ANALYSIS OF VERMONT'S FOOD SYSTEM

Food Processing and Manufacturing

How big is Vermont's food processing and manufacturing industry? How can Vermont increase its capacity for processing local food? What are key processing infrastructure needs?

The perishability of the late summer harvest is an annual reminder of the need for in-state processing capacity. Putting food by has always been a part of Vermont's cultural heritage. Early European settlers had no choice but to preserve their summer harvest, and the Great Depression and the scarcity of the World War II era only heightened Vermonters' self-sufficiency ethic. The generation that emigrated from increasingly urbanizing areas to Vermont during the back-to-the-land movement of the 1970s chose to increase their personal supply of year-round local foods, and year-round interest in local foods today has been spurred on by the localvore movement.

Most of the farms that I know of that are doing really well right now are creating a niche product. They are doing value-added marketing and something innovative and are attracting employees to their business.

—Northwestern Vermont focus group participant

Bridging the harvest from summer to winter isn't the only reason for processing. Some foods are rarely found in an unprocessed form: meat is butchered, oats are rolled, milk is pasteurized, and maple sap is boiled into syrup. Farmers may wish to use processing to recover value from an overabundance of fruits and vegetables or when cosmetic or other minor blemishes keep them from being sold as fresh, whole produce. Other forms of processing transform a commodity ingredient into a specialty food with a significantly higher retail value, such as transforming milk into artisanal cheese or yogurt.

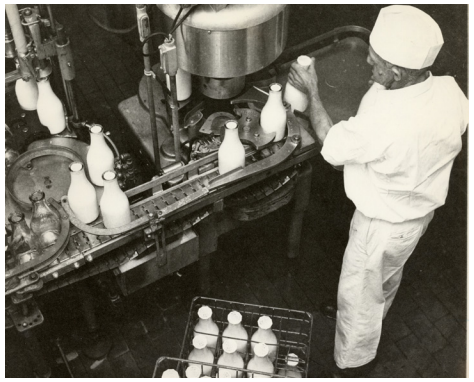


PHOTO CREDIT: UVM Special Collections

Bottling milk, date and location unknown.

Processing can open up new markets, such as high-volume, year-round businesses (e.g., restaurants and hospital and school cafeterias), many of which are interested in lightly processed foods as a way to reduce the labor that would otherwise go into peeling winter squash, washing and chopping vegetables for salad bars, or slicing apples for baking.

Over the course of the 20th century, the nature of food processing changed from the kind of light processing that could be completed and recognized in a home kitchen to a new system that disassembles and reassembles ingredients in unprecedented ways. In *Pandora's Lunchbox*, Melanie Warner says that this transition represents

"the most dramatic nutritional shift in human history" since human biology did not evolve to metabolize these kinds of ultra-processed products and since research suggests that 70% of the calories that most Americans consume is from processed food.[1] Additionally, **as with retail outlets; equipment, seeds, feed, fuel, and fertilizer firms; and food production; the food processing industry is now heavily consolidated**: the top 20 North American food processors own thousands of sub-brands and had sales of about $274 billion in 2011.[2] In comparison, the value of all shipments from food manufacturers in Vermont was equal to over $2.4 billion in 2011.[3] As Wenonah Hauter explains in *Foodopoly*, these corporations exert significant influence over the global food system since they buy and sell so many products, employ many millions of people, and impact international, national, and state rules and regulations. Several of these large corporations own or contract with Vermont companies (Table 3.4.1). Table 3.4.2 shows the top Vermont food manufacturers that are not owned by multinational corporations.

Table 3.4.1: Food Processing Companies that Own or Contract with Vermont Companies

National Rank	Company Name	2011 Sales	Owns or Contracts With
1	Pepsico Inc.	$38,396,000,000	Operates several bottling facilities and fast food stores in Vermont.
7	Dean Foods Co.	$12,698,000,000	Processes and bottles VT milk in other states.
21	Unilever North America	$5,986,000,000	Ben & Jerry's ice cream
47	H.P. Hood Inc.	$2,200,000,000	Booth Brothers
83	Agri-Mark	$900,000,000	Cabot Creamery Cooperative
93	CROPP Cooperative (Organic Valley)	$715,000,000	Contracts with organic VT dairy farms.
NL	North American Breweries	--	Magic Hat Brewing Co.
NL	C&C Group	--	Vermont Hard Cider Co.

Source: Food Processing, *www.foodprocessing.com/top100/index.html*. NL = not listed on Food Processing Top 100 list.

Table 3.4.2: Top Vermont Food Manufacturers, 2011

VT Rank	Company Name	2011 Revenues
1	Green Mountain Coffee Roasters	$2,650,900,000
10	St. Albans Cooperative Creamery	$310,000,000
27	King Arthur Flour Company	$94,200,000
34	Poulin Grain, Inc.	$81,000,000
38	Maple Grove Farms of Vermont	$77,000,000
58	Black River Produce	$45,500,000
88	Whitman's Feed Store, Inc.	$45,500,000
131	Grafton Village Cheese Co, LLC	$8,800,000
149	Monument Farms, Inc.	$5,500,000

Source: Vermont Business Magazine, *www.vermontbiz.com/news/january/vermont-100-25th-anniversary-gmcr-new-number-one*.

Throughout the F2P planning process, we heard from Vermonters who believe that Vermont should have additional in-state processing facilities available for farmers and food entrepreneurs. However, getting from that expressed desire to viable business models is not a simple process given variations in stages of development and scales of operations in Vermont; the types of market outlets accessed; the types and origins of sourced ingredients; and the impacts of multinational food processing corporations.

Focusing on a company's scale of operation is necessary in order to understand its developmental needs, such as the regulations that cover the facility, the infrastructure needed for distribution, the packaging needed for transport, the market capacity to take local farmers' products, and challenges in sourcing enough local supply. Understanding a company's stage of development is important in order to focus business planning and technical assistance resources to promote success. Since Vermont processors of all scales of operation and stages of development import ingredients from around the world (e.g., cocoa, coffee, wheat), weather-related disruptions, geopolitical events, and other issues can impact cost and availability. Finally, multinational food processing corporations wield immense power in shaping public policy and consumer preferences, and Vermont food processors and manufacturers

may present inviting targets for buy-outs that may reduce local employment and reduce processing and manufacturing capacity (e.g., *Green Mountain Gringo*, Chester, was purchased by TW Garner Food Co. and *Annie's Naturals*, Calais, was purchased by Homegrown Naturals and both facilities were moved out of state).

GETTING TO 2020

Goal 11 of the Farm to Plate Strategic Plan addresses the desire to strengthen Vermont's food processing and manufacturing sector in order to provide farmers with more market outlets at the local, regional, national, and even international scale.

Goal 11: Vermont's food processing and manufacturing capacity will expand to meet the needs of a growing food system.

CURRENT CONDITIONS

This section of Chapter 3 highlights the ways Vermont businesses are developing processing facilities and the challenges they are facing. It is by no means an exhaustive inventory of all the business models, opportunities, and challenges in food processing. Instead, it describes common challenges and opportunities, and some creative approaches to food processing that are emerging in the state.

The number of practices covered under "food processing and manufacturing" makes any comprehensive inventory a continuously moving target and one that doesn't always reveal direct linkages with the farming community. Market outlets can range from major dairy processing facilities (*St. Albans Co-op Creamery*) or maple syrup processing facilities (e.g., *Maple Grove Farms of Vermont*) that ship nationwide, to on-farm slaughter facilities that feed a single family or specialty products sold in only one or two local stores. Some of our favorite locally processed foods and beverages are manufactured in large commercial facilities, such as *Green Mountain Coffee Roasters*, *Lake Champlain Chocolates*, *King Arthur Flour*, and *Madhouse Munchies*. Even when they use few, if any, locally produced ingredients, these manufacturers are significant employers and economic engines of Vermont's food system.

Processing and food manufacturing facilities in Vermont take many forms and operate at many different scales. Consider the following examples:

- Dairy processing, including fluid beverage milk, yogurt, cheese, butter, ice cream, and powdered milk
- Slaughter and meat cutting and packing facilities
- Mobile processing, including custom slaughter and butchering
- Sugarhouses
- Bakeries
- Canneries
- Breweries, wineries, cideries, meaderies, and distilleries
- Co-packing facilities
- Incubator and shared-equipment space for specialty food producers
- Custom on-farm equipment, including: bean threshers, grain millers, oil presses, dehydrators, and textile processors
- Community kitchens
- Household kitchens

The most recently available data from the *Vermont Department of Labor's Covered Employment and Wages* statistics (second quarter 2012) and the *U.S. Census Bureau's nonemployer statistics* (2010) indicate that Vermont has 616 food processors or manufacturers.[4] Most of these, 66% (*N* = 407), are considered nonemployers (i.e., businesses that have no paid employees) and they generated only 0.4% ($11.1 million) of the total value of all food manufacturers in Vermont ($2.4 billion).[5] The remaining 209 companies employed nearly 5,900 Vermonters and generated 99% of the value of food manufacturing in Vermont.

Food processing and manufacturing is the largest manufacturing sector in Vermont by number of establishments (*N* = 616, FIgure 3.4.1), the second-largest manufacturing sector by number of employees (*N* = 5,846, FIgure 3.4.2), the second-largest manufacturing

Figure 3.4.1: Vermont Manufacturing Establishments, 1997-2012

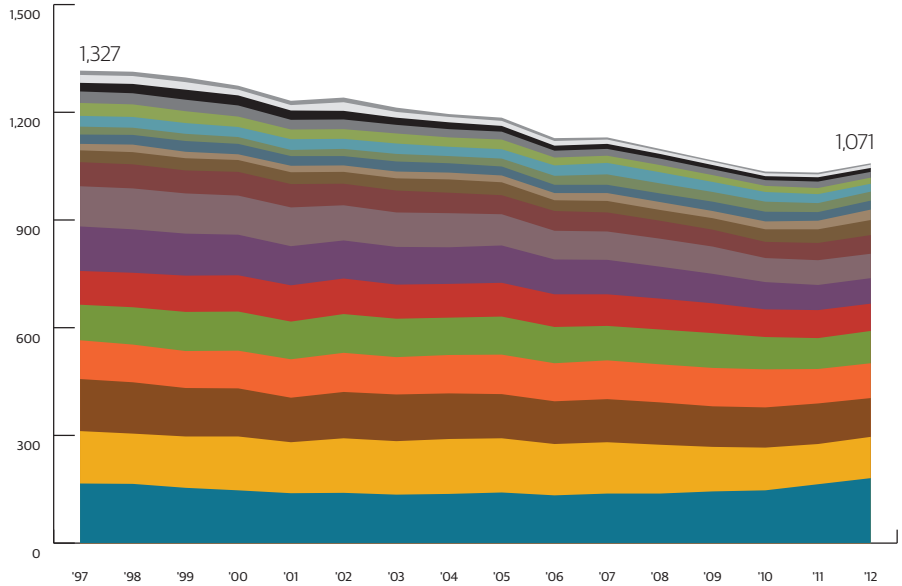
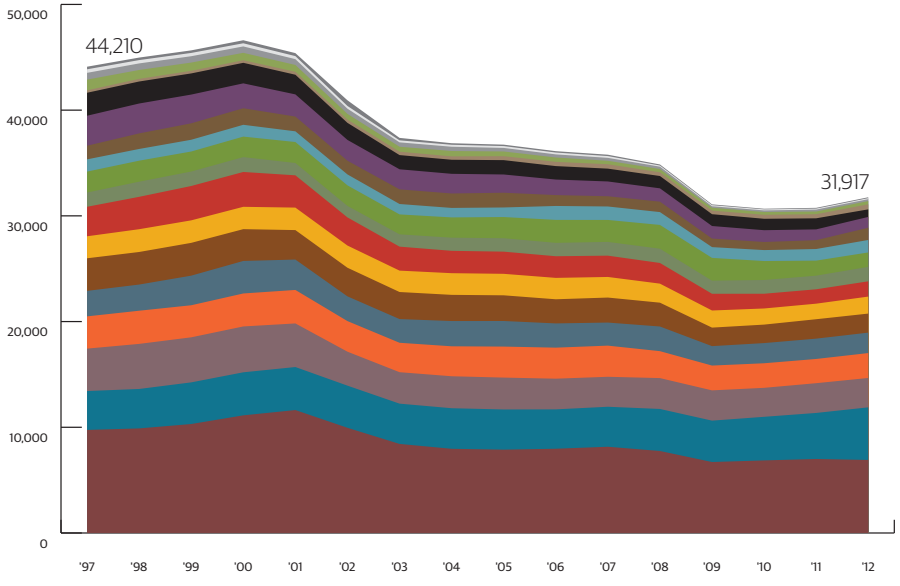


Figure 3.4.2: Vermont Manufacturing Employment, 1997-2012

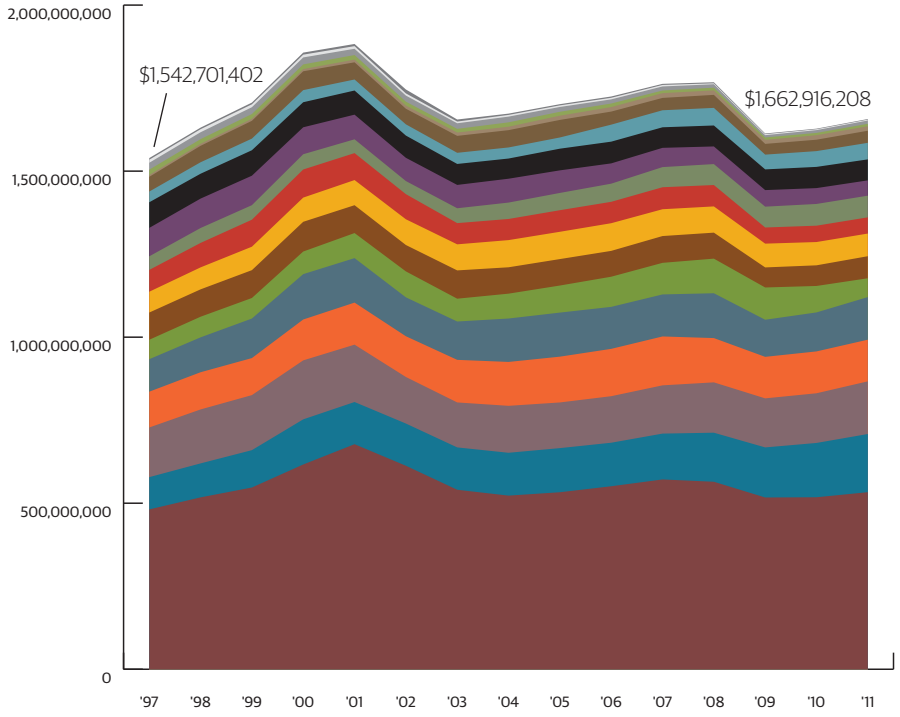


Source: Vermont Department of Labor, www.vtlmi.info/indnaics.htm. Note: Figures 3.4.1 through 3.4.3 do not show nonemployer data.

Legend

- Food
- Nonmetallic mineral products
- Wood products
- Fabricated metal products
- Miscellaneous
- Furniture + related products
- Printing
- Machinery
- Computer + electronic products
- Chemicals
- Beverage + tobacco products
- Transportation equipment
- Electrical equipment + appliance
- Plastics + rubber products
- Apparel
- Textile product mills
- Paper
- Textile mills
- Primary metals

Figure 3.4.3: Vermont Manufacturing Total Wages, 1997-2011



sector by total wages ($188,628,076, FIgure 3.4.3), and the 12th largest by average wages. Computer and electronic products manufacturing is the largest manufacturing sector by employment, total wages, and average wages.

Food manufacturing is one of only four manufacturing sectors that saw establishment (*N* = 26, 14.1%) and employment (*N* = 1,548, 24.9%) growth from 1997 to 2012, even though the total number of manufacturing establishments (-19.3%) and total manufacturing employment (-27.8%) decreased during that time period (These figures do not include nonemployment data).

Based on data from the 2011 Annual Survey of Manufactures and 2010 nonemployer statistics from the U.S. Census Bureau, we calculate that **Vermont's food processors and manufacturers generate over $2.2 billion in value per year** (Table 3.4.3). It is clear that dairy product manufacturing (48.6% in 2011 and 46.7% in 2010) makes up a significant percentage of the value of covered food manufacturing (i.e., food manufacturing from facilities with multiple employees). In contrast, dairy product manufacturing makes up a small percentage (3.8%) of the receipts of nonemployers, while bakeries (18.7%), other food manufacturing (e.g., snack foods, 24.7%), and fruit and vegetable processing (17.6%) make up a much bigger share.

Table 3.4.3: Value of Food Manufacturing, 2010-2011

2011 Annual Survey of Manufactures	
Food + Beverage Manufacturing	**Value of Shipments**
Food manufacturing	$2,434,257,000
Dairy product manufacturing	$1,183,741,000
2010 Annual Survey of Manufactures	
Food manufacturing	$2,276,597,000
Dairy product manufacturing	$1,063,363,000
2010 Nonemployer Statistics	
Food + Beverage Manufacturing	**Receipts**
Food manufacturing	$11,049,000
Dairy product manufacturing	$423,000
2011 ASM + 2010 Nonemployer TOTAL	**$2,444,093,000**
2010 ASM + 2010 Nonemployer TOTAL	**$2,286,433,000**

Source: U.S. Census Bureau, 2011 Annual Survey of Manufactures, *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ASM_2011_31AS101&prodType=table*. **U.S. Census Bureau, 2010 Nonemployer Statistics,** *http://www.census.gov/econ/nonemployer*.

Vermont's food processing and manufacturing industry includes over 70 on- and off-farm dairy processors[6] (including six dairy co-ops), 49 on- and off-farm licensed cheese makers, 61 slaughterhouses and meat processing facilities, at least 27 breweries,[7] 27 wineries,[8] and 47 commercial bakeries.[9] A few small-scale facilities exist for products such as organic canola and sunflower cooking oil, vodka and mead. These tallies do not capture the other businesses that support food manufacturing activities (e.g., machinery and equipment) and create a significant economic multiplier effect.

The following six examples illustrate critical concepts in charting future opportunities for Vermont food processing and set the context for the analysis and strategies that follow.

- **Relieving bottlenecks in current processing capacity**: We use the example of livestock processing to illustrate the challenge of product supply exceeding Vermont's current capacity to process it.
- **Localizing processing infrastructure:** We use the example of fluid milk to describe the opportunity of operating processing facilities closer to the farm where the raw ingredients are produced.
- **Vertically integrating operations:** We use the examples of farmstead cheese and light processing of fruits and vegetables to illustrate the opportunity of bringing light processing under the same roof as the core farm operation, creating efficiencies and improving margins by controlling the number of steps in the value chain.
- **Developing localvore products along the supply chain:** We use the example of localvore bread to illustrate issues entrepreneurs face when introducing previously unavailable locally sourced products to a larger audience through collaboration with processors, distributors, commercial users, and end customers.
- **Promoting mobile processing:** We use the examples of quick freezing of berries and poultry processing with mobile units to illustrate ways to generate an adequate volume of inputs by bringing processing to multiple farms instead of bringing the products of multiple farms to processing facilities.
- **Increasing locally grown inputs:** We use the example of specialty foods to indicate opportunities for increasing local inputs in food processing.

Bottlenecks in Processing Facilities: The Case of Livestock[10]

Farmers need to be able to slaughter their animals in a timely manner, with the appropriate regulatory oversight, for their desired method of marketing to consumers. As part of the F2P planning process, interviews were conducted with a number of existing slaughter and processing establishments to assess their capacity to increase profitability and animal throughput. Farmers were interviewed to capture their perspective on needed improvements to the existing slaughter infrastructure. The availability of various types of slaughter services, regulatory oversight of slaughter, and access to inspected slaughter facilities have concerned Vermont livestock producers since the mid-1990s and generated significant discussion during the statewide F2P meetings.

The demand for slaughter appears to be rising while capacity to meet that demand has suffered setbacks. As Table 3.4.4 shows, between 1997 and 2010 the number of commercial red meat slaughter and processing plants (state and federal) decreased from 14 to 8, and the number of commercial red meat processing plants (state and federal) decreased from 23 to 14. This has significantly decreased the ability of Vermont livestock producers to access slaughter and processing to support the wholesale or retail marketing of meat from Vermont raised animals. Franklin County is particularly underserved since *Bushway Packing Inc.* in Grand Isle was closed in 2010 and *Green Mountain Packing* in Swanton closed in 2004. In addition, many of the owners of existing facilities are reaching retirement age, and new operators have not stepped up to take over the facilities. Many small grocery stores that had the capacity to process slaughtered carcasses have dropped the service, placing additional pressure on meat processing plants.

However, the news is not all bad. As Table 3.4.4 also shows, over the past 13 years, the total number of state- and federal-inspected slaughter and processing facilities in Vermont has increased to 58 from a low point of 50 in 2005. The doubling in number of custom red meat processing plants from 14 to 28 over the past 13 years reflects the demand for locally raised meat and has reduced the pressure on commercial slaughterhouses to process meat for home consumption. Compared to other New England states, Vermont has maintained a fairly diverse system of state-inspected facilities and other slaughter options for meat producers, such as itinerant slaughterers (on-farm slaughter for home consumption), custom slaughterhouses (for home consumption) and commercial slaughter plants (for meat sold commercially). A new state-of-the-art 18,000-square-foot USDA-inspected plant, *Westminster Meats*, recently opened in southern Vermont. A number of new state- or federal-inspected processing and fabrication facilities are on the brink of opening, including one in Orleans that will further reduce the bottleneck for access to slaughter in a timely manner. Perhaps just as important, some existing plants have recently expanded their operations, thereby increasing Vermont's slaughter capacity. Figure 3.4.4 shows the location of the various types of livestock and meat processing locations throughout the state.

Table 3.4.4: Vermont Inspected Slaughter Facilities

Inspected Facilities	State			Federal			Total		
	97	05	10	97	05	10	97	05	10
Commercial red meat slaughter and processing	3	1	1	9	7	7[11]	12	8	8
Commercial red meat slaughter (no processing)	1	0	0	1	0	0	2	0	0
Commercial red meat processing (no slaughter)	11	2	4	12	13	10	23	15	14
Custom red meat slaughter (no processing)	0	1	1	1	0	0	1	1	1
Custom red meat processing (no slaughter)	14	22	28	0	0	0	14	22	28
Commercial poultry slaughter and processing	2	1	3[12]	2	2	3	4	3	6
Custom poultry slaughter only	0	1	1	0	0	0	0	1	1
Total unique facilities	**31**	**28**	**38**	**25**	**22**	**20**[13]	**56**	**50**	**58**[14]

Note: The Westminster Meats plant and the mobile poultry unit are unique. Westminster does both red meat and poultry and thus is counted in both categories above. The mobile unit does only slaughter.

Fundamental concerns still exist around processing capacity *after* slaughter, such as a lack of experienced meat cutters who understand what consumer and restaurant chefs are looking for, the potential for changes in the regulatory environment, and changing or increasing demands from producers (e.g., packaging and presentation).

The people who are doing the complaining about slaughterhouses are the ones who bring in animals once or twice a year in the fall and they have a different cut sheet for every animal, or each side of every animal, for each of their customers.

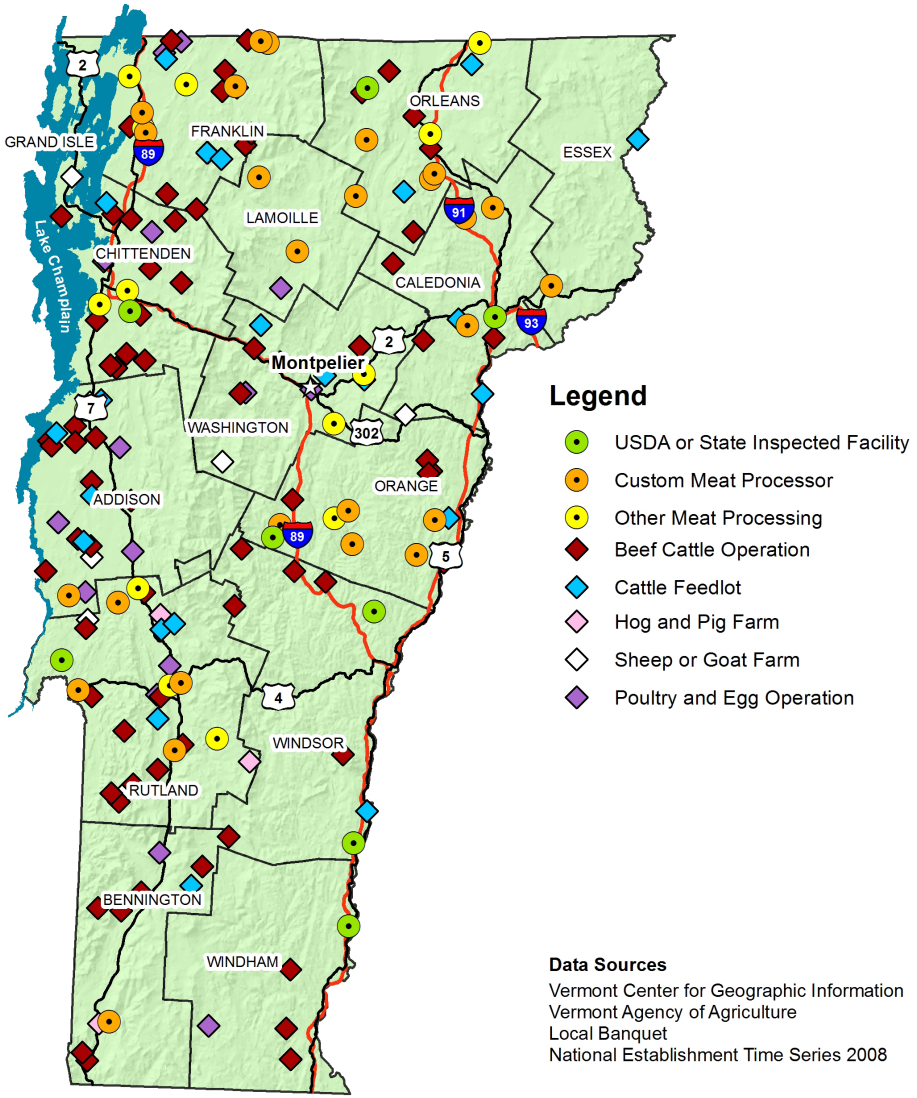
—Northwestern Vermont focus group participant

Balancing Processing and Fabrication

A *Slaughterhouse Feasibility Report* prepared for Pride of Vermont by *Sleeping Lion Associates* in 2005 found that Vermont had more than enough slaughtering capacity but insufficient processing and fabrication capacity. That is, even with the decrease in red meat slaughtering facilities, Vermont has sufficient "kill floor" square footage to slaughter a consistent number of animals five days a week, year-round. Currently, most Vermont slaughterhouses kill animals only one to three days per week and spend the other days processing carcasses.

Many facilities operate on a limited basis from February through August. In 2010, Sam Fuller of *NOFA Vermont*. conducted a survey of slaughterhouses and processors and found that they operated from 30 to 80% capacity during this off-season. The seasonality of grass-fed livestock production in Vermont places a premium on slaughterhouse access, processing, and fabrication from September through January. On one hand, if facilities are sized to accommodate high fall demand, then expensive space is underused for most of the year. On the other hand, the shortage of sufficient slaughter and meat processing capacity during the high-demand September to January season is a well-documented reality and limits the production of livestock and poultry in Vermont. Some livestock producers book slots more than six months in advance to ensure the timely slaughter of their animals, and some Vermont slaughterhouses are currently booking slaughter dates over a year in advance. What's clear is that it is not sufficient to simply look at the square footage of slaughtering space available in Vermont. Processors need to balance the slow times with the overbooked times of year, and kill floor activities with the time it takes to process the carcasses.

Figure 3.4.4: Livestock Production, Slaughter, and Processing Facilities



For the most up to date maps, please visit the Vermont Food System Atlas at www.vtfoodatlas.com.

Regulatory Environment

The *Federal Meat Inspection* and *Poultry Products Inspection Acts* as well as state laws govern the slaughtering and processing of meat and poultry for human consumption. The USDA's *Food Safety and Inspection Services* (FSIS) is responsible for ensuring that meat and poultry are safe; wholesome; not adulterated; and properly marked, labeled, and packaged. These federal acts define the process for pre- and postmortem inspection and describe the specific marking, labeling and packaging requirements.

Vermont is home to a number of "itinerant" custom slaughterers who slaughter animals on farms for home (noncommercial) consumption. An itinerant custom slaughterer may slaughter livestock owned by an individual who has entered into a contract with a person to raise the livestock on the farm where it is intended to be slaughtered. There has been some confusion around the amendment to 6 V.S.A. 3306(f), dubbed the "on-farm slaughter amendment," which was adopted in 2009. VAAFM, in consultation with the USDA, has clarified these federal regulations that govern this particular type of custom slaughter.[15]

Meat to be sold through institutional or retail channels must be slaughtered and processed in a state- or federal-inspected facility. Generally, federal inspectors oversee facilities that slaughter and process meat and poultry. FSIS has cooperative agreements with many states, including Vermont, that allow state inspectors to enforce requirements "at least equal to" those imposed under the federal acts for state-inspected facilities. Regardless of how a facility chooses to operate, federal and Vermont law require it to be licensed if it is engaged "in the business of buying, selling, preparing, processing, packing, storing, transporting or otherwise handling meat, meat food products or poultry products."[16]

Many farmers have concerns about in-state and out-of-state distinctions. Any commercial meat shipped across state lines must receive federal inspection. Some Vermont farmers feel that small-scale production is doubly penalized; that is, they believe that many of the federal requirements are not scaled appropriately to their size of operations and that being in a small state makes it more likely that they will have to cross state lines to find markets. Some food safety professionals also express frustration at the state–federal distinctions, because the FSIS pays these same state inspectors to enforce the federal regulations. Exemptions to the inspection rules are described in Chapter 3, Section 3, Food Production: Livestock and Meat, along with additional details on regulations for facility construction.

PHOTO CREDIT: Vermont Livestock Slaughter and Processing

Alan Cushing of Vermont Livestock Slaughter and Processing.

In the mid-2000s, the Vermont Legislature enacted several statutes to ease the regulatory oversight of food safety requirements for poultry processing, and placed more responsibility for making informed decisions on food sourcing in the hands of consumers. Similar efforts are underway to increase consumer access to uninspected and farm-slaughtered beef, hogs, and sheep. Current federal regulatory language limits some opportunity for inspection flexibility at the state level. Agricultural producers differ in their opinions about the wisdom of this effort. **Any regulatory changes to the Vermont meat inspection program must be made only after careful consultation with a true cross section of all producers.**

Several producers expressed an interest in regulatory changes to allow the retail sales of meat derived from on-farm, uninspected slaughter. However, a number of producers cited grave concern about any decrease in the regulatory oversight of slaughter. **This issue was raised a number of times during local and statewide food summits, with strongly held opinions both in favor of and opposed to uninspected meat**

entering retail sales. Several slaughterhouse owners pointed to the number of animals being slaughtered and sold outside of appropriately constructed and inspected facilities as a significant contributor to their profitability challenges. If changes to Vermont laws disrupt our reciprocal agreement with FSIS, then slaughterhouses sending meat across state lines may face shortages or lower responsiveness from their federal inspectors. Slaughterhouse owners interviewed for this report frequently stated their impression that uninspected facilities are able to charge less for their services and therefore draw business away from inspected facilities. Vermont meat is also a small industry that relies on a reputation for wholesome, quality food; any lapse in standards affects the reputation of the whole industry, and some processors are concerned that those lapses are more likely with uninspected facilities.

Producers Respond to Evolving Markets

Recent changes in meat and poultry production in Vermont reflect an increased interest in marketing specialty products. These specialty meat items have value added by being locally sourced or through other designations, such as grass-fed or organic, all of which impose restrictions on how the animals can be handled. However, *Sleeping Lion Associates'* Slaughterhouse Feasibility Report identified substantial concerns about the quality of fabrication and packaging. A report by *SJH Associates* in 2006, *The Economic Analysis of Agricultural Markets in Vermont: Organic / Grass-fed Dairy and Livestock for Meat*, found similar concerns. It reported that 60% of producers cited poor processing quality as a major impediment to succeeding in the organic and grass-fed markets. Several producers believed they did not always receive meat from the same animal they had sent to slaughter. Many producers had started personally supervising their animals' slaughter and processing at the plant. Anecdotal concerns were still being expressed by producers during the F2P stakeholder sessions in 2009-2010.

Even if producers are assured that the final product does, in fact, meet the standards set by a specialized designation, they still need to sell a product with overall high quality. Livestock producers who raise high-quality lamb, beef, pork, and goat meat need attractive cuts and packaging to command premium prices. Poorly cut carcasses, unattractive packaging, and sloppy labeling all eat into profit margins. The packaging and presentation demands of consumers are often unfamiliar to slaughterhouses, which are used to packaging cuts in freezer wrap. Because processing services are

Brault's Market

Tony Brault.

PHOTO CREDIT: Julia Shipley

Tony Brault has cut things all his life, everything except his own hair, and he's so busy lately, he hasn't gotten around to letting someone else at it. One of his earliest memories as a kid in the Northeast Kingdom is "standing on an overturned soda crate, cutting meat beside my grandfather with a butter knife so I couldn't injure myself." Back then his grandfather owned a slaughterhouse in Troy, and there were others in nearby towns Orleans, North Hyde Park, and Richford.

Now Brault is the owner of that Troy slaughterhouse, and a third generation meat cutter. He is also the father of the fourth generation, as his son is also working at Brault's Market, a custom slaughtering, cutting, packing, smokehouse, and curing facility and store.

To get there, a customer will turn off Route 100, by the Brault's sign, and cruise down a long straight lane that leads directly to a wide building. If you'd stopped there last year, you would have parked your car in front of an unwelcoming, but kempt building, and let yourself in by a door that seemed as much a private entrance as it did "the door to the store." Now, thanks to grant money from the *Vermont Farm Viability Program*, a customer will find a handsome edifice with a few windows and a door that leads to the spacious renovated meat shop.

The new retail facility at Brault's has a slicer, a meat case, a food-grade band saw, and bags of their famous leathery spicy beef jerky on the counter. Brault said they're still putting the finishing touches on the retail area meat case. Nevertheless, a customer will currently find a carnivore's larder of ham, Canadian bacon, boneless pork loin, West New York strip, western rib eye, local T-bone, water buffalo rib eye, franks, and sirloin top butt, all purveyed by Brault's sister. And they can help themselves to even more in the new self-service freezer.

From Julia Shipley, "A Boost to the Butchers," *Vermont's Local Banquet*, Winter 2010, *www.localbanquet.com/issues/years/2010/winter10/slaughterhouses.html*

Market and Brand Opportunity: Humane Certified

Vermont has the opportunity to provide national leadership in the movement to promote the humane treatment of food-producing animals. Livestock producers have new opportunities to explore as the market for products from food-producing animals that have been raised and slaughtered humanely is growing as a result of consumer demand.

Consumers and Humane Farm Animal Treatment

Consumers are increasingly concerned about the quality of their food and of the food production process. Survey results consistently show that consumers are willing to pay more for agricultural products that meet higher animal welfare standards. In a 2004 survey by *Ohio State University* researchers, 59% of respondents stated that they would pay more for meat and dairy labeled as humane. In the same study, 92% of respondents agreed that it is important "that animals on farms are well cared for," and 85% agreed that "even though some farm animals are used for meat, the quality of their lives is important."[17] A 2007 *American Farm Bureau Federation*–funded study out of Oklahoma State University showed that the majority of respondents believe that higher welfare standards produce meat that tastes better and is safer to consume.[18]

What does it mean to be humane?

In the United States, several certification programs have been created to give consumers the assurance they are looking for when they wish to purchase products made from humanely raised and slaughtered animals. These programs have precise, science-based, objective standards to which certified producers adhere, yet requirements vary among programs giving producers options to choose the certifier who best fits the circumstances on each individual farm. The programs are also transparent in that the requirements are freely available to consumers. The three programs most widely accepted within the national animal protection community are *Global Animal Partnership* (GAP), *Animal Welfare Approved* (AWA), and *Humane Farm Animal Care* (HFAC). Although many other programs with meaningful requirements exist, only these, which are endorsed by respected nonprofit humane organizations, will withstand consumer scrutiny. Standards established and promoted by industry associations are, by and large, less well received by consumers, who perceive those organizations as having conflicting interests.

How have producers and food retailers responded to consumer interests?

Many large and small producers have embraced the animal welfare concept and are using it as a marketing tool. For example, *Smithfield Foods* announced it will phase out the use of restrictive gestation crates to confine pregnant sows,[19] and *Niman Ranch* has committed to selling only natural, sustainable, and humanely produced meat. Several retail grocery outlets, restaurant chains, and fast-food marketers, including *Safeway* stores, *Wendy's*, and *Burger King*, are increasingly requiring their suppliers to meet strict criteria for animal care and treatment. *Whole Foods Market* sells only cage-free eggs in the United States and internationally. A 2008 survey conducted by *Harris Interactive* on behalf of *Whole Foods Market* found that despite rising food prices, nearly 80% of consumers would not compromise on the quality of the food they buy.[20]

In Vermont, 129 retail establishments sell HFAC–certified products. For example, *Hannaford*, *Shaw's*, *Price Chopper*, and several co-op and natural foods markets carry a variety of Certified Humane eggs, meat, and cheese.[21] Several Vermont farms are certified by AWA."[22]

Humane Handling Improves the End Product

Humane handling not only improves the welfare of the animals, but also results in tangible meat quality and productivity improvements. Acute preslaughter stress due to excitement or rough handling can affect the quality of pork, beef, and lamb. Studies of pigs show that highly negative interactions, such as prods with an electric goad, can increase muscle glycogenolysis;[23] increase plasma lactate concentrations;[24] and produce pale, soft, and exudative (PSE)[25] meat. Stress can also reduce beef tenderness[26] and cause dark-cutting problems in the meat of cattle[27] and sheep.[28]

Inspections that audit animal handling at slaughter plants have led to reductions in steer and heifer carcass bruises from 48 to 35%.[29] In contrast, crowding cattle during transport and using a stick to drive them can lead to bruising.[30] Pen, ramp, and race designs can be improved to facilitate the quiet movement of animals into the stunning box, reducing excitement, bruises, and injuries prior to slaughter.[31]

Certification programs that follow the animals through slaughter and include a respected auditing system, such as the *American Meat Institute's* Recommended Animal Handling Guidelines and Audit Guide, can drastically improve animal handling, reduce animal fear and stress, and improve meat quality and yield. As explained by the *American Meat Institute*:

> *Animals that are handled calmly and humanely produce higher quality meat. Stress hormones can cause quality problems called "bloodshot" in beef or "PSE" in pork, both of which require that parts of the meat be trimmed away. Plants with optimal animal handling produce higher and better meat yields. Good animal handling also enhances safety for workers. Animals that become agitated due to rough handling can injure workers – and themselves. Calm animals also are less likely to damage equipment – but a stressed or struggling animal might.*[32]

What are the costs and revenues of going humane?

The costs of becoming certified by reputable programs vary. Some programs charge an inspection fee as well as a certification fee assessed per head, based on the amount of product processed and the number of certified animals or animal products sold. However, the inspection fee can often be shared by farms in close geographical proximity, and small operations may be subsidized with a grant through the certifying program.

The program with the highest standards for animal welfare, *Animal Welfare Approved*, is free to producers. As stated in the AWA policy manual, "There is currently no charge for joining the Animal Welfare Approved program, for audits or for any other services."[33] Additional costs may be associated with improving facilities to meet the requirements for humane certification.

The promotion of humanely raised meat, milk, and eggs in the state of Vermont could have carryover effects into other areas, including agricultural and culinary tourism. Humane-certified establishments can confidently allow guests to view all aspects of animal production, because the high standards required by certification programs make it easy for farmers to explain agricultural practices to urbanites who may have never set foot on a farm.

To prevent "bad actors" from casting Vermont agriculture in a negative light, high standards of animal care with effective oversight and enforcement should be implemented. Incidents such as the *Bushway* slaughter plant investigation in 2010 give the entire industry a bad image, and must be avoided in the future.

Vermont agriculture could benefit from certifying humane farming, transport, and slaughter, thereby tapping into the demographic of consumers who care about the treatment of food-producing animals. Humane certification could also be used as a marketing tool to differentiate Vermont farms from those in other states. Certifying animals through a well-respected program and auditing slaughterhouses would be good first steps in preventing future problems. Given the level of social awareness of this issue in the wider context of natural, sustainable, and "green" production, the meat quality and productivity benefits, and the domestic and international trend toward humane farming, Vermont could and should be a leader in this effort.

> *"If Vermont is to retain and grow its unique brand reputation as a traditional pastoral producer of high-quality, natural agricultural products, it will need to focus not only on those production techniques that enhance margin, production, and quality, but also on those that are intrinsic to its tradition of benign animal husbandry."*
>
> **— Bill Schubart testimony before the Vermont House Committee on Agriculture, 2010.**

in such high demand, commercial livestock producers have been stymied in their attempt to encourage greater attention to packaging and presentation. Both SJH and *Sleeping Lion* reported repeated instances of errors in meat fabrication that made cuts unsuitable for sale in the premium market for which these animals had been raised (at a higher cost to the producer). As producers and processors attempt to increase the sale of Vermont-raised meat to high-margin clients, it is essential that the butchering quality enhance, rather than degrade, the value of the meat.

While Vermont's livestock industry struggles to keep up with the demands of specialized labels today, new ones are emerging. For example, during the 2010 legislative session, language was developed to address humane slaughter violations by creating a system of administrative and punitive penalties and allowing video installation at slaughter plants at the discretion of the Vermont Secretary of Agriculture. This legislation sets basic standards for a Vermont product and also may lead to specialty "humanely treated" label options in the future. It is essential that slaughter be carried out in a humane manner; however, several interviewees mentioned that regulatory requirements cannot be so burdensome as to limit the operation and expansion of Vermont slaughterhouses. If producers and processors try to offset additional costs, or market Vermont's steps toward humane standards through a "humanely treated" label, they also need to know the label can be enforced to maintain its integrity.

Producers are also looking to in-state institutional markets (e.g., hospitals and schools) where they may be competing with commodity meat from the Midwest. For instance, there has been growing interest in processing dairy beef for these institutional markets, but some end users of this type of meat require additional processing steps such as carcass pasteurization and the production of preformed hamburger patties. Access to this equipment, such as has been recently installed at *Westminster Meats*, could open up these institutional markets and large retailers. Unfortunately, the cost of even the smallest versions of specialized equipment is prohibitive for most Vermont slaughterhouses. A pasteurizer costs approximately $250,000 to purchase (and even more to install), and a patty machine costs approximately $75,000.

Chapter 3, Section 3, Food Production: Livestock and Meat examines Vermont's livestock and meat processing industries in depth. This overview introduces some of the ways a processing bottleneck can form. It isn't only a question of the square footage of processing space available in Vermont. As reported by *Sleeping Lion Associates*, those facilities need to balance excess capacity in low demand seasons with insufficient capacity during high demand. They also need to balance the time and labor needed for slaughter with their capacity for fabrication after the slaughter. The regulatory system can mean that facilities suitable for meat destined for one market cannot be used for another market. Quality can present another constriction: if higher volumes of meat processed lead to lower quality products, producers can't use those facilities to reach a premium market. Additionally, emerging markets may require equipment that current facilities don't offer.

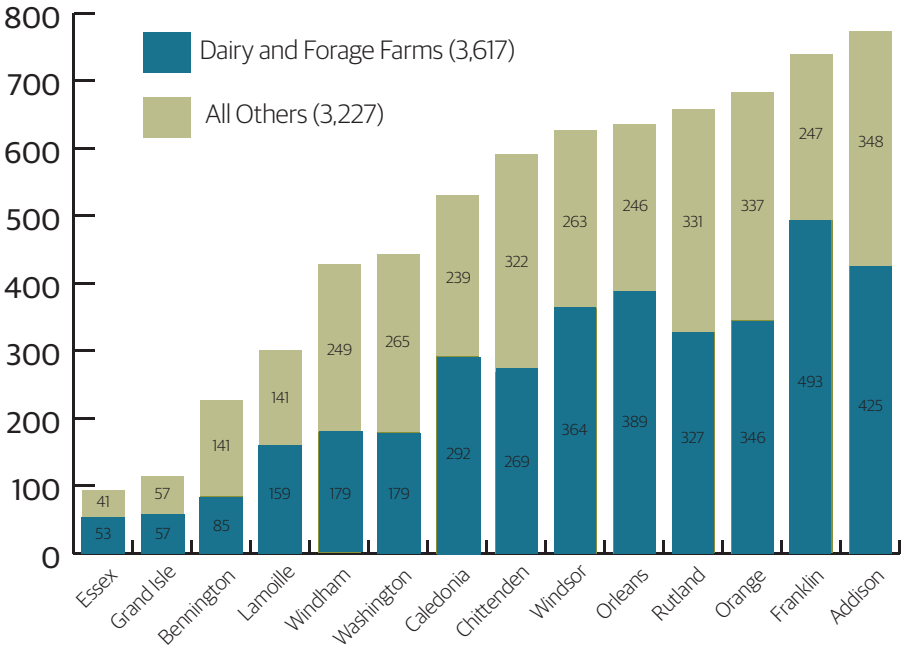
Localizing Processing Infrastructure: The Case of Fluid Beverage Milk

Dairy farms define the physical working agricultural landscape across Vermont, making up a significant percentage of all farms in each of our 14 counties (Figure 3.4.5). **Vermont is the largest dairy producing state in New England, and dairy products (milk, dairy beef, and forage crops grown for livestock) account for upwards of 83% (≈ $584 million, adjusted for inflation to 2010 dollars) of the state's agricultural products' sales, and as much as 90% depending on market prices.** The majority of this milk (40 to 46%) is in fluid form. However, only 8% of Vermont milk is processed in-state.[34]

Milk processing is a highly competitive field, with established national players and a national production and processing system. Despite the prominence of Vermont dairy production in New England, most Vermont dairy farms are competing in a national fluid milk market characterized by the following:

- High integration in the companies that bring the product to the retail market
- Low variability in price by region (although the federal milk marketing order does mandate some regional variations)
- Little perceived difference between the taste of beverage milks by customers
- More than a doubling in the volume of milk produced per cow since 1970[35]
- Rapid increases in the economies of scale experienced by the largest dairies as they expand both per-cow production and per-farm herd size.

Figure 3.4.5: Dairy Farms and Nondairy Farms by County



Source: USDA, 2007 Census of Agriculture, *www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1_Chapter_1_State_Level/Vermont/vtv1.pdf*.

Our farms are significantly smaller than their national counterparts, with sizes ranging from a dozen cows to 2,000 cows, compared to farms with herd sizes of more than 15,000 found nationwide. Size disparity is a primary reason that farms outside Vermont have consistently lower costs of production. This starting advantage is sometimes augmented by public subsidies, such as federally funded infrastructure like water for production, lax environmental standards or enforcement of standards, and lack of sufficient humane treatment protection for the animals. With other products, Vermont has been able to parlay its small size and high production standards into premium pricing. For beverage milk, this strategy is difficult because customers usually don't distinguish between the taste of different milks, and segregating Vermont milk from other milk sources in processing facilities is difficult.

A primary focus for those working to improve the economics of Vermont's dairy industry is currently on increasing the amount farmers receive from processors for

PHOTO CREDIT: Blue Spruce Farm

Milking cows at Blue Spruce Farm, Bridport.

their milk. Other strategies include diversifying farm products beyond dairy, encouraging on-farm energy generation (e.g., *Cow Power*) and renewable energy credits, and reducing production costs (e.g., through complementary partnerships such as taking grains or soy from local producers or creating cow-bedding material on-farm). The full range of options is addressed in Appendix B.

Most Vermont dairy farms belong to one of six dairy cooperatives: *St. Albans Cooperative Creamery* (Vermont's largest dairy cooperative), *Dairy Farmers of America*, *Dairylea Cooperative*, *National Farmers Organization*, *Organic Valley*, and *Agri-Mark*. Additionally, *Dairy Marketing Services* works with independent farms and cooperatives in the Northeast on marketing their milk to processors. Cooperatives manage the flow of raw milk through regions and the nation. Some manage the flow through processing and retail distribution, while others remain more narrowly focused on coordination between suppliers of the raw input and processors. This arrangement allows processors to receive large volumes of milk that has been aggregated and screened for quality by an intermediary. Cooperatives can spread sales over multiple processor clients (or process their own) and balance milk across the fluctuations in supply caused by

weather, feed, and other factors unique to dairy. Balancing may involve holding milk for a day or two or diverting it to another market (e.g., from fluid beverage milk to cheese production). Farmers may also join national groups such as the *National Milk Producers Federation*, whose Cooperatives Working Together program attempts to stabilize milk prices through herd buyouts and export assistance.

The federal government maintains programs that effect the price of milk as it moves from farm to customer. Much of this control occurs at the processor level. The *Federal Milk Marketing Order* (FMMO) system manages the *minimum* amount received by both producers and processors. It also manages producer payments by performing audits to ensure that they receive proper payments twice monthly, and that milk quality testing is accurate. The New England Interstate Dairy Compact allowed the New England states to work cooperatively in this processor-level price management from 1996 to 2002 (Congress did not renew its authorization in 2002). As with other commodities, the federal government will also buy out dry milk, cheese, and butter when the private market prices fall below a certain minimum—establishing a known clearing price for dairy products. Programs may also provide subsidies directly to producers. The current *Milk Income Loss Contracts* pay farmers a direct subsidy when the price of milk falls below $16.94 per hundred pounds in the Boston market. In some years the federal government offers herd buyouts to reduce the supply of milk. The U.S. government does not use strict supply management strategies, such as the quota system used in Canada, to balance supply and demand.

Organic beverage milk has increased in popularity among producers, with production growing from a handful of certified organic farms in 1995, to approximately 194 in 2010. Buyers for organic milk in Vermont are *Organic Valley* and *Horizon*. Appendix B, which discusses the dairy industry in more depth, outlines the differences between conventional and organic milk. For this section, it is important to note that, unlike the cooperatives that manage conventional milk, the organic industry exercises supply management systems. These systems can produce a stable price and maintain that price above the average cost of production. When supply gets too high for demand, producers are required to cut back by a certain percentage. Organic milk also sidesteps the lack of distinction that customers make in the taste of milk by offering a different set of criteria (the organic certification) to draw a premium price in the retail marketplace.

Vermont dairy producers have long held concerns about their relationship with processors. **Within New England, the centers of production, processing, and consumption are not within the same location. Vermont farms provide the major share of raw milk, while processing occurs in multiple locations (particularly Massachusetts), and most consumers are in urban centers such as Boston and Hartford.** One major drawback of this interstate arrangement is that the pricing structure for milk relies on the processor-to-producer payment (or processor to cooperatives representing producers), and that price, in turn, is affected by federal regulations and pricing rules.

Larger states, such as California,[36] have instituted a state-controlled milk marketing order to be more responsive to local conditions for farmers than the federal system. New England, on the other hand, does not have that option because the payments occur across state lines. Only the federal government can regulate interstate commerce unless Congress enacts a special dispensation, such as the one that allowed the Northeast Interstate Dairy Compact to begin in 1996.

Concern has also been raised over monopolies at the processor level. *Dean Foods* and *Dairy Farmers of America* control approximately 90% of the Northeast region's processing, exerting what U.S. Senator Bernie Sanders claims is a monopolistic control in both the conventional and organic markets.

In-state processing can give Vermont better control over the process of getting milk to market and allow Vermont dairy producers to more easily market a Vermont-branded milk with a potential for higher retail value. Rhode Island has succeeded in this type of local brand development with *Rhody Fresh*, milk produced entirely within the state. Vermont's program for connecting consumers with local milk production is *Keep Local Farms*, which allows consumers to pay a voluntary premium on their milk, which goes to New England farmers. This program does not change the milk product itself (and in fact, some customers simply donate without purchasing any milk at all), but it does raise awareness of New England dairies. Some of the milk currently produced and processed in Vermont do have some branded initiatives, such as the Co-op Milk produced by *Monument Farms*, but they supply very small distribution areas almost entirely within Vermont and do not capitalize on the Vermont brand in the full regional milk market.

The growing interest in in-state fluid beverage milk processing is balanced by the factors that led to a regionalized system in the first place. The economies of scale afforded by moving high volumes of milk can create price point advantages over start-up, in-state processors. Processing is only one link in the supply chain; farmers doing on-farm processing or new local off-farm processors need to find a way to get milk to retail locations. Distribution is complicated by the fact that milk is a highly perishable product and also a staple that needs to always be fresh and on the shelves. Established co-ops manage minor fluctuations in supply and have the ability to quickly calculate the best price available to their farmers, and then divert milk to capture that price, including to new purposes (e.g., from the fluid beverage class at one facility to cultured milk at another). New processors and on-farm processors may have supply fluctuations and also may not be able to shift milk to other purposes when they have a surplus. Finally, building milk processing facilities is expensive. Entrepreneurs must raise the start-up capital to enter a marketplace where other businesses have established facilities and where supply regularly outstrips demand.

It is difficult for a new local processing facility to enter this marketplace, but there may also be advantages to creating this local capacity. Since the original publication of this section in 2010, the number of in-state processors of fluid milk increased from four to six: *Booth Brothers*, *Kimball Brook Farm*, *Monument Farms*, *Strafford Organic Creamery*, *Sweet Rowen Farmstead*, *and Thomas Dairy*

- *Booth Brothers*, although located in Barre and using Vermont milk, is part of the national company HP Hood. *Booth Brothers* has created the local processing infrastructure but does not maintain local ownership over the processing itself. *Booth Brothers* milk is widely available in Vermont grocery stores.

- *Kimball Brook Farm*, North Ferrisburgh, was certified organic in 2005 but the recent recession and lower organic milk prices threatened to shut operations down. With assistance from the *Vermont Farm Viability Program* and funding from *Slow Money* investors, Kimball Brook opened the Green Mountain Organic Creamery at the former Saputo location in Hinesburg in May 2012. They now sell milk, cream, and half and half from 200 Jerseys at grocery stores, co-ops, and restaurants throughout Vermont, New England, and New York.

Strafford Organic Creamery

PHOTO CREDIT: Katie Rutherford

Cookies and Strafford's Sweet Guernsey Cream ice cream.

Over in Strafford, husband-and-wife team Earl Ransom and Amy Huyffer—owners of *Strafford Organic Creamery*—use the certified organic milk from their herd of 40 Guernseys to produce 13 different flavors of small-batch ice cream, about 100 to 150 gallons a week. They incorporate fresh-brewed coffee, mint plucked by hand from their garden, and organic eggs. Some flavors include coconut almond, egg nog, and black raspberry. Smooth maple is a popular choice among localvores, since the ingredients are all from Vermont.

Seven people, plus Amy and Earl, do all of the field work, milking, processing, administrative duties, and delivery of products. The creamery also produces milk sold in glass bottles. Their ice cream can be found in stores, co-ops, college cafeterias, and restaurants from Craftsbury to Brattleboro.

"We do almost all our own distribution, but we do deliver to [distributors] Squash Valley Produce in Waterbury and Hillside Poultry in Wilmington, and they bring our stuff to places we can't get to, like Waitsfield and Manchester," says Huyffer.

"My hat is off to *Ben & Jerry's* for paving the way for what we do," she said. "They introduced people to super-premium ice cream, in a pint at the grocery store, from cool people in Vermont who went out of their way to make a great product. We sell out of ice cream every summer, and have a knee-deep waiting list of stores and restaurants that are interested in carrying it. I suppose if another operation came along and made ice cream that was better than ours and less expensive, that might be an issue, but I'd be surprised if anyone could make ice cream as good as ours for less money. I think it might be hard to make ice cream better than ours on any kind of commercial scale, period."

From Lisa Harris, "Beyond Ben & Jerry's," *Vermont's Local Banquet*, Summer 2008, *www.localbanquet.com/issues/years/2008/summer08/icecream_s08.html*

- *Monument Farms* milks approximately 450 cows and employs 35 people in Weybridge, making this dairy one of the largest employers in Addison County. Its milk is hormone free, but not organic. Their local branded milk has been the only milk on campus at Middlebury College since 1950. Today, they also serve other regional schools and restaurants. *Monument Farms* has become a version of a "store brand" for Vermont's three largest cooperatives, which have sold a full line of their milk since 2006. Even with expansion, Monument retains an honor system cooler at its farm, where neighbors can stop by to take products and leave payment in a cash box.

- *Strafford Organic Creamery* specializes in premium organic products. They milk a herd of 50 Guernseys (plus a few other breeds) that graze on pasture in season, and sell a full line of milk in distinctive glass bottles at natural food stores and food co-ops in Vermont and western New Hampshire. A handcrafted ice cream line complements the beverage milk selection. Strafford's focus is on artisan-scale dairy production, with a small herd, small batches, and a small distribution area.

- *Sweet Rowen Farmstead* experienced a setback in 2011 when the facility where they processed their milk, Ploughgate Creamery (Albany), was destroyed in a fire. With funding from the *Center for an Agricultural Economy* and a *USDA Valued Added Grant*, the West Glover farm decided to build a processing facility on their farm. Milk and cheese from primarily grass-fed cows is now available at several Northeast Kingdom and central Vermont locations.

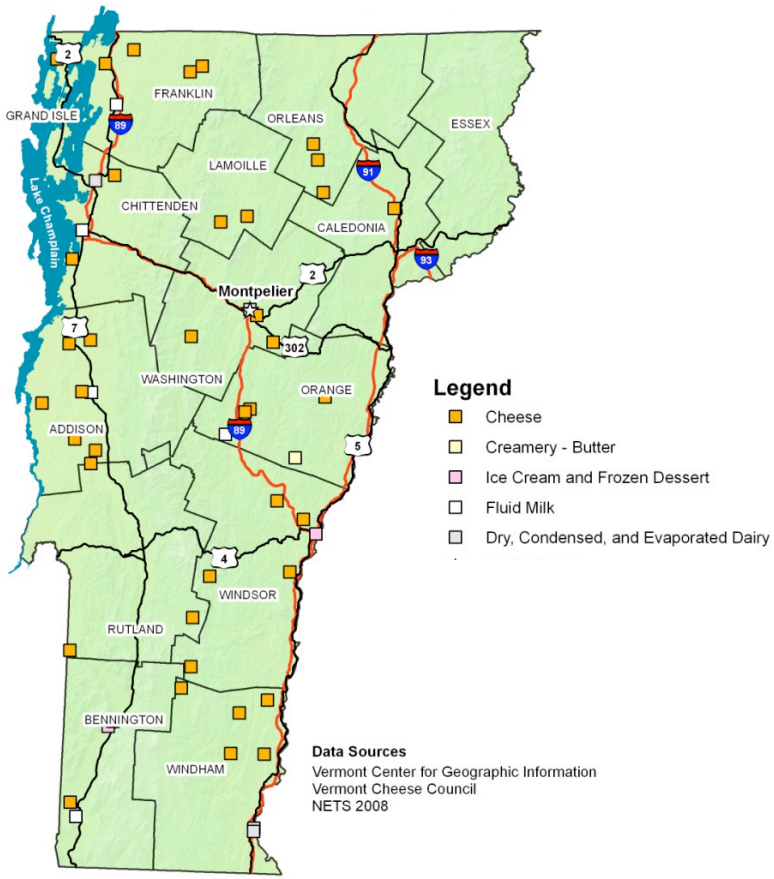
- *Thomas Dairy*, located in Rutland, purchases milk from six nearby dairies to process into milk, flavored milk, half and half, cream, and eggnog. *Thomas Dairy* then distributes its products in the immediate Rutland vicinity. The cows producing the milk are hormone-free, but not organic, because managers of the dairy didn't think their small distribution territory had enough customers willing to pay organic premiums. When deciding whether to remain conventional or expand their distribution to catch more customers for organic milk, they chose not to expand.

All of these Vermont milk sellers tout local sourcing, personal connections, and healthy cows free from hormone treatments as reasons to purchase their product regardless of whether a consumer believes the milk tastes better than other milk. Each claims superior taste due to the attention to detail possible from a small-scale processing facility, but does not rely on customers recognizing the taste difference. Other attempts at developing Vermont-branded milk have hit roadblocks due to a lack of in-state processing and the difficulty of keeping milk segregated by origin in out-of-state facilities. Two companies who once used a Vermont label, *Organic Cow of Vermont* and *Vermont Family Farms*, were found in violation of consumer protection laws that outline what constitutes a Vermont product.

Vermont also has examples of how ambitious projects to localize dairy processing may fail as businesses. The now defunct *Vermont Milk Company*, although not processing fluid milk, began in Hardwick in 2006 as a way to bring greater local control to dairy processing, create a Vermont-branded product line, and provide a stable price for farmers' milk. A recent case study on the Vermont Milk Company by some UVM graduate students listed some of the factors that led to the company's liquidation in 2009, and offers a cautionary note for any processing facility attempting to localize fluid milk processing.[37] Following are some immediate causes of *Vermont Milk Company's* problems:

- Insufficient start-up capital
- Difficulty balancing the product mix so that all of the milk received could be used
- Poorly priced products, with incorrect calculations of production costs
- Need to make high milk payments in a volatile market that was in an "up" phase at the company's launch
- Failure to establish a competitive advantage on the retail shelves
- Struggles managing distribution to customers with the consistent product quality and predictable production schedules that established brands offer
- Lack of time for customer service, which impeded resolving problems with existing accounts and securing new accounts
- Lack of a plant manager with sufficient experience in managing a diverse product line

Figure 3.4.6: Dairy-Related Food Processing Facilities



For the most up to date maps, please visit the Vermont Food System Atlas at www.vtfoodatlas.com.

Processing as Part of Vertical Integration: The Case of Farmstead Cheese and Light Processing of Fruits and Vegetables

Vertical integration happens when a business consolidates along a supply chain—from growing or raising food to processing and from distribution to marketing. By controlling multiple stages of product development, a business can control costs at each stage, receive all the profits at those stages, and directly manage for quality. Some businesses may also reduce their transportation costs. These benefits must be weighed against the need for a diverse set of management skills in-house, the need for equipment and facilities for each step in the process of getting to market, and the potential of losing out on economies of scale that are available from producing in higher volumes (a key problem for fruit and vegetable processing, as discussed later).

This section looks at challenges and opportunities in vertically integrated processing for two types of products: a premium product (farmstead cheese) and a product made for a market with high price sensitivity (lightly processed produce for commercial buyers).

Farmstead Cheese

Over the past 15 years, Vermont has earned a reputation for producing high-quality artisan cheese (i.e., cheese made in small batches) and farmstead cheese (i.e., cheese made by the farmers who raise the animal), garnering consistent first place finishes from the American Cheese Society's annual competition. Although some regions of the world have benefited from centuries of serious artisan cheese making, Vermont's modern cheese revival is quite recent. Only a handful of cheese-making facilities existed in Vermont in 1995, but with the development and support of the *Vermont Cheese Council*, that number grew to 42 by 2009, including Vermont's largest premium cheese producer, *Cabot Cheese*, and other notable producers such as *Grafton Village Cheese Company*, *Vermont Butter & Cheese Company*, *Champlain Valley Creamery*, *Franklin Foods*, and *Crowley Cheese*. Vermont's farmstead cheese makers use cow, goat, and sheep's milk to produce over 100 varieties of cheese.

A 2006 report on Vermont's farmstead cheese industry declared that farmstead cheese represented Vermont's entrance into the slow food movement of handcrafted foods that are commanding the "attention and pocketbooks" of consumers worldwide. The report indicated an average retail price of $14.70 per pound with some cheeses going for $25 per pound.[38] In contrast, raw fluid milk producers receive on the order of $12.00 to $18.00 for every 100 pounds of their milk.

Every farm has a slightly different approach to developing a farmstead cheese-making business. However, there are some common characteristics of this value-added business opportunity. Starting a farmstead cheese-making operation, or transitioning from other forms of dairy to cheese making, requires an investment in equipment

PHOTO CREDIT: Erika Kerekes

Consider Bardwell Farm (West Pawlet) goat cheese.

and training in how to make a high-quality cheese product. Vermonters have sought this training through universities and apprenticeships at home and abroad, and more recently from the *Vermont Institute for Artisan Cheese* (VIAC). The VIAC is a center for scientific research and training in artisan cheese making and has been housed at the *University of Vermont* since 2004. The 2006 Vermont Dairy Task Force surveyed on-farm dairy processors about their preferred source of processing assistance and found that they looked to VAAFM and VIAC for their technical assistance needs. The new *Vermont Food Venture Center* in Hardwick will offer additional facilities for new cheese makers in a long-term tenancy agreement with the *Cellars at Jasper Hill*.

One advantage of farmstead cheese making is the ability to create a unique product in a highly differentiated marketplace. The difference between cheese characteristics can translate into price differences of as much as $17.50 per pound.[39] Crafting a cheese from milk production through to final sales allows a cheese maker to carefully shape the character of each product line so that it will stand out from its competitors. It takes years for a producer to develop the skills, product recipes, and techniques to achieve not only the desired taste but also consistency in that taste from batch to batch.

A new twist in maintaining the consistent character of a particular variety of cheese has emerged in recent years. As Vermont's farmstead and artisan cheeses have become more popular and entered more markets nationwide, the volume of cheese needed to adequately serve larger markets far exceeds this handcrafted capacity. The challenge for producers is whether, and how, to expand their cheese lines without losing the premium quality that created demand in the first place. A solution that has worked in the past for other niche products is for a group of individual small farmers to work collectively. However, a cheese's taste can respond to changes in everything from the type of soil the herd's grass is growing on, to the bacteria naturally present in any given cheese cave. Thus, two farms using exactly the same recipe will not necessarily produce the same product. Scaling up volume for a premium marketplace in a way that creates inconsistency in the product can quickly hurt Vermont's cheese-making reputation and, by extension, its marketability. Several projects, including from the Cellars at Jasper Hill, research at UVM, and the *Taste of Place* initiative at VAAFM, have been looking to European and Quebec models to learn techniques for producing identical cheeses sourced from multiple farms.

One of the principal reasons for cheese makers to go to the trouble of reaching out-of-state consumer markets is to avoid saturating the in-state market. Each cheese needs to command a premium price to generate a profit, and the segment of buyers willing to pay that price on any given day is small. Even if local demand for artisan cheese grows, it will not grow quickly enough to use all the local cheese being produced. Larger concentrations of consumers, especially those who are used to paying gourmet prices for premium-quality foods, offer an outlet for cheese that won't be consumed in Vermont. Within the regional market, these cheeses can also benefit from a "local" label, as retailers in Boston and New York City regularly classify Vermont as local. Farmstead cheese makers need to constantly cultivate new high-end markets, which requires a particular skill set and leaves each operation vulnerable to economic downtowns, but also can lead to higher profits.

Farmstead cheese demonstrates a successful vertically integrated business model for Vermont agriculture. These cheeses promote Vermont's food brand reputation

nationally. They transform milk from a commodity competing in a marketplace defined by homogeneity and low prices into a specialty food in a marketplace defined by uniqueness and premium prices. However, entering this marketplace requires a significant investment in training, patience for product development of a slow-aging food, a skill set that ranges from milking to aging to marketing, and the ability to ride out the impacts of economic downturns.

Lightly Processed Produce

The term lightly processed covers a range of products. For this report, lightly processed produce refers to produce that has undergone some processing, but has not been fundamentally altered from its original state. Examples include apples that have been cored and sliced but not made into a pie, berries that have been frozen but not made into jam, and carrots that have become "baby carrots" but have not become baby food.

This category of processing commanded a high level of interest at the F2P local food summits and is the subject of a number of feasibility studies by local food hubs. This interest is attributable to the complementary interest in serving two market channels for local foods: institutional purchasers (e.g., hospitals and school cafeterias) and wintertime customers. Schools, restaurants, hotels, and other large-scale food service establishments can integrate local foods into their meals more easily when they are preprepared (e.g. sliced apples), which saves them from costly labor. Freezing, canning, and dehydrating all use peak quality produce and preserve it for the winter. Light processing has the potential to make local foods available to a new category of buyer and during a new season of the year. However, as this section shows, many barriers currently exist to generating the volumes necessary for commercial processing.

Just as the term lightly processed covers a range of products, it also covers a range of business models. The following are four key models that have received attention through either feasibility studies or pilot projects:

- Established farms with raw products expanding into on-farm processing
- Established nonfarm businesses that handle Vermont raw products expanding into processing
- New nonprofit organizations or businesses launching to process local foods
- Mobile units

Of these four options, only the first two are vertically integrated; the third often includes an element of integration in the business planning. Mobile units are addressed separately later in this section.

On-Farm Expansion Into Processing

Farms throughout Vermont have added processing capacity that allows them to use "salvaged" product and diversify their business. Orchards are a common example of these types of businesses. Apples can often incur damage from events such as hailstorms that leave the fruit cosmetically damaged but otherwise fine. Other apples are simply too small for the standard consumer market. Read Miller, of *Dwight Miller Orchards*, reports that these challenges become even more pronounced in organic apple production, which can yield very inconsistent crops for the fresh market from one year to the next.[40] When orchards want to extract value from apples that can't be sold as fresh, whole fruit they often add cider making capacity.

Bill Suhr, of *Champlain Orchards*, has brought his processing to a highly diversified level. The products he creates on-farm include fresh cider, applesauce, apple pies, turnovers, apple butter, cider syrup, fresh sliced apples (for sale to commercial buyers), and dehydrated apples. He also works with *Eden Ice Cider* to press apples for making ice cider at their facilities. In 2009 he also began contract apple pressing for *Sunrise Orchards'* branded line of cider. *Champlain Orchards* is also one of a few farms in Vermont that has built cold storage to keep local apples available through the winter. Suhr's integrated model doesn't stop at storage and processing. He manages the packing, marketing, sales, and distribution to over 250 retail outlets. The farm also runs an extended pick-your-own season and year-round retail farm market.

Champlain Orchards has diversified as a way to use as many of its apples as possible. The farm now enjoys name recognition with many customers in many types of markets, from school food services to individuals at the grocery store. However, this level of diversification into on-farm processing also has drawbacks. Adding processing to an established farm involves much more than integrating growing and processing. It often means that a farmer has a hand in distribution, marketing, and customer service to find a retail home for the final product. It requires investment in equipment, having the labor available to work the equipment, and the ability to harvest the additional fruit used for processing.

PHOTO CREDIT: Jenni Bryant

Apple pulp.

The more a business diversifies, the more challenges exist in managing all of the enterprises as distinct profit centers. Also, every new product developed requires effort in building a market for it. For local foods, this often requires attention to marketing details at every stage, not just making a pitch to wholesale buyers. Processors often must follow through to help those buyers market new items to their retail customers and establish a farmer connection in the store. Many farms find this approach to be a good way to grow their businesses, but the caveat is that, to be successful, the farmer needs to plan for managing much more than simply a piece of processing equipment.

Nonfarm Business Expansion Into Processing

In 2009, the *Deep Root Organic Cooperative* received a USDA Value-Added Producers' Grant to explore the feasibility of adding light processing to its enterprises for a school food services market.[41] *Deep Root* provides marketing services for its 19 organic vegetable–growing members, connecting them with buyers as large as Whole Foods and negotiating deals for delivery. The majority of *Deep Root* vegetables leave the state, but some have gone to Vermont schools at the end and the beginning of the school year, primarily as a way to sell surpluses. *Vermont Food Education Every Day* (VT-FEED), which helps increase local farm-to-school relationships, partnered with *Deep Root* to investigate whether they could feasibly introduce a lightly processed product for this market.

Six *Deep Root* farmers chose to participate in piloting the concept. These farmers retained control of the product through its processing, but for the pilot, the *Vermont Food Venture Center* did the processing. The farmer members of the cooperative would retain ownership of the product, with *Deep Root* serving in a broker capacity bringing together buyers and sellers for a commission, while constructing a multipurpose facility where future processing can take place (in addition to storage and distribution).

School food service personnel also participated in the study. It is important to note that these end users provided guidance throughout to ensure that the product developed was the one best suited to the target market. Their involvement went beyond simply advising on which vegetables to use; the school food service personnel continued with suggestions up through the conclusion of the work.

Steve Paddock, the author of the report, identified three core questions to answer in evaluating potential products: whether students would accept the product, whether the school food services would like to work with the product, and whether the price point would be affordable to school meal programs. Although these factors are simple to articulate, achieving them requires a study of production costs for different products, consistency of supply, marketing plans, labor costs for the processors and labor savings for the schools, legal structure, management capacity, distribution channels, and budgets for different stages of start-up and operations.

The study found that *Deep Root* would have difficulty offering an acceptable price point to schools when compared with competitors who purchase raw commodity products in large volumes and process them for the school market at very low price points. A few schools may have the ability to adjust their budgets to afford the local product, but there are not enough of these schools to make the business model feasible.

On the other hand, the study also found significant components already in place for light processing. The quality of the product and *Deep Root's* ability to develop processing

facilities were both positive. *Deep Root* has the capacity to manage the logistics of producing, gathering, storing, transporting, and arranging processing of the product. It also has capacity to manage the sales effort, and facilities existed for processing equipment. These results illustrate that Vermont has potential for businesses to expand into viable light produce processing and that interest exists from major purchasers. The *Deep Root* study also illustrates the many questions that need analysis before determining whether a product matches what consumers (even those enthusiastic about local foods) will buy.

The owners of *Vermont Refrigerated Storage* (VRS) in Shoreham, which primarily provides year-round storage for much of Vermont's apple crop, are exploring the possibility of providing other types of storage and light processing for Vermont producers. VRS recently received a *USDA Rural Business Enterprise Grant* (RBEG) to conduct an economic feasibility study of bulk processing and quick and long-term freezing for institutional markets. The project will include a market potential analysis, the design of a USDA-approved facility, and a financing strategy for converting a former apple storage warehouse to a multipurpose regional food center.[42]

Establishment of New Produce Processing Facilities

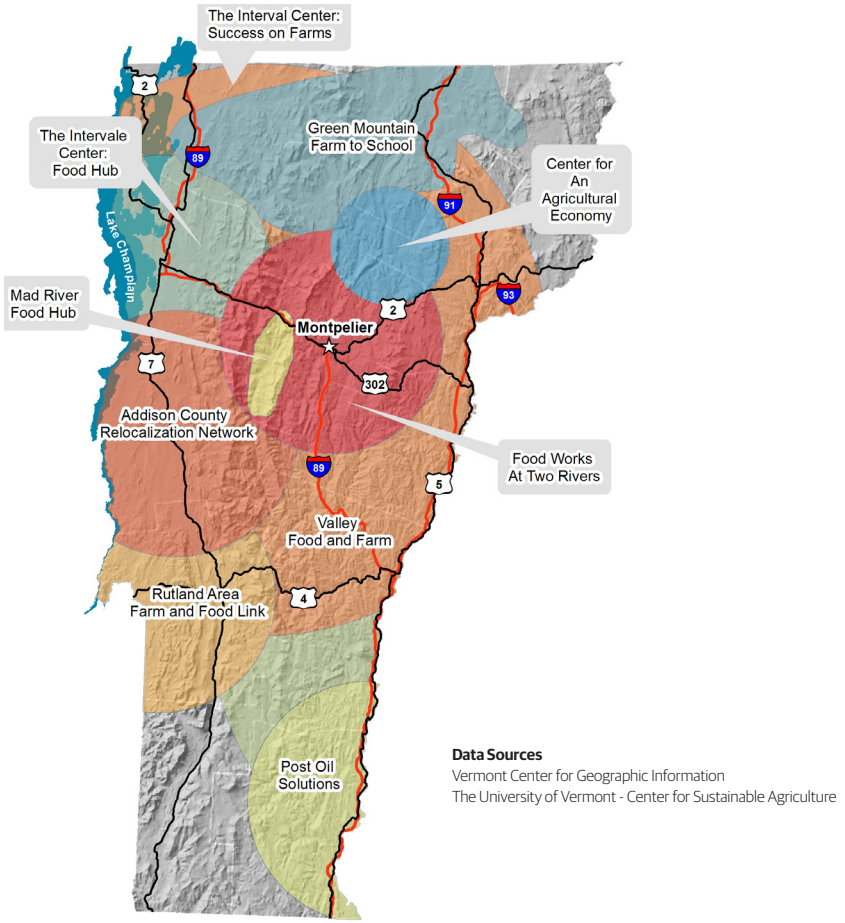
In 2009, a network of food hubs across Vermont crafted a platform paper on the development of a Regional Food Centers Collaborative (Figure 3.4.7). These nonprofit organizations have a broader food systems mission that encompasses supporting local farmers and supporting the growth of the local foods movement on the consumer side. Many of them offer a range of services, such as research into the food system, technical and business assistance, community education programs, networking opportunities, and facilities (including processing) available to local farmers. As hubs for agricultural activity within their respective regions, these organizations have the potential to attract a sufficient volume of produce (or other raw products) to expand into a processing venture.

The Regional Food Centers Collaborative's goals focus on achieving a localized food system, with diverse markets and sufficient demand to entice farms to scale up and put more food into local communities. They consider infrastructure to be a critical gap in achieving this goal:

> *Examples of infrastructure needs that currently exist include shared, multi-use regional milk processing facilities, slaughterhouses and meat processing facilities, profitable and energy efficient season extension greenhouses, eco-agricultural industrial parks, and light processing to meet the institutional market.*[43]

Several food centers are currently exploring the economic feasibility of either community kitchens or larger-scale facilities to help small producers with aggregation, distribution, storage, and processing.

Figure 3.4.7: Food Centers by Region



For the most up to date maps, please visit the Vermont Food System Atlas at www.vtfoodatlas.com.

The *Center for an Agricultural Economy* in Hardwick has integrated the relocation of the *Vermont Food Venture Center* (VFVC)[44] into its vision and plans for the region. VFVC has offered producers the opportunity to process their own surplus products into value-added food without investing in on-farm facilities or equipment, and with access to technical assistance for product development. Technical assistance ranges from
business planning to meeting food safety requirements. In July 2010, VFVC broke ground in Hardwick on a new $3.1 million facility that will act as an incubator space, expanding opportunities for all food entrepreneurs and adding new cheese-making and meatpacking capabilities that weren't available at the previous facility. The *Center for an Agricultural Economy* is the nonprofit partner in this venture, bringing the perspective of whole food system development and the public benefits that extend beyond the incubation of a single business.

Other processing facilities are in the planning stages. The *Rutland Area Farm & Food Link* (RAFFL) recently completed a feasibility and planning analysis for a Green Mountain Food Hub. As with VFVC, this project would situate a processing facility with a nonprofit organization to address weaknesses in its region's food system. The recommendations from the analysis include offering a variety of equipment to area producers, combining access to that equipment with a workplace CSA (to provide early cash flow and offer a direct market complement to wholesale sales), and partnering with the Vermont Foodbank to meet its processing and storage needs. As with other feasibility studies, price points for processing certain raw products proved a concern within a dedicated light-processing facility. The complementary lines of direct market CSA and *Foodbank* usage would add additional revenues to support the processing enterprise without directly competing against nearby for-profit businesses.

The *Intervale Center* in Burlington has also started experimenting with diversified services that may include processing at a future date. The *Intervale* has developed a variety of programs to support land-based businesses, stewardship of natural resources, and development of greater economic and social opportunity since 1988. It recently expanded its focus to include food hub development, defined as providing farmers with marketing support, storage infrastructure and distribution services. Various ideas for food processing enterprises have remained on the drawing board at the *Intervale* for several years, while the Center has expanded in other directions such as local food

Intervale Center Food Hub

The *Intervale Center Food Hub* aggregates, markets and distributes local vegetables, fruits, meats, eggs, cheeses and specialty products. The Food Hub creates a link between local farmers and the local marketplace. The goal is to provide the greater Burlington community with convenient access to high quality foods while returning a fair price to farmers.

Eric Seitz and Rob Rock of Pitchfork Farm

PHOTO CREDIT: Intervale Center

This expanding social enterprise serves individuals, businesses, retailers, restaurants and institutions through a multi-farm Community Supported Agriculture (CSA) program and through wholesale marketing and distribution. In 2009, its second year, the Intervale Food Hub collaborated with 21 farmers, including 6 from the Center's Farms Program, to deliver local food shares to over 200 members at 20 participating business drop-off sites, generating $180,000 in gross sales. Seventy percent or $130,000 was returned to farmers with an average of $6,000 per participating farm. By 2012, the Food Hub projects $585,000 in CSA and wholesale sales with $310,000 returned to farmers, averaging $15,000 per farm. Eric Seitz of *Pitchfork Farm* says of the partnership with the Food Hub, "It is a great group of farmers, it provides us with advanced working capital, serves as a significant market account, and it gives us the ability to participate in CSA without all of the hassle."

"As a multi-farm collaborative, the Food Hub has opened new market opportunities, has increased overall farm income and most importantly, has resulted in a farmer camaraderie that extends well beyond the scope of this enterprise."

Sona Desai, Food Hub Manager at the Intervale Center

Overview of Food Safety and Consumer Protection Regulations Relevant to Processing and Food Manufacturing

There are four basic areas of regulation or requirements that processors need to consider:

- Construction permits (including local zoning and environmental codes)
  - *Vermont Agency of Natural Resources, Department of Environmental Conservation*
- State regulatory agencies
  - *Vermont Agency of Agriculture, Food and Markets* (VAAFM)
  - *Vermont Department of Health – Food & Lodging Division*
- Federal regulatory agencies
  - *USDA Food Safety and Inspection Service* (FSIS)
  - *U.S. Food and Drug Administration* (FDA)
- Commercial buyer (who may require a particular audit)

Multiple regulations cover food processing, but not all will apply to every facility. Following are some key distinctions:

- Products containing meat or poultry are covered by USDA (federal) and VAAFM (state) regulations. Those without meat or poultry are generally covered by FDA (federal) and Department of Health (state) regulations.
- The Vermont regulatory agency in charge of products containing eggs or dairy is VAAFM.
- VAAFM is responsible for honey and maple production and processing regulation.
- Products containing ingredients shipped interstate or sold interstate are subject to federal regulations unless they meet a small business exemption.

Producers and processors should be aware of the following federal safety programs:

- Hazard Analysis and Critical Control Points (HACCP): HACCP programs apply to the processing stage and are intended to prevent contamination before a test of the end product.
  - *FDA HACCP*
  - *USDA HACCP*
- *Current Good Manufacturing Practices* (CGMP): GMPs provide guidance on establishing a safe manufacturing facility and are a basis for HACCP.
  - The USDA/FSIS equivalent to CGMP is Sanitation Standard Operating Practices (SSOPs).
- *Good Agricultural Practices/Good Handling Practices* (GAP/GHP): The USDA Agricultural Marketing Services maintains a guide to best practices for produce production and handling. Auditing for these practices is currently optional, but that may change with new food safety regulations.

Not all regulations are about the processing facility and practices themselves; the following address labeling:

- The VAAFM's Weights and Measures department can provide guidance on food labeling requirements.
- The *Vermont Attorney General* enforces truth in advertising laws, including how the word Vermont is used in product labeling.
- Required nutritional information and nutrition claims are regulated by the FDA.

aggregation and marketing through a multi-farm CSA. The low price of commodity processed foods and low volumes of local food that would go into processing make light processing a lower priority at the present.[45]

The *Great Falls Food Hub* in the Bellows Falls region recently received a grant to hire a Project Coordinator, primarily to advance the business planning and coordination for the infrastructure components described in its mission statement. Its mission includes developing "the necessary infrastructure that would allow regional farmers to produce more local food for local and regional markets, including: dry, cold & frozen storage facilities; a licensed, commercial-sized food processing kitchen; and a wholesale/retail distribution outlet for fresh, stored, and processed local food."[46] As with the other regional food centers, the *Great Falls Food Hub* intends to combine the business of food processing with a larger social mission of creating a strong, community-based food system.

Common Themes in Produce Processing

Farmers can use light processing to create value from seasonal surpluses or lower-grade produce that can't be sold as fresh, whole fruits or vegetables. However, the supply of this additional produce remains low. The best business model for most farmers is currently to target the fresh market and limit the time or money that goes into salvaging produce that can't be sold there. As one forum participant stated, "Profitability decreases like it's going down a staircase. Your first and best dollars are picked today and gone tomorrow."

Owners of existing processing facilities have seen this equation play out, with processing equipment being used on the margins to handle occasional excesses. According to Jeff Mitchell at *Green Mountain Co-Pack* in South Burlington, the only way for producers to make money from processing is to have sufficient volume. By Mitchell's estimate, about 50% of Vermont's specialty food labels are processed at his facility, but very few use Vermont-grown ingredients, with the exception of apples and peppers. Many of his clients use the plant only one or two days per year, although a few use it one or two days per week. As with all examples in this vertical integration discussion, Mitchell has combined multiple services in his co-packing facility and does not rely on the lightly processed produce business to make the facility profitable. Mitchell sees greater advantages in connecting the dots between existing businesses, rather than building new facilities.[47]

Another challenge that plays into all feasibility studies for processing is the regulatory environment. Currently, fresh produce is not required to go through inspection or certification at the farm, unless it is certified organic or the purchaser for that produce requires inspection such as a Good Agricultural Practices (GAP) audit or one of the several private company variations on that standard. A limited amount of preparation for the customer is also allowed, such as washing and bagging. Any form of additional processing does introduce regulatory requirements.

Future trends may lead to a more favorable processing environment. For example, increased production levels overall will naturally lead to increases in lower-grade and surplus food for processing. Innovative business models in processing facilities may create new ways to make this infrastructure economically viable. Commercial buyers are also becoming more adept at finding ways to afford more local products, even at a higher price. For example, according to Diane Imrie, Director of Nutrition at *Fletcher Allen Health Care* (FAHC), the institution currently pays at least 3.5 times less for frozen commodities (cut corn, broccoli cuts, blueberries, and raspberries) than the price point VFVC estimated for a locally grown and processed product. Nevertheless, FAHC has found ways to purchase fresh, peeled butternut squash from Eric Rozendaal of *Rockville Market Farm*, who developed an on-farm processing facility for the butternut squash market. Businesses, nonprofit organizations, and technical assistance providers continue to work on developing feasible plans to increase in-state produce processing.

Developing Localvore Products Along the Supply Chain: Localvore Bread[48]

Interest in local foods has spurred many producers to develop all-local products that have not been available commercially for generations, if at all. Vermont has recently seen the emergence of new localvore items such as culinary oils, dry beans, liquor, mead, wine, vinegar, kombucha, mushrooms, tea, oats, wheat berries, cornmeal, barley, flour, bread, and hops for beer making. This section considers the case of localvore bread as an example of developing a product through collaborations along the supply chain. The development of localvore bread demonstrates how many partners can work to convert a local product to a commercially available Vermont food.

Developing a new specialty product is a multi-step collaborative process that involves producers, processors, commercial users, retailers, and consumers. The development process likely will include:

- Initial identification and quantification of market demand for the proposed product
- Cooperation between farmers and targeted buyers to define the specifications of a value-added product—for example, quality standards that may differ between private consumers and commercial users (e.g., bakers, brewers, vintners), or retail outlets' requirement for particular production practices such as "eco-friendly"
- Collaboration among farmers, technical assistance providers, researchers, and others to meet the agreed-on specifications
- Agreements among farmers, processors (if necessary), distributors or aggregators, and buyers on systems for product delivery
- Increase in volume of product going through the established supply chain, including bringing in new producers and new buyers
- Protecting original production standards and ensuring the continued quality of product—for example, offering technical assistance to new producers or writing specification manuals[49]

Grain growing in Vermont remains limited, with about 15 commercial producers of food-grade grain, but interest has grown rapidly. In 2004, Dr. Heather Darby, an Assistant Professor at *UVM Extension*, hosted a grain growers' conference with 20 attendees. Five years later, the same conference drew 150 people. Existing growers, such as Ben Gleason of *Gleason Grains*, are expanding. Gleason is not only investing in new equipment, but also contracting with three farmers to grow wheat in 2010. New growers are joining original pioneers such as Jack Lazor of *Butterworks Farm*, and new customers are interested in their products.

The steps involved in providing local bread began with improving grain quality. Cereal grains can grow well in Vermont because they are bred for cooler climates. Currently, farmers and *UVM Extension* faculty are conducting variety trials, and bakers are

Olivia's Croutons

Olivia's Croutons has grown from a small, home kitchen operation—where 20 bags was a large order—to occupying an 8,000 square foot facility in a renovated barn in New Haven that ships to stores across the US. While the move to the new facility was prompted by a need for a larger production space, an additional consideration was the landscape. Francie Caccavo, founder of *Olivia's Croutons*, recognizes that the way to preserve Vermont's open landscape is to keep it a working landscape.

Harvesting wheat.

Bagging croutons.

Sited on the 50-acre farm is a 1912 dairy barn that would have been lost without a new purpose. Growing wheat on the land is an integral part of the work to save the barn, with forty of the 50 acres used on a rotating basis to grow wheat that makes its way into *Olivia's Croutons*. Their locally grown whole wheat flour cannot entirely replace the white flour used in making croutons, but *Olivia's* wants to use as much local whole wheat as possible.

Growing wheat can be a challenge, but the hardest part has been figuring out the milling. The bigger mills are simply not set up to mill under contract. Olivia's has found *Gleason's Grains* in Bridport very accommodating, however Francie reports "milling is still a hole" in local grain infrastructure.

PHOTO CREDIT: Olivia's Croutons

evaluating baking quality to determine the best varieties for the region. Wheat doesn't just have to grow with good yields; it also needs to be at food-grade quality for human consumption. The occurrence of mycotoxins, which are produced by strains of fusarium fungus, can cause wheat to be either downgraded to feed or declared completely nonmarketable. Wet weather and spores blown in from other areas of wheat production exacerbate this problem in Vermont.

Technical assistance from *UVM Extension* has helped improve the quality and yield of Vermont wheat. UVM helped to reintroduce heirloom wheat varieties developed for Vermont in the 1800s, saving these seed lines and bringing back qualities bred for Vermont's growing conditions. Other research trials focus on weed control and fertility management to improve yield and quality. Educational opportunities at small-scale grain-growing locations beyond Vermont and demonstrations on Vermont farms have also improved Vermonters' wheat growing skills.

In 2004 a group of farmers began to gather to talk about production challenges, such as organic seed saving, plant breeding, and variety improvement. Today that group has evolved to be the *Northern Grain Growers Association*, which includes a range of growers, bakers, support personnel, and local food enthusiasts.

After harvest, food quality grains need to be milled. Wheat hasn't been a serious commercial product in Vermont for over a century, and therefore, milling infrastructure has not been maintained. Processing facilities do exist nearby in Quebec, which has developed a grain industry larger than that of the Northeastern states. Robert Beauchemin's *La Meunerie Milanaise* in Quebec is co-owned by farmers, bakers, and millers who work together to ensure fair prices across all sectors. *Champlain Valley Milling* in Essex, New York, processes grains sourced from multiple regions, and requires a certain volume before it can segregate out Vermont grains. Some grain producers also mill for their own purposes and are expanding to be able to take on more volume, such as Ben Gleason.

Currently, all wheat in Vermont is milled into whole wheat flour. There are no white flour milling services in Vermont. Ben Gleason and Jack Lazor are establishing flour-sifting systems to create a bolted flour (a type of flour that has about 80% of the bran removed). It is important to note that a far greater market exists for white flour as compared to whole wheat flour.

Growing grains and accessing infrastructure for milling local flours is only a part of the puzzle of making a localvore bread. Commercial bakers need to be able to use the flour to bake a bread that matches their quality standards. A certain amount of personal preference goes into defining these qualities, but all bakers are accustomed to obtaining flour of a specific quality for baking bread. These characteristics include mycotoxin analysis, crude protein analysis, moisture, ash, and falling number (the falling number measures how much the grain has sprouted when it fluctuates between damp and dry conditions and begins to change starch into sugars). To assist the nascent grain industry, *UVM Extension* acquired the appropriate laboratory equipment to assist farmers and millers in conducting these tests

Red Hen bread.

PHOTO CREDIT: Amy Kong

Bakers have spent several years figuring out how to work with local flours. Throughout this experimentation, local food enthusiasts have been eager to get localvore bread and have been willing to work with bakers as they developed a retail-quality loaf. Early breads produced with Vermont wheat often came with full-page disclosures on why they did not meet the baker's standards. These breads did not go onto store shelves, but were sold through social networks and CSAs that targeted customers who had a larger goal of supporting localvore efforts to increase locally sourced flours, even if it meant really dense toast!

For several years, some bakers made breads that use local flours in combination with nonlocal flours, and a few made an all-local loaf. In 2009, *Red Hen Baking Company* introduced its first retail-quality all-local loaf (named Cyrus Pringle in honor of a distinguished Vermont wheat breeder) for broad distribution. *King Arthur Flour* followed quickly with its own local loaf at its Baker's Store & Café in Norwich. Jeffrey Hammelman, Baking Director at *King Arthur Flour*, reports producing about 600 loaves a week (using 2,500 pounds of flour), with a very local distribution area of about 12 miles.[50] *Red Hen* produces approximately triple this amount and distributes through routes extending hundreds of miles.

Localvore bread development is an example of collaborative work during all steps in the food supply chain from farm to customer. The work to get this product on Vermont store shelves brought together growers, millers, bakers, and consumers, along with necessary support systems of technical assistance from UVM Extension and peer-to-peer assistance in the *Northern Grain Growers Association*. Lessons learned from this process are now helping other types of grain growers explore the potential for products, such as Dr. Darby's new project of bringing local hops to Vermont's microbreweries. She plans to follow a strategy similar to that seen in the grain industry, beginning with creating a network among farmers and brewers.

Mobile Processing Units: Bringing Processing to the Farm

In 2008, VAAFM piloted two mobile processing units, one for individual quick freezing of berries and the other for poultry processing. Providing mobile units was meant to bring processing to the farm, with the hope of building enough volume (through visiting farms) to create a viable business, as well as prevent stress to animals or damage to product caused by their transport. Shortly afterward, UVM student Faye Conte conducted a review of both Vermont's early experience with mobile processing units and experiences of projects in other states. This summary is taken largely from her report.[51]

The **mobile quick freeze unit** (or IQF, for individual quick freeze) was funded through a *USDA Rural Business Enterprise Grant* and the *Vermont Department of Tourism*, and was built by VAAFM. The purpose was to pilot mobile quick freezing as a way to build local berry supplies for specialty food processors. Farmers generally cannot freeze berries for this market on their own, because the berries need to be individually frozen instead of frozen in blocks or bags. The starting premise was that if a processor could provide the equipment to freeze berries in the manner appropriate for use in commercial baking, then that company could build up a local supply of berries through contract growing. Additionally, because VAAFM does not regulate produce freezing, it could retain ownership (and liability insurance) of the equipment, a further savings at the experimental stage.

As with any new equipment, the IQF encountered early technical difficulties. It did not have a built-in generator, which meant that it had to be near a power supply and the farmer needed to have the right type of electrical hookups to plug it in. The unit also lacked packaging capabilities, and had trouble with the balance of compressor weight, making it difficult to travel with. Moreover, because berries are a relatively unique product that does not require blanching before freezing, when the original partnership for purchasing berries fell through, using the equipment for other projects was difficult because it did not have blanching capabilities. These flaws could all be fixed in a second construction attempt.

Other IQF problems involved management logistics and a lack of business planning. The unit was vulnerable to the loss of the specialty food processor that was originally driving demand, especially because buyers prefer to have existing contracts for frozen berries, not to pick up surplus when it becomes available. Demand from the producer side proved very low—even without any charge to use the IQF. Farmers did not have labor to pick fruit that couldn't be sold on the fresh market, or the necessary storage space once the berries were frozen.

Scheduling also proved difficult, because berries begin to go bad very quickly and often simultaneously across farms. There was little opportunity to plan ahead for which day's surplus would require processing, and there was limited ability to move quickly between farms in a single day.

In general, the demand for frozen berries did not translate into commercial buyers building contracts with Vermont berry farmers, and Vermont berry farmers were not themselves demanding equipment to freeze berries. The IQF is now a stationary unit at *Green Mountain College*, where it complements equipment (including blanching) at the college's new commercial kitchen and can be used to process products for the college. RAFFL also makes it available to local farmers interested in exploring on-farm processing capacity building.

The **mobile poultry processing unit** (MPU) produced results very different from those of the mobile quick freezing unit. VAAFM developed the MPU in response to producer concerns about a bottleneck in facilities for processing private label poultry. The Vermont State Legislature provided an $80,000 loan to build the unit. Because VAAFM inspects poultry processing facilities, it could not also serve as the operator. Additionally, because the funding came in the form of a loan and not a grant, the operator needed to run the MPU as a profit-generating business from the start to pay

back the loan. It took several attempts to find an independent operator to pioneer the mobile poultry processing unit.

At the time of Faye Conte's study, the MPU had finished its fall 2009 operating season. It ran 25 times at 12 producer locations under inspection. More producers may have brought their poultry to each location. The unit can also run without an inspector present for farms that are selling direct to consumers within Vermont. One point of confusion for inspected runs was that, although the MPU itself meets inspection requirements, the site where it operates *also* needs to pass inspection. Several farms failed to pass the potable water test and so could not process poultry that day.

Two primary issues in the business model were the costs associated with maintaining the unit and assistance farmers required to understand insurance, the inspection process, and preparing their site for the unit's arrival. Nonetheless, mobile processing for poultry met with general success in its first attempt, and in fact, one recommendation is to find strategies to avoid over-scheduling during busy weeks.

Other states, including New York, Massachusetts, Wyoming, and Wisconsin, have either researched or piloted different types of mobile processing units, including those for large animals and cheese. Vermont is also home to a new mobile pasteurization and cheese-making unit that produces cheese curds with the milk collected from livestock at state and county fairs. These curds are sold to fairgoers, and the unit serves as a vehicle for dairy education and promotion.

Presently, mobile processing is a very small piece of the processing picture. However, mobile processing can work for specific applications, given sufficient feasibility analysis before building the unit and given the willingness of operators to work with equipment that may be in the early stages of design refinement. For examples of cooperatively owned mobile meat processing units, please see the November/December 2010 issue of *Rural Cooperatives*, a publication of *USDA Rural Development*.

Opportunities for Specialty Food Manufacturing Using Local Inputs

Vermont is home to hundreds of exceptional specialty food makers that have contributed significantly to the state's reputation for quality food and that have built processing capacity within the state. Some of Vermont's most nationally recognized companies are in this sector, including *Ben & Jerry's*, *Cabot Cheese*, and *Lake Champlain Chocolates*.

The *Vermont Specialty Food Association* (VSFA) is the oldest such association in the country. The Association counts 385 specialty food businesses in the state making over 1,500 Vermont specialty food products and representing 10% of the state's manufacturing sector.

The use of Vermont-grown ingredients varies across manufacturers. Some use only local ingredients, such as certain signature maple products, while some specialize in foods that can't be grown or sourced in Vermont, such as coffee and chocolate. Many others contain a mix of local and nonlocal ingredients either within a product or across a product line.

The way manufacturers promote their Vermont sources of ingredients also varies across products. For example, *Ben & Jerry's* is a large-scale ice cream company that actively promotes its connection to Vermont dairy through the *St. Albans Cooperative Creamery*, while *Strafford Organic Creamery* is a small-scale ice cream company that promotes its ability to source dairy from a single Vermont farm. Sometimes companies create special edition products centered on a particular Vermont farm item, such as when *Otter Creek Brewing* developed Ben Gleason's White Ale using Gleason grains and Will Stevens Pumpkin Ale as part of a special *Wolaver's* line of beers

Vermont has a broad range of specialty foods. These businesses represent a variety of creative entrepreneurs creating self-employment opportunities. Following are examples of foods of specialized Vermont companies:

- *Fat Toad Farm's* goat milk caramel
- *Laughing Lotus Farm's* traditional Korean kim chi and condiments
- *Eden Ice Cider*, one of America's first Quebec-style ice ciders
- *Butterfly Bakery's* refined sugar-free cookies, scones, and truffles
- *Vermont Cookie Love's* gourmet frozen cookie doughs
- Gluten-free baked goods from *Westmeadow Farm* and *Against the Grain Gourmet*
- *Millborne Farm's* drinkable yogurt
- *Aqua Vitea's* local kombucha
- *Vermont Soy's* local tofu and soy beverages
- *Miss Molly's* gourmet, all-natural buttercream frosting

See more at *www.vermontspecialtyfoods.org*

featuring American farmers. Other specialty food manufacturers work to support small-scale farmers and community development generally, even when they can't source from local farms. *Green Mountain Coffee Roasters'* social responsibility mission, for example, includes supporting small, sustainable farms in coffee-growing regions and supporting employees as they contribute to their own local communities.

Many retailers tracking local sales recognize specialty food makers as important local businesses, even though they may not use locally produced raw ingredients. Sourcing local ingredients has many
benefits for specialty food producers, from supporting the local food system to providing a unique marketing hook. However, making a local ingredient connection is not always practical. A 2008 study by VAAFM revealed that price and availability were the primary obstacles to sourcing local ingredients.[52] Other obstacles included trouble finding products in the volume needed or in lightly processed form. Survey respondents also reported problems with regulation, the poor quality of local products, and distribution.

In addition to creating a direct benefit to farmers when they purchase local ingredients, specialty food producers also create the indirect benefit of defining a high-quality food brand for Vermont. Many specialty food producers are heavily invested in the use of the word Vermont as part of their marketing and branding strategy. For example, a 2006 study requested by *Cabot Cheese* and the *Vermont Department of Tourism* investigated visitor perceptions of Vermont and of a signature Vermont food product[53] (Cabot Cheese). **The survey results reported in this study indicated that maple syrup, ice cream, and cheese are the products most associated with Vermont.** Visitors reported higher loyalty to the *Cabot* brand after spending time in Vermont, and sampling *Cabot* cheese while in Vermont improved the level of loyalty after leaving the state.

This study also collected information on the wider Vermont food landscape. Although 50% of respondents normally visited farmers markets while on vacation, only 21.5% reported visiting a farmers market in Vermont during the summer months. Although respondents clearly associated food items with Vermont products, slightly fewer than half described Vermont products as "high quality." This additional information is useful to all food producers, not only Cabot. Businesses involved in Vermont's food industries can benefit from collaborative research and project development to establish Vermont

Fat Toad Farm – Goat's Milk Caramel

Fat Toad Farm caramel.

PHOTO CREDIT: Katie Rutherford

Five years ago, *Fat Toad Farm*, a small family-run goat dairy in Brookfield, was looking for ways to improve their financial viability through an on-farm agricultural enterprise that combined rising interest in local foods and consumer appeal for the Vermont brand. "It all started with the goats and the milk itself. All of a sudden we had pounds of milk and we asked ourselves what could we do with it?" Judith Irving recalled. "We looked around to see what was in the stores and made some cheese, but the cheese market is crowded. We lucked out with a unique product when our daughter went to Mexico and tried it."

Traditionally called cajeta, *Fat Toad Farm's* goat's milk caramel is made in copper kettles in the farm's small production room. While standard caramel sauces are based on sugar or high fructose corn syrup with very little dairy, cajeta is primarily made from goat's milk that's boiled down like maple syrup into a creamy sauce. The first step in building a market was familiarizing people with their special product by offering samples at farmers's markets and other local events. Realizing the limited market in Vermont, Irving traveled to stores in Boston and New York to cultivate new customers. Website sales also proved to be critical for earning the top dollars for their products. An operation that started with a couple of pans on the kitchen stove, quickly expanded to another production space with larger pans, then larger stoves. "If you don't start small and work your way up, then you can put a lot of money out there without knowing what your market is going to be. We had to grow our production capacity in synch with the goat capacity, and slowly increase the herd size along the way."

Today, *Fat Toad Farm* produces 750 jars a week, compared to the early days when 80 jars a week seemed like a lot, and their goat's milk caramel can be found in close to 200 stores nationwide. "We've been exposed to broader audiences, and I'm not sure if it can be found in every state, but we are widespread and in some unusual places where you wouldn't think a Vermont food product could go."

PHOTO CREDIT: Rhino Foods

Cookie dough for ice cream manufactured at Rhino Foods.

as a center for high-quality food and then translate that reputation into consumer dollars.

Vermont specialty food producers proactively bring the Vermont brand to customers from outside of the state through a system of trade shows, such as the New York Fancy Food Show, where major companies generally have their own booths and smaller producers share space, often with help from trade associations. The VSFA, with funding assistance from VAAFM, builds the Vermont presence at national shows through shared space, shared marketing materials (e.g., banners), and subsidized registration fees. VSFA and VAAFM also work together to establish opportunities for Vermont producers and regional or national buyers to connect, such as at the *Eastern States Exposition* and the Local Foods Matchmaker. Recent expansion at the Local Foods Matchmaker has included giving specialty food producers information on how to best use trade shows to establish new customers. More training is needed on this topic.

One result of Vermont's success in establishing a national reputation for specialty foods has been increased concern about protecting the Vermont name. This protection includes ensuring that companies claiming to be from Vermont *are* currently located in the state, and that companies that imply the use of Vermont-grown ingredients are, in fact, using these ingredients. These distinctions become more difficult as some businesses that began in Vermont outgrow the supply from Vermont producers or even outgrow their facilities and headquarters within the state.

The Attorney General's Office is in charge of enforcing regulations regarding use of the Vermont name through its *consumer protection division* and the *Vermont Origin rule*, which went into effect in 2006. It is designed to protect how companies use the name Vermont and implied association with Vermont in their advertising. The rule requires that a value-added food's most recent "substantial transformation" (e.g., from milk to yogurt) take place in Vermont, that companies using a Vermont address do a substantial amount of their business in Vermont, and that products that use the word *Vermont* to describe their ingredients (e.g., Vermont Blueberry Jam) source those primary ingredients from Vermont.

The Vermont specialty food sector can play an important role in food system development. These businesses offer one outlet for farmers to sell products that are not going into fresh markets but, instead, require some amount of processing. Specialty food businesses reinforce Vermont's reputation for high-quality food and build customer markets locally, regionally, and nationally. Maintaining a strong food manufacturing sector maintains processing infrastructure and a pool of workers with food processing skills. This sector also creates a reputation of Vermont as a friendly location for entrepreneurs interested in beginning their own food business. Support systems such as the *Vermont Food Venture Center*, the *Vermont Institute for Artisan Cheese*, and the *Vermont Specialty Food Association*, and co-packing facilities such as *Freedom Foods* and *Green Mountain Co-Pack*, all help these entrepreneurs become established.

☼ Climate Change Impacts on Food Processing and Manufacturing

Two new reports from the *U.S. Department of Agriculture* (USDA) and a draft report from the *U.S. Global Change Research Program* indicate detrimental effects from climate change on most crops, livestock, and ecosystems that will vary somewhat by region.[54]

Rising temperatures and altered precipitation patterns will affect agricultural productivity. Crop sector impacts from weather are likely to be greatest in the Midwest, and these impacts will likely expand due to damage from crop pests. Decreased yields in the major corn, soybean, and wheat supplying region of the country will, of course, have ripple effects, including impacting the cost and availability of ingredients for marquee Vermont food processors like *King Arthur Flour*. Since the impacts of climate change are global, the availability of food products that we have been accustomed to enjoying—and that Vermont companies use as key ingredients—will diminish. For example, *cocoa production* in Ghana and the Ivory Coast is expected to decline[55] (which will impact *Ben & Jerry's*, *Lake Champlain Chocolates*, and other chocolatiers), as is *coffee production*[56] (which will impact *Green Mountain Coffee Roasters* and other coffee companies).

ANALYSIS

The F2P local food summits, interviews, and public comments revealed a high degree of interest in expanding Vermont's processing capacity. In-state processing facilities can allow producers to expand their product lines, gain greater control over the process of bringing food to market, and capitalize on local branding as well as other certifications based on processing procedures, such as organic, humane slaughter, or a form of the Vermont Seal of Quality. A range of consumers interviewed for F2P expressed demand for more processed products, everything from artisan cheese to low-cost products developed for the food service industry. F2P research also showed that many consumers underestimate the challenges of developing viable processing businesses in the state.

Although a diverse range of types of facilities may be pursued, all of them have common business issues that must be addressed. Factors that determine whether to process, or *what* to process, will vary by farm and food enterprise, but include the following considerations:

- The most cost effective and profitable ways to manage surplus volume
- The level of customer demand for a given processed product
- The level of competition with other farmers vying for the same local customers
- Proximity to off-farm processing facilities
- Available labor for on-farm processing
- Access to year-round local food outlets
- The level of additional regulatory compliance required for processing and the costs associated with that compliance
- The existence of partnership opportunities with specialty food processors
- The ability to manage multiple steps along the value chain, from the farm to the processing facility, and from branding and marketing product lines to reaching the consumer

Technology and Infrastructure

Infrastructure development doesn't end with the processing equipment. Producers—particularly those using processing to extend sales into new seasons and those with special storage needs such as freezers—still need a way to store the processed product. Products need to enter into distribution systems; some producers find space on existing distribution trucks while others self-distribute. Also, because many processed products are marketed as value-added local items, farmers need sales outlets to connect with locally conscious buyers. Established retail outlets offer one option, if they can make shelf space for a new product. Also, year-round direct sales outlets such as winter farmers' markets are being developed across the state that offer more opportunities for sales. Some customers who seek out local Vermont products do not live here, which underscores the need for efficient distribution.

Financing

Vermont's current processing landscape reveals a need for a wide range of start-up and expansion financing, from organizations building hybrid nonprofit or for-profit models to businesses in micro niches with low start-up costs to larger projects that sometimes underestimate their needs as they try to establish a new product. Costs of bringing new or expanding meat processing facilities up to code can be prohibitive. Complying with HAACP and new GAP standards can require new equipment and employee training. The price that can be charged for lightly processing fruits and vegetables may be insufficient to cover the cost of operating such a facility. Incubator facilities, such as the Vermont Food Venture Center, need publicly provided operating funds for at least the first five years to support their tenants' needs. Chapter 4, section 5 provides an in-depth analysis of this challenge for agricultural businesses and provides recommendations for addressing financing needs.

Sales and Distribution

Sufficient Volume: Business models for new processing facilities in Vermont often falter on the issue of volume. For example, produce processing relies on items that can't be sold for a higher price as fresh produce, and farmers often do not have enough left over to justify operating their own processing facilities. Other facilities are affected by the seasonality of products (e.g., rush periods at slaughterhouses are offset with very slow periods). And, as with all stages of farming, economies of scale achieved by larger processing operations that are already established outside of Vermont can make our products not price competitive in some markets.

"We want to pay our farmers good prices and we do, but they are not making a fortune. If you are raising 100 lambs, then the economies of scale are so poor. Like with grain—you can't buy it in bulk because it rots eventually. There are just 101 ways that the costs are higher. Plus the fact that taxes are higher unless you are in current use. It's just a lot of things that are going against the small Vermont farmer."

—Rutland area focus group participant

A variety of strategies can help address volume problems. Specialty products, such as farmstead cheese, combine very small-scale production with very high-quality, premium-priced, and unique products. Farmers can work cooperatively to build up a business, pooling inputs and resources. Processing facilities can offer diverse services, such as the *Vermont Food Venture Center* and *Green Mountain Co-Pack*, combining equipment with technical assistance and business incubation. Some of these facilities may also combine nonprofit programs with fee-for-service programs. In some cases, mobile units may help. Volume concerns are a fundamental part of business planning, but are not insurmountable.

Price Sensitivity: The price expected by the marketplace can vary significantly across processed products. Some are processed into premium specialty foods, and others are processed so that they can be more easily used by larger-scale, commercial buyers. These large buyers may seek a high-quality Vermont product, and are important in getting Vermont foods to a larger customer base, but they also have significant budget constraints. Producers entering into processing need to thoroughly understand their pricing options before starting a business, including their costs for equipment, labor, distribution, and marketing, and how much their target customers are realistically willing to pay. As the *Deep Root* processing study illustrated, even local-eager customers may not be able to manage the price point of a new Vermont-processed product.

Workforce Development

A common concern voiced by producers was an inability to find labor for both harvesting (in the case of produce seconds) and processing. Often, the additional labor demands also extend to distribution and marketing for the new products.

In 2006 the Vermont Dairy Task Force reported that dairy producers doing on-farm processing ranked trouble finding labor as their primary barrier to expansion (33% of survey respondents). Even at their present level of operations, 43% reported a shortage of part-time labor; full-time labor fared better with slightly less than 20% reporting shortages. The meat industry faces particular challenges in finding, and retaining, appropriately trained workers for quality butchering. This lack of butchering capacity is a major factor behind current bottlenecks in meat processing. The mobile quick freeze unit pilot project made low-cost equipment available for freezing small volumes of

berries, but producers did not have the labor needed to pick those berries for a day or two of freezing time. Almost every type of processing expansion comes with labor challenges.

Regulatory and Public Policy

Creating a processing facility requires an additional layer of regulatory compliance, at local, state, and national levels. These regulations cover both the construction and operation of the facility. Different regulations are managed by different agencies, including VAAFM, the Vermont Department of Health, USDA, and FDA. Perhaps one of the most prominent—and complicated—debates has arisen in recent years around what constitutes an unfair regulatory burden for slaughterhouses. This discussion is detailed in Chapter 3, Section 3, Food Production: Livestock and Meat. Chapter 4, Section 7 looks specifically at regulatory issues.

GETTING TO 2020: OBJECTIVES AND STRATEGIES

The following objectives and strategies address underlying issues in infrastructure development, aggregation, market development, workforce training, and regulatory assistance. They also address specific recommendations for dairy, meat, and produce processing as well as emerging specialty products such as local grains. The overarching goals are to ensure that future processing facility development is well planned and includes comprehensive business analyses and any necessary technical assistance or professional development for new managers. Some strategies also identify specific research needed to educate a range of entrepreneurs and provide strategies for undertaking market development in tandem with product development.

Table 3.4.5: Objectives and Strategies for Expanding Food Processing and Manufacturing Capacity

OBJECTIVE	STRATEGY
Research Strategies	
To help Vermont food processors and manufacturers adapt to climate change.	Climate change will directly impact Vermont's food processors and manufacturers as the availability and cost of ingredients fluctuates due to adverse weather. Food processors and manufacturers and technical assistance providers (including educational institutions) should begin exploring adaptation strategies.
Natural Resource, Physical Infrastructure, and Technology Strategies	
Dairy Processing	
To grow the number of on-farm dairy processing facilities over the next 10 years, and the infrastructure of off-farm processing will be maintained to produce a variety of valued-added products for consumption by Vermonters and export from the state.	Coordinate with the *Vermont Institute of Artisan Cheese*, the *Vermont Cheese Council*, and key Vermont cheese makers to conduct a revised market demand analysis for artisan cheese processing, aging, and storage facilities for the next 10 years.
	Assess equipment and training needs and secure funding to increase the sophistication and production of artisan cheese and seek funding.
	Vermont farmers and milk processors will have access to necessary technical assistance to efficiently develop dairy processing plants and achieve compliance with the Pasteurized Milk Ordinance (PMO) and state water quality regulations.
To increase the amount of Vermont-produced fluid milk that is locally consumed or is used in value-added processing.	Conduct a market analysis and, if viable, develop opportunities for additional local processing plants for fluid milk. Use the lessons learned from *Vermont Milk Co.*, *Strafford Organic Creamery*, *Monument Dairy*, *Wilcox Dairy*, and *Thomas Dairy*.
	Identify and connect Vermont dairies interested in developing a local milk processing facility with each other, and provide technical assistance and business planning services.
	Identify key marketing strategies for cheese and noncheese value-added dairy product development such as cottage cheese, yogurt, sour cream, kefir, etc., and nonfood dairy-based products. Marketing strategies should be for both in-state consumption and export and include terroir/taste of place content and case studies of success stories. Ads for Vermont dairy products, and their origin stories, should be regularly placed in related industry and tourist publications.
Produce Processing	
To increase opportunities for local producers to access existing local retail markets and institutions and develop new markets.	Support regional food centers in the development of food aggregation centers for small to medium-size producers, coordinated with an appropriately scaled distribution plan and network.
	Inventory existing food processing facilities or commercial kitchens in Vermont able to serve smaller early-stage producers interested in value-added processing.
	Evaluate the additional capacity needs for incubator and value-added processing facilities for smaller and early-stage producers.

OBJECTIVE	STRATEGY
Natural Resource, Physical Infrastructure, and Technology Strategies	
Produce Processing	
To maximize opportunities for local producers to provide lightly processed fruits and vegetables to existing institutional wholesale markets.	Conduct a feasibility study for a medium- to large-scale fruit and vegetable processing facility specifically to serve institutional markets. The study would include the amount and types of product needed to meet demand, viable price points, the number of production acres needed per product, the facility service area, the number of facilities needed in Vermont, facility operation issues and financing, etc.
To improve producer access to all types of markets, but primarily larger institutional markets, through the creation or expansion of aggregation points in the state (services include product consolidation, sorting, storage, packing, delivery, follow-up / relationship maintenance).	Review maps of existing sites of food aggregation and related functions and coordinate with regional food centers and other available assessments to identify the best geographic regions and sites for additional private or farmer cooperative–owned aggregation facilities. Criteria for site selection should include an adequate concentration of farmers/producers for a predictable supply and potential participation as managers and owners; an adequate concentration of consumers of raw and processed product; strong local interest and a committed organization or set of individuals in the area with adequate expertise and a capacity and willingness to develop and manage the facility and develop strategic partnerships with consumers, including retail market outlets, institutional purchasers, and distributors; proximity to existing related physical infrastructure that could be use; and financial viability.
	Coordinate with regional food centers and other committed organizations to develop replication materials for new food aggregation hubs in Vermont to learn from and build on models such as *Deep Root Cooperative*, *Intervale Food Hub*, and the CISA model in western Massachusetts and the *Tuscarora Organic Growers Cooperative* in the Mid-Atlantic region. Replication materials would include a business model for aggregation and collective marketing to ensure profitable price points for farmers and buyers.
Meat Processing	
To significantly increase slaughter capacity and meat cutting quality by 2020 in order to contribute to the profitability of livestock producers and slaughterhouse owners, as well as increase access to locally grown meat for local and regional consumers.	In addition to existing slaughterhouses, two new slaughterhouses (in underserved areas of the state); one new, privately operated, small ruminant mobile slaughterhouse; and three significantly expanded existing slaughterhouses will be operating in Vermont by 2020. This expanded plant capacity would provide for the slaughter of 20,000 beef animals, 4,200 lambs, and 4,200 hogs annually, with 10% of the meat processed being sold to Vermont institutions and food processors.
	Develop a publicly funded, low-interest loan program for capital improvements to new and existing slaughterhouses, which could include the development of satellite processing sites and additional on-site storage to maximize the use of kill floor capacity.
To encourage the use of itinerant slaughterers for on-farm slaughter of animals raised for home use. By 2015, a majority of animals raised for home use or direct sales from the farm will be slaughtered by itinerant slaughterers or in custom-exempt plants.	Provide business assistance to itinerant slaughterers and custom exempt plants to help them improve their services and overall profitability.
	Conduct outreach and education to livestock producers who raise animals for home use or direct sales from the farm, to increase their awareness and use of itinerant slaughterers and custom-exempt plants and to determine the demand for itinerant slaughterers and custom-exempt plants.
	Encourage the development and improvement of custom-exempt slaughter plants through competitive grants and training programs.

OBJECTIVE	STRATEGY
Natural Resource, Physical Infrastructure, and Technology Strategies	
Meat Processing	
To decrease, by 2015, the cost of slaughterhouse operations by 10% on average through energy efficiency and risk management process improvements.	Provide access to technical assistance and funding to address energy efficiency opportunities for Vermont slaughterhouses and meat processing plants (e.g., *Efficiency Vermont* and *USDA Rural Development*-REAP grants).
	Develop risk management training (similar to the program developed for Vermont dairy producers) to reduce insurance premiums. Explore the potential of pooled liability insurance.
Sales and Distribution Strategies	
To increase the volume of high quality, locally sourced processed food at local and regional market outlets, and maximize the availability of dependable markets for local producers.	Encourage VAAFM, the *Vermont Fresh Network*, and other related organizations to host at least four matchmaking opportunities among producers, institutions, and retailers annually, located in different regions of the state. Invite market outlets from Boston, New York, southern Quebec, funded by both producer and buyer registration and sponsorship fees.
	Explore building matchmaker functions into non-Vermont-based events that nevertheless draw Vermont producers (e.g., the Big E) in addition to inviting buyers into Vermont.
	Support initiatives (e.g., funding, feasibility studies) between enterprises within the same supply chain to explore and capitalize on cooperation opportunities, such as new product development.
	Develop an online information portal, clearinghouse, or food system atlas to connect food system stakeholders with information, resources, online markets, and Farm to Plate Strategic Plan documents.
	Identify, coordinate, and expand existing brokers, sourcers, or local food coordinator positions. Identify where these positions currently exist and then expand the number of staff within private sector producers and distributors, nonprofit organizations, schools, institutions, and government entities, so that local and regional markets become more available to local producers.
Technical Assistance and Business Planning Strategies	
Dairy Processing	
To expand and increase technical assistance and business planning to dairy farmers and other value-added dairy processing professionals in order to strenghten the brand of Vermont dariy products.	Maintain and expand technical assistance and regulatory oversight as needed to ensure the production of high-quality milk and processed dairy products from Vermont dairy farms.
	Support a system of safety and quality standards, and provide assistance when problems arise.

OBJECTIVE	STRATEGY
Technical Assistance and Business Planning Strategies	
Dairy Processing	
To increase and improve access to offerings at the Vermont Institute for Artisan Cheese and other high-level tech assistance aiding the development of value-added processing.	Support the expansion of technical assistance for cheese makers through the *Vermont Institute for Artisan Cheese*, the *Vermont Food Venture Center*, the *VHCB Farm Viability Program*, and the *Vermont Pasture Network*.
	Identify resources and incentives to support education classes for producers and value-added product entrepreneurs.
	Develop a scholarship fund through the *Vermont Cheese Council* for Vermont cheese makers to take production, marketing, and other types of continuing education classes.
	Continue and expand the current work of the *Vermont Cheese Council* and the *Vermont Institute for Artisan Cheese* to provide marketing and food safety training and technical assistance to Vermont cheese producers.
Meat Processing	
To increase the number of skilled meat cutting professionals.	Once formed, the Vermont meat industry council should assess and make recommendations for increasing the number of high-end meat cutting professionals to serve gourmet and high-end producers and restaurant and other retail markets.
	Establish technical assistance and training programs for skilled meat cutters and butchers through NECI, *Vermont Technical College*, and appropriate high school career and technical education centers.
To work with existing slaughter and meat processing businesses to improve their overall business operations and financial bottom line.	Provide free business assessments for each slaughter and meat processing plant to determine the potential of each facility to improve profitability, and provide a recommended work plan for each facility owner.
	For those slaughterhouse owners interested in improving the profitability of their operations, provide low-cost business advisors (foundation or publically funded) to work with them over a two-year period to make identified process and infrastructure improvements. Provide ongoing monitoring and evaluate process improvement results over a five-year period.
	Assist slaughterhouse owners in accessing funding for needed capacity improvements, such as additional storage, to maximize total usage of the plant (i.e. year-round full capacity).
Produce Processing	
To maximize opportunities for local producers to provide lightly processed fruits and vegetables to existing local retail markets (to be included in the overall percentage increase in local food consumption).	Provide technical assistance and access to the right match of capital to farmers, as needed, who want to ramp up their production scale to serve institutional markets with lightly processed fruits and vegetables.

OBJECTIVE	STRATEGY
Technical Assistance and Business Planning Strategies	
Produce Processing	
To maximize opportunities for local producers to provide lightly processed fruits and vegetables to existing local retail markets.	Coordinate with the Agricultural Development Board, regional food centers, the VAAFM, and the *Department of Economic Development* to release an RFP to conduct the next stage of feasibility study for a light processing facility specifically for larger-scale, institutional markets.
	Identify ingredient demand and price points for particularly products destined for the processed food markets.
To increase the amount of Vermont-grown fruits and vegetables that are used in value-added food manufacturing.	Work with members of the Vermont Specialty Food Association to identify which raw inputs are used in greatest quantities and identify a group of growers who would be interested in working with these specialty food producers to provide these inputs at a price point that works for both the grower and the food producer.
Grain Processing	
To increase the availability of Vermont-grown grains in retail and wholesale outlets.	Conduct an inventory of the variety of grain milling facilities existing or being considered in Vermont, and analyze the possibility of a collaboration with Maine (e.g., new *Somerset Grist Mill* in Skowhegan), New Hampshire (e.g., *Littleton Grist Mill*), New York (e.g., *Champlain Valley Milling Corp.*), and Quebec. Identify the processing gaps and expansion interests of grist mill owners and plans for other local millers of various sizes.
	Coordinate with the *Northern Grain Growers Association*, grain farmers, and leading bakeries and artisan bread makers committed to local ingredients to develop strategic partnerships and identify a specific focus on various types and volumes of grains and processing needs to meet all or a percentage of market demand.
	Inventory and increase infrastructure for combining, cleaning, and storing grain. Determine the next steps in developing mobile grain harvesting and processing opportunities, and consider the cooperative ownership of equipment and infrastructure.
	Assess and develop a budget for organic and conventional grain growing and milling as opportunities for farm diversification.
	Use existing movement data from food co-ops and other retail outlets to learn which grains have the highest consumer demand.
	Identify packaging sizes to maximize consumer purchasing.
	Determine the quantity and types of grains that producers of grain products need.
To increase access to local grains for value-added artisan grain products and for the beer-making industry.	Assemble a group of independent value-added artisan producers and microbreweries committed to local ingredients to identify their specific grain processing needs (quantity, quality, form, etc.).

OBJECTIVE	STRATEGY
Technical Assistance and Business Planning Strategies	
Grain Processing	
To increase access to local grains for value-added artisan grain products and for the beer-making industry.	Identify and find ways to support the expansion interests of owners of microbreweries and value-added grain product companies.
	Support farm viability through improved technical assistance for animal- and human-grade grain production and processing for on-farm use.
	Based on an inventory and feasibility analysis, develop a commercial grain-milling facility within a viable distance to Vermont grain growers; consider a collaboration with Maine, New Hampshire, New York, and Southern Quebec grain growers and millers.
	Provide funding for programs that encourage knowledge transfer from successful Quebec-based organic grain milling company.
	Provide workshops, tours, and mentorship opportunities to farmers interested in grain growing and milling.
	As conditions warrant, *UVM Extension* should provide additional technical assistance to the grain grower community.
General	
To maximize opportunities for value-added processing through appropriate technical assistance and business planning services.	UVM should once again be an active participant in the *Northeast Center for Food Entrepreneurship* (NECFE; a partnership with Cornell) to bring related services to Vermont food entrepreneurs.
	Provide funding support to the *Vermont Food Venture Center* (VFVC) for ongoing professional development services to start-up value-added producers.
	Ensure that food safety trainings (GAP, HAACP) are available throughout the continuum of food processing enterprises (incubator, co-pack facilities, commercial kitchens) via *UVM Extension*, VFVC, and the *VHCB Farm Viability Program*. Use the expertise of existing food processing professionals who are doing business in Vermont and out of state.
	Provide marketing and business skills training for farmers and food processors, concentrating on kitchen-ready products for the restaurant and institutional market.
	Provide specialized technical assistance to wineries, breweries, meaderies, etc., to help them ensure a consistent quality product, navigate the regulatory landscape, and develop or identify local ingredient sources.
To increase production and infrastructure capacity and provide technical assistance for the development of on-farm lightly processed and value-added products.	Use the findings from the RAFFL and Vermont FEED processing feasibility studies, and other data, to identify markets for, and determine the viability of, an enterprise model for on-farm light processing and value-added product development.
	Provide enhanced technical assistance to farm and food producers in the areas of marketing, sales, financing, and scaling up to serve larger institutional customers and regional markets. Assistance should be based on their current stage of business and their desired type and scale of operation.

OBJECTIVE	STRATEGY
Education Strategies	
To improve access to an appropriate pool of skilled, trained workers at Vermont slaughterhouses and meat processors.	Work with practitioners and successful farmers to design a training format and curriculum suited to existing and emerging Vermont farm and food enterprise models. Include regional technical education centers and culinary programs in the training.
	In conjunction with the Workforce Investment Board, an exhaustive list of meat science schools, certificate programs, and college programs will be developed by 2012 for distribution to Vermont high schools, slaughterhouse owners, and livestock producers for the dual purpose of increasing the awareness of meat science educational opportunities and increasing access to potential employees.
	A collective effort will be conducted by appropriate Vermont private and public colleges, vocational career centers, slaughterhouse owners, livestock producers, the Agency of Agriculture, and other interested parties to explore the development of degree or certificate programs for meat science in Vermont. Alternatively, a formalized mechanism will be developed to increase Vermonters' access to existing programs in other parts of the country.
	Conduct a feasibility study of locating a full-service training center for livestock production, slaughter, processing, cutting, and marketing at a new slaughter or processing facility in an underserved region.
	Develop training programs for itinerant slaughterers through existing high school career and technical education centers to increase the number and geographic distribution of itinerant slaughterers in the state.
Regulation Strategies	
To improve access to information regarding GAP and HACCP requirements so that farmers and food entrepreneurs have the tools they need to make informed decisions regarding expanded marketing opportunities and value-added processing.	Establish an online guide and a regulatory ombudsman to help prospective food processors determine the regulatory paths they need to follow, keep the guide up to date, and analyze proposed changes to food regulations.
	Increase and improve the food safety training offered through *UVM Extension*, the *Vermont Food Venture Center*, and regional food hubs.
	Working with the *Vermont Vegetable and Berry Growers Association* and *UVM Extension*, increase producer understanding of the regulatory framework imposed through the GAPs, and customize a certification process geared toward Vermont-based producers.
	Ensure that producers are knowledgeable about regulatory and insurance requirements and all procurement ("case ready") specifications of all market outlets prior to attempting to serve those markets.
	Provide farmers and aggregators with information about all regulatory, insurance, food safety, and procurement specifications for each type and scale of regional market outlet including institutional buyers.

End Notes

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7 Vermont Brewers Association, http://brewersvt.com/vba.

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10 The following section is a summary of more detailed information that can be found in Chapter 3, Section 3: Food Production - Livestock and Meat.

11 *Westminster Farms* does poultry slaughter and processing in addition to red meat slaughter and processing

12 The mobile poultry unit does only slaughter, no processing.

13 The *Westminster Farms* facility is counted twice.

14 The *Westminster Farms* facility is counted twice.

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ANALYSIS OF VERMONT'S FOOD SYSTEM

Food Processing and Manufacturing

Credits

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Vermont Sustainable Jobs Fund

farm to plate STRATEGIC PLAN

farm to plate NETWORK

VERMONT FOOD SYSTEM ATLAS