

**Case Study****Milner Ranch: Is the Grass Greener in Processing?**Hwangwon Lee<sup>a</sup>, Tanner McCarty<sup>a</sup>, Anastasia Thayer<sup>b</sup>, and Ryan Larsen<sup>a</sup><sup>a</sup>Utah State University and <sup>b</sup>Clemson University

JEL Codes: Q12, Q13

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**Abstract**

This case study explores the decisions facing a cattle producer in southern Idaho. Milner Ranch is a diversified family-run business that currently has cow-calf, grazing, and feedlot operations that produce 1,000 head of cattle per year for processing. Like other beef producers, Milner Ranch has recently faced bottlenecks in beef processing and an increasing gap between beef and fed-cattle prices. They wonder whether they would be better served by constructing their own beef processing plant rather than continue to deal with their regional processors. This case study pushes students to conceptualize and analyze the key economic tradeoffs (revenue, cost, risk, etc.) that come with expanding an agricultural firm's boundary. It also provides practice with examining the strengths and weaknesses of various transactional arrangements between producers and processors (marketing contracts, co-ops, and vertical integration).

**1 Introduction**

Milner Ranch sits at the base of the Albion Mountains. The region's rugged landscape and distance from major urban centers make it ideal cattle country. That is what brought Jack Smith here twenty years ago when he agreed to become the manager of Milner Ranch. Milner Ranch began with fifty head of black angus cattle and has since grown to over 1,000 head. Milner Ranch grazes their cattle on a combination of federal, state, and privately owned grazing leases. They have worked with their local conservation district to increase water storage and irrigation capacity on their operation. Milner Ranch provides all the feed their livestock need either through their grazing lands or the hay/grass that they harvest each year. This ability to feed their cattle inexpensively has provided them with growth opportunities. At each growth opportunity, Milner Ranch has looked for ways to increase efficiency and profitability. Milner Ranch focused purely on selling calves in the beginning. Identifying potential opportunities, they expanded operations and acquired a feedlot. The addition of the feedlot has enabled Milner Ranch to control cattle production from calf to finishing. The ability to provide low-cost feed and produce high quality animals has helped Milner Ranch manage the risk that is inherent within the cattle industry.

Recently, Jack listened to the *Wall Street Journal Podcast* (2022), which got him thinking about expanding his business into meat processing. Like many ranchers, Jack has always had a complicated relationship with local beef processors. Processors provide a valuable service, but it always feels like processors end up with the lion's share of the beef-marketing profits. Jack has also been reading about the supply chain issues in the beef processing industry that were highlighted during the COVID-19 pandemic (Cowley 2021). Jack has considered that perhaps some smaller scale processing facilities could mitigate some of the supply chain issues present in the beef processing industry.

Milner Ranch adheres to specialized production practices for their cattle. Their cow-calf, grazing, and finishing operations are both Global Animal Partnership (GAP) 2 certified (USDA 2022a). This means that they do not use any antibiotics, growth hormones, or feed containing animal by-products. They also open their practices to independent auditors every fifteen months to maintain this status. Milner Ranch also maintains a Certified Angus Beef (CAB) designation for its cattle. This requires cattle to be at least 51 percent black hided (a dominant genetic trait within Angus cattle) or have verified Black Angus genetics. The CAB designation also requires that the beef grade as either prime or the top two categories of choice

at processing. Milner Ranch gets this rating for 80 percent of their cattle, but it requires special attention to genetics and feeding practices.<sup>1</sup> Owning a processing plant may allow Milner Ranch more control over marketing their specialty beef and allow for a higher margin on their cattle than they currently receive from processors.

On the other hand, beef processing plants are an expensive and a somewhat irreversible investment. Even a small plant capable of processing 1,000 head of cattle per year would cost around \$1.9 million just to get the plant up and running. An unprofitable processing plant would reduce Milner Ranch's available liquidity and could starve their successful feedlot and grazing operations of financial capital. The owners of Milner Ranch share Jack's interest in a potential processing plant. They are so interested that they have a meeting scheduled for tomorrow to discuss the viability of this processing plant. Before the meeting, Jack has three primary questions to answer: Should Milner Ranch build and operate a beef processing plant? If they build a plant, how large should it be? If they build a plant, how should they acquire sufficient cattle to run it at capacity? Jack has a lot to consider before his meeting.

### 1.1 Learning Objectives of This Case Study

1. *Should Milner Ranch build and operate a beef processing plant?* Students should gain insight into the tradeoffs associated with expanding the boundaries of a beef livestock producer into processing in terms of revenue, costs, and risk exposure in a dynamic context.
2. *If they build a plant, how large should it be?* Students should learn to define and conceptualize the tradeoffs associated with various processing plant sizes, and how these tradeoffs affect margins at a beef processing plant.
3. *If they build a plant, how should they acquire sufficient cattle to run it at capacity?* Students should learn the tradeoffs associated with increased processor and producer coordination.

## 2 Cattle Industry Overview

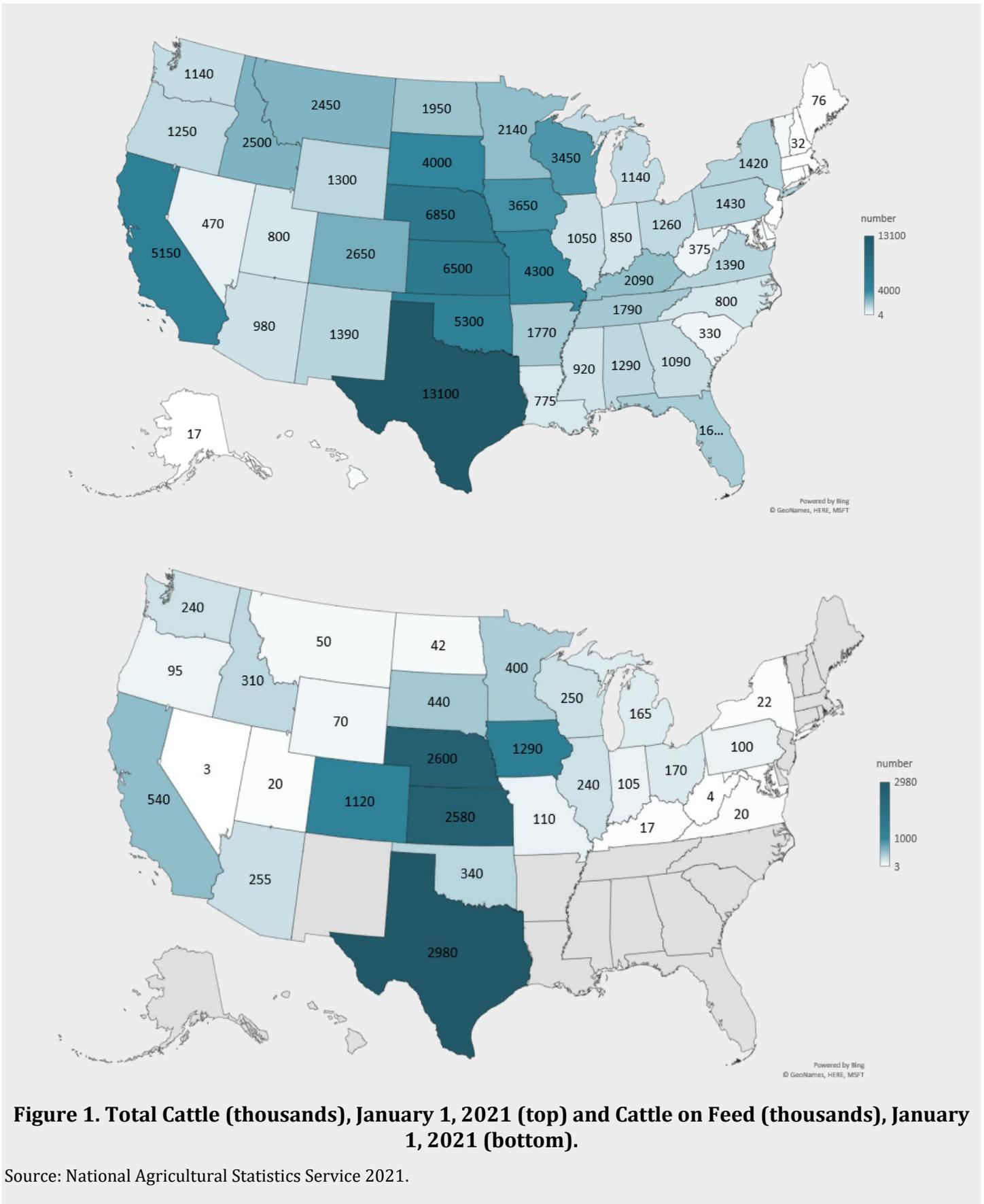
The United States is a global leader in cattle production, characterized by the largest fed-cattle industry in the world (USDA 2021b). Further, the cattle-beef supply chain is an important agricultural sector within the United States. In 2020 the cattle/calves sector represented the largest sector of all livestock or crops produced in the United States by cash receipts (Economic Research Service 2022a). In 2020 the retail value of all beef produced was estimated to be \$123.3 billion (Economic Research Service 2022b). The cattle supply chain is uniquely characterized by geographically dispersed stages of production and cyclical expansions and contractions in the national herd size (Drouillard 2018).

Cattle begin their life cycle on cow-calf operations and then get sent to grazing/range operations. These first two stages are spread across the United States. Once they have grown to a sufficient weight grazing, usually somewhere between 600 and 800 pounds, cattle are relocated to feedlot operations typically located in the middle of the country (Figure 1). As a result of geographically distinct areas for cow-calf grazing operations and feedlots, the cattle supply chain is dependent on long-haul trucking routes for individual cattle. In 2003, approximately 57 percent of cattle born in the United States were shipped interstate, which doesn't include intrastate shipments that are present in states with feedlots, such as Colorado, Kansas, Nebraska, and Texas (Shields and Mathews 2003).

Compared to their counterparts in southern and southeastern states, cattle operations in the Intermountain West are characterized as grazing operations. Surveys of producers in the west suggest that nearly all operations have cows in their herd, and approximately half are exclusively cow-calf operations (Asem-Hiablíe et al. 2017). Some finishing occurs on farm, with approximately 15 percent of operations finishing on the ranch in northwestern states (Idaho, Montana, Oregon, Washington, and

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<sup>1</sup> Beef is graded by U.S. Department of Agriculture (USDA) meat inspectors. Grading for quality comes down to meat marbling, which affects tenderness, juiciness, and flavor of the beef. The highest possible USDA beef grade is prime, followed by choice, followed by select (USDA 2019). Higher grades fetch higher selling prices.



Source: National Agricultural Statistics Service 2021.

Wyoming) and 22 percent finishing in southwest states (Arizona, California, Colorado, Nevada, New Mexico, and Utah).

In addition to variation in local production practices and farm size, it is important to understand that total cattle inventories in the United States have declined since the late twentieth century (Figure 2). Further, the cyclical nature of the roughly ten-year cattle cycle leads to fluctuations in inventory over the cycle, which drives national prices and herd size. The negative relationship between prices and inventory can be an important driver for on-farm management decisions.

Finally, vulnerabilities exist in the current supply chain that highlight the need for additional processing capacity. There is growing concern that the segregated production stages of the cattle and beef industry, consolidation in the packing and processing, and reliance on transportation, renders the industry vulnerable to supply chain disruptions. This vulnerability was highlighted on two recent occasions: when a fire broke out in a Tyson beef processing plant in Holcomb, Kansas (Dennis 2020), and when the COVID-19 pandemic led to widespread packing plant closures (Hirtzer and Freitas 2020). Individually, each incident caused enough market disruption (rising beef prices and falling live animal prices) that the President asked the U.S. Department of Justice to look into allegations that U.S. meat packers broke antitrust law.

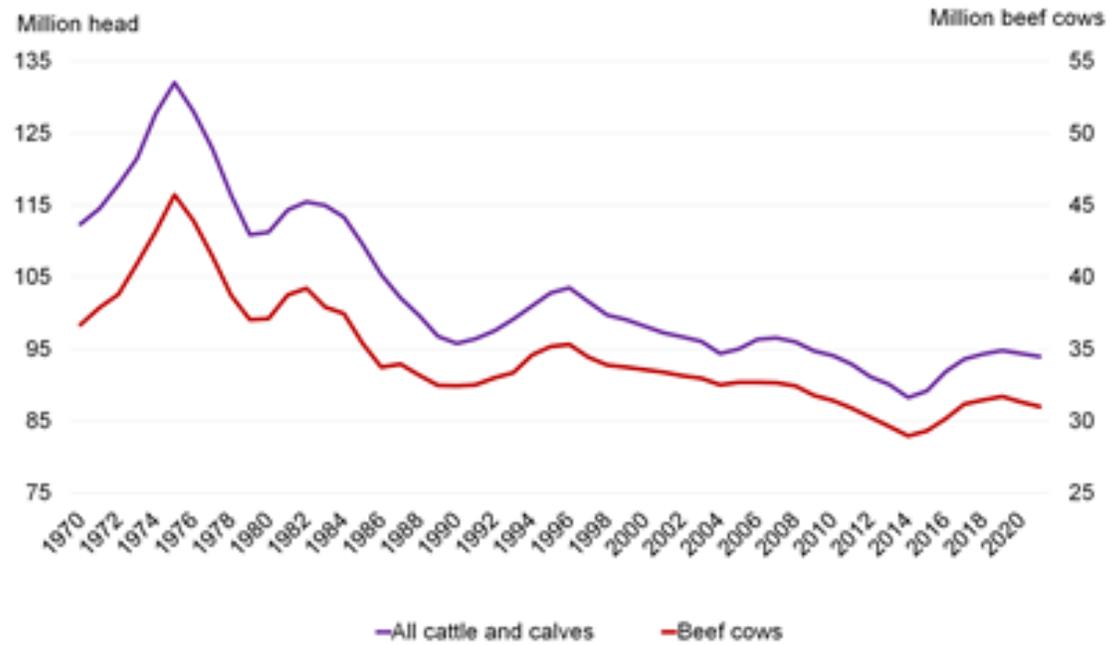
While most recent events have been linked to processing capacity, other vulnerabilities exist in the feedlot sector and for small cow-calf producers, specifically, industry reliance on long-haul trucking routes. Shortages in trucks, drivers, changes to transportation routes, transportation policies, and fuel costs could all have a negative and significant impact on the cattle supply chain. For this reason, developing regional processing capacity that would eliminate some of the beef industry's reliance on trucking would increase resilience of the supply chain.

## 2.1 Domestic and International Beef Demand

Total cattle inventory declines in recent decades have mirrored the fall in domestic demand for beef. While per capita beef consumption has decreased since the late 1990s (Figure 3), spending has remained relatively constant at 2–2.5 percent of disposable household incomes spent on beef (USDA 2021a). There still remain concerns about the long-term demand for beef and shifting consumer preferences to poultry or meat alternatives (Davis and Lin 2005; Bryant 2019).

While there have been decreases in per capita domestic beef demand, international beef exports have grown over the same time period. The value of exports decreased slightly in 2020 due to the pandemic, but the average value of beef exports from 2016 to 2020 was \$7.55 billion (USDA 2021b). Over the last five years, the top countries importing U.S. beef included Japan (valued at \$1.88 billion), South Korea (valued at \$1.52 billion), Mexico (valued at \$995 million), Canada (valued at \$735 million), and Hong Kong (valued at \$789 million).

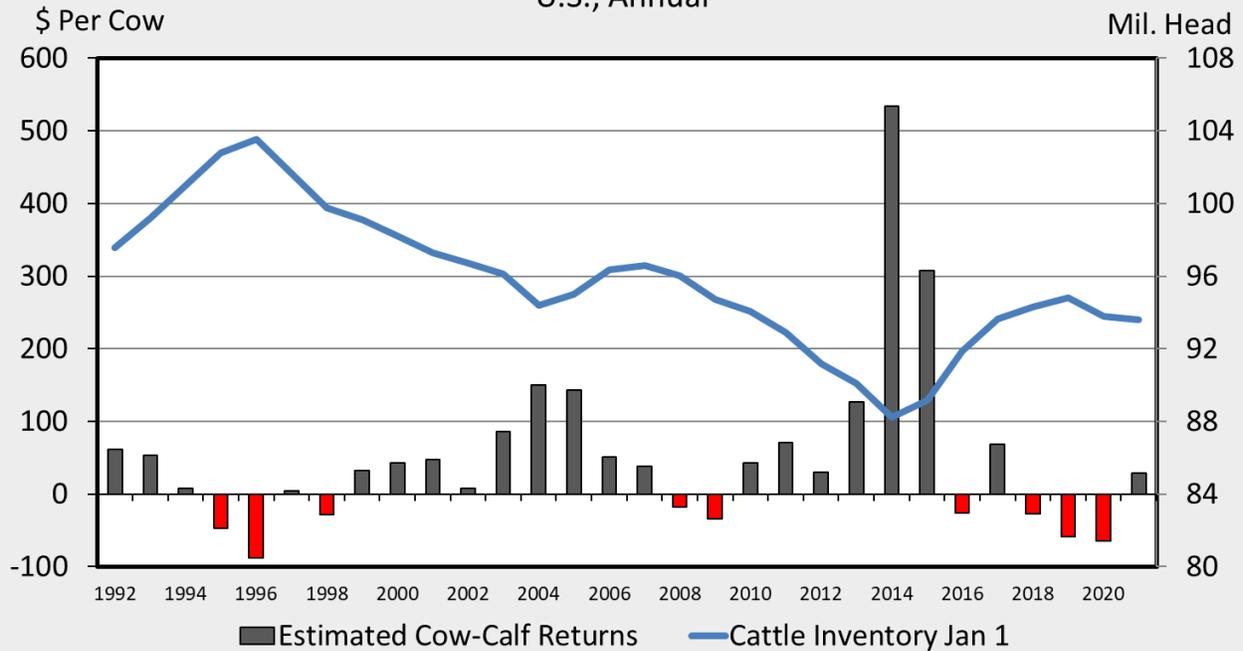
**Figure 1. Cattle and beef cow inventories 1970-2021**



Source: USDA, Economic Research Service calculations using USDA, National Agricultural Statistics Service data.

### COW CALF RETURNS AND CATTLE INVENTORY

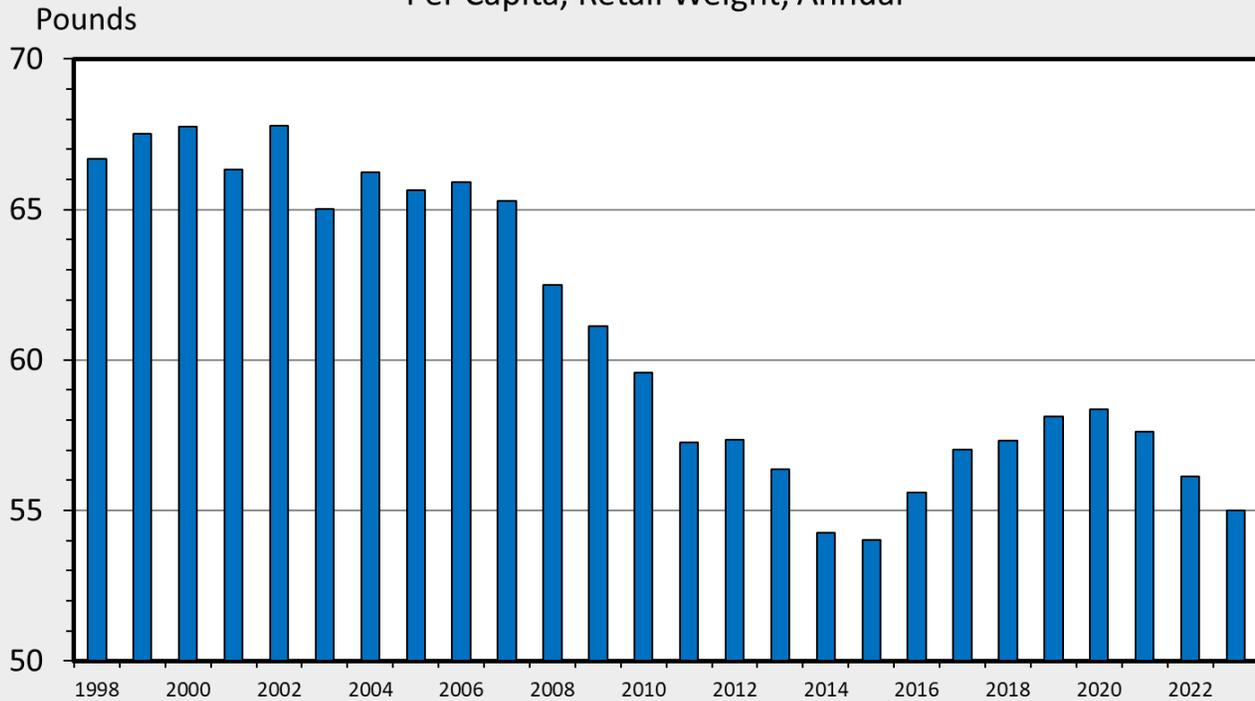
U.S., Annual



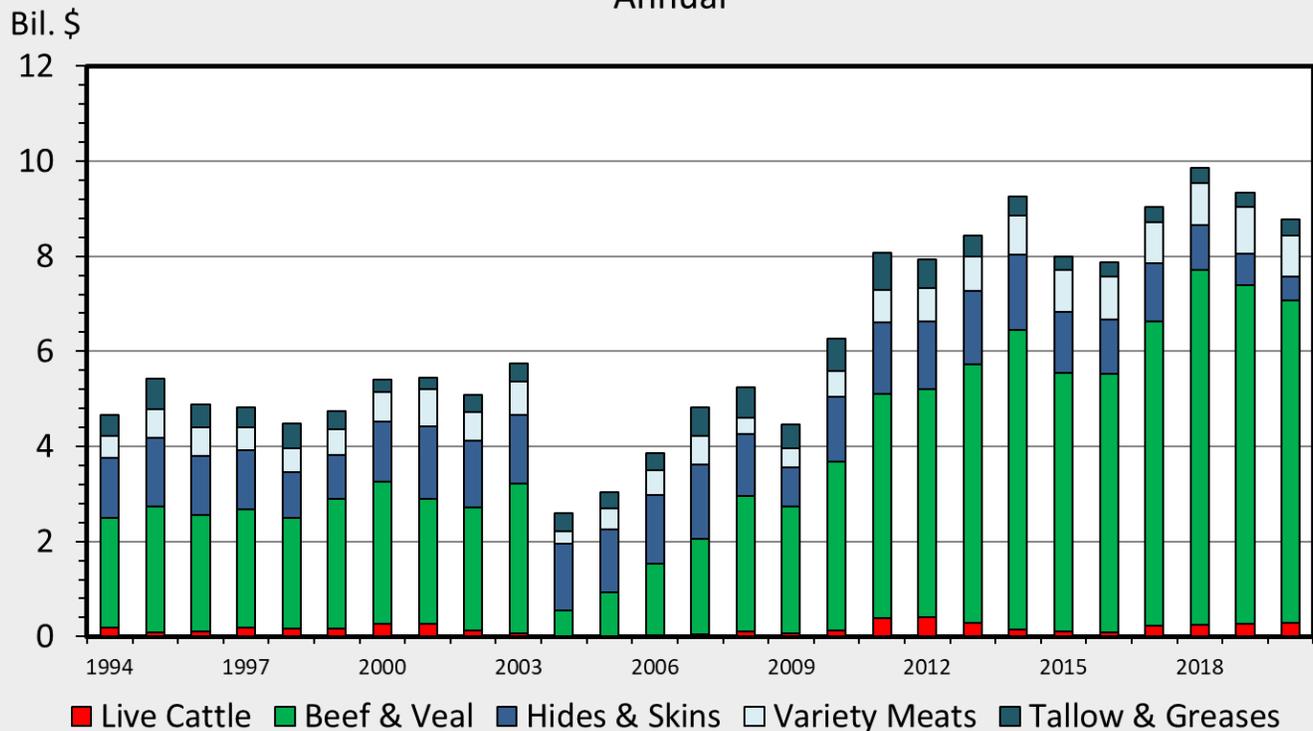
**Figure 2. Total Cattle Inventories 1970-2021 (left) and Corresponding Prices (right)**

Source: Economic Research Service 2022a.

### US BEEF CONSUMPTION Per Capita, Retail Weight, Annual



### US BEEF INDUSTRY EXPORT VALUES Annual



**Figure 3. U.S. Beef Consumption (left) and U.S. Beef Industry Export Values (right)**

Source: USDA 2022b.

## 2.2 Future Issues

The cattle and beef industry appear to be in a period of transition. Pressure to reduce climate impacts, new international consumers, and competition from plant-based protein sources appear to be the greatest threats, as well as potential opportunities for the beef industry to meet changing preferences of consumers.

### 2.2.1 Climate Change and Emissions

The cattle industry has come under scrutiny and criticism for greenhouse gas emissions, reactive N emissions, deforestation, land use change, and runoff (Gerber et al. 2013; Rotz et al. 2019). Globally, the livestock industry is responsible for 14.5 percent of greenhouse gas emissions, which has caught the attention of the general public, putting greater scrutiny on the cattle industry and increasing pressure for the industry to address the effects of climate change (Carroll 2019; Kaplan 2019; Quinton 2019). In response, growing consumer consciousness and increasing preferences for reducing the environmental impact of food choices are new areas for both research and producers to capture additional market share (Lusk and McCluskey 2018).

The industry has sought to quell these concerns by making commitments for increased transparency and sustainable sourcing.<sup>2</sup> In particular, large retailers such as Walmart and McDonald's have sustainability plans to convince consumers of their commitment to a more environmentally friendly supply chain (McDonalds 2019; Walmart 2020). On the production side, large processors such as Cargill and JBS are now publicizing their environmental impacts with commitments to improvement in the areas of water use, emissions, and energy use (JBS 2020; Cargill 2022). In the most ambitious commitment yet, the National Cattlemen's Beef Association in August 2021 announced that the industry would achieve carbon neutrality for U.S. cattle production by 2040 (Stewart 2021).

While the cattle and livestock industry has faced increasing pressure from consumers to change production practices, how these plans manifest in practice, and their subsequent impact on the industry remains to be seen.

### 2.2.2 International Markets

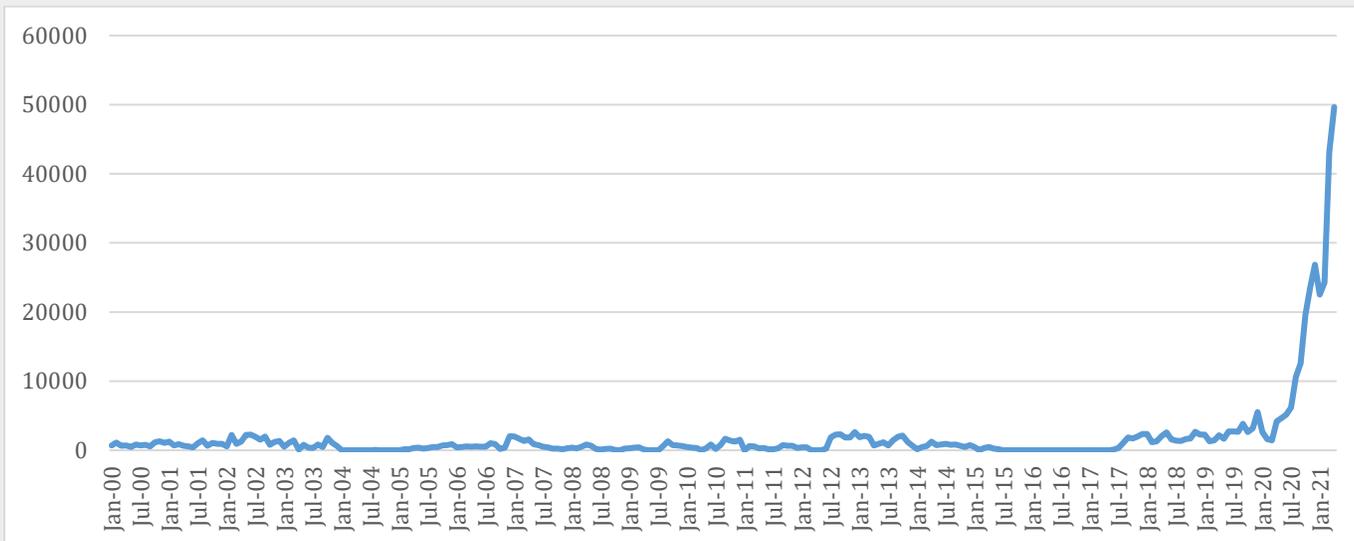
Looking forward, there is a lot for beef processors to be excited about. World population growth combined with income growth continues to expand opportunities for beef processors. China in particular has recently become a major consumer of U.S. beef. This trend is displayed in Figure 4. While international beef trade is highly dependent on trade agreements, cattle exports to China reached nearly 50 million pounds in April 2021. Further, Chinese imports have increased 210 percent from 2019 to 2020 (USDA 2021b). While the value of trade is only \$310 million in 2020, the opportunities for export of beef and growing demand from other countries remains to open future marketing opportunities for domestic producers.

### 2.2.3 Plant-Based Alternatives

There are also a fair amount of future headwinds for producers to be wary of. For decades, traditional beef substitutes such as chicken and pork have threatened the industry. Now, they will also have to face growing competition from nontraditional sources such as lab-grown and plant-based meat (PBM). A survey by Bryant (2019) illustrates consumer familiarity and acceptance of lab-based meat and PBM in the United States, with 29.8 percent of respondents indicating they would be extremely or very likely to purchase lab-based meat, and 32.9 percent of respondents were either very or extremely likely to purchase PBM alternatives. Researchers Hoek et al. (2013) found that sampling vegetable-based or clean

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<sup>2</sup> Sustainable sourcing is a broad category but typically refers to the inclusion of environmental and social criteria in supply chain decisions. This can take the form of reductions in energy, water, or chemical footprints in agricultural production. It can also take the form of animal or worker welfare considerations.



**Figure 4. U.S. Beef Export to China (January 2000-April 2021)**

Source: USDA 2021b.

meat reduces consumer aversion to it. Thus, people can become used to consuming beef substitutes. PBM or lab-grown meat, also called cell-based meat (CBM), has the potential to alleviate climate-related, environmental, health, or animal welfare issues associated with traditional beef production practices.

On the other hand, PBM and CBM substitutes have their limitations. Most Americans have a robust preference for eating natural beef rather than choosing PBM or CBM. In one research result, Van Loo et al. (2020) show that 72 percent of respondents they surveyed preferred to purchase farmed beef. Furthermore, market preference for farmed beef soared to 80 percent when specific brand names, such as Certified Angus Beef, Beyond Meat, Impossible Food, and Memphis Meats were explored. Hence, the movement to alternative beef exists, but the preference for genuine beef remains significant.

### 2.3 Beef Industry in Southern Idaho

While most people think of Idaho when they think about potatoes, cattle represents an even larger sector within the state. In 2019, cattle and calves was the second most valuable commodity at \$1.4 billion, while potatoes came in third at \$1.1 billion (National Agricultural Statistics Service 2021). Southern Idaho’s extensive public grazing land makes it desirable for cattle production. Grazing allotments are relatively cheap and easy to obtain. Over 70 percent of the state is composed of public land. Grain for running a feedlot is a little more expensive than in the Midwest, but with the nearby city of Burley sitting right on a freight train line and Interstate 84, the basis for feedlot grain remains modest.

The labor pool in the Burley area is fairly shallow. Burley sits at the intersection of Cassia and Minidoka Counties, which have a combined population of about 45,000 people. Given Idaho’s 3.2 percent unemployment rate, plant workers and skilled supervisors may be tough to find. Jack’s rough estimate suggests Milner Ranch would require somewhere between five and seventy-five additional workers depending on the size of the beef processing facility. Jack thinks that they could get the workers they need in either case but may have to pay a premium if they need a large number of employees.

Another consideration for Jack is that Milner Ranch would not be the only beef processing plant in the region. JBS has a 500,000 head per year processing plant 140 miles to the Southeast in Hyrum, Utah. Caviness and Simplot (CS) jointly run a 442,000 head per year processing plant 166 miles to the northwest in Kuna, Idaho. Two new facilities are being built within just a couple hours of Milner Ranch.

True West Beef is being built just to the west of Burley, and Intermountain Packing is building a facility in Idaho Falls. Both of these facilities should be operational within one year. USDA surveys from 2017 estimate that Idaho and its surrounding states (Montana, Nevada, Oregon, Washington, Wyoming, and Utah) produce a combined total of about 449,000 fed cattle annually (National Agricultural Statistics Service 2021). This means that there is currently a surplus in regional processing capacity for fed cattle. While it is not required to source cattle from within the region, it would add to Milner Ranch's transportation cost if they had to acquire fed cattle from outside the region.

## 3 History of the Business

### 3.1 Mission Statement

Milner Ranch has always prided itself on producing the highest quality beef possible. Eighty percent of its fed cattle grades at prime or upper tiers of choice, helping to achieve its CAB certification. The majority of what doesn't make CAB grade still receives choice grade. While consolidation swept across various grazing and feedlot operations to achieve economies of scale, Milner Ranch bucked this trend. In response, they doubled down on improving genetics and management practices to improve the quality of their beef (e.g., CAB certifications). They have also experienced success by following production practices aimed at achieving animal welfare accolades (e.g., GAP 2 certification). Both of these support Milner Ranch's mission of producing the best beef possible, while allowing them to earn a premium on their product in the market.

Their decision to not follow the conventional wisdom in U.S. agriculture of "get big or get out" is by choice rather than lack of financing. Their cow-calf, grazing, and feedlot operations have been successful, and they have the resources to aggressively expand any and/or all of these operations. However, they feel too much expansion in any area would make it difficult to maintain their self-imposed high standards. Their hope is that a successful processing plant would complement their core philosophy of doing everything they can to produce the best beef possible for the consumer by giving them more control over the marketing process.

### 3.2 Grazing Operation

Milner Ranch has been in ranching for multiple generations. When Jack took over management of the operation more than two decades ago, he made it a priority to cut costs and make the operation profitable. The grazing operation follows a traditional cow-calf operation in Idaho with spring calving, maintaining a herd of approximately 1,200 cows and 48 bulls. During this time, the herd is on hay and straw moving to a private pasture through the spring melt. The herd moves to public grazing lands during the summer months, returning to private pasture and range land during the fall. In terms of the operation, Jack has worked to enforce and maintain a 12 percent cow replacement rate, a 2 percent cow death loss, and 88 percent calf weaning rate. These efforts have helped maintain the health of the herd. For the purposes of sale, Jack assumes calves wean at eight months and weigh approximately 510 pounds for heifer calves and 550 pounds for steer calves.

### 3.3 Feedlot Operation

For the last ten years, Milner Ranch has operated a feedlot. Jack operates the feedlot as a separate operation from the cow-calf herd. This has helped track profitability across the two operations. The weaned calves move into the feedlot in late fall and begin on a starter ration for sixty days before moving to a finish ration for 200 days. Given that calves are moving from the cow-calf operation without additional purchased cattle, it is assumed that approximately 70 percent of the calves are steers and 30 percent are heifers. The steers are assumed to have 2.7-pound average daily gain (ADG) over the starter rations and 3.5-pound ADG when feeding finish rations, being fed to a weight of 1,350 pounds. Heifer

calves are assumed to finish at 1,275 pounds. Feed rations are generally a mixture of alfalfa hay, corn silage, grains, minerals, and salts. Given that the land is generally poor for crop production, the operation is forced to purchase their silage and grains. They grow their own hay. Finally, unlike other operations that cycle cattle, this feedlot assumes one cycle of 1,000 head of cattle.

## 4 Beef Processing Plant Decision Considerations

Milner Ranch will ultimately make a decision based upon Jack's recommendation. Jack has identified three key questions and two key variables that will dictate whether a processing plant makes sense. These questions include: should Milner ranch invest in a processing plant, if they invest in a processing plant how large should it be, and how should they maintain relationships with feedlots?

### 4.1 How Large Should a Potential Processing Plant Be?

Jack doesn't think that the region Milner Ranch operates in would benefit from constructing a large-scale processing plant (over 100,000 head per year). There are already two such plants in the region, and Milner Ranch does not have the liquidity or the appetite for risk to make that large a plant interesting to them or profitable. He has narrowed the size decision down to either a 1,000 head per year processing plant (small-scale) or a 20,000 head per year plant (mid-scale). Either of these sizes comes with its own benefits and costs.

#### 4.1.1 Small-Scale Plant

The major benefit of a small-scale plant is that Milner Ranch could feed this plant entirely with its own cattle. This would give Milner Ranch total control over the cattle within its operation from birth to processing. This control could lead to the ability of marketing their beef as high-end and fully capturing the benefits and higher price premium associated with how they already raise their cattle. Milner Ranch also wouldn't have to worry about regional competition from larger processors for fed cattle since they would be able to run this plant at capacity with their own herd. Finally, a small plant requires considerably less up-front costs than larger scale plants. After some preliminary research, his ballpark estimate for the cost of constructing a 1,000 head per year plant is \$1.9 million. Milner Ranch has \$4 million in financial capital, so they could pay for this in cash if they desired to do so.

The main drawback of a small beef processing plant is the operating cost and its effect on long run average total cost. This plant would lack the economies of scale that larger regional competitors have. Jack's rough estimated long run average total cost of processing cattle into beef is about \$5.50 per pound of meat produced for a small plant. Last Jack checked, average weighted prices for various beef cuts were wholesaling for about \$5.10 per pound in the area.<sup>3</sup> This means that even with beef prices on the rise, Milner Ranch would still need to achieve premium above-market wholesale beef prices to cover the costs of being small. Another consideration is that the size of the plant puts a lot of pressure on the grazing and feedlot divisions of the operation. High death loss in either stage of production will leave the processing plant with idle capital, which would quickly increase the long run average total cost of production. While Jack has a lot of faith in these other divisions, he is the one running them after all; it leaves little room for error or unexpected events.

#### 4.1.2 Mid-Scale Plant

The mid-scale plant provides a compromise between the economies of scale of a large plant and the increased quality control and marketing that a small plant provides. A 20,000 head per year processing plant has a lower long run average total cost of production compared to the small-scale plant, estimated at \$5.00 per pound of meat produced. This would make the plant profitable under current prices. Milner

<sup>3</sup> One fed steer produces multiple cuts of meat. Each cut has a different price. We weight the different prices associated with different cuts as well as their percent occurrence. On average, processed beef is worth \$5.10 per pound.

Ranch would have to be careful though because there would be little room for profitability if selling prices decrease or input prices increase. This scenario would also greatly benefit from marketing a premium product to help ensure positive margins.

A mid-scale plant requires coordinating with other feedlots to ensure the plant runs at capacity. Milner Ranch would have to find and incentivize various feedlot owners throughout the region to supply 19,000 cattle in addition to their 1,000 to ensure the plant would run at capacity. They would have to be competitive with the existing prices paid for fed cattle by existing beef processing plants in the region. If Milner Ranch wishes to sell the meat as a premium product, they would need to additionally establish and incentivize production practices consistent with higher standards from the birth through feeding. This would require either contracting or forming a co-op with other feedlots. Finally, the up-front cost of a plant this size is estimated to be \$34.2 million. Milner Ranch has up to \$4 million of financial capital on hand but would need to acquire the rest through a business loan or shared ownership with other co-op members.

## 4.2 What Type of Relationship Should Milner Ranch Processing Plant Maintain with Feedlots?

Jack recognizes that ensuring the processing plant runs at capacity will be key for maintaining profitability. This is going to depend upon Milner Ranch's ability to acquire quality finished cattle in a timely manner. The ability or inability of Milner to achieve this will depend upon the relationship they have with their suppliers. He has narrowed this decision down to three possibilities.

1. **Owner Fed Plant:** Milner Ranch supplies its own cattle to a small-scale plant.
2. **Marketing Contracts:** Milner Ranch acquires the 19,000 additional cattle they require through marketing contracts that specify price per pound and various bonuses/penalties based upon meat quality/attributes.
3. **Co-op Plant:** Milner Ranch starts the plant as a co-op for cattle feedlot owners. Milner would be a 5 percent owner because they would provide 5 percent of the total cattle to run the plant. They would find other feedlots within the region that they would share all costs and profits with evenly, provided cattle were meeting all pre-specified quality expectations.

### 4.2.1 Owner Fed Plant

The advantageous part of this particular plan is its simplicity. Milner Ranch doesn't have to shop around for more cattle or convince other feedlots to buy into their vision of best feedlot practices. Since both the feedlot and processing plant are housed within the same company, coordination would be easy. What will also help them maintain a low transportation cost for acquiring cattle is that both operations would be housed at the same location. This plan would synergize best with a small-scale processing plant because Milner Ranch would have to scale up its feedlot dramatically to supply enough fed cattle for a mid-size plant with only its own cattle. This degree of scale-up is not something they currently are interested in pursuing.

This plan puts a lot of pressure on Milner Ranch's cow-calf, grazing, and feedlot operations. If at any point those operations are not producing the amount of cattle they are supposed to, they risk their plant not running at capacity, which will lose them money. This marketing arrangement only works with a small-scale plant, so Milner Ranch would have to contend with the relatively higher production costs associated with a smaller plant.

### 4.2.2 Marketing Contracts

Marketing contracts between feedlots and beef processing plants are the industry standard. This arrangement would allow Milner Ranch to add value to all of their finished cattle while allowing for economies of scale that come with a mid-sized operation. This would allow them to take a cut of the

marketing bill for all of the additional cattle they contract with. There would also be some logistical advantages for getting their packaged meat to wholesalers, retailers, and/or restaurants.

Under this scenario, Milner Ranch would bear the entire cost of a 20,000 head per year processing plant by themselves. They have enough resources to put 10 percent down and obtain financing for the rest, but it would spread finances pretty thin. Their loan would come from a local bank with 8 percent interest, to be paid back over fifteen years. The marketing contract scenario exposes Milner Ranch to the most risk because they would pay for the entire processing operation. The marketing contract scenario also requires monitoring quality of purchased cattle. Milner Ranch has to write and enforce contracts carefully to ensure that they are getting the type of cattle they want to achieve premium high-quality beef.

### **4.2.3 Co-op Plant**

This arrangement would allow Milner Ranch to reap many of the benefits of a mid-size processing plant without having to pay the full cost of one. They would be in charge for 5 percent of the purchase price and operating costs of the plant, with the other 95 percent being paid by other co-owners. They would pay their share of up-front fixed costs (\$1.71 million) with their own capital. Member feedlot incentives may be more closely aligned in this arrangement than under marketing contracts since everyone who provides cattle will share in the profits from processing.

Under this scenario, Milner Ranch would only receive 5 percent of the profits of this plant because they are 5 percent owners. They would also give up a significant amount of control since they are only partial owners. The co-op plant scenario would require considerably more negotiation and back and forth than the other two arrangements, raising transaction costs. Co-ops are also only as strong as their weakest members, so recruiting others with similar quality concerns and work ethic is critical for this venture.

## **4.3 Should Milner Ranch Even Build a Processing Plant?**

After coming up with the size and transactional relationships likely to be the best options, it is worth asking the final question, is the best option better than business as usual or a minor modification? Milner Ranch is already profitable and is under no obligation to build any kind of processing plant. While processing constraints and supply chain disruptions from COVID-19 shutdowns motivated some of Milner Ranch's conversations, processing has mostly returned to normal. Instead of considering a processing plant, they could instead take that money they would have spent vertically integrating their operation and expand or enhance the business in other ways.

## **4.4 Future of Cattle and Beef Prices**

Another important question to think about in making a recommendation is how is the market likely to evolve over time? This plant will operate for several decades, and the current prices Milner Ranch is responding to will almost assuredly not be the same in the future. While Jack doesn't have a crystal ball, a little bit of critical thinking and basic economic analysis may help him determine if beef processing is likely to become more or less profitable over time. Here Jack thinks about the two most important variables to meat processing: fed-cattle prices (input cost) and beef prices (output price), and what could potentially happen with them over the life of the investment.

### **4.4.1 Steady Margin Scenario**

In this scenario, cattle and beef prices follow the typical boom-bust cycle, but real margins remain stable and similar over the long term. After some research and consulting, Jack thinks that this scenario will be the most likely over the life of the plant. This scenario becomes even more likely when one realizes that cattle price and beef prices are positively and highly correlated. This correlation makes large margins

unlikely, but it also lowers the probability of negative margins. Jack thinks that this scenario has a 50 percent probability of occurring in the long term.

#### **4.4.2 Best Case Scenario**

Under the scenario, continued expansion in population and income growth increases the demand for beef. Risk and regulations keep the supply of new beef processing plants constrained, limiting competition. If this occurs, Jack expects beef prices to increase in real terms (2 percent annually). On the cattle side, improvements in genetics and management practices increase herd sizes, and the price for fed cattle remains steady in real terms. In this scenario, a processing plant would see a modest improvement in its margins each year. Jack sees this scenario as somewhat, having a 25 percent probability of occurring.

#### **4.4.3 Worst Case Scenario**

Under this scenario, meatless substitutes to beef continue to increase in quality and decrease in price. This increased competition lowers real beef prices by 1 percent annually. Housing development combined with climate change reduces available rangeland for cattle grazing and increases grain prices. Increases in government regulation on cattle production further drive up the cost of producing cattle. These changes in turn increase the price of fed cattle by 1 percent annually. Jack sees this scenario as being somewhat likely to occur and ascribes a 25 percent probability to this outcome occurring.

The real world is a little messier than having three discrete and well-defined scenarios. It could be any combination of steady prices, price increases, or price decreases for fed cattle and beef prices. The general ideas of steady margins, best or worst scenarios, helps highlight in which way the profitability for the industry may move in the future. Movements of both prices in the same direction would likely fall into the steady margin scenario, even if both prices greatly change; as long as margins remain similar, the plant will maintain similar levels of profit over time.

## **5 Milner Ranch Strategy Questions**

### **5.1 Reflection**

As Jack weighs his options for the upcoming meeting, he marvels at how complicated an initially simple decision of processing plant vs. no processing plant has become. He now has four realistic options: no processing plant, small-scale plant fed with only Milner Ranch Cattle, mid-scale plant with marketing contracts, and a mid-scale plant formed as a co-op with other feedlots. Each of these options is complicated by the fact that Jack sees three plausible future states of the world: steady prices, increasing prices, and decreasing prices for fed cattle and beef, respectively. Either of these variables could have a huge impact on Milner Ranch's best option to follow.

Over the past two decades, Jack has helped build Milner Ranch into a successful and profitable business. Even more impressively, he has done it while staying true to Milner Ranch's vision. Jack has to make big decisions and take more than a few risks to make Milner Ranch profitable. A successful processing plant could further enhance Milner Ranch's brand, reach, and profitability by allowing them to highlight their cattle. On the other hand, an unsuccessful processing plant could significantly impact the other two divisions of the operation. He wonders if it is worth one more dice roll to take the company to the next level or if it is time to start playing a little safer and make smaller changes with less of a potential payoff.

## 5.2 Discussion

### *Setting Up and Modeling the Problem*

1. Sketch out a SWOT analysis of Milner Ranch's current operation. Pay careful attention to list the internal factors that they have control over (strengths and weakness) as well as the external factors currently affecting the operation that are beyond their control but they must respond to (opportunities and threats). Once you complete the baseline SWOT analysis, conduct a SWOT analysis for each of the three strategies under consideration. Use these four SWOT analyses to inform your answers to discussion questions 3–10.
2. Conduct a PESTEL analysis of the most important external factors Milner Ranch would likely face if they invest in a beef processing plant. Come up with at least one example for each category. Use this PESTEL analysis to inform your response to discussion questions 3–10.

### *How large should a potential processing plant be?*

1. Would a small or mid-size plant be more likely to be successful?
2. What are the two greatest benefits of the plant size you chose?
  - a. Explain why you think these benefits are the most important.
3. What are the two greatest costs or risks associated with the plant size you chose?
  - a. Explain why you think these costs or risks are the most important.

### *What type of relationship should a Milner Ranch processing plant maintain with feedlots?*

1. What are the two greatest benefits of the relationship you chose?
  - a. Explain why you think these benefits are the most important.
2. What are the two greatest costs or risks associated with the relationship you chose?
  - a. Explain why you think these costs or risks are the most important.

### *Should Milner Ranch even build a processing plant?*

1. After considering potential future factors that could affect the fed-cattle and beef prices, do you personally think it will be easier or harder to make money with a beef processing plant in thirty years than today? Why?
2. What is Milner Ranch's opportunity cost for building a processing plant?
3. After considering the best possible size, transactional relationship, predicted trend of the industry, and opportunity cost, would you make this investment? Why?
4. What other strategies could Milner Ranch follow to make their overall operation more profitable?

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