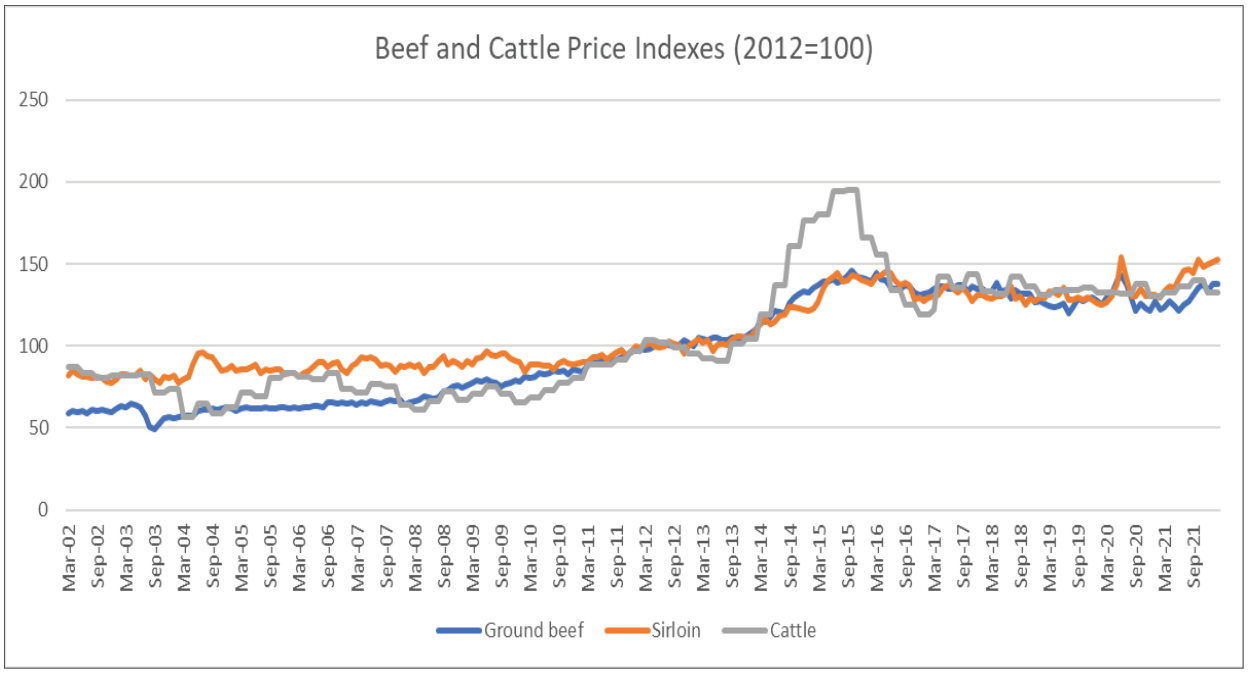
A final tie to the cost of land is the potential for even higher costs for both feed grains and pasture if Western Canada faced a drought over a large region. While producers in drought regions may survive if the dominant export demand still drives local prices, if regions become so desperate for feed that they start paying to import that feed into regions with dense livestock numbers, it leads pricing closer to export values. At export plus transportation prices, livestock farms will face tough choices between feeding animals or liquidating their herds. Droughts have been part of the recent decline in beef herd size in the U.S. and are being tied to climate change (USDA 2023), but it has happened with a North American crop sector that is still exporting a large share of production.

ECONOMIES OF SCALE

Research suggests that larger beef farms have lower costs per unit of beef produced. Gillespie et al. (2023) found that cow-calf farms with 500 or more cows had total costs less than half of operations with fewer than 50 cows; however, their operating costs were quite similar. They argue that cow-calf operations offer one of the best options for farmers interested in small scale, due to the low startup costs. Thus, although economies of scale can have an impact on the cow-calf part of the supply chain there is no concern of concentration of market power and at the margin this is not likely a cost factor.

It has also been argued that beef packing plants exhibit economies of scale (Hobbs 2021). Four firms have controlled more than 94 per cent of beef packing in Canada since 2010 (Rude 2020). While this raises concerns of market power, nearby U.S. competition and the need for enough animals to maximize returns to plants seem to have kept beef prices at a fair level relative to the cost of cattle (Rude et al. 2011). Figure 4 shows slightly increasing beef prices over recent years but no widening of beef prices over cattle prices. There are several points where cattle prices are rising faster than beef prices, indicating tighter margins for packers, and we are likely in the middle of one right now as the U.S. cattle herd has contracted to a record low (Polansek 2023).

Figure 4. Relative Beef and Cattle Prices



Source: Statistics Canada (2023e)

Rude (2020) catalogues the evolution of packing plants in Canada and the U.S. He argues that the economies of scale in the four largest firms in Canada have led to virtually no successful entrants into the major beef packing supply chain since the late 1980s. Rude also lists research identifying major cost savings for packing plants which slaughtered over 1.1 million head. In Canada, only the Cargill plant in High River and the JBS plant in Brooks slaughter that many animals (Rude 2020). There have been calls to build more packing plants in Canada. The basic economies of scale and total needs of the Canadian herd do not suggest further expansion at this time.

OTHER SUPPLY CHAIN COSTS

In his review of options for the beef packing sector, Rude (2020) noted that any increase in slack capacity to protect the beef supply chain from periodic shocks and any needed infrastructure for worker safety, animal welfare improvements or improved food safety would add costs to the sector whatever the plant configuration. Rude noted recent investments by JBS in robotic technology suggest the sector is moving towards high levels of automation. Joshi et al. (2017) agree:

> Robotics holds the promise of reducing the processing cost by helping speed up processing lines, making production more efficient and reducing labour requirements. The time is not far away when all the processes in meat processing starting from the primary processing, secondary processing, packing and dispatch, will be fully automated.

POLICIES TO SUPPORT BEEF PRODUCTION

FREE TRADE

With incomes increasing worldwide, the export demand for beef remains the biggest challenge facing the Canadian beef supply chain. Although live animals and a large share of our processed beef are heading to the U.S., maintaining good trade relations in Asia and Africa is important given the forecasts for growth in those areas (Komarek et al. 2021). Several of the policies noted above regarding crops and risk management have likely led to more feed production in Canada relative to a crop sector with less insurance subsidization or production research, but more production from either sector requires access to world markets. Thus, free trade as a policy remains the backbone of good policy for agriculture. Any move to protectionism and increased tariffs poses the biggest potential for new costs in the supply chain.

The U.S. has been the main trade concern for beef in terms of live animals and processed beef. With the signing of the United States-Mexico-Canada Agreement (USMCA), Canada secured access to U.S. markets for both live animals and beef despite threats from the Trump administration to curtail beef imports (Cardwell and Kerr 2021). Although also a member of USMCA, Mexico's own processing expansion is not likely to be a major concern to Canadian producers as it seems to be targeting its own domestic market (Peel 2023). Under the current administration in the U.S., a move to more multilateral agreements is likely the best strategy for securing Canadian markets (Cardwell and Kerr 2021). As long as trading rules are co-ordinated between the U.S., Mexico and Canada, the large North American market will provide a fair playing field for both ranchers and packers.

Some of the check-off funds collected by beef organizations in Canada are targeted at market access activities. Australian research suggests this is the best return to a check-off dollar although most of the activities of the beef research funds have a significant payoff (BCRC 2016). More on this below.

ADJUSTMENTS TO GRAIN POLICY

Several of the policies noted above have likely led to more feed production in Canada than would otherwise be the case. Any benefits from that supply are dampened by rail rate policy that likely makes export demand in Canada higher relative to the U.S. Removing the MRE to allow higher rail rates could reduce barley prices in Alberta, Saskatchewan and Manitoba, but this would be a great cost to the crop sector. Basic research into new crop varieties and in disease and pest mitigation increases yields and supports grain production such that feed grain prices should keep grain production competitive in Canada. The worldwide supply and disposition of wheat and oilseeds may still lead to a continued erosion of the area seeded to barley and other feed grains if these crops face lower total demand, but similar production costs on a limited area of arable land. As a crop with falling area, barley does face a disadvantage in terms of the payoff for either private or public research investments relative to crops with more area.

In Canada, the canola sector contains hybrid seed and patented herbicide technology that helps canola generate its own seed development (Malla and Brewin 2019). The public sector, in partnership with producer groups funded by check-offs, has continued investing in wheat and barley breeding and production research (Malla and Brewin 2019), but the high returns to research suggest there has been under-investment. There has been some success from smaller crops — especially pulses — when individual producer groups increased check-off funds to target gains in yield (Gray 2014). Barley producers and barley consumers may benefit from an increase in funding for production research.

RESEARCH FOR BEEF PRODUCTION AND FARM EXTENSION

The gains from research shown in crops are also apparent in the beef sector. In its own assessment, the Beef Cattle Research Council in Canada estimated a $14 benefit for every dollar spent by producer-funded associations on beef production research and market access activities (BCRC 2016). This is a greater contribution than similar spending in Australia and the U.S., likely because those two countries are spending more dollars and moving closer to a reasonable return. Although there have been changes in beef quality, almost all of the gains from research come from improving the relative cost of producing one more kilogram of beef.

The extension of research results is a major need in Canada. Since the 1980s there has been under-investment in both agricultural research and the extension of those research findings to farmers. Alston et al. (2002) looked at the gains from agricultural research around the world. They found huge returns to both agricultural research and in farm extension services that share research results towards incorporating results into farm production. They found annual rates of return of 80 per cent for both production research and extension (these are remarkably high rates for an annual return on an investment, even compared to recently improved deposit rates). Although online extension from BCRC and other provincial and national research groups has been excellent, increasing extension further along with research investments seems to be a win-win policy change for the sector.

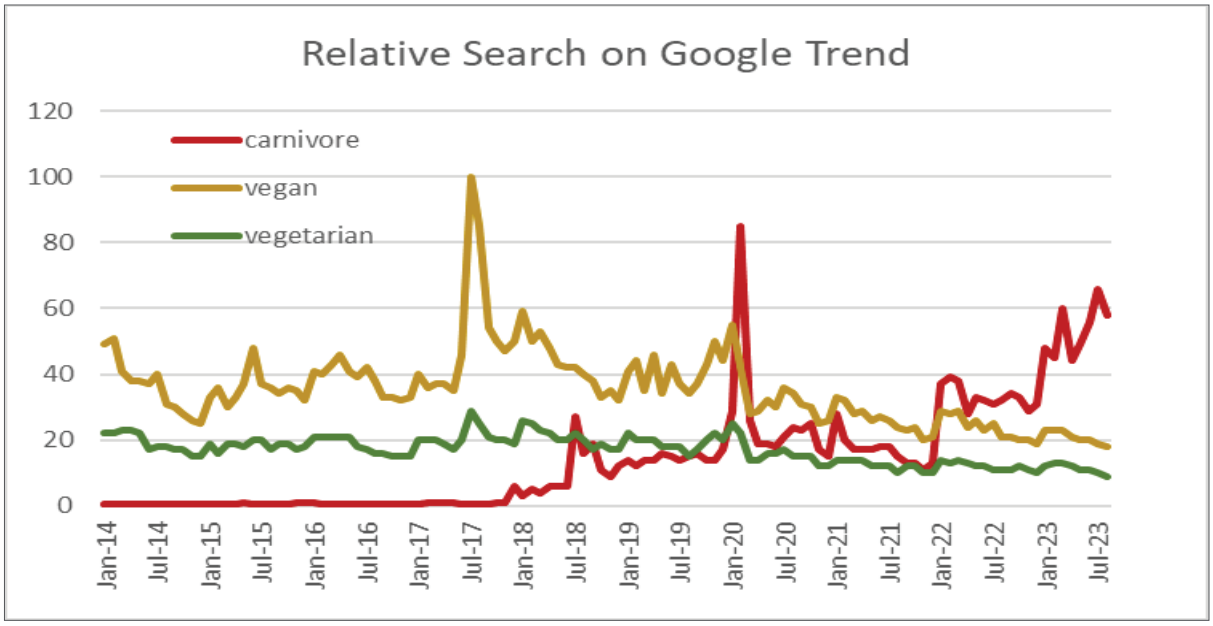
National beef associations have a third role as a co-ordinating body in the supply chain when it faces a major shock. Rude (2021) discusses the role of the Canadian Cattlemen's Association and Western Stock Growers Association in lobbying for policy responses in the midst of the COVID-19 lockdowns in Canada and the U.S.

CONCLUSIONS

Given the sticker shock of sirloin steaks in Canadian grocery stores in 2023, there is little good news in this paper for significant reductions in the costs of producing beef. The large firms in charge of processing most of the beef in Canada are already capturing the lion's share of available economies of scale. Beef producers adopt new technology as it emerges into their market, but no new savings were identified in this paper. There may be gains to the supply chain in emerging automation technology and in improved production options identified by public and private researchers. Continued support for ranch-level production research and extension as done by the Beef Cattle Research Council appears to be a good investment. Also, there is evidence of significant gains in a national co-ordination of the sector to protect trade access and prepare for changing consumer demand. National co-ordination from producer associations also provides a forum for pivoting in the face of any future supply chain interruptions like the plant closures during the first year of the COVID-19 pandemic. While some pro-crop farm support likely inflates land costs and domestic feed prices, and a reduction there could support beef producers, this is unlikely to change any time soon. As is true for most of Canada's agriculture and food supply chains, the beef sector requires low-cost access to foreign markets, making free trade policy the single most important policy focus for the sector.

APPENDIX

Figure A1. Relative Rank of Monthly Searches Using Google Trend for: "Carnivore Diet," "Vegan Diet" and "Vegetarian Diet" in the U.S.



Source: Google Trends (2023; 100 = vegan search in July 2017)

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