

Maine's Artisan Cheesemakers:

The Opportunities and Challenges of Being an Artist, Scientist, Agriculturalist, Alchemist, and Entrepreneur

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Abstract

Maine's artisanal cheese sector has grown rapidly in the last six years. Maine cheesemakers take a variety of approaches including those based on farmsteads and operations sourcing milk from local dairies. This study examines cheesemakers' business operations and their approaches to sustainability, opportunities, and threats. Cheesemakers report that they derive several benefits from their enterprise, but that they face challenges to ensure their long-term sustainability.

Maine's artisanal cheese sector has opportunities to grow and strengthen its presence both locally and regionally. The quality of the state's products is demonstrated by the top awards from regional, national, and international cheese competitions won by several Maine cheesemakers. The quantity of licensed operations is increasing, placing Maine among the top artisanal cheese-producing states in the country and at the top in the Northeast (Wilson and Roberts 2014). According to an article by Abigail Curtis (*Bangor Daily News*, October 25, 2015), because the cheesemaker-to-output ratio is comparatively low, growth potential for the sector is strong. US demand for cheese has climbed steadily since 1995, with per capita consumption increasing from 27 pounds per person in 1995 to 34 pounds per person in 2014 (USDA 2015). With Maine's growing reputation as a destination for consumers seeking good and interesting food—*foodies*—(Bieman 2015), the demand for artisanal cheese appears to be growing. Cheesemakers are one of a growing number of new types of creative producers who use Maine-based raw materials to make products for higher-profit markets, thereby supporting the production of raw materials upstream. These creative agricultural value-added producers can act as a linchpin in Maine's agricultural sector by demanding a raw product, creating a food by which Maine is known, and supplying a growing number of restaurants, retailers, and distributors specializing in

fresh, local, and high-quality ingredients. Such producers can provide many potential economic and social benefits for the state.

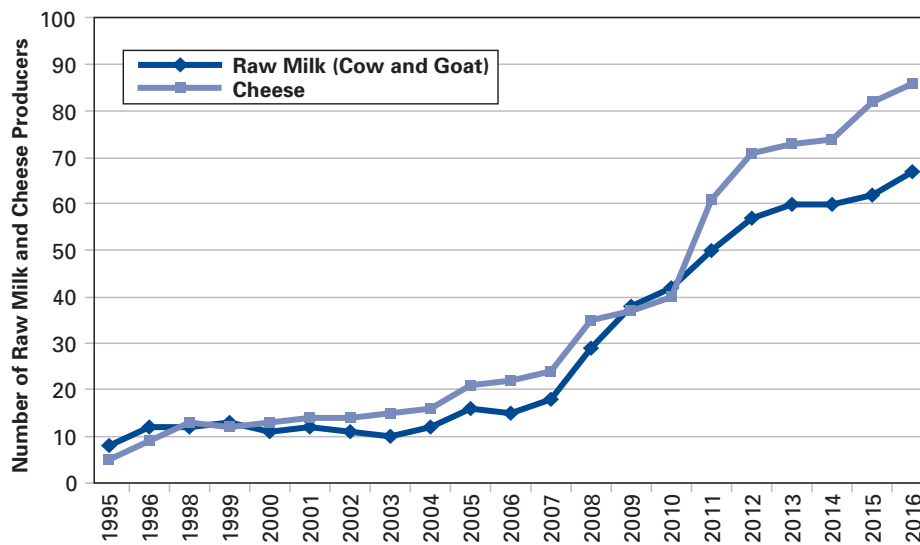
Strengthening support for Maine's small-scale cheesemakers and increasing the interaction across cheesemakers' value chains can have important social, economic, and environmental benefits. The USDA's *Local Food Systems* report notes the

benefits of local food markets range from economic development to reduced energy use and greenhouse gas emissions (Martinez et al. 2010). Economically, not only does cheesemaking have a direct impact via revenue to the producers, it can also help localize processing and reduce imports (Martinez et al. 2010) and generate multiplier effects associated with this revenue (Gabe, McConnon, and Kersbergen 2010).

We think it is crucial for the individual businesses in this sector, communities housing these businesses, and regions where these businesses are clustered that policymakers find the right mix of tools to support them. This study provides a descriptive analysis of key factors in the business approaches cheesemakers are using. Outcomes from this study include policy and resource recommendations.

THE ARTISANAL CHEESE SECTOR OF MAINE

Artisan cheesemakers are distinguished as such by two main factors: their scale and the use of *by-hand* techniques. Artisanal scale is typically less than or equal to 100,000 pounds (and often considerably less) of cheese per year, and cheesemaking is done by individuals who complete the process, rather than a machine-based process. Artisanal cheese production has grown in the United States (Kiesel 2016), and there has been a dramatic increase in Maine in the number of licensed

FIGURE 1: **Maine's Small Dairy Industry Growth**

Source: Maine Department of Agriculture, Conservation and Forestry Milk Quality Lab, October 2016.

artisan cheesemakers from 21 in 2006 to 86 in 2016 (Maine Department of Agriculture, Conservation and Forestry, Milk Quality Lab, personal communication). Figure 1 shows the rapid rise in both raw milk and cheese producers in Maine since 2007.

The economic impact of these small businesses is potentially notable. In a report on artisanal cheese in the United States, Kiesel (2016) states, “Sales in the natural and specialty cheese markets are expected to reach \$19 billion in 2018. And small cheesemaking facilities accounted for 46 percent of all cheesemaking establishments, up five percent since 2007.” Cheesemakers can have an impact on local employment, economic earnings, other businesses, and community members. Cheesemakers who source milk from dairies have an upstream effect on the milk producers, buying milk at prices typically higher than commodity market prices. Synergies in the food system can be generated as farmstead cheesemakers with small herds support farmers producing grain and hay, provide pig farmers with whey, and supply various wholesale and retail markets with fresh and aged cheese.

Given the growth in the artisanal cheese sector, it is important to better understand the sector's structure, namely via cheesemakers' scale, desired scale, capital investment, sources of milk, market approaches, and core challenges. This study details Maine's resources

and gaps, providing specific contours of the needs of Maine's artisan cheesemakers, as well as a fine-grained picture of their business practices.

THE STUDY

We interviewed 30 (approximately 70 percent) of the 39 cheesemakers who were members of the Maine Cheese Guild (MCG) during 2016. (This study, therefore, may not be generalizable to the entire population of artisan cheesemakers and may reflect characteristics idiosyncratic to the sample.) The MCG is the first modern organized guild of cheesemakers in the United States (Donnelly 2016),

and is Maine's premier organization for cheesemakers, holding high-visibility events such as Open Creamery Day and the Maine Cheese Festival, as well as a range of other activities oriented towards cheesemaking. The MCG has monthly meetings distributed across the state so that the widely dispersed cheesemakers are accommodated. Founded in 2003 (Donnelly 2016), the MCG functions as an important hub for different types of education and information; it organizes and hosts cheesemaking workshops with national and sometimes global experts, publicizes upcoming dairy workshops and business seminars, and monitors and provides guidance and feedback on federal and state regulations that affect cheesemaking.

Central to cheesemaking is milk—and high-quality cheese starts with high-quality milk. Cheese also varies based on the source of the milk. For example, sheep milk is higher in protein and fat than goat and cow milk. And the time of year, feed, and breed of animal also influence milk composition. The fat content of different breeds of cattle, for example, ranges from higher (e.g., Jersey, Guernsey) to lower (e.g., Holstein). Table 1 presents the breakdown of milk type and source for the 30 cheesemakers who we interviewed.

This mix of sources has a number of implications. For farmsteads in this sample, goats are the preferred dairy animal, which parallels the wider US growth in

TABLE 1: Milk Type and Source for Participating Cheesemakers

Animal Source	Milk Source		
	Farmstead (%)	Farmstead with External Source (%)	External Source (%)
Cow	3 (10)		8 (27)
Goat	12 (40)		
Goat+Sheep or Goat+Cow	3 (10)	4 (13)	
Total	18	4	8

dairy goat farmsteads (Kiesel 2016). For cheesemakers using an external source of milk, cows are the exclusive source selection (though some expressed the desire to externally source sheep milk, but it is rarely available). With regard to the supply of cheese, results indicate that 63 percent of cheesemakers produce goat milk cheese, but because differences in the scale of cow vs. goat milk production, we cannot conclude that more goat milk cheese is being made. The results also indicate that some farmstead cheesemakers who rely on seasonal ruminant lactation (mostly goats and sheep) are starting to externally source from cow dairies so they can make cheese during the winter and have a steadier supply of cheese for markets.

Figure 2 shows the scale of operations for the participating cheesemakers, which ranges from less than 1,000 pounds per year to more than 10,000 pounds per year. The vast majority of the cheesemakers interviewed produced less

than 10,000 pounds per year. The total annual output of the 30 participants in our survey was approximately 246,300 pounds, for an average of 8,210 pounds per cheesemaker.

Table 2 provides a more nuanced understanding of production by looking at production by type of source. In looking at this production breakout, we can see that cheesemakers who externally source cow milk produce the most cheese when measured on average (16,042 pounds per year). The mean, however, can be skewed by outliers such as one very large producer who is at a different level from the category's average producers. The median measure, since it is not influenced by outliers, shows that the median for producers in this category is 3,950 pounds per year. This mean/median difference is also evident among goat milk farmsteads (mean = 5,763, median = 1,560). Farmsteads of cow milk or goat milk with cow milk externally sourced appear to have similar levels of production. It is also important to note that farmstead production measures do not necessarily reflect the farmsteads' overall productivity, as farmsteads

FIGURE 2: Annual Cheese Production (Pounds per Year) among Participating Cheesemakers

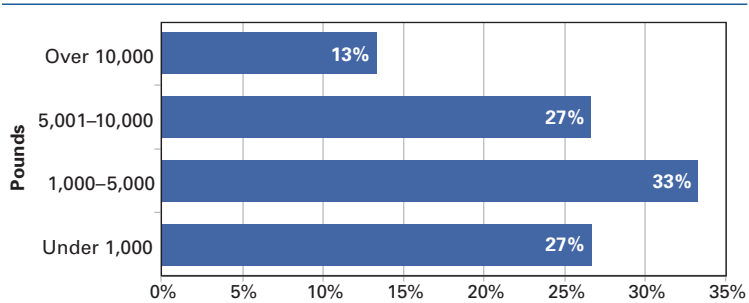


TABLE 2: Milk Type and Source for Participating Cheesemakers

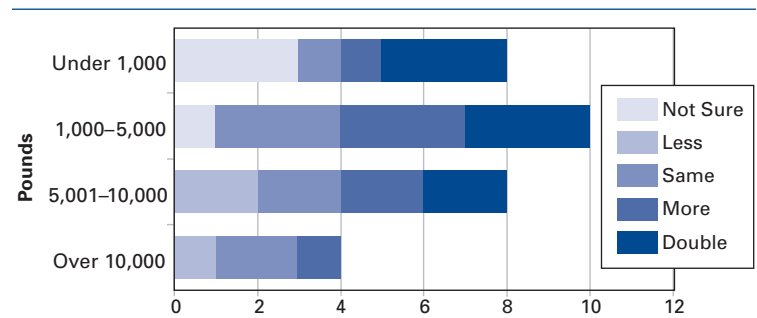
Animal Source	Milk Source								
	Farmstead			Farmstead with External Source			External Source		
	Total	Mean	Median	Total	Mean	Median	Total	Mean	Median
Cow	16,200	5,400	6,200				128,340	16,042	3,950
Goat	69,151	5,763	1,560						
Goat+Sheep or Goat+Cow	8,600	2,867	2,000	24,000	6,000	5,250			
Total	93,951			24,000			128,340		

invariably produce other goods in addition to cheese, including meat, yogurt, milk, fudge, vegetables, flowers, and more.

The scale at which cheesemakers operate is at the heart of the business, dictating quantity and often quality parameters. Cheesemakers are faced with scale trade-offs that are not easy to settle. Corresponding to increased production are increased revenues and costs, potential efficiencies from economies of scale, more visibility for the cheese's brand, and wider access to distribution channels. With increased production, however, there is often less opportunity for cheesemakers to engage in the processes that attracted them to the field in the first place: time with their animals, time with their hands in the curds, creating new varieties of cheese, studying historical and new trends, or interacting with customers. As scale increases, external labor becomes crucial and division of labor becomes imperative. For the entire sector, projections of future scale are an important indicator of the sector's projected output. We asked cheesemakers their intended mid-term scale goals, and their responses indicate that, at all levels of current production (less than 1,000, 1,000–5,000, 5,001–10,000, and more than 10,000 pounds per year), there is a diversity of intent (see Figure 3).

Desired scale, therefore, provides insight into potential trends. The findings depicted Figure 3 indicate that the sector may be changing shape, as some of the smaller cheesemakers move to the next level of production, while some of the cheesemakers currently producing at a higher level may scale back and others may grow bigger. Using these findings, we can estimate mid-term scale changes to the sector. If we assume that “more” and “less” production cancel each other out, there is no net gain or loss at any production level except one cheesemaker planning to make more at the lowest production level (less than 1,000 pounds per year). With the assumption that cheesemakers at the second lowest level (1,000–5,000 pounds per year) are making a median of 3,000 pounds per year, then the three cheesemakers who plan to double production could result in an additional 9,000 pounds of cheese per year. Additionally, assuming an increase of 50 percent more for the three cheesemakers at this level who plan to produce “more,” there could be an additional increase of 4,500 pounds of cheese per year. This gives us an estimated total net increase in this second lowest level of 13,500 pounds. If we assume

FIGURE 3: **Intended Scale Goals of Cheesemakers by Current Scale***



*Number of cheesemakers is on the horizontal axis with pounds of cheese per year per cheesemaker on the vertical axis.

the median production in the second highest level (5,000–10,000 pounds per year) is 7,500 pounds per year, then we can estimate that the two cheesemakers who plan to double their production will result in an additional 15,000 pounds of cheese per year. Based on these assumptions and recognizing that they only represent a subset of artisan cheesemakers, Maine's artisanal cheese sector could see a minimum increase of 28,500 pounds per year of new cheese production. At an average of \$20 per pound of cheese, this would lead to a net revenue increase of \$570,000 per year.

CHEESEMAKERS' KEY BUSINESS DRIVERS

Businesses use a range of models in executing their operations, but there are common patterns. It is useful to think about a business as the set of assumptions it makes. Peter Drucker summarizes this: “These are the assumptions that shape any organization's behavior, dictate its decisions about what to do and what not to do, and define what the organization considers meaningful results” (1994: 95–96). These assumptions include characteristics of markets, technology, customers, and strengths and weaknesses and encompass its identity and operations. For the cheesemakers surveyed in this study, business approaches were undergirded by two primary drivers: their *core vision* and their *economic urgency*.

Cheesemakers can be divided into segments based on the core visions that led them into cheesemaking (Paxson 2012). In our sample, the cheesemakers' core visions differed between those who entered to focus on the process of turning milk into cheese (cheese focus) and those who entered to make cheese as a part of a

wider farmstead encompassing dairy animals (farmstead focus). Each vision has a set of distinctive and overlapping values (Table 3).

The other key driver for Maine's artisan cheesemakers is the economic urgency of the operation, or the extent to which they are supporting themselves via cheesemaking. Some cheesemakers, regardless of source of milk, are supporting themselves with cheesemaking, while others are only supplementing their household income. Cheesemakers augmenting income have another household income, and though cheesemaking is

expected to compensate the cheesemaker, it is not the defining source of household income. In this sample, the cheesemakers split nearly evenly: 16 were self-supporting and 14 were augmenting income.

Together, the core vision and the economic urgency drivers provide the basis from which cheesemakers' business models emerge and evolve. For instance, pricing differences can be linked to the economic pressures facing the cheesemaker, as well as the cost structures behind the milk. For example, farmstead cheesemakers may have had to pay high hay prices to feed their animals over the winter. Market choices can also vary according to vision, that is, the story of the product may focus more on the cheesemaker or the cheese for a cheese-focused artisan and may focus more on the farmstead origins or the animals for the farmstead-focused artisan. In our study, we found three cheesemakers with a cheese focus who were self-supporting; five cheesemakers with a cheese focus who were augmenting income; thirteen cheesemakers with farmstead focus who were self-supporting; and nine cheesemakers with a farmstead focus who were augmenting income.

For sector members, it is important to understand the capital investment linked to each approach, the market approach, and the profit level. To check how these business models corresponded to incurred capital investment, we compared the four business models to the capital investment levels of our survey: under \$50K, \$50–75K, \$75–100K, \$100–125K, \$125–150K, over \$150K (Table 4).

It is notable that farmstead cheesemakers have a wider range of investment levels than cheese-focused cheesemakers and that farmstead-focused self-supporting cheesemakers have a higher level of capital investment than others. Another contrast is that most of

TABLE 3: Comparison of Values Associated with a Cheese Focus or a Farmstead Focus*

Cheese Focus	Farmstead Focus
<i>Pride in a well-made product</i>	<i>Pride in a well-made product</i>
<i>Using high quality ingredients</i>	<i>Using high quality ingredients</i>
<i>Controlling how product is sold</i>	<i>Controlling how product is sold</i>
<i>Connecting with customers through cheese</i>	<i>Connecting with customers through cheese, animals, and farmstead</i>
<i>Ties to the land and seasons through milk characteristics</i>	<i>Being on a farmstead</i>
<i>Carrying on cheesemaking tradition</i>	<i>Carrying on farming and cheesemaking traditions</i>
<i>Knowing where inputs come from</i>	<i>Creating inputs</i> <i>Caring for animals</i>

*Values associated with these classifications are listed with overlapping values italicized.

TABLE 4: Investment by Business Model

Core Vision	Economic Urgency	<\$50K (%)	\$50–75K (%)	\$75–100K (%)	\$100–125K (%)	\$125–150K (%)	>\$150K (%)	Total
Cheese Focus	Augment income	5 (100)						5
	Self-support	2 (67)	1 (33)					3
Farmstead Focus	Augment income	3 (33)	4 (44)	1 (11)			1 (11)	9
	Self-support	2 (15)	3 (23)	2 (15)	1 (8)	3 (23)	2 (15)	13
Total		12	8	3	1	3	3	30

the cheese-focused cheesemakers have lower levels of capital investment, less than \$50,000.

Business models also can influence the approach cheesemakers use to reach markets (Table 5). Marketing approaches for the cheesemakers fall into three general categories: direct, indirect, and mixed. Direct marketing includes an emphasis on selling directly to customers in face-to-face venues and includes outlets such as farm stands (connected with farmsteads) or cheese stands (connected with cheese-focused producers), CSAs, self-run online store, and farmers’ markets. Indirect marketing is selling cheese to an agent who represents the product and includes distributors, retail establishments (e.g., specialty stores and grocers), and restaurants. A mixed approach includes both direct and indirect methods.

Interestingly, there was some use of indirect and mixed marketing approaches across all business models, but cheese-focused artisans were the least likely to use a direct-marketing approach. Farmstead cheesemakers relied more on either direct or mixed approaches, with 16 out of the 22 farmstead-focused producers using these approaches.

LIFE CYCLE OF CHEESEMAKERS

Maine’s cheesemakers can also be categorized by the life cycle stage of their business. Business life cycle stages are categories representing the challenges and opportunities endemic to that phase of the organization’s evolution. Our study identified three stages: emerging (average of one year of making cheese professionally), optimizing (average of eight years of making cheese professionally), and maturing (average of 22 years of making cheese professionally).

- Emerging cheesemakers are new to the businesses and are focusing on licensing, understanding and systematizing their cheesemaking processes, trying new products, experimenting with markets, and understanding distribution. The cheesemakers perform most of the tasks.
- Optimizing cheesemakers have some cheeses that constitute their core products, but are adjusting their product mix to match market and price considerations. They are also experimenting with market approaches, but have goals regarding which markets are ideal. Prices are often, but not consistently, a result of cost and revenue analysis. Facility infrastructure and scale are dynamic as the cheesemaker aims to find revenue and profit levels that meet income goals. At this stage, the cheesemaker is likely to have part-time help who requires training. Interns and apprentices are sometimes used, though many also use year-to-year wage workers.
- Maturing cheesemakers have developed their brand. The cheesemakers are known for expertise, and their cheeses are sought out. Cheesemaking processes and products are consistent though there are still new additions to the base products to meet emerging consumer demand as well as cheesemaker interests. Cheesemakers are not necessarily large in scale, but the price and revenue structures are established. Cheesemaking processes are consistent enough that horizontal integration is considered (e.g., ecotourism), and succession and exit strategies may be considered.

To help understand another aspect of the sector’s structure, we compare investment levels of the different life cycle stages. As reflected in Table 6, emerging cheesemakers have the lowest level of investment overall (less than \$50,000). Optimizing cheesemakers have a range of investment levels, with the highest number being in the less than \$50,000 category. Maturing cheesemakers also have a range of investment levels, indicating that

TABLE 5: Marketing Approach by Business Model

Core Vision	Economic Urgency	Marketing Approach			Total
		Direct (%)	Mixed (%)	Indirect (%)	
Cheese Focus	Augment income	1 (20)	3 (60)	1 (20)	5
	Self-support		2 (67)	1 (33)	3
Farmstead Focus	Augment income	4 (44)	2 (22)	3 (33)	9
	Self-support	4 (31)	6 (46)	3 (23)	13
Total		9	13	8	30

not all established cheesemakers invest more than \$150,000 in their nonland-based infrastructure.

Market approaches also vary by life cycle. Intuitively one might expect that more emerging cheesemakers would take a direct-marketing approach and introduce their new products to customers in face-to-face conversations. Because optimizers are searching for the fit between scale, products, and markets, one could expect that they would be the most likely to pursue a mixed marketing strategy. Similarly, one might expect that maturing cheesemakers would rely more on indirect-marketing approaches such as distributors and retailers because their brand is better known. Results from our study indicate some support for these expectations (Table 7). Emerging cheesemakers are not using an indirect approach, but are trying some retailers in addition to direct sales through CSAs, farm stands, and farmers' markets. Optimizers are the most likely to be pursuing a mixed marketing approach, relying on direct sales and indirect channels such as distributors. Most maturing cheesemakers, somewhat surprisingly, are pursuing a direct-marketing approach though they also use indirect and mixed approaches.

To this point, we do not have an indication of the profit levels of artisan cheesemaking. How satisfied are artisan cheesemakers with their profit? We asked cheesemakers to rate their level of satisfaction and found that for some cheesemakers profit was not a straightforward economic measure, but was a holistic measure inseparable from quality-of-life aspects of their business (e.g., the satisfaction of making cheese, managing a herd, being one's own boss). Satisfaction with profitability, for the cheesemakers sampled, is a measure of cheesemakers' economic and business-related well-being.

Is profit at a satisfactory level attributable to investment? Does money spent on capital investment relate to profit satisfaction? Figure 4 indicates that at all levels of investment, except for \$75,000, most cheesemakers are satisfied and possibly highly satisfied.

How does profit relate to cheesemakers' business model? The two components of the business model are whether the milk is from the cheesemaker's farmstead or is externally sourced from another dairy producer

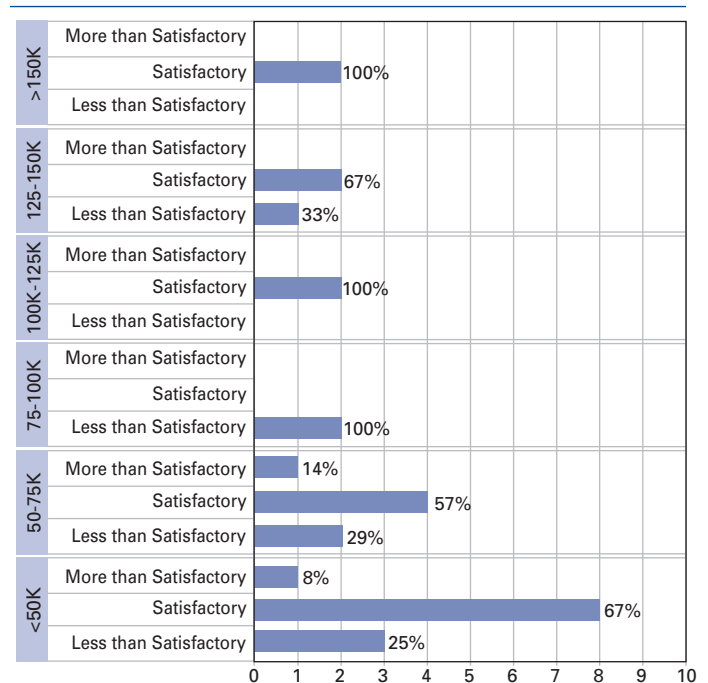
TABLE 6: Investment by Business Life Cycle Stage

Life Cycle	<\$50K (%)	\$50–75K (%)	\$75–100K (%)	\$100–125K (%)	\$125–150K (%)	>\$150K (%)	Total
Emerging	2 (50)	2 (50)					4
Optimizing	8 (50)	2 (13)	2 (13)		1 (6)	3 (19)	16
Maturing	2 (20)	3 (30)	1 (10)	2 (20)	2 (20)		10
Total	12	7	3	2	3	3	30

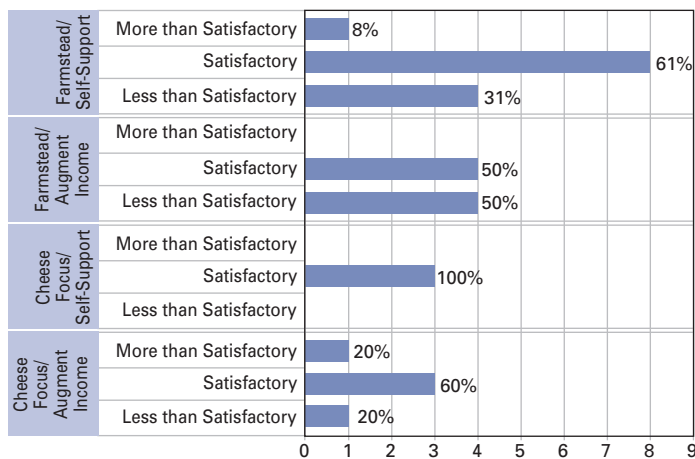
TABLE 7: Marketing Strategy by Business Life Cycle Stage

Life Cycle	Direct (%)	Mixed (%)	Indirect (%)	Total
Emerging	2 (50)	2 (50)		4
Optimizing	4 (25)	7 (44)	5 (31)	16
Maturing	4 (40)	3 (30)	3 (30)	10
Total	10	12	8	30

FIGURE 4: Satisfaction with Profit by Capital Investment*



*Number of cheesemakers is on the horizontal axis with percentage at each level of satisfaction within the investment category next to the bar.

FIGURE 5: Satisfaction with Profit by Business Model*

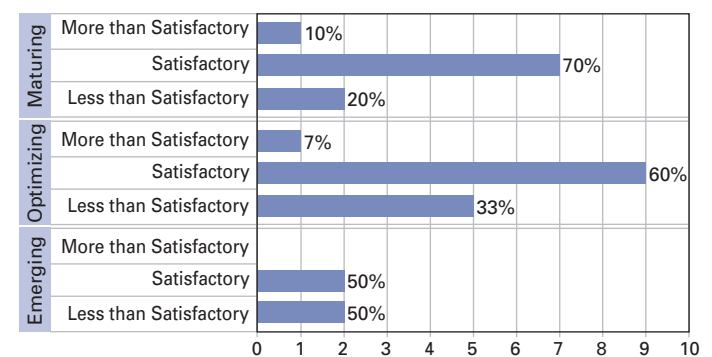
*Number of cheesemakers is on the horizontal axis with percentage at each level of satisfaction within the business model category next to the bar.

and whether the cheesemaker is self-supporting or augmenting income. As seen in Figure 5, farmstead-focused cheesemakers are most likely to be less satisfied with their profit. Cheese-focused cheesemakers who are externally sourcing their milk are more likely to be satisfied, regardless of whether they are self-supporting or augmenting income. Interviews indicate that farmstead-focused cheesemakers have more uncertainty about their animals and infrastructure costs, and less time to dedicate to cheesemaking, which could explain the lower profit satisfaction rate. Interestingly, among farmstead-focused cheesemakers, those augmenting income report higher levels of profit dissatisfaction. One possible explanation for this may be that farmstead-focused producers who are augmenting income are not completely focused on cheesemaking as an occupation, so they have not intensively matched selling price to incurred costs. All of the cheese-focused self-supporting producers are satisfied, and most of the cheese-focused producers who are income augmenters are satisfied.

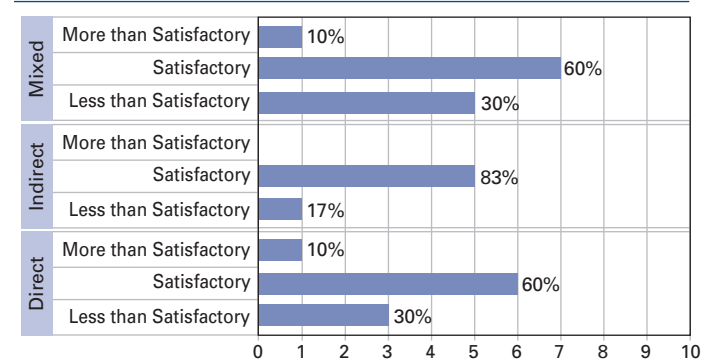
Profit trends may also be discernible by life cycle stage. At early stages of the life cycle, business risks are high because entrepreneurs are learning about rules of the sector, as well as situating their own internal business practices. We would expect profit-level satisfaction in the emerging stage to be lower than in later stages. In the maturing stage, the cheesemaker is more established and is oriented toward maintaining profit levels and eventually leaving the field. Optimizers, as the

name implies, are still in flux. Figure 6 indicates that as cheesemakers move from the emerging category, the likelihood of their being satisfied or highly satisfied increases. Notably though, at all stages, some cheesemakers are less than satisfied with their profit, suggesting that prices are not generating profits commensurate with goals.

Profit satisfaction can be affected by cheesemakers' market approach. Small businesses may struggle with the time needed for direct marketing, and indirect marketing may offer more opportunities to focus on the cheese. Yet, these artisans' markets largely depend on product differentiation, which requires intensive marketing—often done by the

FIGURE 6: Satisfaction with Profit by Business Life Cycle Stage*

*Number of cheesemakers is on the horizontal axis with percentage at each level of satisfaction within the business model category next to the bar.

FIGURE 7: Satisfaction with Profit by Marketing Strategy*

*Number of cheesemakers is on the horizontal axis with percentage at each level of satisfaction within the marketing category next to the bar.

cheesemaker. Figure 7 suggests that cheesemakers pursuing an indirect-marketing strategy are most likely to rate profit as satisfactory, and that though cheesemakers pursuing strategies of mixed and direct marketing are largely satisfied with their strategy, there is still a sizeable minority that is less than satisfied.

To better understand the relationship between profit satisfaction and market approach, we looked at how they relate to the business model (Figure 8A) and to the business life cycle (Figure 8B). Comparing profit and market approach in relation to the business model reveals an interesting trend: farmsteads have the lowest levels of satisfaction across all marketing approaches, and self-supporting farmsteads who use a mixed marketing approach have lower levels of satisfaction.

When we examine profit satisfaction and market approach relative to the business life cycle, a couple of

key patterns emerge. Mixed marketing approaches in emerging and optimizing stages are more likely to yield dissatisfaction with profit. It is also notable that most optimizers use a mixed marketing approach, whereas at the later stages of the business life cycle, more cheesemakers have moved to a direct-marketing approach. This could be because optimizers are exploring both indirect and direct markets to fine-tune the fit between their product mix and their intended consumer base.

CHALLENGES, RESOURCES, GAPS, AND RECOMMENDATIONS

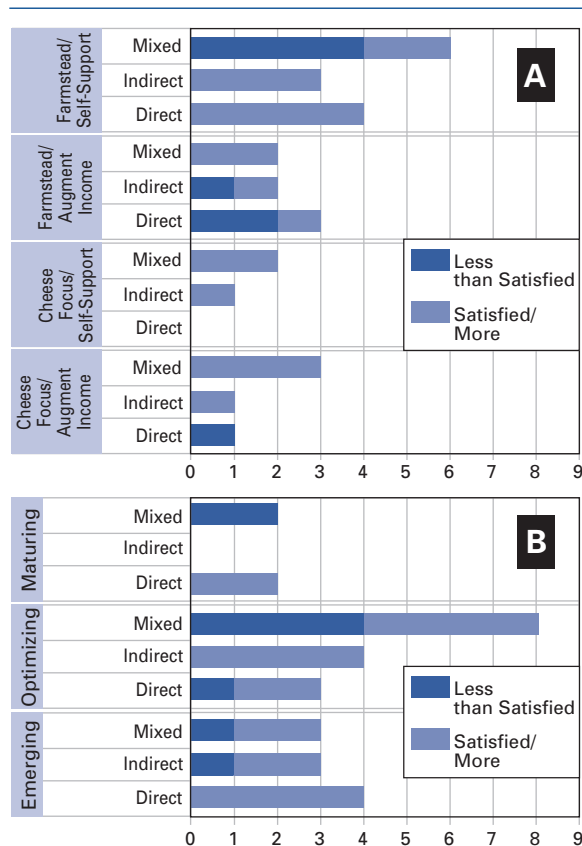
Individual entrepreneurs face particular challenges germane to each stage of their business life cycle. To help Maine's artisan cheesemakers, therefore, it is important to understand the challenges corresponding to each life cycle stage and cheesemakers' strategies in responding to these challenges, the resources they use, and to identify any gaps in available resources.

Emerging Cheesemakers

Emerging cheesemakers face the challenges of learning the craft, understanding the cost structure of their business, setting up infrastructure, and learning different marketing channels. To meet these challenges, we found that emerging cheesemakers are voracious consumers of information. They seek to understand cheesemaking recipes and processes, milk sanitation, infrastructure basics, herd management, marketing options, and policies and regulations that affect the business. They use a range of information-seeking behavior and look for many different sources of information.

There are resources available for some of these challenges. For dairy- and business-related state regulatory information, these cheesemakers often turn to University of Maine's Cooperative Extension and to state agencies such as the Maine Milk Quality Laboratory. For federal regulations, cheesemakers access information via the MCG, the American Cheese Society (ACS), and the Maine Department of Agriculture, Conservation and Forestry (MDACF). Herd management presents a challenge, especially for goat and sheep farmsteads. Veterinarians specializing in these ruminants are rare. Often farmsteaders rely on other goat- or sheep-based cheesemakers for advice and help, but they also use books and the internet as resources. For cow farmsteads, Cooperative Extension

FIGURE 8: **Satisfaction and Marketing Strategy by (A) Business Model and (B) Life Cycle Stage***



*Number of cheesemakers shown on the horizontal axis.

plays a larger role, as do veterinarians, which may be attributable to the historical presence of cow-based dairy farms in Maine and the Maine Dairy Association. For information related to mechanical infrastructure, most emerging cheesemakers turn to established cheesemakers, and they network with the MCG. By visiting other dairies, they can see the layout of milking parlors, creameries, aging caves, and more. Sometimes sales associates of companies that sell infrastructure can be a trusted partner in assessing needs and options. In general, though, emerging cheesemakers assess their infrastructure needs through other cheesemakers and through other external sources. For information about markets, most emerging cheesemakers adopt a trial-and-error approach, trying direct or mixed approaches and seeing how they fit.

The MCG has several educational seminars that help emerging cheesemakers with techniques, troubleshooting, addressing infrastructure questions, (e.g., aging facilities), along with some business workshops. The MCG has also served an invaluable role in connecting cheesemakers to each other. Resources for a spectrum of informational needs are listed at on their website (<http://www.mainecheeseguild.org>). Additionally, the Maine Organic Farmers and Gardeners Association's (MOFGA) apprenticeship program has provided a pipeline of potential apprentices as well as opportunities for apprenticeships prior to starting a business. Some cheesemakers have also used a limited number of national and international apprentice pipelines, with mixed results. The Southern Maine Dairy Goat Association is a source of information and support for goat-based farmsteads in southern Maine.

Although there are a number of resources available for emerging cheesemakers, several gaps remain:

- A comprehensive and up-to-date list of steps involved in becoming a licensed cheesemaker
- Information and counseling about marketing approaches
- Resources for goat and sheep herd management
- Business help, including cost management, pricing, and loan sources

Optimizing Cheesemakers

Optimizing cheesemakers have successfully navigated the emerging stage, and face a shifting set of challenges. These cheesemakers are concentrating on

refining the product line, adjusting the infrastructure to meet supply goals and consumer demand, pursuing marketing strategies more vigorously, and strategically networking to balance exchanging information while protecting competitive approaches.

Optimizing cheesemakers are determining their product mix, which involves identifying distinctive characteristics and a customer base that fits. They usually hire labor, so supervision becomes an issue for scale increases and distribution help. The cheesemakers need to find ways to transport cheese to market that minimize cost and time, yet allow them to connect with retailers, distributors, and customers. Cheesemakers in this group need to match infrastructure to scale and product mix, which becomes a challenge involving “what if” revenue and cost projections, and they need to fund infrastructure improvements, especially pasteurizers. Additionally, the hazard analysis and critical control points (HACCP) processes become part of the cheesemakers’ goals. Producers try to link their pricing calculations to their long-term goals and a more articulable cost structure. Furthermore, for farmsteads in this category, maintaining their herds or flocks is an ongoing concern.

Optimizing cheesemakers seek information more strategically, and there are more two-way information flows as some cheesemakers begin to more vigorously pursue collaborations with others, leveraging knowledge and resources. Though they continue to attend workshops held by the MCG and Cooperative Extension, they select these workshops to dovetail with evolving scale, product, price, and market mix positions. Although some cheesemakers in this category have received financial help from banks, due to scale and personal financial resource limits, it is not common. Also, some have hired an independent business consultant, but that depends on their financial resources.

These tasks are crucial to the health of each business and to the sector as a whole. Yet, although some resources exist for optimizing cheesemakers, there are several gaps in resources, including

- Business consulting to help with detailed and customized projections of different pricing, marketing, costs, distribution, and scale questions
- Labor issues continue to be a challenge
- Resources for maintaining goat herds and sheep flocks

- Increased access to sources of financial support for technology upgrades, such as pasteurizers and aging facility improvements

Maturing Cheesemakers

Maturing cheesemakers, who are focused on brand development and have developed a consistent scale, product mix, and marketing approach, face challenges related to maintaining a viable income level amid growing competition, augmenting cheese production without jeopardizing high-demand core products, and training highly skilled labor and perhaps successors in preparation for exits.

These cheesemakers are involved with horizontal integration into related products to build brand identity and reduce dependence on cheese. Labor continues as an issue for this group as well as a way to maintain scale and potentially offer an employee the opportunity to take over the business. These cheesemakers are concerned with tapping potential markets that reward consistency and quality, along with planning for the eventual next steps to scale down, or exit, or sell the business. And for farmstead-based cheesemakers, maintaining the herds or flocks is also a concern.

Though some resources bolster maturing cheesemakers' tasks, there are several gaps:

- Business consulting regarding brand worth estimates, debt restructuring, horizontal integration opportunities and potential exit strategies
- Labor issues can be a bigger challenge for maturing cheesemakers because of the importance of highly skilled workers to maintaining quality and quantity
- Resources for maintaining goat herds and sheep flocks

General Recommendations

The following recommendations are tied to the gaps our study identified and stem from cheesemakers' two key operational areas (cheesemaking and farmstead herd/infrastructure). The recommendations include business functions, advocating for supportive policies, and specific resource needs for the sector (summarized in Figure 9). Specifically we recommend:

Cheesemaking resources

- Continue cheesemaking and food sanitation workshops

- Continue work of trade association organizations, particularly MCG, Southern Maine Dairy Goat Association, MOFGA
- Continue events that connect consumers, retailers, and restaurants to Maine's cheese and cheesemakers
- Build HACCP workshops
- Build and maintain online resource targeting emerging cheesemakers

Herd and infrastructure

- Increase resources for research and outreach for goats and sheep
- Workshops on infrastructure improvements, innovations, and options
- Increase incentives for entry of sheep-based dairies

Business

- Workshops for market development and selection
- Small business consulting, including business plans, marketing, cost and price structuring, scale projections
- Succession planning, increase access to organizations that specialize in processes and funds

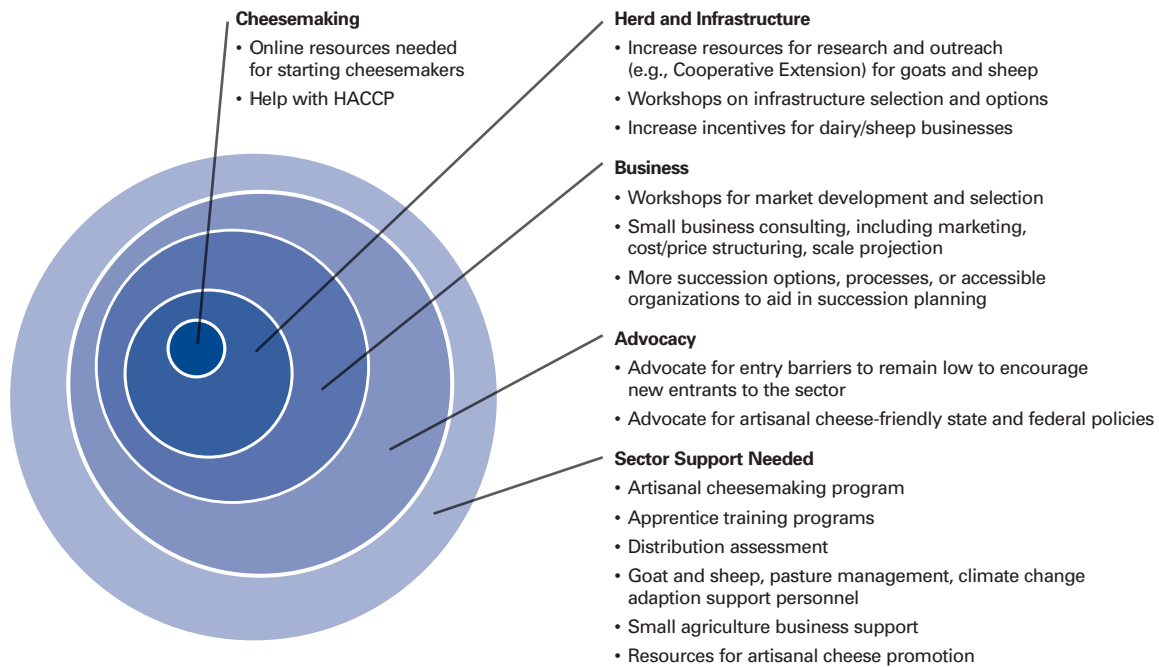
Advocacy

- Advocate for continued low entry barriers to encourage new cheesemakers
- Advocate for artisan-scale-friendly state and federal policies (e.g., the 60 day rule)

Sector support

- Build artisan cheesemaking training at a community college or four-year institution
- Assess existing apprentice programs and identify successful characteristics
- Conduct distribution assessment—form a working group to assess strategies for either hubs or mass transit options
- Increase state agricultural support personnel for goat and sheep, pasture management, climate change adaptation
- Increase support for artisanal cheese as part of Maine's distinctive food branding

FIGURE 9: Summary of Recommendations



Also note that three other reports suggest actions relating to this study's recommendations and provide comprehensive analyses of Maine's agricultural sector:

- *Action Plan for Agriculture and Food System Development: Creating Job Growth in Agriculture and Food Production: Opportunities and Realities* (Wilson and Roberts 2014)
- *Growing Maine's Food Industry, Growing Maine: The Maine Food Cluster Project* (Bieman 2015)
- *The Maine Food Strategy Framework: A Tool for Advancing Maine's Food System* (Maine Food Strategy 2016).

Maine's artisanal cheese sector faces many of the same challenges confronting Maine's small farmers. Because of their small scale, they do not receive subsidies that go to larger mass-produced manufacturers. Additionally, regulations are often aimed at larger-scale producers, so artisans bear disproportionate costs to meet regulatory statutes. Furthermore, they usually have

few full-time employees, so there is little backup in terms of staff or expertise. Perhaps most challenging, however, are the gaps in physical and knowledge-based infrastructure. As suggested in a report on agricultural sectors in the Northeast, "cheesemakers need educational offerings, research, and technical support; unfortunately, the region suffers a lack of these services" (Wilson and Roberts 2014: 10). Our recommendations underscore the findings of Wilson and Roberts (2014) and include specific areas to target.

Maine's artisanal cheesemaking sector has a visible presence in the state's agricultural, food, and cultural systems. Its high quality has been recognized at the highest national levels. Through innovation, networking, and intense effort, cheesemakers have implemented strategies to move themselves through the business life cycle phases. However, the sector's potential impact and long-term health is challenged because of absent or inadequate resources related to business and technology consulting, goat and sheep management expertise, distribution hubs or networks, and advocacy for scale-appropriate regulations and local food system resilience. 🐄

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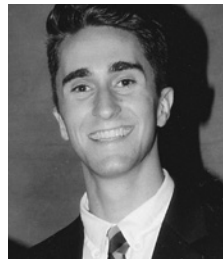
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