The average American consumes almost 68 gallons of cow milk in the form of fluid milk and milk products, and milk ranks amongst their top four consumed beverages (not including tap water). These and other statistics show that milk is a ubiquitous part of our cultural diet. How cultural, however, is knowledge about the average dairy cow’s life? Recently, while visiting at a neighbor’s house following evening milking chores, I was amused by their four-year-old son’s response to learning that I had spent the last few hours milking cows. “Milking the…cows?”, he replied in shocked amazement. I’ll chalk this one up to being a four-year-old, but must also acknowledge a study published in the U.K. in 2012 by LEAF (Linking Environment and Farming). In their study only 6 out of ten participants between the ages of 16-23 were able to successfully link milk to a photo of a dairy cow. Knowing the cow (or goat or sheep) as the origin of milk is an important first step in agricultural literacy. In promoting agricultural literacy and consumers that are actively making conscious food decisions, however, we must also be educating about the concepts of animal welfare, behavior and nutrition, as well as the daily routines and management decisions of farmers. It is an easy step to be a part of a culture that embraces a product but it is a vital step to be a part of a culture that knows the story of the product’s origins.

Evolution of the domestic ruminant

Throughout different cultures in history the cow has been (and in some cultures still is) celebrated as sacred. Modern insights into Indian culture, where the cow remains sacred for many, have suggested that this status in religion and culture is perhaps rooted in the essential contributions that the cow offers in exchange for relatively little inputs. The cow in India is a major contributor of physical labor, dairy products, and nutrients from excrement (manure and urine). Observers note that the typical cow in India is given freedom to graze roadsides and cropland after the harvests have been taken off, essentially what is otherwise wasteland and has a very low cost of production. Despite this low input demand, the cow is still productive and fruitful. She produces valuable offspring, which are either raised as cows or if male are trained as oxen to be used for labor; she also produces nutrient dense milk which humans consume, and manure which can be used as a fuel source for cooking and heating as well as a vital fertilizer for crop fields. Given this relationship, the sacred cow is a symbol of care, compassion, sustainability and equity within the Indian culture.

Archaeologists estimate that the domestication of ruminant animals began roughly 11 thousand years ago (ruminants are animals with a unique four-chamber stomach and include cows, sheep and goats amongst others). This theory of domestication is supported with bone remains and other evidence, which show a gradual spread of domesticated ruminants from the Middle East through modern-day Turkey and eventually into Europe. At a number of these sites archaeologists have found pottery shards and other vessels that are reminiscent of modern day cheese-making or yogurt fermenting technology. It is theorized that fermentation techniques were utilized by these early cultures to allow digestibility of the milk.

DNA research has allowed scientists to pinpoint a genetic mutation that encourages the production and presence of an enzyme that allows for the digestion of unfermented milk beyond the weaning years and throughout adulthood. Roughly 35% of today’s human population has this mutation and is thus able to digest unfermented dairy products beyond the age of 7-8 years old. It is thought that this mutation first occurred in Europe roughly 7,000 years ago.
Why Organic Dairying?

by Jack Kittredge

Organic dairy products, at 15% of the U.S. organic market, are second only to fresh fruit and vegetables in sales. The northeast, with our cool seasons, plentiful rainfall, abundant pastures, and hilly (even rocky) terrain, is ideal for dairy farming. The presence of so many nearby population centers makes small, specialized, value-added and raw milk dairies financially possible – in some cases even attractive.

Most of us know someone who is a dairy farmer. Many of us even buy our milk at a local farm. But how much do we know about the biology of milk production itself, the biochemistry of fermentation and culturing which makes so many milk products, or the advantages of natural, unpasteurized milk? For that matter, how many of us know much about the economics of dairying or the realities of raising and milking goats, sheep, or cows?

For that purpose, to inform readers interested in all aspects of organic dairy production, we devote this issue of The Natural Farmer. During the short few years that your humble editors kept a family cow for their thirsty offspring we learned a lot about the dedication and labor required in dairying. We also learned about the amazing wealth that nature has enabled ruminant digestion to create from humble grass. The cheeses soft and hard, cream, yogurt, butter, ice cream and abundant fresh milk we enjoyed made us feel very rich. Looking back, we were!

As we learn more about the incredible evolutionary partnership among herding ruminants, photosynthesizing plants, and carbon-hungry soil organisms – each taking from the others and giving back more in return – the more dairying looks less like another way to make a living and more like a calling. I hope we have touched on that sense among the dairy farmers we feature in this issue.

---

(continued from page 1)

ago. Those with the genetic mutation are suggested to have had a reproductive advantage during this period of history, likely due to improved quality and availability of food supply in the form of under-mented dairy. This advantage promoted the spread and migration of the human populations with the enzyme gene mutation. Due to the mutually benefi-cial relationship between humans and dairy animals, dairy animals also experienced a population and migration increase following the development of the genetic mutation in humans. This genetic mutation is traced as the major contributor of modern dairy digestibility in individuals of European descent. Several other isolated pockets of populations that have evolved to digest raw dairy, however, have since been found in West Africa, the Middle East and south Asia. These ‘hot spots’ are all linked to different genetic mutations.

During the European colonization of the United States in the 1600s, immigrants brought cattle with them from Europe. These colonists continued the migration of cattle for the observed benefits of food production (meat and dairy) and labor in the form of draft power. Records show that it wasn’t until the late 1800’s that cattle in America began to be bred specifically for dairy purposes alone, and even during this period cows were primarily kept for home or local needs. As people in the US increasing began to populate cities through the turn of the century, the demand for systemized milk production grew and innovations such as milking machines, commercial milk bottles, pasteurization and homog-enization techniques and equipment, refrigerated trucks, automated bottling machines, advances in crop production for animal feed, and advances in veterinary medicine came about. By the mid-1920s, government regulations began to be established to improve milk price stability and to ensure the availability of a sufficient quantity of safe (or unadulterated) milk. In 1946 the US government passed the National School Lunch Act, which mandated that each school lunch include between ½ to 2 pints of whole milk.

Today, dairy is one of the top five agricultural commodities in the United States. It is estimated that there were over 9 million mature milk cows in the US in 2013 with an average annual production of 2,450 gallons (or 21,805 lbs.) of milk per cow. These numbers are evidence of the influence that the dairy industry continues to plays within our culture; however, they do little to reveal the intricacies of the true player – today’s dairy animal.

What is a ruminant?

Our most common domesticated dairy animals, cows, sheep and goats, are all mammals classified (by their digestive system) as ruminants. Ruminants are herbivores (consume plant materials) and have evolved to digest a diet composed primarily of fibrous plants such as grasses. This is unique from mammals with a single stomach (or a monogastric) digestive system, such as humans. In the human diet, the fiber from plant material, such as leafy vegetables, is beneficial but does not provide actual nu-
Digestion system of ruminant animals is distinctive because, as suggested previously, they have a unique digestive feature: a four-compartment stomach. The four parts of their stomach are known as the rumen, reticulum, omasum and abomasum. When a ruminant animal swallows a chewed mouthful of food that has been mixed with saliva, it travels through the esophagus to the rumen and reticulum (also known as the reticulorumen). The reticulorumen is essentially a fermentation vat; it plays host to a variety of microbes that are essential for the fermentation and breakdown of the consumed plant materials. In the fermentation vat (or rumen), solids are clumped together to form a bolus or cud. The bolus of partially digested plant material is then regurgitated by the animal for further chewing and particle breakdown. This is where the common phrase of ‘to ruminate on a thought’ or ‘to chew something over’ originated.

During the ruminating process of swallowing, regurgitation, chewing, swallowing again and further fermentation in the reticulorumen, volatile fatty acids (a main source of energy for the ruminant animal), vitamins, and other by-products of fermentation microbes are absorbed into the animal’s bloodstream through the rumen wall. Other materials of fermentation, such as methane gases, are released from the rumen via belching (or eructation). When thoroughly broken down, plant materials are transported from the reticulorumen to the omasum. In the omasum, particularly within the first 24 hours of age, is vital for the oral transfer of immunity to the newborn because immune system traits are not transferred to the offspring through the placenta.

Today, most commercial dairy operations separate newborns from the dairy cow within the first 24 hours of birth. This practice stems from the business end of dairy operations, which is milk production and collection for commercial sales. Arguably, the practice of separation also allows for farm management to have more specialized attention on the mother’s milk quality and health following birthing as well as the calf’s milk intake and growth. Recent research has observed the potential impacts that separation at birth has on calf development and lifetime production versus alternative management methods for calf-cow relationships that still promote herd health and milk quality. Once such study from the University of Veterinary Medicine in Vienna showed an increase in the sociability of adult cows that had been raised with a herd and their mother. It is not yet clear how the sociability of a cow translates to milk production or the ease of adopting new management practices on farm. Continued research and on-farm trials of raising calves with their mother will improve the chance of adopting any of these practices on commercial operations.

Milk production
After learning what makes a cow’s digestion (or goat, sheep, etc.) unique from other mammals as a ruminant, the next defining characteristic to understand about the dairy animal is how (and why) they produce milk. Like most mammals, lactation for the female ruminant animal begins with parturition (or the birthing of offspring) and the natural release of the oxytocin hormone. The start of milk production for a dairy animal is also known as freshening. Following parturition, all mammals produce colostrum for approximately 3-4 days. Colostrum is similar to milk but is composed of antibodies to be ingested by the newborn ruminant animal; the consumption of colostrum, particularly within the first 24 hours of age, is vital for the oral transfer of immunity to the newborn because immune system traits are not transferred to the offspring through the placenta.

Mammal’s milk is roughly composed of 2.8-8% (by weight) lactose, though this proportion varies depending on the species. Lactose is a carbohydrate, or sugar, that is essentially unique to the mammary gland of mammals. Mammals are born with the ability to digest the lactose in their mother’s milk (and consequently that of other mammals) due to the presence of an enzyme known as lactase. The lactase enzyme, along with other cells, forms what is commonly called the brush border. The brush border is the area of small intestine where nutrients are absorbed into the bloodstream. As lactose sugars from milk approach the brush border, lactase enzymes housed in the brush border activate the breakdown of lactose sugars into simple sugars. One of these simple sugars, glucose, is a key energy source for the mammalian body. During maturation and the weaning process, the presence of lactase in the digestive system lessens for most mammals including our earliest ancestors. The evolution of the genetic mutation in humans, as noted previously, allows for the persistence of lactase enzyme production and therefore the digestion of milk throughout adulthood.

Runnen development begins with the introduction of forages and/or grain to the calf diet. Under a less intensively managed though still domesticated setting, we can predict that calves would self-wean from their dam (or cow mother) at approximately 8 months of age. Breeding occurs on today’s farm in two manners: 1) with the help of a bull, or 2) using artificial insemination. After being bred, gestation periods vary by species; similar to humans, a dairy cow carries her young for approximately 9 months (this period is shorter for goats and sheep).

Cows have evolved in an annual cycle that follows the availability of abundant forages. When observing wild ruminant populations, it is notable...
that they freshen (or give birth) at the onset of the growing season (or spring). This allows for maximized milk production for a short period of time, as the high energy demand associated with producing milk for their offspring. To remain on this evolved cyclical pattern, and due to their relatively long gestation period, healthy cows are able to be rebred only 2-3 months following parturition (or birthing). When managed on this cycle, an average dairy cow will be milked for approximately 9-11 months following parturition. At the end of this period she is dried off, which essentially means that her milk production ceases. Similarly, wild ruminant populations would be self-weaning at approximately a similar time. This dry period evolved to occur during the non-growing season. The cow’s energy demand is lower without needing to produce milk and her energy is directed to the growing fetus during this period. Animal welfare The average dairy cow can live to be 12-15 years old. At 10 years of age, a dairy cow would have had a maximum of 8 lactation cycles and an estimated lifetime milk production of at least 20,000 gallons of milk. The average age of dairy cows in today’s agriculture tends to be closer to 5-6 years of age. If a cow is injured or ill and unable to maintain milk productivity, the farmer must often cull the cow. A cow is injured or ill and unable to maintain milk productivity, the farmer must often cull the cow if it is injured or ill and unable to maintain milk productivity. The farmer must often cull the cow if it is injured or ill and unable to maintain milk productivity. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance. Organic dairy information The emergence of the organic movement and local food awareness has bolstered consumer interest and awareness about the dairy industry. The implementation of a national set of standards for organic dairy production, which accounts for animal welfare, animal feed, and management systems, has improved the transparency of organic milk production practices for consumers. It has been suggested by some retailers that organic milk is a gateway product for consumers into the organic marketplace. Overall, milk production trends in the US, even for organic dairy operations, show a shift away from small family-owned farms and towards larger commercial operations. The number of dairy farms is decreasing and in our communities small working dairy farms are becoming less prevalent. Given this trend, it is less likely that today’s youth will have gleaned a knowledge of food production from childhood experiences on or near farms. It is important to highlight the work of farms and to educate our communities about them. With an awareness of our food production systems, consumers will be empowered to promote animal health and welfare as well as the rights of farmers. This begins with young generations being able to identify a dairy cow and know the basics of how and why a dairy cow produces milk.

by Jack Kittredge

New York’s Cortland County, just south of Syracuse and east of Ithaca, is stunningly beautiful in the spring. Rolling hills with their broad expanses of grassy pastures, treed hills and cultivated bottomlands are dotted with modest farmhouses and outbuildings. In May, when I traveled these roads, the trees and bushes were in peak flower and the promise of fruitfulness was everywhere.

A sign that the local food movement has penetrated to this farming heartland is a new grocery store in the city of Cortland, the county’s seat and largest municipality at under 20,000 souls, called The Local Food Market. They have contracted with a local organic grower to provide their produce.

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promot- ing their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.

The Natural Farmer

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promoting their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promoting their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promoting their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promoting their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.

The area’s fertile farmland and access to good markets have also resulted in the presence of a small but growing Amish community. Primarily young farm food intake is for the animals to support the health and welfare of the dairy cows, promoting their production and prolonging their life span.

For example, researchers have observed that, given freedom of movement, the average lactating dairy cow has a relatively routine expenditure of her daily activities. The cow spends roughly 12-14 hours of her day lying down and resting. The remaining hours of the day are spent eating and drinking (2-3.5 hours), socializing or standing (2-3 hours) and milking and other herd management activities. Additionally, it’s estimated that approximately 7-10 hours are spent ruminating; these hours overlap with time spent lying down and standing. These numbers are essentially a cow’s internal time management system. It is suggested that by providing appropriate housing and animal management routines that allow for animals to maintain this natural schedule farmers can promote cow welfare, health and performance.
Donn and Maryrose have 57 acres in the home farm they bought from the Norths, and for twelve years have been able to lease another forty acres from a neighbor which they have fenced and which has become their primary grazing land. They are now leasing an additional 40 acres from that neighbor and are fencing it right now. Fifteen acres of their land is wooded and used for cordwood, the rest is open.

“We not only need to graze the sheep,” Maryrose observes, “we also have six horses and mules, and we make hay for them all for the winter. We think we have enough land for our grazing and hay now, but the last two years we ran short on second cutting hay -- we needed to graze it instead of cutting it -- and had to buy it from a neighbor.”

Compounding the demand for land is the fact that Donn and Maryrose are helping out a young couple, Scott and Aubrey, who are using some of the land for an organic vegetable business as well as a raw milk dairy. Both couples also farm with horses, which increases the demand for grazing land and hay.

“Our idea was to cut a bridge,” Maryrose explains, speaking of taking on Scott and Aubrey. “How do some of these young farmers make it? They have been working on farms and gaining some really deep skill sets, but because they have been working on farms they can’t afford to buy land. How can they become farmers? How do you give them some level of autonomy?”

“What will happen in the future we don’t know,” she continues. “They have committed for a year here. But it may be longer term and may be a way for them to buy into our farm and for us to retire. We don’t have children, so that is not an issue.”

There are 6 horses in all, a Suffolk Punch and two Percheron mares, and three mules which Donn -- whose passion is being a teamster -- likes because they are more heat tolerant than the mares. The animals are used for most draft purposes: cultivating, making hay, cutting timber, plowing snow, spreading manure, hauling carts. Maryrose and Donn also keep four pigs in the woods, which they raise on whey, and a flock of chickens. Scott and Aubrey also have a couple of steers besides their milk cows. The Northland sheep operation is based on a small flock of 40 ewes. Maryrose raises about 7 replacements from David Major and I’m very happy with them."

"These are cross-bred dairy ewes,” Livingston says. "The mix is East Friesian, Dorset, and Tunis. East Friesian is the Holstein or high-producing variety of the dairy sheep world. But I experimented with a few purebreds and they don’t so well in our system being 100% grass-fed animals. I like these cross breeds a lot. Dorset is a good all around ewe, with good mothering ability and a good carcass on them. Tunis sheep I am less familiar with. They are primarily a meat variety, but the ewes are good milkers. I got the ewes and ram originally from David Major, in Vermont, and I trust him.”

Maryrose turns the ram in with the ewes in late November and are all bred within one heat cycle, in a couple of weeks. The gestation period of lambs is 147 days, or about 5 months, so she aims for lambing to start in mid April. She weans the lambs when they reach 35 pounds, are 30 days old, and are vigorous. Then the milking begins, twice a day, at the end of May. This seasonal schedule means she milks and makes cheese only from the end of May through November, getting the winter off.

When I visited, the ewes were still nursing and were out in the pasture with lambs at heel. But milking was to start the next week, followed by renewed cheese making. They say that lambs know their mothers, and vice versa, by vocal and facial recognition. The pairs that I saw seemed to have no problem finding each other amidst the general bleating. A few ewes had triplets and one had quadruplets, and Maryrose sold the extras. She says she is done with bottle-feeding lambs!

Donn and Maryrose had to replace their entire flock 3 years ago. The sheep had always had an inherent disease, which came with the original stock when Jane and Karl started the farm. It was a retrovirus, like HIV, called Ovine Progressive Pneumonia.

“It is very common,” Maryrose explains. “They estimate it is in a third to a half of the flocks in the country. You can’t breed it out. As soon as clean sheep start sharing a pasture and a water trough with a diseased sheep, they get it too. So we culled the entire flock. That was hard. But I bought these replacements from David Major and I’m very happy with them.”

She does her own castration of the wethers, using the rubber band method. But she has also done some short scrotum castration, where you take the scrotum before the testicles descend and they stay in the body. The animals are fertile because of the heat of the body cavity. The method is supposed to be less painful for the animals, and results in a better rate of gain. Donn was off the farm on the day I visited, working at his job as a firefighter. He actually has a great schedule for someone who wants to be a farmer despite having a fulltime off-farm job. He works 2 ten-hour days, then 2 fourteen-hour nights -- so he’ll be at the farm all day and then leave at about 5 pm to go to work -- and then he has four days off. So he will have 6 days in a row at home, and then 2 days away.

Maryrose sits in the straw bale house she and Donn built. This one is a 2x4 stick-built frame with the walls stuffed with straw bales for insulation.

“We built this with the cheese cave downstairs as part of the plan,” says Maryrose. “Donn is a handy person all around. He enjoys a challenge, which is why he went for the straw bale. It takes a little longer, but we really enjoy this house. We like the curved softness of the walls. It is also really energy efficient -- cool in summer, warm in winter, with vapor permeable walls.”

Sheep graze in the foreground, oblivious to the ElectroNet fence set up for their next paddock.
Maryrose feels that his job takes a lot of pressure off them financially, while letting him participate in the farm in a major way.

“The decisions we have made on the farm,” she says, “aren’t necessarily about the bottom line but about how we want to farm. That has been made possible because we have that income. And the health benefits are very important. I couldn’t be farming without that job. I just had a knee replacement. I was almost defunct last year. But the schedule enables us to manage the farm together. I’m the shepherd and cheese maker, Donn is the teamster. We collaborate on the pasture.

“We think about it extensively,” she continues. “Our pastures are pretty diverse already because we have a lot of natives that come up. But I’d like them to be even more biodiverse. Now that we are leasing some more land we are seeing a little more diversity. But not as much as I would like. I would like to plant more varieties -- forbs, legumes, other grasses -- into the pastures to amp them up. Donn is not so enthused about that. We have to frost seed in order to keep the legume numbers high. I’d like them to be 60 to 70% but I think they are running about 40% right now. Each pasture is different. We’d like to get birdfoot trefoil in there, as that out-crosses and reseeds itself. We didn’t do any frost seeding this year. You want freeze-thaw cycles going on to open up cracks in the ground, but the window this year for that was about 2 days when the snow was off. If I win the Lotto I want a fancy seed drill! It would be ground-driven, of course!”

Donn has been putting up about 2500 bales of hay, which is not quite enough for their needs. They would like about 3000 and hope with their new leased land they can make that much. He makes square bales with a powered forecart, with a haywagon behind it for the bales. Donn is driving the baling equipment. The horses draw the forecart, with a haywagon behind it for the bales. The animals eat hay until the pasture is adequate for them, which happened this year in the second week of May. Donn doesn’t do any haylage or balage. One, they don’t have the equipment for it and two, Maryrose doesn’t want to do any ensiled feed. She feels it imparts flavors to the cheese and you can feel it imparts flavors to the cheese and you can

Maryrose feels that his job takes a lot of pressure off them financially, while letting him participate in the farm in a major way.

“Donn Hewes teaching about draft horses with one of the farm’s teams.

Maryrose feels that his job takes a lot of pressure off them financially, while letting him participate in the farm in a major way.

“Donn Hewes teaching about draft horses with one of the farm’s teams.

Maryrose feels that his job takes a lot of pressure off them financially, while letting him participate in the farm in a major way.

“Donn Hewes teaching about draft horses with one of the farm’s teams.
Livingston explains the way they make cheese: “We milk, bring it in here, cool it, put it in the vat, add rennet to coagulate it, form a curd, put the curd in the molds, press it, salt it, and put it in the cave to age.”

As raw milk products, the Northland cheeses must be aged for at least 60 days. The cave is a large, windowless room under their house. Beautiful, rustic shelves contain many wheels of cheese. On each shelf is a mark showing the date, the type of cheese, and the batch number.

The cheese room has cheese presses, shown on upper left hanging from the ceiling, cheese molds on the shelves, the vat in which the milk is heated, and a freezer made into a milk cooler.

“We haven’t made cheese for a while,” she says, showing me through the cave, “so our stock is down. But we won’t sell all these before we have the new cheeses ready. I have two main kinds. These are the tommes, and in the back are the blue cheeses. Tomme is a hard cheese that originated in the French Alps. To make the blue cheeses I have to introduce a particular mold in the vat with the milk. You can also sprinkle it in the curd. In raw milk cheeses the vat temperature only ever goes up to 80°F so you don’t worry about killing the mold. I also make a little bit of Pecorino (ed. - Pecora is Italian for sheep and is a name for many Italian cheeses made from ewe’s milk).”

Donn and Maryrose make about 2000 pounds of cheese a year from their 40 ewes, so one ewe can produce enough milk for about 50 pounds of cheese annually. They have been selling it at $20 a pound retail, no matter which variety. That is a low price, however. It is antagonistic to the worst internal parasites of sheep — Haemonchus contortus, the barber pole worm. The worm causes anemia in the sheep and will kill them. It can also persist in the soil for three to five years. T. chus contortus, the barber pole worm. The worm causes anemia in the sheep and will kill them. It can also persist in the soil for three to five years. 

The cheese-making room contains a vat, cheese presses and the molds. The vat is 35 gallons, large enough to hold milk from two days’ milkings. Maryrose seldom makes cheese two days in a row because she doesn’t have enough presses and that many cheeses will create a bottleneck. A chest freezer has been retrofitted and made into a home-made milk cooler. She fills it with water, puts the milk cans in it, and a pump circulates cold water to cool them.

Livingston explains the way they make cheese: “We milk, bring it in here, cool it, put it in the vat, add culture and rennet, coagulate it, form a curd, put the curd in the molds, press it, salt it, and put it in the cave to age.”

As raw milk products, the Northland cheeses must be aged for at least 60 days. The cave is a large, cool, windowless room under their house. Beautiful, rustic shelves contain many wheels of cheese. On each shelf is a mark showing the date, the type of cheese, and the batch number.

“It was an excellent market,” she explains, “but for the last two or three years it wasn’t as good as it used to be. Even though the market is still really well attended, I have found that more and more people are going just because it is attractive. They will have lunch there, sit by the dock, but don’t want to do most of their shopping because it is so crowded. Parking is a nightmare, too. So I found fewer and fewer people were there for actually buying their food.

“I found the time required to go to the Saturday farmers market was a problem,” she continues. “It is 30 miles away and I had to have someone here to milk and tend the sheep for all that time. Also, at the market not many people want to buy a whole cheese. A tomme is about 6 pounds, and my blue cheese is about 3 pounds -- a whole cheese can be over $100. So they all have to be cut for retail sales. We mostly sell half pound wedges and I spend hours and hours cutting and wrapping cheese.”

The couple has thus decided to go wholesale to avoid spending such time in marketing. They have been asking $17.50 a pound wholesale -- not too much of a reduction -- and getting it. Right now they are dealing with a distributor, Finger Lakes Family Farms, that sells it all over the region. They are not sure which stores carry it. But they also have some queries from New York City cheese shops, where Finger Lakes Family Farms doesn’t go, to which they would like to sell. Maryrose is working on that market now.

The other products the dairy has are meat from culls, sheepskins and wool. A store in Ithaca, The Piggery, has been able to sell all the meat they offer, and a tannery in Pennsylvania is happy to buy their skins. Maryrose shears the sheep herself and sends the wool to a mill in Maine.

Although all the Northland methods meet organic certification standards, so far they have chosen not to become certified. Since she is the president of NOFA-NY, Maryrose hears a little from people curious why they have chosen not to be organic.

“We don’t need it for marketing,” she explains, “it wouldn’t change a thing about our practices, and I certainly don’t want to do all the paperwork! It is a constant discussion, though. Donn thinks we should be certified, but of course he is not going to have to do the paperwork. For me, my real thing is 100% organic. I might get a little more for the meat if the lambs were organic, as organic lamb is unusual, but it is not worth it.”

Asked what she might do differently had she known more, she says, “nothing -- I’d do the same thing. I had no idea about the paperwork and marketing. I wish I had done the paperwork earlier, but I didn’t want to do it before I was ready. I’ve been working my way up to where I can do it. Maryrose shears the sheep herself and sends the wool to a mill in Maine.

The cheeses made from ewe’s milk are the tommes, and in the back are the blue cheeses. Tomme is a hard cheese that originated in the French Alps. To make the blue cheeses I have to introduce a particular mold in the vat with the milk. You can also sprinkle it in the curd. In raw milk cheeses the vat temperature only ever goes up to 80°F so you don’t worry about killing the mold. I also make a little bit of Pecorino (ed. - Pecora is Italian for sheep and is a name for many Italian cheeses made from ewe’s milk).”

Donn and Maryrose make about 2000 pounds of cheese a year from their 40 ewes, so one ewe can produce enough milk for about 50 pounds of cheese annually. They have been selling it at $20 a pound retail, no matter which variety. That is a low price, however. It is antagonistic to the worst internal parasites of sheep — Haemonchus contortus, the barber pole worm. The worm causes anemia in the sheep and will kill them. It can also persist in the soil for three to five years. T. chus contortus, the barber pole worm. The worm causes anemia in the sheep and will kill them. It can also persist in the soil for three to five years.
Artisan cheese makers may also standardize milk but, because of their simpler processing equipment, some adjust their process or even change the product altogether. For example, milk from a seasonal herd of cows in late lactation will often not set a curd as firmly as that made from early-lactation milk. This difference would favor making a softer cheese late in the season, such as a soft-ripened washed-rind cheese or a fresh spreadable cheese. Home dairy processors often adjust their process in response to gradual changes in milk performance. For the more gradual changes in milk performance. For the more

Temperature control during milk processing is critical. Microbial activity and the physical response of milk solids change with temperature. Always keep milk in gentle motion while heating it. Raw milk as it comes from the animal is the best starting point for home dairy processing. Raw cow’s milk is not homogenized and contains natural fats. Check with your NOFA chapter for local laws about buying raw milk as it is available in most northeastern states. Check with your NOFA chapter for local laws about buying raw milk as it is available in most northeastern states.

Introduction

Dairy products such as yogurt, kefir, and cheese result from similar processes. Outcomes that range from soft and spreadable quark to hard grana-style cheeses like Parmigiano–Reggiano DOP (Protected Designation of Origin in Italian) result from variations in process time, process temperature, and the selection of microorganisms. The consistency of dairy products made by large cheese plants and skilled artisans is difficult to achieve at home, it is possible to make good versions of most dairy products with simple tools. After all, fermented milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh cheeses, it will not perform well in certain applications like making whole milk ricotta and other fresh chees...
form as well in others, such as making firm cheeses.

Home processors making cheese may wish to heat-treat a small portion of the cheesemilk in order to control for certain microorganisms. Thermization, which is less common in the United States than in Europe, involves briefly heating the milk to temperatures as low as 135°F, which has the effect of killing many undesirably bacteria without altering the performance of the milk. This can be a useful step when milk must be held for a few days before processing, or when the production is not to exactly control the microbiological community in the milk.

Pasteurization entails holding the milk at 145°F for 30 minutes, which kills a broader range of microorganisms but can have the effect of causing milkfat to separate from the milk and can potentially affect cheese yield. Small countercurrent cream separators help home processors separate cream either to make a cream product or adjust the milkfat in cheese milk. Alternatively, cow’s milk cream will rise to the top on its own and may be skimmed off.

The home processor will usually not manipulate the milk, but will begin with fresh raw milk. In general, it is best to work with at least a gallon at a time when making cheese because much of the milk’s volume is lost as whey during processing. Firm cheese will yield 10%–12% of the weight of the milk. Twenty pounds of milk (2.33 gallons) will yield two pounds of saltier-style cheese, which is a minimum size for proper ripening of firm cheeses. Yogurt and kefir, however, have a 100% yield; one gallon of milk yields one gallon of yogurt. Strained yogurt products such as labneh and “Greek” yogurt lose some weight as the whey drains from the yogurt.

Milk processing basics

Most dairy processes rely on the development of lactic acid in the product as a result of temperature manipulation over time. Lactic acid bacteria digest the milk sugar lactose and excrete lactic acid. These bacteria utilize other products of fermentation, such as butyric-tasting diacetyl, that are responsible for flavors characteristic of dairy products. Mesophilic bacteria are most active and produce the most lactic acid at temperatures close to body temperatures, and die at temperatures above about 105°F. Thermophilic bacteria are less active at lower temperatures, but thrive in the range of 110°F to 135°F. Cheese and many lower temperatures, such as Alpino-style cheeses like Cricket Creek Farm Maggie’s Round, rely on mesophilic bacterial species. Cheese-making courses, such as Alpino-style cheeses like Robinson Farm’s A Barndance, rely on thermophilic bacteria.

In addition to time and temperature controls, the home dairy processor will manipulate the product mechanically to achieve the desired result. This includes straining yogurt to produce a thicker product, aging the cheese during the cheddaring process of cheese making, or the hooping and pressing of cheese curd to form wheels.

The first step in almost any process, save kefir- and possibly butter-making, is to heat the milk to the initial process temperature. When heating milk on the stove, always work in heavy-bottomed stainless steel pots, which are non-reactive and easy to clean. Gas or induction ranges are easier to control compared with electric coil ranges. The home processor should gently yet constantly stir the milk as it warms. The milk should be in motion any time it is heating.

Yogurt

Yogurt is a lactic-set curd facilitated by thermophilic bacteria. As the milk incubates at 110°F, the resulting acid from fermentation denatures milk proteins and results in a relatively solid product that can be handled as yogurt’s texture. An initial high-heat process facilitates this matrix: heat the milk to 180°F, cover the pot and turn off the heat and let it cool to 110°F. After 10 minutes, place the pot in a sink filled with cold water and stir the milk to rapidly cool it to 110°F. Once the milk is at the incubation temperature, inoculate it with a desired bacterial culture.

There are different yogurt cultures available that yield slightly different acidities and consistencies. Most cultures feature multiple species; ABY-2C from Danisco includes Streptococcus thermophilus, Lactobacillus delbrueckii subsp. bulgaricus, Lactobacillus delbrueckii subsp. lactis, Lactococcus acidophilus, and Bifidobacterium lactis, where each species contributes in part to the thick body, lactic aroma, and mild acidity found in the finished product. Follow the dosage directions on the package when using a commercial direct-set culture such as this. Alternatively, inoculate the yogurt with existing yogurt. If using this method, choose a locally made yogurt free of pectin, nonfat dry milk powder, or gelatin. Add enough water to the yogurt to reach the desired weight of the total milk in prepared yogurt. For example, if working with 8.6 pounds of milk (one gallon), add about three ounces of finished yogurt.

After incorporating the culture, fill clean jars and incubate them at 110°F for six to eight hours. To keep the jars warm, place them in a plastic cooler filled with cold water and place the cooler on the counter. Alternatively, use a box-type food dehydrator, such as those made by Excalibur, to maintain the incubation temperature. Set the thermostat to 115°F. After the incubation, set the jars in the refrigerator until they are cold.

If the goal is to make raw milk yogurt, forgo the high-heat processing and heat the milk to only 110°F. The resulting yogurt may not set as firmly as milk that has been treated with high heat. To strain yogurt, line a colander with fine wet cheesecloth and drain the yogurt overnight.

Sour cream and cultured butter

Sour cream is a mesophilic fermentation of cream. To make it, separate cream from cow’s milk, inoculate it with a mesophilic culture blend such as FloraDanica, and incubate the cream in a jar for about eight hours at 75°F–80°F. Once cooked, it will be rich and spoonable, but free of the gums and stabilizers common in commercial sour cream.

To make cultured butter, follow the same steps as those above for sour cream using a half-gallon mason jar as the fermentation vessel. Fill the jar ¾ full, which leaves a significant amount of space in the jar. After fermentation, chill the cream to refrigeration temperature, and then allow it to warm to about 55°F. With the lid on, shake the cultured cream. The mass will liquify and the butterfat will begin to congeal. After the butterfat is clearly separated from the buttermilk and floating on its surface, strain the butter from the buttermilk with a colander lined with wet cheesecloth. Save the buttermilk for use in baking or as a refreshing drink. Place the butter in a pre-chilled metal or ceramic bowl and work it with two wooden spoons to press out more buttermilk. Salt the butter, if desired, and shape it into a squat round before wrapping in paper or plastic and refrigerating.

Kefir

Kefir relies on a symbiotic mass of organisms commonly called kefir grains. This fermented milk product is liquid and thin, and will vary in terms of acidity and carbonation depending on the length of the fermentation and storage. Sander Katz, in his excellent 2012 book The Art of Fermentation, reports that only half of the kefir grains resident in kefir grains are known or even named. The microorganisms in the grains rapidly sour milk while producing other fermentative byproducts, including ethanol and carbon dioxide.

To make kefir, add kefir grains at 5% of the weight of the milk to milk at ambient temperature. It works well to use a glass jar with a lid that seals. Ferment the milk at room temperature for 24 hours to three days. Agitate the jar over the course of the fermentation to redistribut the grains and make more nutrients available to the fermenting microorganisms.

Once the desired level of acidity is reached, fish out or strain out the grains and, if desired, seal the jar. Keep the sealed jar in the refrigerator for one or two days, and the kefir will carbonate in the sealed environment, resulting in a sparking beverage unique among dairy products.

Cheese

Cheese is the result of time, temperature, culture, and mechanical process decisions. In all cases, cheese is defined as the concentration of milk solids. There are three common ways to isolate the protein and fat from milk to yield cheese: the addition of acid, lactic acid fermentation, or the addition of enzymes. Most cheese made in the United States is of the last sort. Many fresh and young goat’s milk cheeses are of the second sort. Acid-set cheeses include paneer, ricotta, and mascarpone.

Acid-set cheese

Acid-set cheeses are made at high temperatures and without the aid of bacterial fermentation. Instead of lactic acid from these organisms, the home cheese maker relies on citric, acetic, or tartaric acid.

To make an acid-set cheese from whole milk, heat one gallon of milk to 180°F, stirring gently but constantly. Once the milk reaches the process temperature, turn off the heat and stop stirring. Pour one cup of white vinegar into the milk and wait one minute. Observe the formation of the curd, which will collect like fluffy white pillows. If the milk is still white and opaque, add more vinegar, up to one additional cup. Ideally, the liquid surrounding the curd should be translucent and have a green-yellow color. Allow the curd to form for another five minutes, without stirring, and then strain

<table>
<thead>
<tr>
<th>Fat</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep</td>
<td>7.00%</td>
</tr>
<tr>
<td>Goat</td>
<td>4.10%</td>
</tr>
</tbody>
</table>

Source:


<table>
<thead>
<tr>
<th>Mean values of fat and protein, different species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat (% of milk)</td>
</tr>
<tr>
<td>Protein (% of milk)</td>
</tr>
<tr>
<td>Cow</td>
</tr>
<tr>
<td>Goat</td>
</tr>
<tr>
<td>Sheep</td>
</tr>
<tr>
<td>Goat</td>
</tr>
<tr>
<td>Sheep</td>
</tr>
</tbody>
</table>

Table: Fat and Protein Content of Milk

<table>
<thead>
<tr>
<th></th>
<th>Fat</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow</td>
<td>3.30%</td>
<td>3.40%</td>
</tr>
<tr>
<td>Sheep</td>
<td>7.00%</td>
<td>5.90%</td>
</tr>
<tr>
<td>Goat</td>
<td>4.10%</td>
<td>3.60%</td>
</tr>
</tbody>
</table>


Handbook of Food Products Manufacturing,

The Natural Farmer

B-9 Summer, 2015
The natural farmer
Summer, 2015

by Jack Kittredge

Summer, 2015 - other things to be more productive. They wanted to So they started all this mechanization and all these had gone and they weren't coming back to the farm. of agriculture caused a lot of problems," he says. "A He reflects on the path dairying has taken in Swan farm there, jokes about their bootlegging days. His The Fournier family goes back four generations in that this was not a bad place to live, a stone's throw its from the lake, and flat as a tabletop. Rumor has it a little peninsula that sticks out south of Quebec into a reasonable size, without having to expand, and be able to transfer it to the next generation. There were another one I met through NOFA Vermont who has been with them ever since. Earl says that his father Rene, the equipment dealer, was a careful student of local economics at the time. He was really happy with organic and felt it was a mid-life crisis. I was better off doing that than was a mid-life crisis. I was better off doing that than going to 1,200 4,200-series and surface-ripening cultures such as Penicillium candidum (white mold). Rennet the milk requires about 25% less rennet than cow's or goat's milk. To make a tomme-style cheese, warm milk within the range of 88˚F–96˚F and inoculate it with a different mesophile culture such as Danisco Choozit Acid-set cheeses such as Rawson Brook Farm will bloom and then subside, and the cheeses will slowly dry and begin to mature under the influence of the mold. Rennet-set cheese Rennet is often the word used to refer to a number of enzymes that are used in cheese making. The primary enzyme, chymosin, may be extracted from the abomasum of kids, calves, or lambs. Microbial rennet is manufactured by microorganisms. Some plant-degrading cellulases have been used in specific traditions that these plant-derived coagulants are not as valuable as animal or microbial rennet. Rennet is available in single and double-strength concentrations and liquid, paste, and tablet forms. Refer to the package for dosage rates. Because it is higher in solids, sheep's milk requires about 25% less rennet than cow's or goat's milk. To make a tome-style cheese, warm milk within the range of 88˚F–96˚F and inoculate it with a different mesophile culture such as Danisco Choozit .圣莫特兰（white mold). Ripen the milk to 102˚F. At this point, turn off the heat and continue to slowly dry and begin to mature under the influence of the mold. This can be a warm mechanical room in the winter, or a shaded corner of a house in the summer. At the end of the fermentation, the curd will have a lactic yogurt aroma and will have contracted from the walls of the vessel. If these characteristics don’t present themselves, the curd likely needs to acidify further before draining. Insufficiently acidified curd will not drain properly.

Work gently with the curd when draining it. Either scoop the curd into a wet cloth or nylon in a cheese-making sack (a clean thin cotton pillowcase can also work), or gently ladle the curd into perforated cup-like cheese molds. Allow the curd to drain for another six to 12 hours. If working with cheese molds, flip the cheeses two or three times during the draining period to result in an evenly shaped and drained cheese.

Salt the resulting cheese with kosher flake salt such as Diamond Crystal. Salt fresh spreadable cheese at a rate of one or two teaspoons per pound of cheese. Like all cheese-making steps that happen as time passes and microorganisms act, the home processor has the luxury to study and care for cheese as it ripens or explore different yogurt cultures with curiosity.

Sanitation is very important when working with milk. Boil equipment prior to use to help yield more consistent outcomes. Always boil cheesecloth or other fabrics before use. Keep ripening areas clean by protecting cheese from dust and rodents. Ripening cheese will often host native molds. While these are not necessarily harmful, they can upset the intended outcome. It is up to the processor to determine what is or is not acceptable in terms of appearance and taste. With freedom comes responsibility.

Facts

• 1 gallon of milk = 8.6 pounds
• Pasteurization temperature: 135˚F for 15 seconds
• A time of 20˚F for 10 minutes
• Yogurt process temperatures: 135˚F for 15 seconds
• Acid-set cheese process temperatures: 180˚F for 10 minutes
• Lactic-set cheese incubation temperature: 75˚F
• Age individual lactic-set cheeses at 90% relative humidity and 60˚F
• Age tomme-style cheese at 95% relative humidity and a temperature of 55˚F

Resources

Dairy Connection/Get Culture https://www.getculture.com

Brent Wanser manages the Sustainable Food & Agriculture Program at Williams College. He made cheese professionally at Sprout Creek Farm in Poundkispskie for four years and made goat’s milk cheeses in Austria and Belgium. His forthcoming book, The Cheese Professional: A Guide to Understanding, Selecting, and Serving Cheese, explains the relationships between cheese qualities and cheese making processes.

Fournier Farm: An Organic Success Story

by Jack Kittredge

Swanton, Vermont, is about as far northwes...
The Natural Farmer

Summer, 2015

B-11

Earl sports his Stonyfield Yogurt hat

told me. ‘He wouldn’t pay. But now he’s gone organic and is paying right up front. So there must be something in that!’”

Earl began his transition in December of 2003, when the National Organic Program had more lenient rules, trying to attract dairy farmers into the program. At that point the 80 percent/20 percent rule was in effect, which meant that feed had to be at least 80% organic and could be as much as 20% conventional. This helped a lot for farmers that were buying in grain as feed, which Earl was.

“We didn’t grow corn even when I was conventional,” he relates. “We had problems with birds, it took a lot of chemicals and herbicides, it was a lot of work, and I just didn’t want to bother with it. I didn’t feel it was worth the effort on a farm this size.”

When he was feeding conventionally he estimates the cows’ ration was probably 50% concentrates and 50% grass. Using that level of concentrates did make more milk, but entailed more expensive inputs. Now he has dropped the level of concentrates, which he raises on the farm, by almost half. Currently the ration is 72% forage and 28% concentrate, on a dry matter basis.

The dairy now averages 20,000 pounds of milk per cow per year. Most of them are Holsteins, but a few are Jerseys and some are crossbreeds.

Since he converted to organic, Fournier says, there hasn’t been much fluctuation in organic milk pricing.

“I’ve been on it since 2004,” he explains, “and the price dropped only one year. In 2009 we were under a quota, because the economy went down the tubes, but we got paid the same price. This year it went up $3 per hundred because there is a shortage. That is because last year conventional prices were at a record so not many people are converting now. It takes a whole year for the cows to be managed organically before the milk is organic, so they have to be fed 100% organic for that year. That is an expensive period. The handlers will give you a couple dollars per hundred out of their pocket for the transition year, just to help you out. The last couple of farms that transitioned that I know about sold their cows and brought in organic ones so they wouldn’t have to wait that year. But the land still has to be three years out of chemicals.”

Organic management has resulted in important physical results for the cows, Earl asserts. “There is no doubt they are in better health now than when I was conventional. I probably have one cow with a little bit of foot rot, rarely do I see any laminitis now, an infection in the hoof. It comes from stress and high starch rations. Too much of a fluctuation in the rumen pH from that starch load — that is one of the major causes of it. That and too much time on concrete. Some of it is genetic but the majority is caused by the environment. Rarely do I see any laminitis now.”

He used to have to trim feet, but says he has some cows that have been on the farm for three years and he hasn’t had to trim them. That health also comes from a high forage ration.

Overall Fournier feels Organic Valley does a good job marketing his milk.

“They are pretty committed to their members,” he observes. “But it is a balancing act. It is a business. Even though it is a co-op and we own it, that business still has to make a profit. We walk a pretty fine line. But I think they do a good job of being a co-op. They are never going to be 100% what everyone wants. They are a business and have to make some decisions for the business. They have to compete in the marketplace and have quality people working for them. I’ve been a part of many co-ops and I think Organic Valley has done a better job as a co-op than St. Albans here, or the DFA (Dairy Farmers of America).”

Right now Earl’s milk is going to several places for processing. One is Oneida, NY. A fair amount goes into Stonyfield, too. But the co-op has a new creamery where they process 100% grass-based milk.

“The grass milk gets a premium,” he explains. “It has to be based on 100% grass or forage feed. No grain. You can use molasses or minerals. In the winter it would be hay or silage – hay silage, not corn silage. There are some people who are doing grass milk successfully, I hear. The key to it is the forage and the quality of the forage. Having enough land to grow all that forage is essential. Production is less on grass, for sure, but depending on the quality of the forage it might not be that much less. I can envision Holsteins, well managed on good forage, making fourteen or fifteen thousand pounds of milk a year. I think that is possible.”

Fournier doesn’t have enough land to do 100% grass-based milk. He would have to either reduce the herd size or get more forage. When he did the numbers he concluded that they would have to reduce the herd size by at least 25% to have enough forage. But he didn’t really gain that much by doing it. It was a break-even proposition.

“I was figuring organic corn at $550 a ton,” he explains. “The difference is for our production per cow — we might be a little bit of an outlier. In the winter I’m feeding 12 pounds of grain per day. Most of that is corn. I don’t buy any soybean meal because our forage has plenty of protein in it. I use a little barley and some flax seed meal because the Omega 3 levels are good for cows.

“We’ll average in the tank from 60 to 70 pounds of milk per cow,” he continues. “But if we were making only 45 or 50 pounds, that 12 pounds of grain would make the numbers quite different. Then we might want to go grass only. The premium is four dollars per hundred weight for grass. And the base price for straight organic milk is $35.05 right now. So the grass premium is about 11 or 12 percent.”

Pasturing

In order to run a dairy based largely on pasture, Earl keeps close eye on his soil fertility. The farm was on a nutrient management plan before going organic and their yields of forage dry matter are essentially what they were then. The only thing that was used before which was stopped by going organic was urea. But he feels they haven’t lost yield because of that. Instead, they are using more minerals such as sulfur or boron, which weren’t being used much before.

“One of the first things we do for our soil,” Fournier relates, “is test it. With cows you have plenty of shit, and manure is one of our big assets. We try to utilize that based on the soil test. We use wood ash for potassium and trace minerals, and poultry compost. We add some approved sulfur and rotate our forages. If the yield drops in a field we’ll plow it up and plant maybe Sudan grass and graze that.
till in some winter rye in the fall, and reseed it the following spring. Or we’ll plow it later, in September, plant triticale in it, graze that off in the spring and then reseed it. We have this rotation now where we don’t leave the soil bare. We are always growing something in it. Our organic matter is getting higher now. It runs about 5%. We probably renovate a pasture every 7 years, on average. Grasses start running out and native ones come in. Clover starts dropping down. We do still use some alfalfa.”

Ideally, Earl shoots for a mix of about 50/50, grass and legumes, to keep the nitrogen up. He uses rye grass, festulolium, some fescues – a mix of different varieties. He returns all their manure to the fields. A pit collects everything from the main barn as well as the bred heifer and dry cow barn. What build-ups in the calf and yearling heifer barns in the winter is not exactly composted, but is piled up and ages. Although he doesn’t continuously turn it, the manure and bedding mix does heat up and break down quite a bit. He uses that on land that doesn’t get any liquid manure out of the pit. Or he uses it on fields he is going to seed in the spring – he puts the rye in and then covers it.

“Our forage runs an average of about 60% grass and 40% legumes,” Fournier says. “That is good for cows. It doesn’t cause excess growth because they have plenty of effective fiber going into them. They are digesting it – their rumen is working the way it is supposed to. They have plenty of bacteria in there, breaking down the stuff. It doesn’t build up any acid in the rumen so you don’t get that effect on their feet, which is a major problem with conventional operations.”

The farm’s cows have an average dry matter intake of 52 pounds a day. So it takes a lot of forage to feed them, even allowing for feeding 25% grain.

“It takes, on good ground, maybe one and three-quarters acre to feed a cow year round,” Earl relates. “That’s an average that takes in hay and pasture both. A lot of people say that smaller cows are more efficient on grass. They have less bodies to main-

The milking parlor on Fournier Farm can handle 8 cows at once.
The year before he transitioned, Fournier bought two Jersey heifers. He has kept all the heifers they got out of them, and is transitioning slowly over. He thinks they are efficient little cows and last a long time.

Pasture Management

Fournier Farm has 80 milk cows on 238 acres, close to 200 of which are tillable. Fournier rents another 70 acres. No matter what the breed, he says, the big trick in transition is getting enough adequate forage.

“And on pastures,” he sighs, “that is more of an art than a science. Judging it is not like putting it all in a mixer, testing it, and knowing what you have going into them. I figured I needed 25% more forage and actually needed 32% more. That is the key thing – you need enough. You can buy some dry hay from out west, but it is $450 to $500 a ton by the time you get it here. I have bought in baleage, but it is hard to find good quality organic. Finally I found another 30 acres to rent.”

Fournier puts his cows out on new grass after every milking. They have movable fencing and move it twice during the day. It’s not a hard job, he insists, but it has to be done every day – if you want to maximize that dry matter you have to manage it. You can’t just let them out on 30 acres and expect you are going to get maximum dry matter into them. There has to be plenty of it, and of high quality.

“I like to see a pasture at least 8 inches tall,” he says. “I don’t mind 10 or 12, really. And it is better for the grass if the cattle don’t graze in the same spot all the time. You have to stay in your pastures and manage them. You want to keep them moving and don’t let them go back to where they were until it is ready. It’s really the only way to do it if you want to make any milk.”

Another advantage of grazing, he points out, is that he is using his equipment less. “We don’t have to harvest as much forage. In the summertime the cows are out there grazing. That’s a big savings right there. You are out there in a little four-wheeler instead of a 150 horse power tractor. It’s a lot cheaper that way.”

Earl, himself, had to learn a lot about grazing when he converted.

“The first year we went back to grazing was tough,” he recalls. “The cows weren’t used to it, they were spoiled. They just hung around the gate and waited to come back in. We weren’t used to it, either. I think I broke down first, let them in. Being a conventional farmer I had a different mindset. When we harvested hay we used a mower. So that was what I was looking for – that mown look. I expected these gals to go in the field and when they came out it would look like it got mowed.”

“But Sarah Flack came down for a visit,” he continues, “and said to me: ‘You know, Earl, you need to give them more feed.’

“I said: ‘I can go out there and open that gate, but I can tell you those cows aren’t going to come to this new field. They’re not done.’

“She said: ‘Well, go out there and try.’

“So I did. I opened that gate and they all came running. After that I was pretty much all set. They were just hungry. I was trying to starve them enough to eat that, but that is not the way to do it. The second year we went out there with more determination and it was better. Things have turned around in these 10 years.

I asked Fournier how about forage plants that the cows don’t like to eat. If they are not eaten or cut, won’t they spread?

“Sometimes I do have to clip pastures,” he agrees, “because there is some stuff in there that needs to be clipped down. Especially in the early part of the spring some of that is going to get by you because it is hard to keep up with it. You are better off a couple of times a year if you have to clip it, just do so. If you don’t it is going to get too mature. You can leave it, but I find it works best if you clip it down and then you are set of the rest of the year. You don’t have all those seed heads hanging around.”

Farm Viability

Earl is proud that the farm recently won the Dairy Farmers of America (DFA) quality award for the northeast. It was based on the milk’s low somatic cell count, indicating that the cows are in excellent health. They are milked twice a day in a double four herringbone-style milking parlor which has four milking stations on each side using a low-line vacuum system. One person can milk all the cows, but usually there are two, one working on each side. During the season the cows go right back out onto pasture.

It takes about a hour and forty-five minutes to milk the 70 cows, Fournier says. Most will come in on their own in the summertime because they want to get back out, but in the winter he usually has to get some of them who might be lying down.

Once a cow has exhausted her milking life, she is still a valuable asset.

“These girls weigh 1200 to 1400 or even 1800 pounds for one of them,” says Fournier. “There is a good market for bulls, started by Organic Valley. They make hamburger, but pull out some of the loin as well. Things are pretty good in the organic meat market right now, I guess it tracks the economy in general.”

Although the farm is financially stable for now, Earl wants to pass it on to his sons. That entails some planning.

“I want to make sure my wife and I have a reasonable retirement,” he says. “We have a house down the road and will stay here. Then I want to be sure the boys aren’t overburdened with debt. It is not easy to make sure the next generation can make it on a small farm. At this size it should work, but you have to think about the cash flow and what things might be expanded to generate more income. I try to keep the labor at a minimum and have a reasonable amount of time off. The farm would be over-extended taking on another venture unless one of the family wanted to do it. Each generation has to make a decent living.

“I don’t plan on many changes,” he continues. “We just have to get the paperwork done. All the tax laws for passing the farm along are hard. They tell me it is worth a million and a quarter, so it is not as simple as I thought it would be. The economics are tough, but I’m selling the development rights on about 90 acres.

Fournier is encouraged that so many young people are interested in coming back into farming. He tries to stay up on the latest ideas affecting his operation, reading a lot and attending a lot of meetings. Jerry Brunneti, who just passed away, was at the farm once as a consultant. He gets Grazge magazine, reads the NOFA-VT newsletter and The Natural Farmer, and works with consultants from NOFA-VT and Vermont Organic Farmers.
The Economics of Organic Dairying

by Ed Maltby

In the early days of the organic label, there was the enthusiasm of creating a new type of farming, which some saw as an alternative to the mainstream corporate chemical agriculture, and there was an ability for these pioneers to make a reasonable living from organic dairy as the buyers they were working with understood the economics of organic dairy and were eager participants in its growth. Now the two national brands that effectively set the pay price view organic dairy through the lens of a corporation or a traditional cooperative where the interest of the company/cooperative precede those of the farmer, rather than working together. Organic dairy has matured and there is the need to think about how to attract the next generation of organic dairy farmers who may not want to work seven days a week; who see good health insurance as an entitlement; vacations and the ability to send their children to college a necessity; and to have enough profit to establish a retirement fund that is not based on selling their land and livestock.

The organic milk market has grown dramatically in the last fifteen years and now represents approximately five percent of total domestic dairy sales. From 2000 to 2005, the growth was within a community of processors and farmers where everyone knew each other and understood the challenges that each faced. There were tensions at different times, especially when Horizon tried to lower the pay price and farmers got together to stop them, which resulted in the formation of the Northeast Organic Dairy Producers Alliance (NODPA), but it was generally a question of pioneers working together to expand the market. With the growth of organic dairy and the introduction of a more corporate and confrontational relationship between processor and farmer and between the buyers, the reality of the multimillion dollar market has settled into a more traditional agriculture framework. Large scale organic dairying has the economics of scale to survive better when the pay price is lower; small to mid-size operations struggle to survive in that scenario.

US processors of organic milk have seen tremendous growth in the last ten years. CROPP with its Organic Valley brand is the largest organic dairy cooperative in the US and is currently at around a billion dollars gross income from milk, meat, vegetables and eggs with 1 employee for every 2 member owner farmers. WhiteWave Foods, owner of the country’s leading brand of organic milk, Horizon Organic, has increased its sales of Horizon Organic branded products by 8% over 2014 sales and has created a very diverse company, including plant based beverages (‘milks’), which is why its stock has rallied more than 100 percent since it was spun-off by Dean Foods some two and a half years ago. Stonyfield Farm (actually not a farm) is now owned by Danone and has record sales. Despite these successes, there is currently a shortage in organic milk supply, and competition for supply has been characterized as a “feeding frenzy for organic milk”. And, in 2013 and 2014, we had organic dairy farmers leaving organic milk production quicker than new operations were starting up; we had an increase in imports of organic beef and milk powder; and soaring competition for supply from grass based labels – that pay more for milk from farms that follow forage and grass based rations protocols than was being paid for organic alone.

Supply and Demand

Currently, the supply of organic milk is not keeping up with demand. To understand why this has happened one must look at a number of different areas that are common to many organic commodities. Pay price and lifestyle are two important components at play. No business can exist unless it is paid enough for its products to cover its costs of production, overhead costs, family living expenses and return on equity that allows debt service and money to be plowed back into improving the land and infrastructure of the farm, a central tenet of organic production. Lifestyle is a very important factor for farmers choosing to farm organically and certify under the

B-14  The Natural Farmer  Summer, 2015

Despite higher organic milk pay prices in 2012 and 2013, net farm return was significantly less than in 2006 to 2009. This is because costs of inputs went up during the later period.

Despite monthly fluctuations, increasing demand over the last 7 years is pretty clear.

Since 2006, the farm share of a half gallon of organic milk has risen by almost a third.
How is Pay Price Determined?

Pay price is primarily set by demand for organic milk, which is influenced by the economic sustainability of organic farming. Without adequate demand, farmers can not pay the owner a reasonable wage for their work. In the past, the NODPA News by saying, “What does the future hold for our farmers?” To supply that brand, HP Hood aggressively sought to supply organic milk under the Stonyfield Farm brand. Historically, farmers’ pay price increases when consumer demand for organic food increased. “So, it just started to respond belatedly and raised the pay price in 2014 to take effect in 2015. How Grass-Fed Milk is Changing the Pay Price Dynamic

In 2015, there are many factors that may affect the pay price for organic milk. What makes the situation different in 2014-15 is the increase in demand for grass-fed or “grassmilk” and the strength of regional demand for organic milk in the northeast and the west. There are both organic and non-organic grass-fed brands that require dairies to feed no grain and only certain energy supplements. To qualify for the ‘grassmilk’ programs farmers need to satisfy the individual buyer’s requirements which change from buyer to buyer. Organic and non-organic dairy farmers are already not feeding grain because of their choice of production methods. Cooperatives can and do make the switch ingrassmilk and are subject to change by the buyer. Organic is the only third party certified program that has been what check-off programs have done. Organic Certification: Integrity of the National Organic Program

Organic is the only third party certified program that is based on federal law and regulation. This makes it unique in a market place that is inundated with natural and other undefined and non-verified claims. The requirements of the program are seen as too prescriptive by some. Organic farmers do not usually have a Quality Assurance employee to monitor their NOP compliance. That job falls to the farmer. Some of the requirements are standard contracts that detail the farm work over the previous year and your plans for the future. You record herd health and the media is focused on any health problems. If you used some herbal remedies or vaccines you would have first checked with the certifier that what you were using was approved by them. There is no central list of what can and can’t be used in organic production and certifiers vary in what they allow. Your written plan will be documenting what is plain common sense and required by the contract. However, the contract will allow you to feed grass during the growing season. You will take your inspector on a tour of the farm so be able to see if you are doing what you have put in writing. The inspector cannot advise or point to solutions, only ask for explanations for failure. Then you, the farmer, pay the cost of the certification in order to ensure that the consumer will trust your product.

For many dairy farmers organic certification saved their farms. Bob Parsons noted in his January article in Farming the stuff that organic has provided a saving lifeline to Vermont’s small scale dairy farmers. In discussing what organic methods are doing they would not be in business today if they had not had the option to go organic. “Going organic involves changing many aspects of production practices, herd health care and record keeping. It also means that certified farmers have to protect the integrity of the organic seal to preserve its place in the marketplace which is so essential, especially to those who can only market the product wholesale. Organic dairy farmers can never match the subsidized prices of the mass market dairy as their farm inputs costs are 25 to 40% higher. Producers must be able to have to allow for the time spent meeting the requirement of organic certification.

Organic dairy farmers are well aware of what the consumers wants and will pay for. They didn’t want antibiotics to be used at all in dairy production to preserve the integrity of the organic label and they can do so without any use of antibiotics in organic production and some are allowed in growing organic tree fruit in the USA. Organic dairy farmers learned new production methods that allowed them to ensure that all organic dairy animals were grazing pasture, it was the organic dairy farmers that imposed some very prescriptive regulations in the face of trying to keep the milk supply to processors and the larger organic dairies. Farmers reacted when a few dairies were ignoring the prohibiting requirement that the dairy was feeding grass. They were producing large volumes of organically certified milk that undermined the market and threatened to devalue the integrity of the organic seal. In what many see now as too prescriptive, farmers insisted...
Quality Goat Cheeses Fulfill an Agricultural Dream

The Does Leap Dairy Story

by Jack Kittredge

Northern Vermont has always had a special appeal to the rugged among us. Winters there are not casual; one has to be prepared for isolation, cold, self-reliance. Good jobs are not plentiful. Besides the school and town, employers tend to be small and frugal. Yet the benefits of settling there are many.

George holds a Does Leap 5 pound chevre cheese, which comes in a plastic container.

Land is relatively less expensive than it is farther south, and the less attractive marks of civilization – power lines, billboards, railyards, strip malls, pipelines – are fewer and farther between.

It was to Bakersfield, about an hour northeast of Burlington, that George and Kristin Van Vlaanderen turned in 1997. They had just finished grad school in the University of Maine Sustainable Agriculture program in Orono, Kristin’s family was from Fletcher, the town of mostly hillside, wooded land was available for a price that wouldn’t break the bank. They had a dream.

“We had decided on goat cheese way back then,” George recalls. “We knew nothing about farming or goats or cheese making when we started, but we had taken agriculture courses (laughs). We identified Burlington as our main prospective market and decided to look for land within an hours drive from Burlington.

They moved the yurt they had lived in at school on the land and set up housekeeping. In the early years they made use of their masters degrees by teaching school while building the goat cheese business.

“The first 5 to 6 years we didn’t make any money on the farm,” sighs George. “It was so complex – making a product, managing the goats and the pastures, marketing. You know, it is infinitely complex and getting a handle on it, especially the financial part of it, is hard. Our production efficiency wasn’t very good – it took us a long time to make a product. The product has always been very good, but our cheese has improved since we started out. We have always had high quality milk. But the nuances of producing a product economically and productively and getting it to market in a profitable way are complex. And they make such a big difference.

“It is an ongoing process, learning,” he continues. “We made a ton of mistakes. We rebuilt our entire cheese facility because we didn’t do it correctly the first time and the second time and the third time. There are going to be mistakes.”

The Does Leap 5 pound cheese is a part of the producers’ network of sustainably produced goats and cheeses, some of which are specialty products, others are more conventional. The Does Leap 5 pound cheese is a part of the producers’ network of sustainably produced goats and cheeses, some of which are specialty products, others are more conventional.
first time. We didn’t understand the functions! Our cheese room used to be half of what it is now. And our goats were housed in the other half! When we got ready to do it right we increased the size of our cheese room and thought a lot about flow so all our products come out and go right into the fridge, and then we back our truck or car up here for deliver- ies.”

In addition to the 130 forested acres they bought initially, five years ago the couple picked up a small farm next door and added its 25 acres, plus a farm-house which now houses their employee. That new acreage, plus 10 or 15 more acres which they rent, is open land, enabling them to begin making their own hay.

Finding the right mix of land for their operation is a challenge for George and Kristin. Most of their original land is still forested. George logs it with horses in the winter and sells saw logs besides putting up 20 to 30 cords of firewood for themselves. Generally he leaves the stumps in so as to not disturb the soil profile. In 10 or 15 years they rot anyway, he says. The coppicing stumps create good browse for a few years, as well. George uses pigs to help clear land he timbers. The animals have relatively small paddocks and are moved every 5 to 7 days. They help renovate a lot of the more marginal land by de- poziting their manure. The couple then goes through with a chain harrow to smooth the manure and then seed the area.

Getting the mix right between grass and browse is not easy.

“Seventy to eighty percent of our goats’ diet is from grazing,” George states. “The balance is grain. Of course in the winter that 70 to 80% is hay, although in the summer they get no hay at all. They rely then on grass and browse. Most goat dairies have a lot more confinement and just a few acres of pasture. But we probably have about 50 acres between browse and hay. Maybe we have 40 acres of really open land, and 25 of that we make hay from.

“In general you can say that goats are browsers,” Van Vlaanderen continues. “But we found that they really like variety, which is what we manage for. So for us that includes browse and straight grass. We have different paddocks and it is a constant man- agement thing to shift them around depending on the temperature, how much shade is in a paddock, what we feel they might need. If we put them on grass straight through they would, of course, eat it. But they would get bored and go for browse if they could.”

The pair don’t ever plant forage. They have straight grass meadows from which they take hay. But the browse areas are full of saplings, raspberries, goldenrod, forbs, whatever comes up. George and Kristin have to be careful not to overgraze a pasture because the goats will kill the browse, eventually, and transform it to grass. So they manage their pas-
tures accordingly. Since the goats have preferences for certain plants, and will tend to eat those things, they are kept in small paddocks.

“We use portable net fencing within the perimeter of high tensile fencing,” George explains, “so we can make paddocks on demand. They are not fixed. Depending on the time of year and the stocking den- sity it changes the size of a paddock. We use poultry manure and spread lime, of course, for fertility. And we compost our manure and use that.”

When the Van Vlaanderens started selling cheese they hadn’t yet figured out what their best markets were. They tried everything. They started off doing 4 or 5 farmers markets, but found that the fees and time involved were not always a wise investment. They also signed on with a distributor in Vermont and New Hampshire, Black River Produce. While the company did a nice job for them, it was painful to sell wholesale when the margin took almost half the value off the top of the sale.

“While selling through Black River,” recounts George, “we were also continuing to do our own distribution locally to stores and restaurants in Burlington. But we found that we couldn’t meet the demand for both. In 2007 or 2008 we decided to make the break from Black River. Our goal was to move all of our milk into the Burlington area.”

But when they dropped distribution by Black River, the pair found demand was sometimes not enough to take all their cheeses. Rather than come up with new cheese varieties, they thought a better strategy would be to develop another, non-competitive prod- uct using their milk. So instead of coming up with new and different varieties of cheese they decided to
Dairy employee Melanie Shaw holds a quart of Does Leap kefir.

As a result of the process of analyzing the best strategy for distributing their products, George and Kristin paid a lot of attention to how they used their time. They found that transporting product outside of Burlington was a real costly idea.

“We only deliver to the Burlington area, now,” George says. “If there is a CSA outside Burlington that wants our cheese they have to pick it up at the Burlington farmers market. We have several farms that do that. It takes time and money for us to expand our delivery area.”

Another time sink was weighing and packaging wholesale cheese. While the CSA cheeses are individually packaged, stores and restaurants buy Does Leap soft cheeses in bulk and repackage them with labels supplied by the pair. George feels that being careful about these little uses of their time have made a big difference in their efficiency. Many dairies go with a straight eight, rather than a double four. But that is much less efficient because you have to get all 8 goats up and done before you let them out and bring new ones in. But one person can handle a double four, if he or she is moving – you prep them, do the iodine dip, strip them, wipe them, get machines on, go over to the next side and do the same thing so you are milking four of them, then you do the next and also get grain ready for the next set, transfer the machines over, let this group out and bring new ones in.”

The does get a fresh paddock of grass and browse at least every 12 hours, after every milking. The bucks have a separate grazing operation. In the summer they go with a straight eight, rather than a double four has hugely increased our efficiency. Many dairies go with a straight eight, rather than a double four. But that is much less efficient because you have to get all 8 goats up and done before you let them out and bring new ones in. But one person can handle a double four, if he or she is moving – you prep them, do the iodine dip, strip them, wipe them, get machines on, go over to the next side and do the same thing so you are milking four of them, then you do the next and also get grain ready for the next set, transfer the machines over, let this group out and bring the next ones in.”

Goat cheese is made pretty much like other cheeses, says George: “There are different styles with goat cheese, but the process is the same: you heat the milk up, add bacteria and rennet, process the curd in various ways depending on the style of cheese. There is as much variability between goat cheeses as between goat and cow cheese. Culture and rennet, milk up, add bacteria and process the curd.”

As a result of the process of analyzing the best strategy for distributing their products, George and Kristin paid a lot of attention to how they used their time. They found that transporting product outside of Burlington was a real costly idea.

“We only deliver to the Burlington area, now,” George says. “If there is a CSA outside Burlington that wants our cheese they have to pick it up at the Burlington farmers market. We have several farms that do that. It takes time and money for us to expand our delivery area.”

Another time sink was weighing and packaging wholesale cheese. While the CSA cheeses are individually packaged, stores and restaurants buy Does Leap soft cheeses in bulk and repackage them with labels supplied by the pair. George feels that being careful about these little uses of their time have made a big difference in their efficiency.

The couple started out with Nubian goats which, as between goat and cow cheese. Culture and rennet, milk up, add bacteria and process the curd in various ways depending on the style of cheese. There is as much variability between goat cheeses as between goat and cow cheese. Culture and rennet, plus the time it ages make all the difference.

“Our biggest seller is chévre,” he continues, “which is a soft, spreadable, fresh goat cheese. It is cultured for a 24 hour period, strained for another 24 hours, then packed. In contrast, we do a couple of raw milk hard cheeses that are cultured and renneted in a four hour period, then are put in a mold where they don’t mature for 2 to 6 months. So each cheese has its own process. A raw milk cheese needs to be aged at least 60 days. We don’t pasteurize for hard cheeses because the raw milk flavor is so much better than those made from pasteurized milk. Raw milk is a better product. There is also a lot less time and energy for using raw milk. It takes four hours to pasteurize a big batch of milk like that.”

Goat cheeses are an add-on, which people can choose to have put in their bag on a regular basis as either a weekly or bi-weekly share of cheese. Does Leap kids are separated right after birth, but do drink goat milk. It is pasteurized before they get it, however, because the farm is on a caprine arthritidesencephalitis (CAE) prevention program. CAE is a viral infection that is very prevalent in goats and and is just starting to be recognized as something that commercial dairies should be aware of. Some of the farm’s early goats had positive CAE tests, but showed no clinical signs of arthritis conditions. Nevertheless, that is why the kids are separated at birth and given pasteurized milk – to help control the disease.

The farm has a “double four” milking parlor system that enables one person to milk 8 goats at a time. The goats come into a central pen then, attracted by a scoop of grain, enter the parlor through an inside door. The milker has a device enabling him or her to milk two goats on each side.

“We are pretty busy,” George asserts, “prepping, dripping, stripping, and wiping them, then putting the machine on two of them before we then go to two over on the other side to do the same. We used to go with just a straight four, but having a double four has hugely increased our efficiency. Many dairies go with a straight eight, rather than a double four. But that is much less efficient because you have to get all 8 goats up and done before you let them out and bring new ones in. But one person can handle a double four, if he or she is moving – you prep them, do the iodine dip, strip them, wipe them, get machines on, go over to the next side and do the same thing so you are milking four of them, then you do the next and also get grain ready for the next set, transfer the machines over, let this group out and bring the next ones in.”

The does get a fresh paddock of grass and browse at least every 12 hours, after every milking. The bucks have a separate grazing operation. In the summer they go with a straight eight, rather than a double four has hugely increased our efficiency. Many dairies go with a straight eight, rather than a double four. But that is much less efficient because you have to get all 8 goats up and done before you let them out and bring new ones in. But one person can handle a double four, if he or she is moving – you prep them, do the iodine dip, strip them, wipe them, get machines on, go over to the next side and do the same thing so you are milking four of them, then you do the next and also get grain ready for the next set, transfer the machines over, let this group out and bring the next ones in.”

Goat cheeses are made pretty much like other cheeses, says George: “There are different styles with goat cheese, but the process is the same: you heat the milk up, add bacteria and rennet, process the curd in various ways depending on the style of cheese. There is as much variability between goat cheeses as between goat and cow cheese. Culture and rennet, plus the time it ages make all the difference.

Our biggest seller is chèvre,” he continues, “which is a soft, spreadable, fresh goat cheese. It is cultured for a 24 hour period, strained for another 24 hours, then packed. In contrast, we do a couple of raw milk hard cheeses that are cultured and renneted in a four hour period, then are put in a mold where they don’t mature for 2 to 6 months. So each cheese has its own process. A raw milk cheese needs to be aged at least 60 days. We don’t pasteurize for hard cheeses because the raw milk flavor is so much better than those made from pasteurized milk. Raw milk is a better product. There is also a lot less time and energy for using raw milk. It takes four hours to pasteurize a big batch of milk like that.”

As a result of the process of analyzing the best strategy for distributing their products, George and Kristin paid a lot of attention to how they used their time. They found that transporting product outside of Burlington was a real costly idea.

“We only deliver to the Burlington area, now,” George says. “If there is a CSA outside Burlington that wants our cheese they have to pick it up at the Burlington farmers market. We have several farms that do that. It takes time and money for us to expand our delivery area.”

Another time sink was weighing and packaging wholesale cheese. While the CSA cheeses are individually packaged, stores and restaurants buy Does Leap soft cheeses in bulk and repackage them with labels supplied by the pair. George feels that being careful about these little uses of their time have made a big difference in their efficiency.

The couple started out with Nubian goats which, as between goat and cow cheese. Culture and rennet, milk up, add bacteria and process the curd in various ways depending on the style of cheese. There is as much variability between goat cheeses as between goat and cow cheese. Culture and rennet, plus the time it ages make all the difference.

“Our biggest seller is chèvre,” he continues, “which is a soft, spreadable, fresh goat cheese. It is cultured for a 24 hour period, strained for another 24 hours, then packed. In contrast, we do a couple of raw milk hard cheeses that are cultured and renneted in a four hour period, then are put in a mold where they don’t mature for 2 to 6 months. So each cheese has its own process. A raw milk cheese needs to be aged at least 60 days. We don’t pasteurize for hard cheeses because the raw milk flavor is so much better than those made from pasteurized milk. Raw milk is a better product. There is also a lot less time and energy for using raw milk. It takes four hours to pasteurize a big batch of milk like that.”

As a result of the process of analyzing the best strategy for distributing their products, George and Kristin paid a lot of attention to how they used their time. They found that transporting product outside of Burlington was a real costly idea.

“We only deliver to the Burlington area, now,” George says. “If there is a CSA outside Burlington that wants our cheese they have to pick it up at the Burlington farmers market. We have several farms that do that. It takes time and money for us to expand our delivery area.”

Another time sink was weighing and packaging wholesale cheese. While the CSA cheeses are individually packaged, stores and restaurants buy Does Leap soft cheeses in bulk and repackage them with labels supplied by the pair. George feels that being careful about these little uses of their time have made a big difference in their efficiency.

The couple started out with Nubian goats which, as between goat and cow cheese. Culture and rennet, milk up, add bacteria and process the curd in various ways depending on the style of cheese. There is as much variability between goat cheeses as between goat and cow cheese. Culture and rennet, plus the time it ages make all the different.
Summer, 2015

Between the fresh and the aged, Does Leap makes a Camembert, which is aged about three weeks. That has to be pasteurized, of course. They measure out and package the cheese by hand. They sell chèvre, their most profitable variety, in 5 pound packs, feta in 3 pounds, and also do 5 gallon buckets of chèvre.

The hard cheeses are seasonal. In the winter the farm has more milk than later in the season because the markets are better in the summer – the CSA, farmers market and seasonal restaurant demand all factor in – so George and Kristin use some of the winter raw milk to start cheeses that will be ready in the summer.

George is proud that their goat operation and cheeses are organic, but is not sure the market cares that much: “We certify our cheese because we believe in organic agriculture, but I’m not sure the majority of consumers care too much if it is organic. It is not that big a deal for them. It is now important to be local. Hopefully some day it will come around to being local and organic!

Does Leap kefir is not certified, but only because they use a pectin that is not approved for organic products. George feels that the pectin, a thickening agent which comes from citrus peels, makes a nice thick product. It is possible to make a cow’s milk kefir without pectin, he says, but not a goat’s milk one. They spent a lot of time experimenting with organic pectins, but were unable to find one that satisfied them.

I asked Van Vlaanderen if many of their kefir customers were attracted to it because of problems digesting cow’s milk. He didn’t think that was the case, however.

“They just try our kefir and love it,” he said. “It is competitively priced, about the same as Jack’s [Jack Lazor, a nearby farmer’s cow milk kefir]. Our plain kefir retails for $5.00 a quart, the maple for maybe $5.50. When you compare organic kefirs I don’t think we are that far off from Jack’s prices. Maybe he does pints and we do quarts. I don’t know exactly.”

Besides the kefir, George and Kristin have developed one other product which is a natural for a cheese making dairy farm – sausage. Sausage is the solution to three of their problems. One was the need to make more income from their participation in the Burlington Farmers Market, one was the need to market their goat culls, and the third was the need for using their whey, a cheese making byproduct.

“The sausage is some from culled goats,” he explains, “We process all them that way. But mostly it is from our pigs. We raise 26 or so pigs a year on our whey. I do three or four sausages from pork, and one from goats. The bulk of the sausage we serve is pork. The original purpose was to sell sausage from our goat culls, but when I started putting sausage on the grill at the farmers market it started selling well. So it is a business of its own. I get a nice crusty bun from a local baker and a local sauerkraut. People just love them. I haven’t had to give out a sample of sausage ever.”

The animals are slaughtered at an inspected state facility, as is required by state law. But the meat is frozen and shipped back to the farm where the Van Vlaanderens built a processing plant to make the sausage. Their license covers their taking an inspected cut and processing it into sausage.

“I grew up in New York city,” George recalls, “eating great sausages from Italian delis. We had our sausage here made at first by a commercial butcher. It was fine, but they used dried spice packs and made it in huge batches. People liked it fine, but I knew it could be better. So I started experimenting with my own recipes with fresh herbs. I’m super careful about keeping everything really, really cool. That is a big part of sausage quality. So all of my equipment is frozen before I use it and the meat fat that I grind is right at 33 degrees. The quality is great.”

The couple had 26 pigs last year, raised from feeder pigs purchased throughout the winter and spring. They are not ready to get a sow and boar and start their own breeding operation year round, however, and have been unable to find a source of certified organic piglets for their operation, so the sausage is not organic despite the fact that the pigs eat only organic grain. They are slaughtered in batches of 6 or 7 animals starting in the spring and continuing in 6 week intervals throughout the summer in order to serve Burlington’s 25 Saturday markets from May thru October. Seventy-five percent of the pork goes to sausage for sale at the farmers market (last year they sold about 2700 pounds of sausage there) with the rest sold as retail cuts.

All the whey for the pigs is gravity fed to a 55 gallon tank at the barn, and then pumped a quarter mile to wherever the pigs are. They have a moveable house, a grain feeder, and a whey feeder with two nipples. Since a cheese’s yield is anywhere from 10 to 20% of the milk used, there is a lot of whey left, which is perfect for pigs.

One of the ways in which the Van Vlaanderen’s operation shows most clearly the careful attention to detail they bring to it is their use of dogs. They have three breeds of dogs, each ideally suited for the particular job they do on the farm.

“We have a Maremma guard dog for protection for the goats,” George explains, “two border collies to herd, and a Jack Russell for rodent control. The Marremas do great with whatever livestock you have. The breed is from northern Italy and I think primarily were used with sheep. Ours never leaves the goats – she lives with them in the barn. If you came down here alone she would challenge you. They can be quite aggressive. We used to have a Great Pyrenees that was getting older and we actually lost four goats to coyotes. The Pyrenees are much more domesticated that these Marremas, I think. Anatolian Shepherds are also good. We found our Maremma in New Hampshire. She has been incredible. Coyotes are our main predator but we haven’t had any losses since then.

“The border collies,” he continues, “herd goats but are also good at getting pigs back in their fencing if one gets out. They are absolutely essential. I don’t think we could do what we do without them! And of course wherever there is feed there are rats, so the Jack Russell is invaluable.”

The dogs stay in with George and Kristin at night, except for the Maremma, who is always with the

The Maremma guard dog does an excellent job protecting the goats.
goats. She never comes inside. If they are all outside, George says, they get to barking together and the cacophony is too much. So the others come in at night.

Van Vlaanderen loves horses and has four of them for various purposes around the farm. The main team is composed of two bay Percheron-Belgian crosses. Then there is a Paint-Percheron cross as a relief worker, and a black Canadian which Kristin and their daughter like to ride.

“Parasites are a problem with goats, and they mostly reside in the first two inches of the grass. So part of our strategy is to size the paddocks so the goats aren’t forced to graze real tight and can just top graze. We then bring in the four horses as kind of the clean-up crew. They follow the goats and bring the grass down more. Horses and goats are each dead-end hosts for each other’s parasites, so it works well. We used beef cattle for years for that same function.

“The horses fit in well with our grazing situation,” George explains. “Parasites are a problem with goats. She never comes inside. If they are all outside, George says, they get to barking together and the cacophony is too much. So the others come in at night.

Van Vlaanderen loves horses and has four of them for various purposes around the farm. The main team is composed of two bay Percheron-Belgian crosses. Then there is a Paint-Percheron cross as a relief worker, and a black Canadian which Kristin and their daughter like to ride.

“The horses fit in well with our grazing situation,” George explains. “Parasites are a problem with goats, and they mostly reside in the first two inches of the grass. So part of our strategy is to size the paddocks so the goats aren’t forced to graze real tight and can just top graze. We then bring in the four horses as kind of the clean-up crew. They follow the goats and bring the grass down more. Horses and goats are each dead-end hosts for each other’s parasites, so it works well. We used beef cattle for years for that same function.

“I’m a huge proponent of draft animal power for small farms,” he admits, “but our main reason for having them is that I love horses, I don’t like working on a tractor! But if you take hay, I have maybe $2500 invested in all my haying equipment. The horse drawn mowers are from the 1940s, I have ground-driven rakes and an old baler. But they produce the equivalent of $5000 of hay per year. If you compare that to tractor drawn equipment, rotary rakes and so forth, you can’t get those economics. The scale of horsepower is very appropriate for small farms.”

He logged with a winch for years, but says he can log more efficiently with a team of horses than with a tractor and a winch. The hot water for the pasteurizer and the entire facility is heated by wood. All that is harvested with the horses!

George feels that their business is at a really good spot.

“A big mistake in a lot of cheese operations,” he warns, “is to grow, get more employees, more distribution, a bigger facility. I think you can get in trouble in that middle area, unless you get really big. My personal theory is that you have to have relatively low volume and high margin, or the opposite – high volume and low margin. That means be relatively small with your own distribution, or pretty big. That is not to say that you can’t be profitable in the middle area. But I think from an economic standpoint that is a tougher spot. We’re avoiding that by staying at a size where we can manage it ourselves, mostly. We’re profitable, we live comfortably, and there is no real reason to change that.

“Of course we were at that point 4 or 5 years ago,” he admits, “and I decided to add the sausage component on, just because it interested me. And I may continue to have side projects. But I think we are at a fairly good size. So we don’t aspire to become bigger so much as to become better managers in a finer system. When we started we were one of the first small scale cheesemakers in Vermont. There were a handful of others around, but very few. There was one other goat cheese operation, I believe, at that time. Now I think Vermont has the highest number of cheesemakers, per capita, in the country. So there is competition and it increases. Am I worried about it? Not particularly. I think we have a really good product and a dedicated clientele.”
Why I Raise Raw Milk, and Other Farmers Should Too

by Jerry Snyder

As a 12 year old boy, I found myself walking down the road ½ mile every weekday after school to my uncle’s dairy farm to help with the afternoon chores. In 1966 dairy farms of 20-40 cows surrounded the countryside where I grew up in Upstate New York. I was one of many young people who would learn to work making hay, milking cows, feeding calves, pitching manure, boiling sap, driving tractor, and all the other jobs required on rural American farms. My own father had milked cows on our farm until I was 5 years old, but he had 4 kids to feed and the price of milk dropped from $4 to $2/cwt. With the added requirements of installing bulk tanks (instead of the old milk can cooler), drinking cups, gutter cleaners, and a new milk house, he sold the milking cows and found more profitable work to support his family.

As I finished school and was looking for my own vocational purpose in life, I wanted to spend my working hours doing something that I believed in, something that would benefit my family, neighborhood and the free country that I was blessed to grow up in. My growing up years had been perfect, and I wanted my children to have the same opportunity to experience life in rural America, full of teachable moments working with Mom and Dad.

I was offered the opportunity to enter dairy farming as a college student studying Agricultural Business at Alfred State. My father wanted to set me up in business and show me the ropes. Dad and I worked together for 5 years milking 55 cows: growing all our own feed: corn silage, hay, ear corn, oats, and grazing the cows and heifers all summer. It was a dream come true: working with my parents, outdoors facing all the challenges of a herd of cows, crops, machinery, business decisions alongside a Father to show me how to make it all produce wholesome fresh milk and delicious meat, maple syrup, apples, etc.

All I lacked was a wife to labor with me; Dotty and I were married August 27, 1983. What a gift from heaven to spend a lifetime of happiness, raising seven boys and one girl; producing nourishing food to the masses.

When Dotty and I bought the home farm in 1983, we had been selling raw milk since 1978 when Dad and I started the dairy up again. In 2014 there were 4,950 dairy herds in New York State. Back in 1978 I would guess there were maybe twenty to thirty times that number of small dairies spread all over the countryside, with most supplying their own family, and a few neighbors who desired, raw milk. We had families from church, families from town as well as our own extended family drinking fresh milk from the bulk tank year round. In those years no permit was required and raw milk was not a controlled substance. Ever since man learned to milk cows there has been a demand for raw milk. Milk is nature’s most perfect food. Milk is what newborn babies long for and need to provide all the essential amino acids to build strong bodies.

I chose to be a dairy farmer because I believe in the nourishing power of milk. There are many beverage choices out there but milk is the most wholesome choice I know of. When I ask people why they drink raw milk the #1 response is, “The delicious taste”. They also answer that it is more nutritious as it has not been processed which alters some of the nutritive features of milk. Additionally, recent studies show that cows grazing grass produce milk and meat with a healthier Omega 3 and Omega 6 ratio and more conjugated linoleic acids.

The demand for raw milk was strong in 1978, but it was readily available with so many small dairy farms all over the country and no outside controls. Today the demand is growing rapidly as a recent survey estimates 10,000,000 people have consumed raw milk in the past two weeks. Many people are drinking raw milk and are also making yogurt, cheese, kefir, cottage cheese, ice cream, and butter.

In 2002 I became certified organic through NOFA-NY and started selling organic milk. We have a hill farm with heavy clay soils and at a 2300 ft. elevation the growing season is cool and short. Grass farming is readily adapted to these conditions so we graze animals all during the growing season and feed dry hay and baleage in the winter. It was relatively simple to change our farm from conventional milk production to organic. The main change was finding a source of organic grain and then just filling up paperwork. Change is not something that people like to do, but I have learned that if we don’t change our practices, our results will be the same as before. I have seen the limitations of commodity farming in America in regards to farm income. We as a nation have taken food for granted and the government has adopted a cheap food policy. This cheap food policy aligns well with the Committee for Economic Development’s goal: to grow our economy. Basically the government subsidizes the commodities: corn, soybeans, wheat, dairy, and cotton with our tax dollars, allowing the raw materials needed by processing and food manufactures to remain low.

Jerry’s cows on pasture, where they have a lot of room to roam.
Goats are part of Jerry's herd. Their milk is more easily consumed by some who are allergic to cow's milk.

This was still going on when my Dad and I started the dairy in 1978 and many farm auctions occurred in the area as farmer after farmer stopped milking cows and took off-farm jobs. The remaining farms added more cows and the trend continues today as America only has 45,544 dairy farms milking a total of 9,257,000 cows producing 206,046 million lbs. of milk. As this Industrial Revolution was changing our farms many new technologies were coming along to increase production; rbST was developed to increase milk yield and brought about the first major revolution of the consumer to the industrialized food system. Organic Dairy, which set specific regulations for milk production, was born out of the rbST issue.

Milk is a loss leader in the food industry with many stores selling milk below cost to get customers to purchase their groceries at that store. As farms become fewer and larger in scale, the retailing sector likewise consolidated. The old Mom and Pop's grocery store in town has disappeared and now we have super Walmart's selling groceries as well as a few larger chains or grocery stores.

Consolidation and mergers have gone on in cooperatives, processors, and retailers to the point that the consumers of today have very few choices outside of these huge food companies. The farmers also face fewer choices in the marketplace, which limits their profitability.

So why the increasing demand for raw milk today? Our food system has changed dramatically from the day when most families grew a garden and canned or froze their own vegetables. The local grocery store is gone and for many the local dairy farm is either gone or has 1500 cows and milks three times a day with a huge labor force. People are experiencing health issues and are often prescribed drugs for the rest of their lives to treat the symptoms of diabetes, auto-immune diseases, allergies, and the plague of obesity.

A majority of today's consumers want food that tastes good, is clean and wholesome, and will bless their bodies instead of detracting from their quality of life. Many consumers want to share some of the health benefits that come with organic food and look for shoppers with a variety of opportunities for farmers to market their products. As well as providing fresh milk to farmers who want to start a small dairy, but can't find a market for milk. It would be beneficial to have a market for their milk if they are not convenient to an existing truck route. We need to provide an opportunity for everyone who wants to make quality milk again. The sales in New York State of raw milk is a snapshot of what was in effect in 2010-2013. As long as people eat and drink there will always be demand for raw milk from healthy, grazed cows. How and where will this milk be available? The first hurdle to jump in selling raw milk is the laws of the state. These laws change from time to time but this is a snapshot of what was in effect in 2010-2013. After obtaining a license to sell raw milk I began to educate myself about the basic pathogens that are tested for by the NYS Dept. of Ag and Markets: Campylobacter, Salmonella, E-coli, Ecoli 0157:H7, Listeria monocytogenes, and Staphylococci. I read the "Untold Story of Milk" by Ron Schmid and learned more about the complex make-up of milk. Raw milk researchers in 1938 found two amazing enzymes that kill bad bacteria. Lacto peroxidase and Lacto fermentin is present in milk in different ways. Lacto peroxidase uses free radicals to destroy bad bacteria. Lactoferlin in milk takes iron away from pathogens and carries it through the gut wall into the blood stream. In 2004 the FDA approved Lactofeirin to be used to kill Ecoli 0157:H7 contamination in the meat industry.

I see real opportunity for small family dairy farms to once again thrive by direct marketing their products to the consumers. Joseph Heckman from Rensselaer, University wrote an article illustrating the economic potential of a twenty-cow raw milk dairy in New Jersey. The key is clean raw milk near a population large enough to support selling all your milk raw. As with any successful direct marketing venture you need large numbers of customers because fresh farm milk has a short shelf life. If the farm is diversified with other products you have a variety of products to offer more customers and provide alternate uses for milk. Cheese making and pigs are a natural fit for dairy farms.

As with any successful direct marketing venture you need large numbers of customers because fresh farm milk has a short shelf life. If the farm is diversified with other products you have a variety of products to offer more customers and provide alternate uses for milk. Cheese making and pigs are a natural fit for dairy farms. If you milked 20 cows in a grass based dairy and sold 20,000 gallons of raw milk at $5.00 per gallon your annual gross income would be $100,000. If you charged $7 per gallon your gross income would be $140,000. This exceeds the cost of 200,000 pounds of milk per day which may be difficult unless you are near a large population. You need about 400 customers buying 1 gallon per week. That's a lot of people to deal with and not all farmers are interested in marketing the product they produce. I am not suggesting that everyone sell raw milk, but I would like to share some information about the current conditions in the United States. Conventional milk producers are producing milk in 2015 at a loss. The price pay was up over $24.00/cwt in 2014 as a result of record exports and now is below $17.00/cwt, which is not enough for farmers with debt to stay in business.

Organic milk is experiencing growing demand and offers more stable pricing than conventional. Many times a small farm will experience difficulty finding a market for their milk or they are too far away from an existing truck route. We need to provide an opportunity for everyone who wants to make quality milk to have a market. I have had several people call that want to sell a small amount of milk to a local market again. The sales in New York State of raw milk are limited to the farm itself, so all consumers must drive or walk to the farm. I must say that the most rewarding part of selling raw milk is the relationships that develop with the neighbors.
and health issues such as diabetes and obesity. Nutritious food produced on a farm that stewards the land in a sustainable, healthy way for the animals and nourishes the people should be encouraged.

The economic opportunities in agriculture are huge, but at the same time very much limited by our food safety requirements. We have a raw milk permit and have sold milk for 37 years with no illness, yet are limited to on-farm sales only. Why would the government subsidize big business and limit small business under the food safety ruse? Let’s look at the potential gains awaiting a new approach to our food system. With over 3,000,000 acres of idle land growing golden rod and thorn brush in New York alone we could encourage families to grow food on the local level which would provide jobs, build strong families, grow our rural economies, improve the health of our people, allow better stewardship of our land and encourage small local businesses, butcher shops, markets, and strengthen communities.

For many years our society has chosen the ever-widening path of cheap food, increased dependency on government debt and empty promises. Today people are choosing the narrow path of healthy food, returning to family values and the growing demand for raw milk. People’s willingness to go out of their way to find it is the beginning of a new food system based on quality, freshness, health, and a relationship with the farmer who is willing to explain his methods of production, connecting the consumer directly to the stewardship of the land. Consumers voting with their dollar will bring us to the place where many small, family dairy farms producing high quality milk will again be supplying their community with nature’s most nourishing food. We have been told repeatedly by the media that raw milk is dangerous. “The lie is but for a moment, but truth endures forever. All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.”

Arthur Schopenhauer.

We are about to enter the third stage with raw milk and perhaps GMOs too.

I have great hope for the future and hope American consumers recognize the power of their vote expressed with each dollar spent on food. Where you buy your food will determine the food system of the future. It’s time to choose who you will serve.
Cheese and kefir-maker George Van Vlaanderen stands with some of his Alpine dairy goats at Vermont’s Does’ Leap Farm.

This newspaper contains news and features about organic food and farming in the Northeastern US as well as a Special Supplement on Organic Dairying.