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Case Study

The Future of Four Creeks Farm: Scale-Up, Diversify, or Exit?

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Abstract
This decision-scenario case study is designed to be suitable for both online and face-to-face instruction in an undergraduate-level agribusiness, agricultural policy, or business strategy course. The case challenges students to assume the role of decision makers for a struggling family-owned dairy farm to determine whether the farm should scale-up, diversify, or exit the industry. Students will (1) learn about the unique features of the U.S. dairy market and domestic government support policies for dairy farms, (2) understand the challenges facing small family-operated farms, (3) apply strategic management tools to analyze and select the best strategic option to ensure short-term and long-term survival of the farm, and (4) advance critical thinking and decision-making skills. This case study is versatile and can be adapted to a variety of classroom settings. It can also facilitate broader discussions of management decisions facing agricultural businesses operating outside of the dairy industry.

1 Introduction

Four Creeks Farm in central Florida is at a crossroads. After more than fifty years in the dairy farming business, the McCall family is struggling to make ends meet. George McCall grew up in the dairy industry and, after thirty years of watching his dad milk cows day in and day out, he decided to keep the farm in the family. Ever since George took over as the CEO and manager of the farm, he and his three children—Steven, Jessica, and Adam—have been working hard to grow the family business. However, low milk prices, industry consolidation, and steady milk supply against a backdrop of declining consumer demand for fluid milk makes it a tough market in which to operate (MacDonald, Cessna, and Mosheim 2016). Like many other small U.S. dairy farmers, the McCalls are contemplating whether it is financially sustainable to stay in the dairy industry by scaling up or diversifying operations to include alternative sources of revenue, or whether they should exit the industry.

Steven, Jessica, and Adam look forward to the day they too can raise their children on the working farm. Exiting the dairy market is not an option they want to consider, so they have spent weeks formulating their plan to save the family farm. Steven McCall believes the answer to their faltering finances is to market their milk as free-range or organic. Jessica McCall is eager to diversify by integrating an agritourism segment to the farm that would include a gift shop, ice cream parlor, and a small restaurant or café. Adam, the economist of the family, believes the only way to be profitable is to scale up milk production, which will lower costs due to economies of scale. To weigh these options the siblings will use the Political, Economic, Social, Technological, Environmental, and Legal (PESTEL) framework to analyze the dynamics of the dairy industry that can influence current and future performance of the farm. PESTEL analysis is a commonly used tool that helps managers of agricultural businesses identify various factors from the external environment that may influence performance. To further inform the family's decision, the siblings plan to compare the estimated costs and capital investments necessary to pursue each option, along with nonfinancial considerations.

The market continues to steadily decline, and George McCall faces a challenging decision: should he sell the farm? Or should he market his product differently, build an agritourism facility, or scale up his operation? The family is eager to make a change and avoid locking their gates for the last time. As Mr. McCall sits in his home office, he anxiously chews on a toothpick wondering what move he should make.

2 The U.S. Dairy Industry and the Fluid Milk Market

The dairy industry is an integral part of the agricultural portfolio in the United States. American consumers view dairy products as an essential food item and an important part of a household's weekly shopping basket. However, the U.S. dairy industry has been undergoing a significant structural transformation characterized by farm consolidation, exit of small dairy farms, and a shift of milk production to large operations (Figure 1). Despite a 50 percent increase in the total milk production in the United States, the number of dairy farms has decreased by more than 75 percent in the past three decades (MacDonald, Law, and Mosheim 2020). Larger commercial dairies are absorbing the smaller family-owned dairy farms, or indirectly pushing them out of business through a steady milk supply, one of the factors keeping milk prices low.

The success of the dairy industry depends on economies of scale, technological advances, and a reliable supply of key inputs (Savaskan 2019). Larger dairies can earn substantially higher net returns for the milk they produce when the unit cost of production falls with increased herd size. For example, the unit costs incurred by large farms with herd sizes of 2,000 or more cows can be as much as 24 percent lower than farms with herd sizes between 500 and 999 cows (MacDonald et al. 2016). Despite the competition, some small dairies remain profitable by investing in various value-added activities such as expanding their operations to include agritourism, seeking higher milk prices through organic milk, selling other dairy products in-house such as cheese or ice cream, or breeding high-quality heifers and calves for sale (MacDonald et al. 2020).

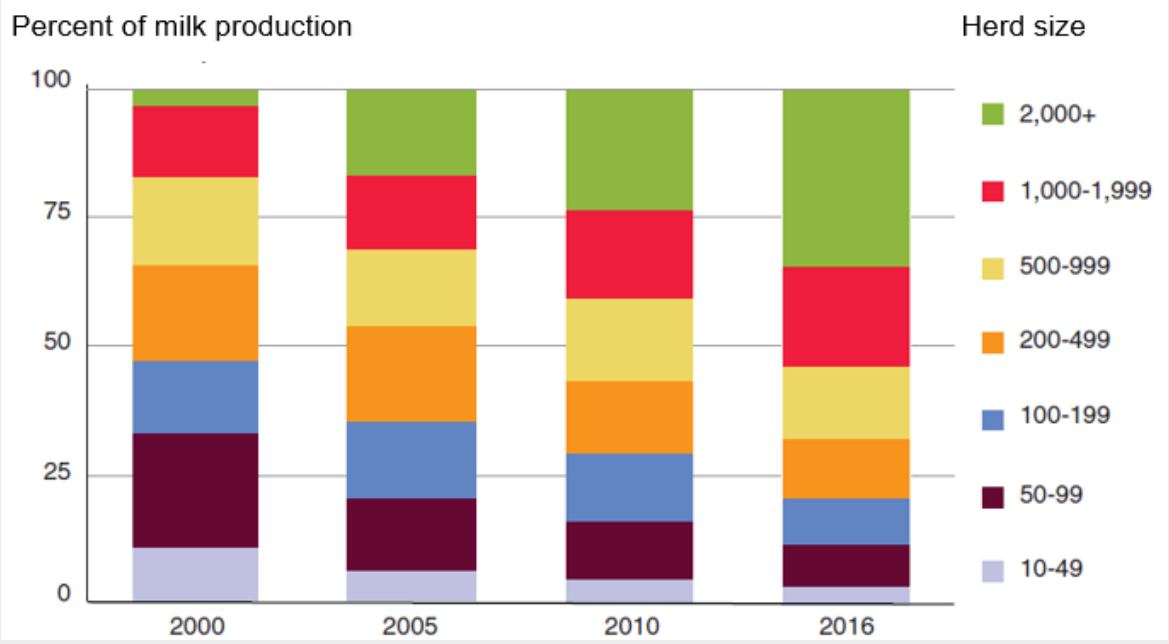

Figure 1. Shift in Milk Production to Larger Farms

Source: Figure taken from MacDonald, J.M., J. Law, and R. Mosheim. 2020. *Consolidation in US Dairy Farming.* Washington DC: U.S. Department of Agriculture, Economic Research Service, ERR 274.

Competition within the industry is based mostly on price and cost-minimization since conventional (non-organic) milk is homogenous throughout the market (Savaskan 2019). Over time, milk production per cow has risen with improvements in genetics, nutrition programs, and new technologies such as cow activity monitors and automated milking systems (Barkema et al. 2015). Milk production continues to steadily increase even as the number of farms and demand for fluid milk is decreasing. Since 2000, dairy milk consumption has fallen by 25.8 percent for the average American (Figure 2). Other segments of the dairy industry (e.g., butter, cheese, and ice cream) and the plant-based milk (non-dairy) industry are outpacing the fluid milk (dairy) market in terms of growth, as consumers continue to shift their preferences away from fluid milk. Non-dairy alternative milk beverages now account for 14 percent of revenue in the retail milk sector (The Good Food Institute 2020). The most popular milk alternatives include almond, soy, oat, coconut, and rice milk.

Decreasing demand coupled with a steady aggregate supply have contributed to low prices of milk. Dairy farm gross income comes primarily from milk sales, while feed represents a large portion of total costs. Prices of both milk and feed fluctuate widely based on factors outside of farmers' control, exposing dairy farmers to high financial risks. Milk price volatility is attributed to unique features of a dairy market that is characterized by inelastic supply and demand that responds weakly to changes in prices (MacDonald et al. 2016). Labor is another substantial component of total costs. Because of increasing labor costs over time and difficulty finding reliable local employment, many large dairy farms depend heavily on immigrant or undocumented labor to complete daily milking tasks (Simnitt and Farnsworth 2016).

The industry is also under increasing pressure from consumers and environmental groups to reduce its negative environmental impacts (Olynk 2012). Dairy operations contribute significantly to climate change and water pollution (Lötjönen, Temmes, and Ollikainen 2020). Methane, a potent greenhouse gas, is released from decomposing manure and from the digestive tract of ruminant animals like cows. Manure spills and runoff contaminate groundwater and surface water, contributing to algae blooms and oxygen-deprived dead zones (Bailey et al. 2020; Lötjönen et al. 2020). These environmental impacts are exacerbated with increasing commercialization of dairy operations that concentrate thousands of cows in a single barn or lot.

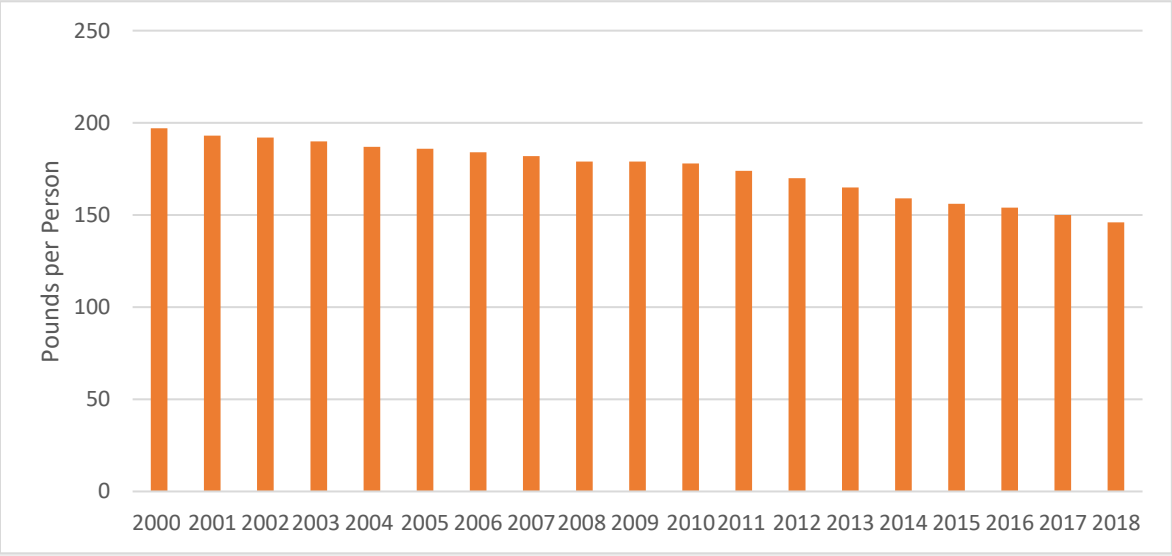

Figure 2. U.S. Per Capita Consumption of Dairy Milk

Source: U.S. Department of Agriculture, Economic Research Service. 2020. *Dairy Data.* Washington DC: U.S. Department of Agriculture, Economic Research Service. Retrieved from https://www.ers.usda.gov/data-products/dairy-data/.

3 Government Support Policies and Regulations

The U.S. government is heavily involved in the dairy market through a variety of policies and programs primarily focused on mitigating the effects of price volatility and financial risk. Over time, dairy support policies have evolved from setting price floors for milk products to creating programs that soften the effects of low prices, particularly in times of large decreases in the price of milk relative to feed (MacDonald et al. 2016).

Created in the 1930s, Federal Milk Marketing Orders[1] (FMMOs) provide guidelines governing the purchase of fluid milk, including a minimum price, from farmers supplying milk in a specified geographical marketing area (U.S. Department of Agriculture, Agricultural Marketing Service 2021a).[2] Minimum prices are determined monthly and move directly with market prices of dairy products. These prices are based on the class in which the milk product falls. Fluid milk is in Class I, for which prices remain volatile due to changes in consumers' tastes that lead to demand fluctuations and changes in feed prices (MacDonald et al. 2016). Class I minimum FMMO price of milk at $17.78 per hundredweight in 2020 is expected to decrease to $16.92 per hundredweight by the year 2025 (Agricultural Markets and Policy 2021). For the McCall family such a price decrease implies a change in annual net returns—the difference between gross income and the total cost of milk production—from a profit of $0.71 per hundredweight to a loss of $0.15 per hundredweight.[3]

In 2014, Congress established the Margin Protection Program for Dairy (MPP), which was revised and renamed as Dairy Margin Coverage (DMC) in 2018. The DMC is a voluntary program that offers payments to enrolled farmers when the difference between average milk prices and feed costs falls below a certain dollar level. The 2018 revisions to the DMC program included a greater focus on supporting small dairy farms by allowing them to pay lower premiums for margin coverage. The payouts under the DMC program totaled $150 million in 2018 and $279 million in 2019 (MacDonald et al. 2020). The Livestock Gross Margin (LGM-Dairy) and the Dairy Revenue Protection (Dairy-RP) programs are aimed at protecting farmers against drops in the milk-feed margin and unexpected losses in quarterly revenues from sales of milk compared to a guaranteed coverage level (MacDonald et al. 2020). Despite substantial federal spending to support dairy farmers, these programs are not designed to assure profitability for all dairy farms. These policies may slow down the trend of small farm closures, but they do not address the broader issues facing the industry such as milk oversupply, continued farm consolidation, and the cost advantages of larger operations in comparison to smaller farms.

The U.S. government also uses trade agreements to expand the U.S. dairy export market, such as the United States-Mexico-Canada Agreement (USMCA) that replaced the North American Free Trade Agreement (NAFTA) in 2020. USMCA will maintain NAFTA's duty-free access to Mexico's dairy market, which is the largest market for U.S. dairy exports (Greene 2019), but will also expand access to the Canadian dairy market. Exports from the United States to Canada have been capped at about 3 percent of Canadian total dairy sales under the tariff-rate quota (TRQs) imposed by Canada (Noll and Litan 2018) that limited exports beyond this amount through high tariffs. Under the USMCA, Canada will allow the United States to export 3.59 percent of the Canadian dairy market tariff-free before the high tariffs kick in. In addition, Canada will expand the quota by an additional 50,000 metric tons (110 million pounds) for fluid milk by 2026 and will keep increasing the quota by 1 percent every year for thirteen years

[1] For more information on FMMOs see Greene, J. 2017. *Federal Milk Marketing Orders: An Overview*. Washington DC: Congressional Research Service, CRS Report R45044. https://crsreports.congress.gov/product/pdf/R/R4504.

[2] A marketing area is typically defined as a geographic area in which processors of dairy products (or "handlers") compete for milk sales (U.S. Department of Agriculture, Agricultural Marketing Service 2021a).

[3] These calculations are based on feed and operation costs provided in Table 1. The dairy industry frequently expresses income and costs per one-hundred pounds or hundredweight of milk produced.

thereafter[4] (van Kooten 2020). The United States International Trade Commission projects that the USMCA will lead to an increase of $314 million per year of U.S. dairy exports to Mexico and Canada (Shikher et al. 2019). Despite these positive projections, the expanded access to the Canadian dairy market will have a negligible impact on the U.S. dairy industry overall (Golub et al. 2020), including on smaller operations like Four Creeks Farm that do not directly export dairy products.

In addition to the support programs and trade policies, the U.S. dairy industry is regulated at the state and federal levels through laws pertaining to food safety and environmental protection. Dairy farms are required to obtain a license from state government before they can begin operating. State departments, such as the Florida Department of Agriculture and Consumer Services, regularly inspect dairy facilities and work with the U.S. Food and Drug Administration to ensure safety of dairy products. Dairy farms are also required to meet federal and state environmental regulations. The Clean Water Act (CWA) requires states to control point sources of water pollution, such as wastewater treatment plants, but this excludes most agricultural runoff, which is considered to be a nonpoint source. However, livestock farms classified as Concentrated Animal Feeding Operations[5] (CAFOs) are subject to the CWA National Pollutant Discharge Elimination System (NPEDS) permitting requirements. NPDES permits are required if a CAFO discharges pollutants to any waters of the United States (U.S. Environmental Protection Agency n.d.). Further, individual states have developed water quality goals with various funding programs available to incentivize farmers to implement best management practices that reduce the amount of animal waste, fertilizers, and other contaminants entering water bodies.

4 Dairy Supply Chain: From Farm to Table

Across the United States, there are several breeds of dairy cattle. The most common breed is the Holstein. Holstein cattle are very efficient producers of low-fat content milk, primarily processed for fluid dairy products (Dairy Dealer n.d.). The dairy supply chain (farmers, wholesalers, distributors, retailers, consumers) is complex, yet efficient (Figure 3). The supply chain starts in the milking parlor where milk is transported in pipes and stored in refrigerated tanks. Cows are milked two to three times daily. Because milk is highly perishable, it needs to be cooled quickly and transported soon after it is produced. Refrigerated tanker trucks pick up the milk from a farm and transport it to a processing facility where the milk is homogenized, pasteurized, packaged, and shipped to grocers. Milk makes its way from the cow to the grocery store shelf within a two-day timeframe (Kroll 2015). Milk typically comes from dairy farms within 300 miles from a grocery store as transporting fluid milk over longer distances is costly and impractical. Most international trade in milk occurs through nonfat powdered milk.

The U.S. milk industry primarily consists of farmers who are members of milk cooperatives that transport, process, distribute, and market their products. Cooperatives allow farmers to pay a certain amount of money for a guaranteed milk market and a commitment for the greatest possible return (Novakovic and Wolf 2018). Milk cooperatives, which began as local or regional associations in the early twentieth century, now primarily include multi-billion dollar businesses, each with hundreds or thousands of farmer-members, such as Dairy Farmers of America, California Dairies, Inc., and Land O' Lakes, Inc. Cooperatives and individual producers alike sell their products in compliance with FMMOs.

[4] Other dairy products will be granted the following additional quota: cheese (12,500t), cream (10,500t), SMP (7,500t), butter and cream powder (4,500t), yogurt and buttermilk (4,135t), concentrated and condensed milk (1,380t), and other dairy products (4,660t; van Kooten 2020).

[5] A dairy farm is classified as a CAFO if it confines at least 700 or more mature cows at a single site or facility. Smaller operations may also be considered CAFOs under certain conditions (University of Illinois Extension n.d.).

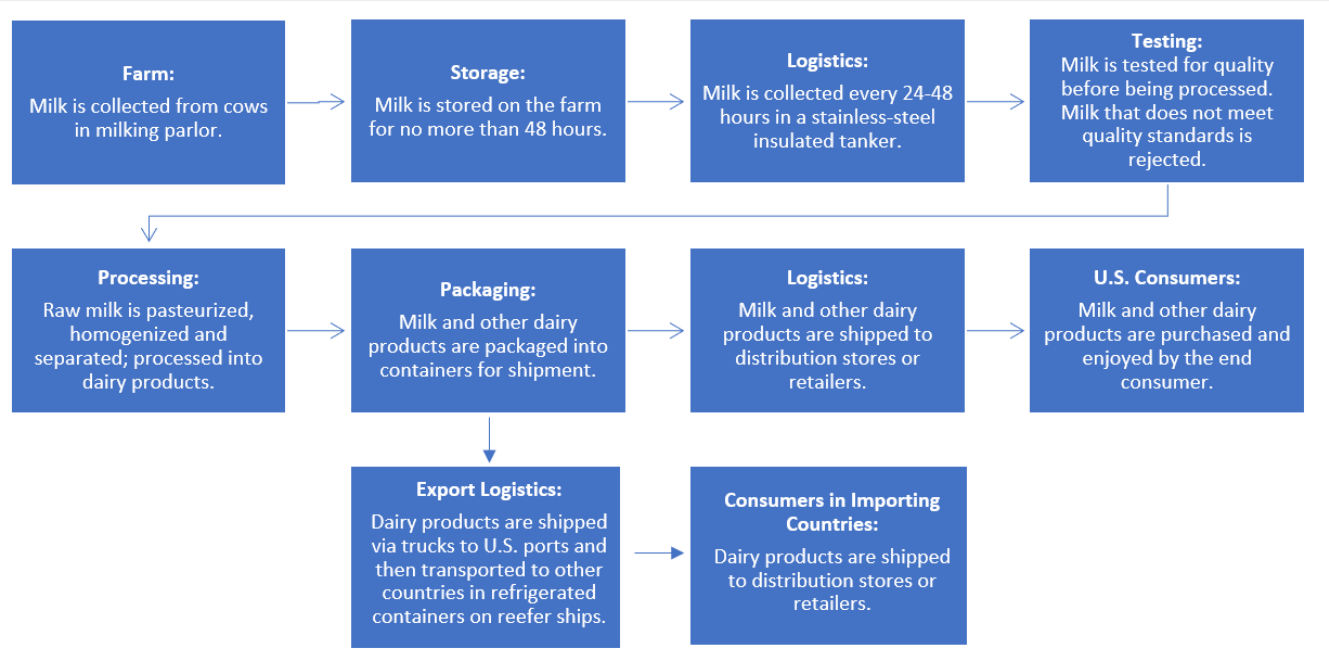

Figure 3. Dairy Industry Supply Chain

5 The Dairy Industry in Florida and The Four Creeks Farm

Florida is one of the leading U.S. dairy states. In 2020, the dairy industry in Florida included 114,000 cows, mostly Holstein, in herds ranging from 150 to 5,000 head. That year, Florida milk production reached 2,343 million pounds (Agricultural Markets and Policy 2021). Most of Florida's dairy cows are concentrated in two counties: Lafayette and Okeechobee. Many Florida dairy farmers, including George McCall of Four Creeks Farm, are producer-members of the Southeast Milk, Inc. dairy cooperative. Southeast Milk sends a truck to pick up milk from Four Creeks Farm every day and transports it to a processing facility before the milk makes its way to the consumer (Figure 3).

Four Creeks Farm was founded in 1948, when George McCall's father, Frank, purchased 2,200 acres of land north of Tampa, Florida, most of which is now used for grazing. Located centrally on the land is the family's milking parlor, where 625 cows are milked twice a day, producing about 18,000 pounds of milk per cow annually. The dairy's basic finances are outlined in the first column of Table 1. Four Creeks Farm supplies milk products to the southeastern United States, primarily in central Florida, through FMMO 6.

6 The Road Ahead

Steven, Jessica, and Adam would like to ensure a strong financial future for the farm, but they have not been able to agree on a single strategy the farm needs to pursue going forward. None of them want to see their family's farm join the ranks of small dairies that have gone out of business over the past half-century. They are considering diversifying the farm operations in different ways—either through marketing their milk outside conventional supply chains, adding an agritourism aspect to the business, or scaling up to reduce their unit costs of production. However, seeing trends in the industry, their father George McCall believes his children should carefully consider selling the herd and leaving dairy altogether.

6.1 Diversification of Farm Operations: Beyond Conventional Supply Chains

The silver lining of dairy production in sunny Florida is that the dairy cattle have access to grasslands

Table 1. Four Creeks Farm Costs and Returns per Hundredweight (cwt), 2016

	Current Herd Size 625	Projected Herd Size 1,000-1,999	Projected Herd Size >1,999
Gross Returns	18.93	19.05	18.90
Milk Sales	16.93	16.93	16.93
Other Returns	2.00	2.12	1.97
Operating Costs			
Total Feed Costs	8.71	8.97	9.20
Purchased	4.51	7.18	7.61
Homegrown	4.15	1.78	1.59
Grazed	0.05	0.01	0.00
Other Operating Costs	2.94	2.71	2.32
Total Operating Costs	11.65	11.68	11.52
Allocated Overhead			
Hired Labor	2.18	2.30	1.75
Unpaid Labor	0.69	0.30	0.10
Capital Recovery	3.85	3.60	3.37
Other Overhead Costs	0.70	0.66	0.41
Total Costs	19.07	18.54	17.15
Net Returns	**-0.14**	**0.51**	**1.75**

Note: Adapted from MacDonald, J.M., J. Law, and R. Mosheim. 2020. *Consolidation in US Dairy Farming*. Washington DC: U.S. Department of Agriculture, Economic Research Service, EER 274. Capital recovery costs are calculated as annualized replacement value of the capital.

every day of the year. This situation reduces feed costs for the farmer and provides a potential marketing opportunity for free-range cattle. Steven McCall learned about a new marketing concept from a dairyman in south Florida, who has started a program called "Free Range 365.[6]" Cattle who graze pastures every day naturally produce milk with health attributes that set the product apart from conventionally produced milk. Free-range cows produce milk that is higher in Omega 3 and Conjugated Linoleic Acids (CLAs), thus providing more health benefits with anti-carcinogenic and anti-inflammatory properties (Viladomiu, Hontecillas, and Bassaganya-Riera 2016). The Free Range certification promises consumers that cattle have access to grass 365 days a year. In contrast, the organic milk certification requires cattle to graze during a grazing season of approximately 120 days. Interestingly, outside of the grazing season, grass-fed cows are fed forage-based feeds such as haylage, but may not necessarily be grazing on grasslands (Free Range 365 n.d.). Free-range products could bring a 25- to 50-cent premium per hundredweight to a farmer. Alternatively, the price premium for organic milk doubles what producers can charge per hundredweight (MacDonald et al. 2020).

Steven McCall believes that free-range milk will excite consumers seeking a premium dairy beverage. If the free-range milk is sold in stores for approximately $3.50 per half gallon, the investment will bring an additional $2.92 per hundredweight to the McCall's dairy operation. A major challenge that comes with selling free-range milk is that the dairy, or a collective of dairies, must produce enough milk to fill an entire milk processing plant daily for the milk to be marketed as purely free-range. There is a very small presence of free-range milk on the market in Florida, with only four dairies in the state being Free Range 365 certified; so there is potential to penetrate the market on a larger scale if a collective of dairies can join together to fill a milk processing plant with free-range milk on a daily basis.

[6] The primary requirements a dairy farm needs to meet to obtain Free Range 365 certification include unrestricted access of lactating animals to pasture 365 days per year and availability of fresh water in each paddock. For more details, see https://www.freerange365.org/qualifications.

Another option Steven McCall believes could be a viable solution is to sell organic milk. With numerous other Florida dairy farms already producing organic milk, the McCall family would have access to a dairy processing plant that is already processing exclusively organic products. This would allow for improved marketing opportunities and a milk price premium without the need to spearhead the production of a new processing plant for free-range milk.

Of course, transitioning to organic milk production presents its own challenges. Farmers producing organic milk must follow the rules outlined under the National Organic Program (NOP) that requires a farm to obtain certification through an accredited USDA certifying agency. There is a three-year transition period where the McCall family must operate as a 100 percent organic farm by not using any prohibited inputs (e.g., GMO seeds, synthetic pesticides, and synthetic fertilizers) before their milk can be labeled as organic (U.S. Department of Agriculture, Agricultural Marketing Service 2021b). In addition, the dairy cows also must meet certain qualifications, such as eating certified organic feed and meeting at least 30 percent of their dietary needs from pasture. The transition to organic certification is easier for cattle who already obtain a large portion of their forage from pasture, rather than nonorganic forages such as corn silage. During the three-year transition period, the McCall family will incur all the costs associated with organic milk production without receiving the organic premium on their milk. For example, the total organic feed cost is about $5.60 more per hundredweight than conventional feed cost (MacDonald et al. 2020).

6.2 Diversification of Farm Operations: Agritourism

Jessica McCall, passionate about agricultural advocacy, also worked in the food service industry for eight years after earning a degree in culinary arts. She is urging her family to invest in an agritourism facility on the farm property. Jessica sees the opportunity to organize field trips for local schools and tourists to learn about the farm via wagon rides through the pastures and touring of the milking barns. Additionally, she envisions the facility will encompass a dairy product processing plant which will allow the family to sell local milk, cheese, butter, and ice cream in a small farm restaurant or café along with other farm merchandise. This option will be costly to start up, and likely will require obtaining a loan for the investment. The startup cost of building the facility equipped for milk processing and for agritourism will be approximately $850,000. Jessica will use her experience in culinary arts and her experiences with local small businesses to manage dairy product production and packaging, agritourism marketing, and finances. She will also manage a team of 8 employees. Two will be hired to work as front of house waitstaff and cashiers, and 2 others will focus on making cheese and ice cream. They would be paid between $20 and $25 per hour. The other 4 employees will be part-time staff who she hires through local high school agricultural groups, like FFA and 4-H, to lead tours and gain unpaid internship experience in the dairy industry. Both Steven and Adam will also help manage the agritourism business full-time if the family decides to pursue this option. The projected revenue of this farm enhancement project is approximately $600,000 annually.

Four Creeks Farm is located on the outskirts of Hillsborough County and just 30 miles outside of Tampa, an established tourism hot spot. Being near a large city will help make the farm a popular destination for tourists and residents alike. Additionally, Hillsborough County has 250 public and 162 private schools and many summer camps within proximity to the dairy. Jessica plans to market farm tours to schools for field trips allowing students at all grade levels an opportunity to learn about dairy cattle and milk production. Additional costs will be accrued as the agritourism operation grows, such as purchasing wagons to transport groups, and additional staff. However, Jessica believes there is room to grow, as the farm will draw customers from schools, out-of-state tourists, as well as the local community who will be excited to pay a price premium for locally produced and processed dairy products in the farm store.

6.3 Scaling Up Farm Operations

Adam McCall, who has earned a degree in economics, insists that the best way the McCall farm can be profitable is by increasing the herd size (scaling up) to achieve economies of scale. Larger farms have lower costs and higher returns because they can use both labor and capital more intensively (MacDonald et al. 2020). Like many other family-owned farms, Four Creeks Farm uses unpaid family labor,[7] but as farms grow, they rely much more heavily on hired labor. To achieve this goal, the McCall family will have to hire more workers to milk more cows three times a day, but it will also result in production of more milk per hour of labor. To increase its herd size, the McCall family will need to purchase more Holstein cows, that cost between $1,000 and $2,000 per cow (Dairy Dealer n.d.). The farm's milking parlor current capacity supports up to 1,000 cows, but it will require additional capital investments in equipment and expansion to milk more cows. It costs $24,000–$32,000 per milking stall for a new parlor and $3,000–$6,000 per milking stall to retrofit an existing parlor (Kammel 2015). A double 16 milking parlor with 32 milking stalls would be necessary to milk 1,000 cows assuming the parlor operates 21 hours a day and cows are milked 3 times a day. While these capital investments are expensive, Adam argues that as the farm becomes larger, it will realize lower capital recovery costs on capital such as barns for the herd and storage of feed and milking equipment (MacDonald et al. 2020). The farm may also need to invest in a computerized feed system to achieve higher milk yield and manage feed costs more efficiently.

The family has enough land to support a dairy with 2,000 cows without the need to purchase additional land. As the herd size increases, cows graze in pastures less, eat a higher share of purchased feed, and spend more time in barns and lots (MacDonald et al. 2020). Adam estimated the returns and costs for different herd sizes and plans to use these estimates to persuade the rest of the family to scale up (see Table 1). It is clear to him that the economic logic implies the family farm should get bigger if they want to stay in the dairy industry in the twenty-first century.

6.4 Exiting the Dairy Industry

The McCalls prefer not to think about the possibility of selling their family farm, but they understand that this option needs to be evaluated as well. Farmland prices range between $3,000 and $13,500 per acre in Florida. George McCall estimates that the family can sell the farm for $11,000 per acre. This would include their five-bedroom house, milking parlor, barn, and other equipment present on the farm. They can also sell their cows for $1,145 per head. However, there is much more to this option than the financial considerations alone. Selling the farm means that the family will give up on their dream of continuing the family business, abandoning a lifestyle and profession they love. They consider a farm environment to be an attractive place to raise children, and the family places a high value on preserving options and building opportunities for future generations.

To determine whether the McCall family should diversify, scale up, or exit the dairy industry, the siblings plan to conduct a comprehensive analysis of the industry and their own farm operations, as well as weigh the pros and cons of pursuing each option based on their overall goals. They will use the PESTEL analysis to understand the current industry conditions and future trends. This analysis will help them identify industry-wide factors that pose risks to the farm's viability and those that present potentially profitable opportunities. The siblings will also evaluate the strengths and weaknesses of the farm operations to understand whether the farm is positioned well to take advantage of the specific options that are proposed. They further intend to compare the estimated costs and capital investments required to realistically pursue each option. Finally, the siblings will incorporate nonfinancial considerations in their decision-making process, such as the importance of continuing the dairy operation for the McCall family and the cultural role that small-scale family-owned dairy farms play in U.S. agriculture and society.

[7] The cost of unpaid labor is the opportunity cost of not working elsewhere.

7 Discussion Questions

This case study is versatile and can be adapted to a variety of classroom settings. Instructors have the flexibility to focus on a range of issues and concepts presented in the case, from learning about the U.S. dairy industry to the application of strategic management tools and quantitative analysis.[8]

7.1 Part I: Introducing the Decision Scenario and the Case Study Method

Prior to assigning this case study, instructors should review the case study method with students. Instructors should start discussion by highlighting that the challenges the McCall family is facing are representative of many family-owned dairy and nondairy farms in the United States and worldwide. It is important to point out to students that in addition to the business-focused analysis of the different options for Four Creeks Farm's future, they should also consider the nonfinancial reasons for why the McCall family may want to keep the farm and, more broadly, why having smaller- to medium-sized farms in the U.S. dairy industry could be valuable.

7.2 Part II: Understanding the Industry

1. What are some of the characteristics and trends of the U.S. dairy industry that impact the Four Creeks Farm? To answer this question, analyze the U.S. dairy industry following the PESTEL framework.

		List the Characteristics and Trends of the U.S. Dairy Industry That Impact the Farm
P	**POLITICAL:** What government actions influence the industry and impact the farm's decisions?	
E	**ECONOMIC:** What macroeconomic factors impact the farm (e.g. price stability, levels of employment, aggregate demand, etc.)?	
S	**SOCIOCULTURAL:** What societal actions, norms, and values have implications for the farm?	
T	**TECHNOLOGICAL:** What technological advancements and innovations within the industry impact the farm and its competitiveness?	
E	**ECOLOGICAL:** What relevant environmental issues impact the industry and the farm?	
L	**LEGAL:** What regulations and laws have a bearing on the farm's operations and profitability?	

[8] Based on the experience of the authors, who have used this case study in their classrooms, students can be easily engaged in discussion of this case. Student feedback suggests that many are unaware of the challenges facing the U.S. dairy industry, how the industry is organized, or the extent of government intervention in the U.S. dairy market.

2. Which of the industry factors you identified threaten Four Creeks Farm's operations and profitability? Why?
3. Which of the external industry factors you identified represent opportunities for Four Creeks Farm that are likely to contribute to the farm's profitability? Why?
4. How is the U.S. dairy industry likely to evolve over time?
5. Should the government continue to intervene in the dairy market and provide support policies for the dairy industry? Why or why not?
6. Do you think there should be any changes in how the government supports the dairy industry? If so, how should policy be changed (e.g., price floors, supply or quantity restrictions on milk production, greater income support)?
7. How do current U.S. trade policies (e.g. tariffs) and the country's relationship with other nations affect the Four Creeks Farm?

7.3 Part III: Analyzing the Farm Situation

8. What internal strengths does the Four Creeks Farm have that can contribute to the farm's success and profitability in the future?
9. What internal weaknesses does the Four Creeks Farm have that can hinder the farm's successful operation?
10. What factors other than profit motivate the McCall family to continue the operation? Do you believe these motivations to continue the family business conflict with or complement the profit motive?
11. Collect arguments for and against pursuing each of the options that the McCall children proposed to save the farm. Make sure to support your arguments with both qualitative and quantitative analysis of each option.

7.4 Part IV: Making a Decision

12. Are these options mutually exclusive? Are these options financially viable? Could more than one option be realistically pursued at the same time? Which ones?
13. Is there another, potentially better, option that the farm could pursue that is not provided in the case?
14. Assume the role of the decision maker for the McCall family. What should the McCall family do to ensure the future survival and profitability of the Four Creeks Farm?
15. How should the McCall family proceed with the implementation of the action plan you recommend?

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References

Agricultural Markets and Policy. 2021. "Current Livestock and Dairy Industry Data (February Release)." University of Missouri. Retrieved from https://amap.missouri.edu/.

Bailey, A., L. Meyer, N. Pettingell, M. Macie, and J. Korstad. 2020. "Agricultural Practices Contributing to Aquatic Dead Zones." In K. Bauddh, S. Kumar, R. Pratap Singh, and J. Korstad, eds. *Ecological and Practical Applications for Sustainable Agriculture*. Singapore: Springer, pp. 373–393.

Barkema, H.W., MA.G. von Keyserlingk, J.P. Kastelic, T.J.G.M. Lam, C. Luby, J.P. Roy, S.J. LeBlanc, G.P. Keefe, and D.F. Kelton. 2015. "Invited Review: Changes in the Dairy Industry Affecting Dairy Cattle Health and Welfare." *Journal of Dairy Science* 98(11):7426–7445.

Dairy Dealer. n.d. "Holstein." Retrieved from https://www.dairydealer.com/collections/holstein.

Free Range 365. n.d. "What Is Required to Become FR365?" Retrieved from https://www.freerange365.org/qualifications.

Golub, A., M. Chepeliev, W. Saeed, T.W. Hertel, and J.F. Beckman. 2020. "Detailed Representation and Analysis of Trade Policies in Dairy Sectors." Unpublished manuscript.

The Good Food Institute. 2020. "Plant-Based Market (2020 Release)." Washington DC: The Good Food Institute. Retrieved from https://www.gfi.org/marketresearch.

Greene, J. 2017. *Federal Milk Marketing Orders: An Overview*. Washington DC: Congressional Research Service, CRS Report R45044. https://crsreports.congress.gov/product/pdf/R/R45044

Greene, J. 2019. *Dairy Provisions in USMCA*. Washington DC: Congressional Research Service, CRS Report 7-9877. https://fas.org/sgp/crs/row/IF11149.pdf

Kammel, A. 2015. "Building Cost Estimates–Dairy Modernization." University of Wisconsin-Madison Dairy Extension Resources. Retrieved from https://fyi.extension.wisc.edu/dairy/files/2015/11/Building-Cost-Estimates-Dairy-Modernization.pdf

Kroll K. 2015. "The Dairy Supply Chain: From Farm to Fridge." New York: Inbound Logistics. Retrieved from https://www.inboundlogistics.com/cms/article/the-dairy-supply-chain-from-farm-to-fridge/

Lötjönen, S., E. Temmes, and M. Ollikainen. 2020. "Dairy Farm Management When Nutrient Runoff and Climate Emissions Count." *American Journal of Agricultural Economics* 102(3):960–981.

MacDonald, J.M., J. Cessna, and R. Mosheim. 2016. *Changing Structure, Financial Risks, and Government Policy for the US Dairy Industry*. Washington DC: U.S. Department of Agriculture, Economic Research Service, ERR 205. https://www.ers.usda.gov/webdocs/publications/45519/56833_err205_errata.pdf?v=908.2

MacDonald, J.M., J. Law, and R. Mosheim. 2020. *Consolidation in US Dairy Farming*. Washington DC: U.S. Department of Agriculture, Economic Research Service, EER 274. https://www.ers.usda.gov/webdocs/publications/98901/err-274.pdf?v=9770.7

Noll, R., and R. Litan. 2018. "Extra Milk Exports to Canada under Trump's Rebranded NAFTA Will Be a Drop in the Bucket." Washington DC: Brookings Institute. Retrieved from https://www.brookings.edu/blog/up-front/2018/10/08/extra-milk-exports-to-canada-under-trumps-rebranded-nafta-will-be-a-drop-in-the-bucket/

Novakovic, A.M., and C.A. Wolf. 2018. "Disorderly Marketing in the Twenty-First Century US Dairy Industry." *Choices* 33(4):1–6.

Olynk, N.J. 2012. "Assessing Changing Consumer Preferences for Livestock Production Processes." *Animal Frontiers* 2(3):32–38.

Savaskan, D. 2019. "Dairy Production in the US. Milking the Benefits: Stabilizing Milk and Feed Prices Are Expected to Drive Industry Growth." Melbourne, Australia: IBISWorld, IBISWorld Industry Report 31151.

Shikher, S., M. Torsekar, M. Semanik, and P. Herman. 2019. "U.S.-Mexico-Canada Trade Agreement: Likely Impact on the U.S. Economy and on Specific Industry Sectors." Washington DC: United States International Trade Commission, USTC Report 4889. https://www.usitc.gov/publications/332/pub4889.pdf

Simnitt, S., and D. Farnsworth. 2016. "Pre-employment Costs Associated with H-2A Agricultural Workers and the Effects of the '60-Minute Rule.'" *International Food and Agribusiness Management Review 20*(1030-2017-2157):335–346.

University of Illinois Extension. n.d. "What Is the Definition of a Concentrated Animal Feeding Operation (CAFO)?" Retrieved from https://web.extension.illinois.edu/ezregs/ezregs.cfm?section=viewregs_byq&QuestionID=385&searchTerm=&ProfileID=1

U.S. Department of Agriculture, Agricultural Marketing Service. 2021a. *Federal Milk Marketing Orders*. Washington DC: U.S. Department of Agriculture, Agricultural Marketing Service. Retrieved from https://www.ams.usda.gov/rules-regulations/moa/dairy.

U.S. Department of Agriculture, Agricultural Marketing Service. 2021b. *National Organic Program*. Washington DC: U.S. Department of Agriculture, Agricultural Marketing Service. Retrieved from https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program

U.S. Department of Agriculture, Economic Research Service. 2020. *Dairy Data*. Retrieved from https://www.ers.usda.gov/data-products/dairy-data/

U.S. Environmental Protection Agency. n.d. "Laws and Regulations that Apply to Your Agricultural Operation by Farm Activity." Retrieved from https://www.epa.gov/agriculture/laws-and-regulations-apply-your-agricultural-operation-farm-activity.

van Kooten, G.C. 2020. "Reforming Canada's Dairy Sector: USMCA and the Issue of Compensation." *Applied Economic Perspectives and Policy* 42(3):542–558.

Viladomiu, M., Hontecillas, R., and J. Bassaganya-Riera. 2016. "Modulation of Inflammation and Immunity by Dietary Conjugated Linoleic Acid." *European Journal of Pharmacology* 785:87–95.