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Pasteurization and its discontents: Raw milk, risk, and the reshaping of the dairy industry

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PASTEURIZATION AND ITS DISCONTENTS: RAW MILK, RISK AND THE RESHAPING OF THE DAIRY INDUSTRY

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ABSTRACT

Milk is something many Americans consume every day, whether over cereal, in coffee or in a cup; as yogurt, cream, cheese or butter. The vast majority of that milk is pasteurized, or heated to the point where much of the bacteria in the milk dies. Pasteurization both slows spoilage of the milk and eliminates potentially harmful bacteria. The fact that we call heat-treated dairy simply "milk" is a testament to pasteurization's widespread proliferation over the past century. Prior to the 1900s, "milk" was raw and unheated, and pasteurized milk was a radically new technology. My research delved into understandings of dairy in both the present and the past, looking in the first chapter at Vermont farmer resistance at the advent of pasteurization, and in the second at consumer resistance to pasteurization in the present time.

A century ago, the dairy industry was in flux, facing pressure to change due to population shifts and rising demands. In lieu of food that could be traced to a neighbor or to a farm on the other side of town, urbanization meant that food could travel hundreds of miles before it reached its destination — Vermont farmers could now send their fluid milk to the Boston and New York markets. Once milk got to the city, however, it was often riddled with bacteria and untraceable to its source. Cities and states struggled to regulate the safety of milk coming into their area. In 1908 the Vermont legislature passed a pasteurization law in an attempt to curb the spread of bovine tuberculosis, but farmers and creameries simply refused to follow it and the state legislature was forced to repeal the law two years later. Despite pushback to pasteurization, however, pressure from the cities forced its adoption, pushing the expense onto the middleman processors and distributors. This, in turn, helped to drive consolidation and bring about the dairy industry as we know it today — an industry that many interviewees in my present-day research felt was deeply flawed.

My second chapter focuses on raw milk consumers in Vermont. Those on each side of the raw milk discussion make broad — and sometimes dire — knowledge claims regarding the values and risks associated with consumption of the substance. Advocacy groups, agricultural associations, and various governmental authorities all voice divergent opinions regarding the safety and health benefits of raw milk consumption. As such, consumers navigate these contests of voices when deciding whether or not to drink raw milk. Yet raw milk consumers are not simply passive recipients of governmental, advocacy and media messaging, but rather consumers making rational decisions based on research, experience and values. In examining how raw milk consumers understand their actions and decisions, I bring this perspective to bear on the larger discussion of the risks and benefits of raw milk consumption.

My investigation of the historical and present context of raw milk shed light not just on the subculture of those who choose to drink raw milk, or on the small group of farmers who fought back against pasteurization in 1909. It revealed common refrains over the course of more than a century, repeating patterns and, I hope, a lens through which to view the nuance and shifting possibilities in other issues in the food system, both past and current.

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INTRODUCTION

Milk is something many Americans consume every day, whether over cereal, in coffee or in a cup; as yogurt, cream, cheese or butter. The vast majority of that milk is pasteurized, or heated to the point where much of the bacteria in the milk dies. Pasteurization both slows spoilage of the milk and eliminates potentially harmful bacteria. The fact that we call heat-treated dairy simply "milk" is a testament to pasteurization's widespread proliferation over the past century. Prior to the 1900s, "milk" was raw and unheated, and pasteurized milk was a radically new technology.

My research delved into these understandings of dairy in both the present and the past, looking at Vermont farmer resistance at the advent of pasteurization, and at consumer resistance to pasteurization in the present time. For my historical research I used both primary sources, including news articles and state agriculture reports, and secondary sources; for the present-day research I used interviews conducted with Vermont raw milk drinkers.

At the turn of the 20th century, milk could be a dangerous substance. The caloric and nutritional qualities that made it a convenient and cheap staple also made it a fertile breeding ground for bacteria, particularly over the time required to transport the milk from the farm to growing urban populations. Pasteurized milk shifted from the exception to the norm as urban health officials and populations increasingly demanded it: Though heat treatment didn't guarantee clean milk, it did drastically reduce bacterial content and, by extension, foodborne illness.

Meanwhile, shifts in the American population were in turn shifting the American relationship to food. By the early 1900s, the majority of the population lived in cities, drawn by the promises of new opportunity and the allure of jobs that paid better than subsistence farming. On-farm mechanization meant that fewer and fewer Americans needed to farm, and a smaller number of farmers were responsible for feeding those urban mouths. Rural farmers were now beholden to remote urban populations and faced increasing economic and regulatory pressures as a result. Rural pushback to this new economic order was strong and persisted over the course of several decades, playing out in smaller dramas at town meetings and statehouses across the country. Vermont farmers were increasingly at the mercy of the Boston and New York markets, which demanded more food more cheaply to feed a growing population.

Those farmers did not take the new demands lying down. The Vermont legislature mandated pasteurization of butter byproducts in 1908 in an attempt to prevent farm animals from consuming bovine tuberculosis-laced milk. Farmers decided not to follow what they felt was an unnecessary and harmful regulation, collectively agreeing to pay the fines of any creamery that got in trouble for disobeying the law. Two years later, the legislature repealed the law.

Both nationally and in Vermont, people raised questions about whether pasteurized milk was actually healthy, whether pasteurization was simply a way to disguise milk that was old or of poor quality, and whether there were better ways to reduce foodborne illness. Pasteurization was just one of many options presented, and

ultimately it was one — albeit prominent — of the many measures put in place to ensure a safe, clean milk supply.

Fast-forward to today: Despite the fact that pasteurization is very much the norm, a small — and in Vermont, growing — subset of the population seeks out unpasteurized milk, often seeking to renegotiate the producer-consumer division that redefined the food system in the 20th century. The sale of raw milk is legal in some form in about 30 states, though in all cases purveyors of the substance face stringent restrictions on sales. While governmental authorities strongly discourage the consumption of raw milk, a recent University of Vermont study found that 11 percent of the state's population had consumed raw milk at least once in the past year. Interviews with Vermont raw milk drinkers in the fall of 2013 revealed themes parallel to those prevalent in the early 1900s. Consumers chose to drink raw milk because they felt it has health qualities that pasteurized milk does not, that it supports farm practices that purchasing pasteurized milk from the grocery store shelves does not, and that it more directly puts dollars back into the local economy. But consumers also noted the direct relationships they had with dairy farmers and other raw milk consumers that formed a network of trust, transcending the regulations. The consumers were rejecting the regulations formed in the early 20th century to protect urban consumers who had become distanced from the farms. They could see the farm and the cows their milk came from, so they trusted its products — in many cases, consumers said they trusted that milk more than milk from the grocery store shelves, of unknown and distant provenance.

Public health agencies and raw milk critics often frame raw milk consumption as retrogressive — attempting to recreate a structure of food system that no longer exists, disregarding scientific and medical evidence that supports pasteurization. But alternately, the choice to drink raw milk questions a public health narrative that's often framed as universal and a historical context that's framed as inevitable. Raw milk drinkers assert that there are possibilities and priorities that don't come within the scope of pasteurization requirements. And in fact, the historical lens reveals that pasteurization was not a singular, inevitable outcome, but one of many possible health interventions to curb dairy-borne illnesses. Some options, like pasteurization, the adoption of bulk tanks, the renovation of milking parlors, caught on. Other options, like certification of milk at each step in the supply chain or urban inspectors inspecting rural farms, proved too complicated. Ultimately pasteurization placed the least financial and structural burden on farmers and city governments. It allowed distributors that purchased raw milk and pasteurized it in large quantities to rid milk of bacteria— in turn accepting the risk if a consumer was sickened. This structure became the mainstay of a highly centralized system. Pasteurization was just one part in that shift, accompanied by other structural and regulatory requirements; for Vermont raw milk consumers, however, the concept of pasteurization serves as a catch-all for a systemic critique of the larger dairy system.

My investigation of the historical and present context of raw milk shed light not just on the subculture of those who choose to drink raw milk, or on the small group of farmers who fought back against pasteurization in 1909. It revealed common refrains over the course of more than a century, repeating patterns and, I hope, a lens through

which to view the nuance and shifting possibilities in other issues in the food system, both past and current.

MILK AT A TURNING POINT: BOVINE TUBERCULOSIS AND PASTEURIZATION IN EARLY 20TH CENTURY VERMONT

INTRODUCTION

Today pasteurized milk is just "milk" in the United States and in much of the world; "raw" milk, which has not been heat-treated, is the anomaly. Yet this was not always the case — in fact, for most of history, milk was only raw. The germ theory of disease emerged in the late 1800s, transforming disease from an act of fate or circumstance to an occurrence that could be traced back to its origin. Shortly afterward, Louis Pasteur discovered that by heating liquids, he could slow spoilage and eliminate disease-causing germs (Latour, 1988).

By the early 1900s, pasteurization technology had been available for some 20 years, but much of the milk produced in the country still reached the consumer in its raw form. The switch to predominantly pasteurized milk happened within some ten years near the turn of the century, brought on by an increasingly urban population and the food safety concerns raised by shipping milk long distances to the cities. Urban populations demanded milk from the country on the grounds that it was fresher and cleaner than milk produced on the periphery — that it was closer to nature. And the late 1800s brought the invention of refrigerated train cars, allowing milk to stay fresh for longer in its travels from the farm to the consumer. Yet as those trips got longer, one cow's milk was transferred from container to container and mixed with the milk from any number of other cows. In fact, the long hours the milk spent on the farm, then in transit, then sitting

in an urban milk distributor's office before being delivered to its final destination made the milk highly susceptible to disease (Smith-Howard, 2013).

Urban public health officials, faced with rampant levels of tuberculosis and typhoid, scrambled to trace the cause of these diseases. Governmental and health experts disagreed on how to solve the problem — and, even more basically, opinions on what the problem was. Eventually, urban governments and public health experts came to the consensus that they would champion pasteurization of milk, which in turn set the dairy industry on a course of consolidation and industrialization. Yet during those years of transition, pasteurization was far from the only solution put forth by those concerned for food safety. New technologies, particularly those related to food, often face mistrust and opposition before being fully adopted. Pasteurization was no exception. As pasteurization emerged as the preferred option in towns and municipalities, it faced a great deal of pushback from rural and urban parties alike.

To complicate matters, the U.S. government had virtually no role in regulating the food system. States had food regulations mainly concerning trade and taxation, but the federal government had taken no stance on matters related to food. The spread of bovine tuberculosis in rural areas pushed state governments to step into a regulatory role, pushing both to test cattle for the disease and to pasteurize. Local and state officials struggled to rein in the spread of a disease that was killing cattle and, some believed, spreading to humans (They were, in fact, correct) (Olmstead & Rhode, 2007). Following years of new testing and sanitation requirements, Vermont's legislature in 1908 attempted to slow the spread of bovine tuberculosis with pasteurization, but their attempts to impose

new regulations sparked resistance. The new law required that all skim milk and buttermilk (both byproducts of butter, one of Vermont's major exports at the time) be pasteurized. The law primarily addressed the milk products that farmers took back to the farm to feed their animals, in an attempt to prevent the disease's spread from one animal to another. In 1909, when the law went into effect, farmers collectively decided that they would not be adhering to the law, since they believed pasteurized milk was hazardous to the health of their animals ("Creamery Men to Ignore Law," 1909). The resulting pushback was so strong that in 1910, the legislature repealed the law ("Tubercule Bacilli in Butter," 1912).

Yet testing requirements continued to get more stringent, and soon Boston and New York demanded pasteurization for milk arriving within city limits. Rather than attempt to patrol farms with their own inspectors, taking responsibility for the public health crisis, cities chose instead to require milk to be pasteurized, banking on companies to purchase pasteurizers and begin processing farmers' milk. It was a change that rural political action had failed to prompt, which was driven instead by economic pressures from urban areas. These new regulations fundamentally changed the dairy industry and the producer's relationship to the consumer, driving the creation of ever-larger middleman companies that could take on the cost of the pasteurizer, aggregate large amounts of fluid milk and ship them to the cities (Dupuis, 2002). This push toward centralization continues to define the U.S. dairy industry today.

In this paper, I examine the new production pressures and the growing public health crisis that drove governments to search for a solution to the milk problem in the

early 1900s. I establish a literature background using primary and secondary source research, then present the information as a magazine-style article, with the aim of reaching a wider audience with my findings.

LITERATURE REVIEW

Pasteurization stands as a flagship of food safety advances in the early 1900s, but the move to widespread pasteurization was not the unanimous move toward technology that it might seem today. Instead, the movement to pasteurize milk came within the context of urbanization, rising milk consumption, a food system moving toward an industrial model, a growing public awareness of the role germs play in sickness, and governments negotiating their role in public health (DuPuis, 2002).

The late 1800s and early 1900s saw a rapidly changing U.S. population, as more and more people left small towns and rural homesteads to seek opportunity in the city. By 1920, the majority of the U.S. population — about 51 percent — lived in an urban area. That ratio was even higher in the northeast. 66.1 percent of the region's population lived in a city by 1900, rising to 75.5 percent by 1920. (U.S. Census Bureau, 1995).

This shifting population drove the rise of the "industrial garden" — rural and suburban farms dedicated to feeding an ever-growing urban population (Lanman, 2004, p. 19). Food for the city dwellers had to last long enough or be produced close enough to reach the city unspoiled. Food merchants sought out commodities that they could purchase and transport in large amounts, and offer many people at a cheap price. "Swill milk" operations fit that bill. These dairies sprung up on the periphery of cities, often adjoined by a distillery or brewery. The cows, living at very close quarters, ate the spent, fermented grain discarded by the brewing or distilling process (Wiley, 2011). The cows' ruminant stomachs did not take well to a diet of fermented grain, and they succumbed to

sickness and disease. Observers reported that the cows often had skin riddled with ulcers, and some had their tails rot off (Velten, 2010).

Meanwhile, a scientific discourse on food safety and germ theory was emerging, bringing bleak warnings: Elie Metchnikoff, head of the Pasteur Institute, estimated in 1912 that gastroenteritis killed some 10,000 children in France each year, and likely a higher number in the more populated United States (Levenstein, 2012, p. 7). Typhoid, cholera tuberculosis and other diseases ran rampant in New York and other U.S. cities, and infant mortality ran high, particularly among the urban poor. In the U.S. during the 1840s, half of all infants born in cities died before the age of five, while infants born in the country had much higher chances of survival. Among the causes were poor sanitation in cities, high poverty rates and low rates of breastfeeding (particularly among well-off families), but researchers primarily attribute high infant mortality rates in the early 1800s to the low-quality milk that many children drank (DuPuis, 2002).

Nutrition was also emerging as a science, however, and with it the idea that milk was the "perfect food," (DuPuis, 2002, p. 107). Contaminated as the urban milk supply was, nutritionists and public health officials heavily promoted the beverage because it contained high levels of vitamins and minerals. To some medical practitioners, it was the easiest and one of the least expensive ways to ensure that people were receiving these nutrients (Wiley, 2011).

In 1873, New York City banned swill dairies. Most cities followed suit and tightened restrictions on distillery dairies, clamping down on the poor feeding practices and requiring that farmers reconfigure their barns so the cows had more space. This

transition was expensive, however, and many urban producers went out of business. For the public, too, the image of the urban dairy was permanently marred. Demand moved to rural dairy farms, which were produced under no such tight restrictions and produced milk of wildly varying bacterial and cleanliness levels (Velten, 2010).

High rates of disease and expert warnings about milk quality inspired fear for many urban families, particularly those with children. Yet in the absence of "the reassuring personal relationships between sellers and buyers" (Levenstein, 2012, p. 3), the urban population had no way to trace their food back to its origin and no source of trust in their food system. Rather than interacting directly with the food producer, "the media now became their major source of information about the safety of their food" (p. 3). And as the issue came to the forefront, so did social reformers like Robert Hartley in New York, who spoke out for temperance, for the rights of the poor and against the swill milk operations. As he advocated purity of behavior, he also painted a picture of an idyllic, rural and "pure" version of the substance, which he described in his writings: "Being ready prepared by nature for food, it could at once be appropriated by the rudest savage, as well as the more cultivated" (Hartley, cited in DuPuis, 2002, p. 26). Indeed, milk was a perfect and complete substance that had the ability to reach across social boundaries and appeal to all.

At the center of this belief was the "rhetoric of the natural" (Jenkins, 2008, p. 87) — an idea that's still evident today in the idyllic landscapes plastered on the side of milk cartons and yogurt containers. Urban doctors at the time advised ill patients to seek out the healthful effects of the countryside, with its fresh air and sunlight. For those who

could not afford to travel, products of the country — including milk — were the next best thing. Though health officials soon realized that rural dairy farms tended to be far from clean and spacious, the idealized image of the country farm that many urban residents had was difficult to dispel. Instead, urban health officials took aim at conditions on the farms, using whatever means they had to influence conditions (Smith-Howard, 2013).

The Dairy Industry in Vermont

Dairy has anchored rural life in Vermont since the late 19th century, acting both as a major economic driver and a symbol of its rural nature. After the crash of the sheep market in the early 1800s, many Vermont farmers switched to dairying, and by 1900, the majority of the 32,890 farms in the state were dairy farms (Albers, 2002). The state quickly became world famous for its butter. By the 1890s, St. Albans had become "the butter capital of the world," and the state had gained recognition as far afield as Paris (Vermont Sustainable Jobs Fund, 2009). (Vermont Sustainable Jobs Fund, 2009). Butter and cheese were easy to transport long distances and had a long shelf life, allowing people to eat dairy products throughout the winter, when grass-grazed herds were dry and did not give milk. Even in the summer, when fluid milk was available, most people likely allowed it to ferment, sour and thicken, becoming a yogurt-like substance called "clabbered" milk. (DuPuis, 2002).

But competition from large farms in the western U.S. drove butter and cheese prices downward, and Vermont, with its small farms and limited land, struggled to keep its foothold in dairy. By the early 1900s, the state was still a prominent figure in the

national butter industry, but more and more farmers had turned to the fluid milk market, attracted by the constant and rising demand from the cities.

George Dunsmore, vice president of the Vermont Dairymen's Association, noted the change in his group's members at the 1908 annual meeting. "At the beginning our membership was composed mostly of butter makers and cheese makers, but times have changed until now the cheese maker in Vermont is almost an unknown quantity and our members are mostly private butter makers, patrons of creameries and condensed milk factories and producers of milk for the retail trade," he told the crowd. "The last named are increasing most rapidly, but we are still dairymen, all or most of us are milkers of cows, although some have come to the use of the milking machine" (Vermont Dairymen's Association, 1908, p. 28).

Dunsmore here was reacting not only to the changing markets of the Vermont dairy farmer, but to another major change in the industry: the recent push to mechanize. While milking machines were relatively new at the time, the push for dairy efficiency was a major one at the time. Many of the talks at the annual dairymen meetings during the early 1900s revolved around maximizing efficiency on the farm. Cow testing associations, groups of farmers that collaborated to monitor the milk output of their cows, were catching on, with 7 operating across the state by 1910 (Vt. Department of Agriculture, 1910). Within these associations (which were sometimes arranged as a competition), farmers would cull the cows with low milk output and replace them with more productive animals. A University of Illinois dairy husbandry researcher illustrated the effects of this type of selective breeding in a paper he presented to the dairymen's

association. He compared production of the best herds in Illinois and the lower-producing cows, and found that 25 of the best could produce as much milk in one year as 1,021 of the worst (Vt. Dairymen's Association, 1909, p. 32). The pressure to produce more milk more cheaply — again, in the service of markets that demanded ever-increasing quantities of fluid milk — pushed farmers to focus on producing more milk per cow and keeping more cows.

Urban Markets Demand Milk

By the 1880s, a relatively new railroad infrastructure brought brand new refrigerated railcars into New York and Boston from the surrounding states, opening up new markets for rural farmers far outside of a metropolitan area and effectively replacing the swill farm (Wiley, 2011). Farmers who lived near the railroad depots found themselves in an enviable position: they could, without much additional transport, access markets for their milk that were many times larger than those in the rural communities in which they lived. Officials in New York noted in 1910 that more than 40,000 farmers up to 400 miles away in six states were shipping their milk to the city (DuPuis, 2002, p. 46). This new infrastructure led to changing demands on the dairy industry. Fluid milk had never before been the primary goal of the U.S. dairy industry: Since fluid milk didn't keep, most milk was processed into butter or cheese before widespread refrigeration. The demand for fresh, fluid milk was relatively recent, and "began amidst the grit and grime of 19th century cities in Northern Europe and North America" (Wiley, 2011, p. 45).

Now, milk from Vermont, upstate New York, Massachusetts and Connecticut was flowing to New York and Boston, and shifting urban/rural ratios were beginning to shift

the traditionally powerful role of the farmer in politics, with urban America quickly gaining ground. With the population shift came a re-imagining of rural America's role with respect to the cities, as "urban publics proclaimed that the farmer's role was primarily to provide inexpensive food to the urban populace" (DuPuis, 2002, p. 70). And as farmers raised production and shipped more milk, it became clear that as the shipping distance and time to destination increased, so did the opportunity for adulteration. Swill milk was no longer an issue, but children and adults were still falling ill and dying from the milk. In 1912, the New York Times wrote of milk, "it has well been called the most valuable and the most dangerous food" ("Germs and Polluted Water," 1912).

So urban public health officials, seeking to curtail urban illnesses at their source, turned to the rural. Cities across the country demanded that dairy farms and creameries implement a variety of safety measures: farmers had to pass routine sanitation inspections, testing for bovine tuberculosis and bacteria levels, or install new equipment (Velten, 2010).

Where the federal government had failed to step in, a web of regulations on town, city, county and state levels attempted to fill in. Milton Rosenau, who in 1912 penned one of the most comprehensive summaries of the struggle for clean milk, offered some insight into this sometimes contradictory web of regulations. In *The Milk Question*, he presented an example of a rural Massachusetts dairy farm providing milk to Boston. The farm would have been visited by a state milk inspector, a Boston Board of Health inspector, and county or town health authorities. If the farm sold its milk to a contractor, that contractor would also send an inspector to the farm, and if that contractor in turn also

sold the milk to New York City markets, the dairy farm would also be subject to inspection by authorities from that city. “Even two inspectors are confusing to the farmer, but more than two are ruinous,” he wrote (1912, p. 181). Where city health departments did not have the legal authority to inspect rural dairies, as when the milk crossed state lines, they instead created a strong economic incentive for producers to agree to an inspection. Cities issued licenses to dairies that they had deemed clean enough, and simply declined to license or purchase milk from those farms that refused an inspection (Smith-Howard, 2013).

It wasn’t only urban interests that were concerned about milk safety. Farmers who supplied the cities struggled with the knowledge that at some point along the way, their milk was becoming contaminated. They were now disconnected from their primary market, completing transactions through a middleman — a creamery, a dairy cooperative, or an urban milk buyer. Yet at the forty-first annual Vermont Dairymen’s Meeting, W. F. McSparren of Maryland spoke to the gathered farmers about the ways in which they were all responsible for the safety of the food they produced:

> The question cannot be only will it pay us to make clean, sanitary milk as a fit food for the innocent consumer, fit for the food of the babe, for the invalid, but rather are we guiltless of wrong doing when we as nature’s agents, God’s middlemen, fail to do our utmost toward the conservation of the public health” (Vt. Dairymen’s Association, 1911, p. 50).

Farmers, then, were aware that their actions on the farm had major, sometimes deadly, impacts on the far-off populations they were feeding. Yet this connection

to the consumer was far from direct: The steps that milk took to reach urban populations were already so complex that the source of any tainted milk was difficult to trace.

Toward Milk Cleanliness Guidelines

Dairy farms in Vermont and across the U.S. faced increasing scrutiny in the early years of the 1900s, but the standards to which they were held varied widely depending on the regulating agency. Many of the milk laws on the books, particularly those in the cities, were geared toward consumer protection and seller fraud. States and municipalities required the Babcock test, which measured cream content in the milk. To prevent farmers or middlemen from adding water to the milk, milk buyers and governments established accepted levels of fat content, below which the milk was considered to be adulterated. The Pure Food and Drug Act of 1906 mandated ingredient labeling and aimed to halt adulteration of fluid milk with substances like formaldehyde and boric acid, which were often added to milk as preservatives (Velten, 2010).

The Pure Food and Drug Act was just one of a spate of food purity regulations the federal government put in place at the turn of the century. Beginning with federal meat inspection laws in 1891, the government began to take a greater and as-yet-unprecedented role in the regulation of the food system. Regulations like these served as intermediaries for urban populations that could not verify the contents or safety of the food they were buying far from the farm. Yet these same regulations drove consolidation in the industry. The pasteurization laws that eventually passed in all states drove small neighborhood milk distributors out of business, since they could not afford the

technology required to heat-treat milk. Laws requiring dairy farms to have bulk tanks and cement floors pushed smaller farmers out of business, too. Even as cities reaped the tangible health improvements brought on by a safer food supply, new food safety regulations helped to push small farmers and distributors to go big or get out of the business (Levenstein, 2003).

In 1912, however, the need for food safety regulations was just beginning to become clear as dairy products were blamed for more and more illnesses and deaths. The bacterial problems in the milk supply manifested in the very look of the milk, too. One need only glance through Rosenau's "Dirty Milk" chapter to get some idea of the variability of milk available: he described the bacterial growths that could lead to blue or red milk, bitter or fermented flavors, and textures that were slimy or ropy (Rosenau, 1912).

One strategy for insuring milk safety was the scorecard: inspectors would travel to each farm with a card and evaluate its appearance, cleanliness and certain farm practices. For creameries, a higher score often allowed a farmer to receive higher milk premiums. Creamery scorecards often included taste factors in addition to the general farm cleanliness factors. Professor Ivan C. Weld, Assistant Dairyman of the Dairy Department in Washington, D.C., outlined the qualities of high-scoring milk to the Vermont Dairymen's Association meeting in 1908. Qualities included flavor and aroma, low acidity, and the conditions of the milk cans. Faults included bitter, silage, manure or weedy taste, lumpy or frozen milk, or foreign matter (Vermont Dairymen's Association, 1908).

Certified Milk

One system that brought together many of these standards was certified milk. A New Jersey doctor had pioneered a system in 1894 by which inspectors tested milk for bacterial content at every step along the way, from the cow to the city distributor. This system, performed under the auspices of medical milk commissions that were established in cities across the country, guaranteed consumers clean and tested milk at a premium price — which ranged from two to four times as expensive as regular, non-certified milk (Velten, 2010). In addition to the milk inspection, medical milk commissions set stringent rules for dairy farmers related to on-farm cleanliness and herd management.

In 1912, Rosenau called certified milk "the very best, the very freshest, the very cleanest, the very purest, and the very safest raw milk that it is possible to produce" (1912, p. 141). Block (2002) wrote that the center of the conflict was:

> A clash between faith in personal connections and faith in technology. Advocates of certification believed trust would best be gained by having an elite group of doctors closely supervise a group of carefully chosen and regulated dairies. Advocates of pasteurization believed trust would best be gained by relying on new scientific methods which cleaned the milk itself, forming a protective wall between consumers and untrustworthy farmers" (p. 25).

Certification never became widely popular, in part because of its price. At a meeting of Vermont dairy farmers in 1910, one speaker noted that whole milk was seven cents per quart (pasteurized milk would have been about one cent more) and certified milk was 15 cents a quart — more than twice as expensive (Vermont Dairymen's

Association, 1910) At its peak, it made up less than one percent of all the milk sold in the country — and despite the price, the low bacteria count did not altogether rule out infectious disease (Velten, 2010, p. 83). For many years, however, certification also served as an argument for those who opposed pasteurization: it was a system in which the milk was clean from its production all the way through to the customer. Many feared that pasteurization was only a superficial bandage on the problem of clean milk: if it could render any milk safe to drink, what incentive did farmers have to produce clean milk in the first place?

But in 1914, when inspectors found bovine tuberculosis in the herd at a large farm that produced milk for the New York and Newark markets, people paid attention. Here was a farm doing everything right — it produced certified milk using state-of-the-art equipment — and yet its cows were "receptacles of disease" (Smith-Howard, 2013, p. 30). Outbreaks like these sounded the death knell for certification as a viable alternative to pasteurized milk.

Pasteurization Meets Resistance

Still, pasteurization faced strong opponents in the early part of the 20th century. The federal government continually rebuffed calls to enact regulations regarding milk, since there was, as yet, limited precedent for federal government intervention into matters of food safety and public health, and the government was reluctant to interfere with the increasingly powerful dairy industry. Further, Harvey Wiley, chief of the U.S. Bureau of Chemicals, argued — publicly but with questionable factual backing — that pasteurization depleted the milk of its nutritional qualities (Wiley, 2011). Wiley's was not

an unusual argument. Some reacted to the milk's taste, which many described as "cooked" — many conflated pasteurization with sterilization, in which the milk was heated to a higher temperature for a longer period of time, resulting in a flavor that was very different from the original raw milk (DuPuis, 2002; Rosenau, 1912). Some expressed concern that, along with a depletion in nutritional quality, pasteurization also would "devitalize" the milk, killing not just the pathogenic bacteria but also beneficial bacteria. Some at the time advocated a "sour milk cure," using raw milk that had been allowed to sour as medicine. Proponents believed that by overwhelming the bacteria causing the sickness, the beneficial bacteria in the milk would help restore the invalid's intestinal health. (Velten, 2010)

On the farm, many also had doubts. When E.S. Brigham, a St. Albans dairy farmer, discussed the "Opportunity Open to Private Dairymen in Supplying Cream to the Home Markets," he discouraged farmers from installing pasteurizers. "It is not the best because heating the cream to the proper temperature of pasteurization reduces its consistency, and it is not best from the standpoint of the public health," he said (Vermont Dairymen's Association, 1908, p. 41). Others expressed concern over the cost of pasteurization technologies, particularly given public demand for milk as a low-cost, highly nutritive staple. Farmers already faced a price squeeze to produce milk cheaply and boost their margins, and adding a host of new technologies to the mix was bound to put stress on the farmers, the consumers or both (Jenkins, 2008).

Bovine Tuberculosis: A Threat to Humans, Too

As the 19th century drew to a close, bovine tuberculosis was emerging as a major issue among the nation's cow herds. Symptoms of the disease were gruesome but took years to develop, and during those years cows could pass the disease along not just to other cows and other herds but also to humans. Interstate cow trade and increasing herd sizes helped the disease to spread even further (Smith-Howard, 2013).

By 1890, scientists had developed a tuberculin test. They injected a small amount of the disease into a cow and, a short time later, observed the injection site and took the cow's temperature. If the injection site showed a skin reaction or the cow's temperature increased, the cow had bovine tuberculosis. The test was groundbreaking for its time, but the road to adoption of the test was anything but smooth. The very concept of injecting live tuberculosis bacteria into a seemingly healthy cow seemed threatening (Olmstead & Rhode, 2007).

Others objected to the cost of the testing and the cost to farmers whose herds were found to be carrying tuberculosis. Many state governments pursued policies mandating the killing or isolation of cows that tested positive. Some states, including Vermont, put in place payout programs to incentivize the testing, with farmers being paid a portion of the market value for each infected cow that was slaughtered. Many of these state laws were so aggressive as to seem draconian, particularly before the tuberculosis test was widely accepted. Vermont's incentive program was relatively generous, paying out $79,626 to hundreds of farmers between 1906 and 1908 — an expenditure that governor Fletcher D. Proctor said seemed to be the highest in the nation (*Journal of the Senate of*

the State of Vermont, 1908, p. 626). By 1922, the state had spent $357,168 over four years compensating farmers for their sick animals, and the federal government had contributed $250,567 (Special Committee on Bovine Tuberculosis Control, 1922, p. 35).

A 1908 editorial from the *St. Albans Messenger*, reprinted in the *Middlebury Register*, expresses frustration with the "hundreds of thousands of dollars out of the State treasury" that had gone to voluntary programs that paid farmers for diseased cows. Instead, argued the editorial, if the state mandated testing of its herds and completed a one-time payout to those farmers whose cows tested positive, it would once and for all eradicate bovine tuberculosis among its herds. Failing this, the editorial concluded, "the only successful substitute will be the higher law of an educated public opinion that will positively refuse to buy an ounce of beef or gill of milk taken from cattle that have not qualified under the tuberculosis test" ("Letter," 1908).

Yet even in those states that had payout programs for diseased cattle, the compensation was generally not enough to recoup the loss of productive and valuable cattle, and not all farmers were satisfied with the new testing regime. "In this hostile environment, dairymen saw the health regulations as unilateral mandates that raised production costs without providing adequate compensation" (A. L. Olmstead & Rhode, 2007, p. 12). Fueled by farmer pushback across the nation, Speaker of the House Edward Shurteff in 1911 headed up an investigation that, in a 2,000 page report, opposed tuberculin testing and pasteurization. The report came amidst a wave of legislative rollbacks on tuberculin test and pasteurization initiatives, victories for opponents of these

practices. Many of these cases eventually went to the courts, where most judges ruled in the interest of public health (A. L. Olmstead & Rhode, 2007).

The concerns of the tuberculin testing (and other vaccine) opponents weren't entirely unfounded. Dosing for vaccines was so imprecise at the time that some serums intended to vaccinate actually did infect the subjects. And the link between bovine and human tuberculosis was still not entirely clear, though research ultimately confirmed that infected cows could transmit the disease directly to humans (A. Olmstead & Rhode, 2004).

By 1917, it was clear that the state-by-state compensation system was not enough to fully address the bovine tuberculosis issue on a national scale. In a rare show of police force, the federal government embarked on a national inspection campaign to eradicate tuberculosis from every one of the country's dairy farms. Yet even through 1931 — when Iowa dairy farmers marched on the statehouse and blocked roads to prevent dairy products from getting through — some farmers continued to rebel against the new restrictions and expectations the government and processors were placing on their livelihoods (A. L. Olmstead & Rhode, 2007).

Nationally, however, the majority of farmers had fallen in line with pasteurization requirements. In Vermont, officials heralded the inspection and testing regime as highly successful; a special committee wrote a report for the legislature in 1922 detailing the large expenditures on tuberculosis eradication, but also noted that rates of tuberculosis within the state had fallen significantly since 1857, when 802 people or 2.55 people per

1,000, had died of tuberculosis. In 1921, only 239, or 0.68 per 1,000, died of tuberculosis (Special Committee on Bovine Tuberculosis Control, 1922).

Though the report's authors concluded that, "the bovine bacillus does not loom high as a menace to the public health of our state" (p. 28), they also noted that in the absence of milk that was guaranteed to be free of bacteria — a nearly impossible feat — pasteurization "protects against all infection that may, in spite of the greatest care, contaminate milk" (p. 27). The authors noted that Vermont was still far from pasteurizing its milk in full, but that the majority of milk that left the state was pasteurized before reaching the consumer. They said, "Pasteurization may seem an impossibility but when have Vermonters balked at any measure, when they were convinced of its value?" (p. 27)

Vermont was already far behind the urban areas on adopting pasteurization. In fact, Rosenau had advocated a similar strategy in 1912, when he urged pasteurization but stressed that heat treatment alone was not enough. "Pasteurized milk simply means heated milk, and is not necessarily synonymous with clean milk, good milk, or pure milk," he wrote (p. 188). He maintained that "pure milk is better than purified milk," (p. 189), and that the conditions under which the milk was produced were vital — that it was better to prevent the bacteria from developing in the first place than to correct it later. Still, given the demonstrated unreliability of urban milk sources, pasteurization was the best form of insurance at the time. "Until the health officer can assure us that it is perfectly safe to drink the milk raw, we should pasteurize it just as we should boil drinking-water that we know is liable to contain infection," he wrote (p. 191).

Philanthropist Nathan Straus had established milk depots in New York City starting in 1892, distributing pasteurized milk to low-income families. By 1910, he was operating 17 depots in the city and had founded or advised the creation of ones in cities around the country and the world (Smith-Howard, 2013). Larger milk distributors had also been pasteurizing milk since the early 1900s. Chicago in 1908 became the first city in the country to mandate pasteurization of all milk from farms where cows hadn't been tuberculin tested.

Though the city had wanted to mandate the tuberculin test, the state legislature, in response to farmer demand, had forbidden municipalities from mandating the test on milk. Thus, the first pasteurization ordinance mainly served as an alternate option, allowing the city to deal with farmers who did not agree to have their herds tested. Chicago's government did not mandate full pasteurization until 1916, becoming one of the last big cities in the country to do so (Czaplicki, 2007).

Back in New York, by 1910, officials generally agreed that the rise of free, accessible pasteurized milk at Nathan Straus's milk depots had been a boon for infant mortality. When a new milk depot opened in Washington, D.C. that year, a headline in the Washington Herald proclaimed, "Straus extolled as infant saver" (1910). That same year Straus closed his 17 New York milk depots due to persistent attacks against pasteurization by the New York Herald "Scientists are divided on the value of the pasteurized product and Mr. Strauss has met with much opposition from the more radical of those who do not share his views," noted an August article in the Burlington Free

Press ("Philanthropist Gives Up Pasteurizing Milk," 1910). Some argued that pasteurized milk negatively affected the nutrition of people, particularly children, who consumed it.

But the philanthropist's decision to close down the depots shifted the conversation. In September of 1910 the New York Times wrote, "It is not right that a private citizen should be asked to do at his own expense what the public health agencies should be empowered to do with the city's ample resources. A plan of enforced pasteurization, where inspection and certification are impossible, should be prepared at once in the form of an ordinance" ("Mr. Straus's Milk Stations," 1910). Sure enough, New York's pasteurization mandate passed in 1912 (DuPuis, 2002). Boston, San Francisco and several other cities followed within three years (Czaplicki, 2007). Many years later, in 1943, Burlington passed an ordinance mandating pasteurization, but by that point all of the milk sold in the city was already being pasteurized. Rutland followed in 1944 (Vermont Department of Agriculture, 1944).

In mandating pasteurization, cities effectively removed themselves from the inspection equation. Though cities and states maintained a role in insuring the safety of the milk supply, neither they nor the farmers had to foot the bill for the technological upgrades, shifting that cost to the distributor — thus further strengthening the development of the middleman processor in the dairy industry. This "industrial bargain" (DuPuis, 2002, p. 89) was the easiest option, but it set the scene for years of consolidation within the milk industry, as small processors struggled to meet infrastructure needs and merged with others. At the time, New York Agricultural Department officer Julius Moldenhauer noted that "A properly controlled consolidation of the city milk supply is of

equal benefit to producers and consumers" (DuPuis, 2002, p. 85). Yet as processor consolidation brought on by high capital costs and the ensuing increased market power for the larger processors also "made the milk industry increasingly oligopolistic and therefore increasingly able to pass on these costs" to the consumers, and to control prices paid to farmers (p. 80).

These changes had massive structural implications, but they also had symbolic ones. As Block (2002) noted, pasteurization represented a choice of technology over personal connections. The new system built around pasteurization pushed the gulf between producer and consumer ever wider — the milk itself now changed substantially between its departure from the farm to its arrival in the kitchen of the consumer. In the middle, the processor/distributor gained control of milk pricing. The frustrations rural farmers had felt over the price squeezes of the early 1900s continued to grow, with the dairy processors that now controlled milk pasteurization and distribution becoming ever more monopsonistic.

Some 90 years after pasteurization became widespread, a 2009 class action lawsuit against Dairy Farmers of America, Dairy Marketing Services and Dean Foods accused the dairy middlemen of conspiring to force northeast dairy farmers to sell fluid milk to the companies at prices they determined. The companies admitted no wrongdoing, but settled out of court. Similar lawsuits against the three compaies in other regions of the country yielded similar results (Astley, 2014). The highly centralized dairy system has given rise to many critics, among them proponents of raw milk sales. Vermont's legislature passed a law allowing on-farm raw milk sales, citing demand from

consumers and a desire to give dairy farmers a viable alternative to commodity markets — that is, selling to the middleman (Sawyer, Calderwood, Bothfeld & Perkins, 2010). That law, though controversial among state health officials, presented a small-scale reversal of the push to pasteurize in the early 1900s. In doing so, it also allowed consumers to re-bridge the distance from the producer imposed by the modern dairy system.

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ARTICLE

"No Attention Would Be Paid to the Law:" A History of Vermont Farmer Resistance to Pasteurization

By Andrea Suozzo

In May 1909, a note appeared in the *Middlebury Register*: "Pasteurized skimmed milk is killing off the calves and pigs in Barre and in other parts of the state."[1]

The statement appeared in the State News column, buried among notes about births, deaths and property transfers. Though brief, the note reflects very real tensions that farmers — both in Vermont and across the nation — were feeling.

At the time, pasteurization (the heating of milk to kill bacteria) was a new technology. It was just one among many solutions proposed to solve the burgeoning health crisis of unclean, disease-ridden milk. To some, it was the least appealing solution: systems of inspection, regulations on farm cleanliness and bacteria testing relied on technologies that weren't quite so newfangled, and they had less of an effect on the ultimate milk product. Despite the resistance, anyone who has purchased milk at the store in recent decades will know that pasteurization won out; the journey to pasteurization, though, was far from direct.

The roots of the growing public health tensions in the early 20th century lay in a growing American population that was shifting away from the farm while demanding more and more food. Throughout the 1800s and early 1900s people fled their small towns and rural homesteads to seek opportunity in urban areas. By 1920, the majority of the U.S. population — about 51 percent — lived in an urban area. That ratio was even higher

[1] No Title. (1908, November 27) *Middlebury Register* (p. 6)

in the northeast. 66.1 percent of the region's population lived in a city by 1900, rising to 75.5 percent by 1920.[2]

In those urban areas, tuberculosis, typhoid and cholera ran rampant. In the 1840s only half of all infants born in cities lived past the age of five — a much higher death rate than that of infants born in the country.[3] Though poor sanitation and high poverty rates were part of the problem, scientists soon fingered milk as the culprit in many of the illnesses and deaths in both rural and urban areas.[4]

The same nutritious, caloric properties that make cow's milk desirable to humans offer a feast to bacteria. Milk in the early 1900s did not have a consistent color, flavor or texture. By the time it had reached the consumer it might appear blue or red, taste bitter or fermented, feel slimy or ropy, or contain visible dirt.

Milton Rosenau, Professor of Preventive Medicine and Hygiene at Harvard Medical School, wrote in 1912 that milk "has been obtained of such viscosity that it could be drawn into threads ten feet in length and of such thinness as to be scarcely visible."[5] That same year, *The New York Times* called milk, "the most valuable and the most dangerous food."[6]

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[2] U.S. Census Bureau. (1995). Table 1. Urban and Rural Population: 1900 to 1990. Retrieved from http://www.census.gov/

[3] DuPuis, E. M. (2002)

[4] Levenstein, H. (2012). *Fear of Food*. Chicago, IL: University of Chicago Press.

[5] Rosenau, M. J. (1912). *The Milk Question*. Cambridge, MA: The Riverside Press.

[6] Germs and Polluted Water. (1912, October 27). *The New York Times*. New York. Retrieved from http://query.nytimes.com

Yet cow's milk was an inexpensive, convenient substitute for urban mothers who chose not to or did not have time to breastfeed. And for adults, milk increasingly offered a quick, inexpensive and nutritious part of the daily diet.[7] Dr. L.P. Sprague of Burlington remarked to the 1908 Vermont Dairymen's Association meeting, "When we consider the amount of nourishment there is in a quart of milk, as compared with other food stuffs, we find that milk even at ten cents per quart is one of the cheapest foods we can buy."[8]

Few questioned the necessity of milk in the modern American diet, but something had to change. Who would bear that responsibility?

Until the late 1800s, the government played virtually no role in how farmers produced food. As populations swelled in the cities and large quantities of food traveled further, federal and state governments stepped in to replace the personal, small-scale relationships that were no longer feasible.

New regulations like the Pure Food and Drug Act in 1906 cemented the role of the federal government in protecting people from their food. Responding to citizen unease over boric acid and formaldehyde being used as food additives, the new act set out guidelines for labeling and ingredient listing in order to protect consumers from fraud and unsafe food additives. [9]

Around that time, many city governments entered the regulatory arena, creating systems to ensure that the supply of milk entering the city was as clean as possible. Officials looked to the source of the milk — and hit a roadbump. Milk came from rural,

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[7] Levenstein, H. (2003). *Revolution at the Table: The Transformation of the American Diet* (p. 304). Berkeley: University of California Press.

[8] Vermont Dairymen's Association. (1908). *Thirty-Eighth Annual Report of the Vermont Dairymen's Association*. Montpelier.

[9] Velten, H. (2010). Milk: A Global History. London: Reaktion Books.

idyllic farms so far removed from gritty urban life, but that meant city governments had to devise creative ways to regulate farms outside of their jurisdiction.

Milk hadn't always been produced outside of the city: up until the mid-1800s, farms within city limits had supplied most of Boston and New York with fluid milk. A series of exposés in New York City in the mid-1800s had exposed "swill milk" farms: dairies attached to distilleries, where cows packed into close quarters fed on spent grain form the brewing process. Reformers had described cows shuttered from the daylight and suffering from skin ulcers and rotting tails, the visceral descriptions driving public outrage. Cities created new regulations for urban dairies, which were forced to rebuild their barns and change their feeding practices.

City milk was now regulated heavily, unlike its rural counterpart. But the damage was done: Urban consumers no longer trusted city milk, and they had shifted their sights to milk from the country. Just as doctors of the time recommended fresh country air and sunshine to heal city-bound invalids, people looked to rural, idyllic country farms to supply products that could cure ailments brought on by cramped, dirty urban life.[10]

Consumers had an image of the pure, wholesome country, but urban public health officials soon realized that country milk was far from clean. On-farm practices varied widely, and once distributors had combined milk from many cows and many farms for transport to the city, any illness caused by tainted milk was almost impossible to trace back to its origin. And even if the milk produced in the most ideal conditions, by the time

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[10] Smith-Howard, K. (2013). *Pure and Modern Milk: An Environmental History since 1900* (p. 240). Oxford: Oxford University Press.

the milk had traveled to the train depot, transferred to the train, arrived at a distributor's facilities in the city, then traveled to the local grocer, it was likely far from pristine.

And that was *after* the milk left the farm. Conditions on rural farms varied widely. Farmers who had formerly supplied neighbors and nearby towns now upped production to feed the hungry mouths of city dwellers. The long arm of urban demand reached further and further out into the country. Though urbanization wasn't new, its scale was putting radical new demands on farms. Growing cities demanded plentiful and cheap food. Instead of living near a small producer who raised vegetables, kept animals and milked a few cows, more and more Americans turned to a middle distributor to purchase food and resell it in the cities. The pressure was on for the "industrial gardens" — large farms that sprouted in suburban and rural America dedicated to feeding urban mouths. Farmers there struggled to produce more and more food for the cities while keeping costs low.[11]

In no industry was this shift more apparent than in the dairy industry. By 1910 — some 50 years after the swill milk exposés had pushed production out of urban areas — some 40,000 farmers were supplying New York City's insatiable appetite for the white elixir. Boston and New York City were each receiving milk from at least six states, including Vermont.[12]

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[11] Lanman, S. W. (2004). "For Profit and Pleasure": Peter Henderson and the Commercialization of Horticuture in Nineteenth-Century America. In P. Scranton & S. Schrepfer (Eds.), *Industrializing Organisms: Introducing evolutionary history* (pp. 19–42). New York: Routledge.

[12] DuPuis, E. M. (2002). *Nature's Perfect Food: How milk became America's drink*. New York: New York University Press.

Vermont Milk in the Big City

Vermont farms didn't begin supplying milk to the Boston and New York markets until the early 1900s. Prior to that, a network of small creameries processed Vermont milk into nationally and internationally renowned butter, which was easier to transport out of state, and which fetched a premium price. Vermont creameries sent the product as far afield as the Paris World Fair.[13]

By the early 1900s, however, competition on the butter markets, proximity to large northeastern cities and the newly invented refrigerated train cars allowed Vermont farmers to enter the fluid milk market. There, they found ample demand for their raw product, though at lower costs than for butter.

As demand patterns shifted, Vermont farmers had a sneaking suspicion they were being duped. F.L. Davis, president of the Vermont Dairymen's Association, bemoaned the loss of milk to the cities in 1911: "Our dairymen are selling their milk to city dealers, to the great loss of the state," he said. "Shipping milk to the city at present prices is all wrong."

Instead, Davis urged Vermont farmers to look to local markets for their cream and skim milk.[14] Though Davis's plea was futile, it revealed rising feelings of helplessness at the hands of the faraway urban mob that demanded milk that was not only cheap, but also clean and safe.

What *was* clean and safe milk, though? City and state officials all over the country struggled to oversee the dairy products coming from increasingly far afield,

[13] Albers, J. (2002). Hands on the Land: A History of the Vermont Landscape (p. 320). The MIT Press.

[14] Vermont Dairymen's Association. (1911). *Forty-First Annual Report of the Vermont Dairymen's Association*. Montpelier.

searching for the best way to ensure a safe supply. Urban America was the hardest hit by milk-related illness, but city officials found themselves trying to exert influence over farms shipping food to the city from what could be six states.

Most cities, including Boston and New York, solved that problem using a licensing system. City governments had no legal jurisdiction over farms, so instead they issued permits to dairy farmers who wanted to sell their milk in the city. Any farmer who did not allow city inspectors onto the farm was effectively barred from the city markets. These new systems stood in for personal relationships with the farmer; urban consumers now had inspectors to protect them from tainted milk.

But these systems turned out to be irksome on the farmer end. At any one time, Vermont farms faced inspection by city inspectors from Boston or New York, depending on which railroad line they were closest to; from state inspectors; from town or county inspectors; federal inspectors; and, if they sold their milk through a large distributor, an inspector from that company. Each inspector had different concerns, and each demanded change from the dairy farmer. John Smith of Barre, Mass. expressed his frustration with the hodgepodge of inspections at the 1911 annual meeting of the Vermont Dairymen's Association, where he was a visiting speaker.

"All visit us with an eye to the welfare of the consumer, with little thought as to the reasonableness of their demands and with no regard for the inconvenience or cost to the producer. We approve of reasonable inspection…but we object to being bossed by ignorant, overbearing inspectors," he said.[15]

[15] Vermont Dairymen's Association. (1912). *Forty-Second Annual Report of the Vermont Dairymen's Association*. Montpelier.

As irksome as inspection was to farmers, it was also costly to the cities. Most public health agencies and governments pursued a policy of cleanliness at each step of the milk's journey, assuming that if the dairying implements, the train cars and the milk cans were clean, the milk would be safe. This meant that cities were spending money sending inspectors all over the countryside at their own expense — and even fully inspected milk could harbor deadly bacteria. There was no guarantee that inspected milk was actually safe to drink.[16]

The State Intervenes

Of course, the pressure on farmers to produce safe milk didn't only come from the cities. Bovine tuberculosis was rampant in dairy herds across the nation, and since it took years to develop, it could decimate entire herds with little or no warning.

A recently developed tuberculin test required a veterinarian or other certified party to inject live bovine tuberculosis bacteria into a cow. If the injection site showed a reaction or the cow's temperature spiked, the cow was infected and had to be killed.

The state of Vermont, along with many others, helped to defray the herd loss for farmers by compensating them for cows that turned out to be sick. The state government spent $79,626 compensating farmers for infected cattle over two fiscal years between 1906 and 1908. The governor at the time, Fletcher D. Proctor, reported that, "as far as I have been able to ascertain no other state expends as large an amount for this purpose."[17] But the test was not mandatory, and sick cows could infect entire herds before the disease

[16] Czaplicki, A. (2007). "Pure Milk Is Better Than Purified Milk": Pasteurization and Milk Purity in Chicago, 1908-1916. *Social Science History*, *31*(3), 411–433. doi: 10.1215/01455532-2007-004

[17] *Journal of the Senate of the State of Vermont: Biennial Session, 1908*. (1908). St. Albans, VT: The St. Albans Messenger Company.

manifested. A letter to the *St. Albans Messenger* (reprinted in the *Middlebury Register*) in 1908 expressed outrage at the state's expenditures on an eradication method that seemed to be working slowly, if at all:

"The only successful substitute will be the higher law of an educated public opinion that will positively refuse to buy an ounce of beef or gill of milk taken from cattle that have not qualified under the tuberculosis test."[18]

So the state legislature stepped in. At the time, much of the state's milk was still going to creameries to be churned into butter; farmers would collect the byproducts, skim milk and buttermilk, to feed their animals.

In 1908 the legislature said that creameries had to pasteurize all of these butter components before they were returned to farmers, thus attempting to stem the spread of disease through the herds of farmers.

But Vermont farmers were anything but convinced by the relatively new technology. In 1909, concerned that pasteurized milk was stunting growth and killing their animals, they embarked on a campaign against the new pasteurization law.

Farmers across the state were outraged at the law, declaring it unconstitutional, and the creamery staff and farmers of Addison County met to discuss their next steps.

"It was unanimously decided that, as the requirements of the statute was a burden, and detrimental to the business of the creameries, and also to the interests of their patrons, no attention would be paid to the law," reported the *Burlington Free Press and Times* in July, 1909.[19]

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[18] No Title. (1908, November 27) *Middlebury Register* (p. 6)

[19] Creamery Men to Ignore Law. (1909, July 1). *Burlington Free Press and Times*. Burlington, VT.

All parties agreed to help pay the fines if the state chose to enforce the law at any creamery. A year later, in 1910, the Senate backed down and repealed the law.[20]

In pushing back against the new pasteurization law, Vermont's farmers and creamery workers weren't just pushing back against what they felt was a new and unproven technology. They were also pushing back against a government that was placing new and unprecedented regulations on their livelihood. The speeches at Vermont's annual agricultural meetings from the early 1900s hold tinges of frustration at a system that was moving more and more to protect the urban consumer, it seemed, by asking more and more of farmers.

If Not Pasteurization, Then What?

Vermont farmers weren't alone in their early resistance to pasteurization. Others advocated for various testing and inspection regimes, including a system of "certified milk" in which the milk was inspected and tested for bacteria at every step of its travel from the farm to the city. But this milk could be anywhere from two to four times as expensive, and it never made up more than one percent of the nation's milk supply.[21]

Tuberculin testing, accompanied by herd certification, was another strategy Chicago and many governments across the country pursued in the years before pasteurization. In 1908, Chicago became the first city in the nation to mandate pasteurization of milk coming into the city — but only milk from herds not certified as free of tuberculosis. Yet compliance with the law remained relatively low. For one thing, few distributors at the time had the infrastructure required to pasteurize milk. For another,

[20] Tubercule Bacilli in Butter. (1912, January 18). *Burlington Free Press and Times*. Burlington, VT. Retrieved from http://chroniclingamerica.loc.gov/lccn/sn86072143/1912-01-18/ed-1/seq-10.pdf

[21] Velten, H. (2010)

farmers still didn't trust the bovine tuberculosis tests, which sometimes found the disease in cows that outwardly seemed healthy and productive.[22]

Even after pasteurization had become the norm, bovine tuberculosis was still a problem for herds. By 1922 in Vermont, the state had spent $357,168 over four years paying farmers indemnities for diseased cows, with additional payments of $250,567 from the federal government.

Though costly, mandated testing regimes had begun to show effects, and human deaths from tuberculosis in Vermont had dropped from 802 in 1857 (a death rate of 2.55 per 1,000) to 239 in 1921 (a 0.68 death rate). The authors of a report on bovine tuberculosis questioned the state's continued investment in eradication of the disease, noting that, "the bovine bacillus does not loom high as a menace to the public health of our state." (The authors added that pasteurization would be the best strategy to insure a clean milk supply going forward).[23]

Yet as late as the 1930s, some 1,500 farmers marched on the state capital in Des Moines, Iowa to protest the use of federal force to test cattle for tuberculosis.[24] In the early years of the century, condemned cows could be shipped to slaughterhouses, the infected parts cut out and the rest processed — in some states only rendered for fertilizer, but in some, processed for human consumption. This practice fueled many farmers' distrust, as this indicated to them that the tests were designed primarily to line the pockets

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[22] Czaplicki, A. (2007). "Pure Milk Is Better Than Purified Milk": Pasteurization and Milk Purity in Chicago, 1908-1916. *Social Science History*, *31*(3), 411–433. doi: 10.1215/01455532-2007-004

[23] Special Committee on Bovine Tuberculosis Control. (1922). *State of Vermont Report of Special Committee on Bovine Tuberculosis Control*. Rutland: Tuttle Company.

[24] Olmstead, A. L., & Rhode, P. W. (2007). Not on My Farm! Resistance to Bovine Tuberculosis Eradication in the United States. *Journal of Economic History*, *67*(3), 768–809.

of politicians and the meat industry. The practice was eliminated with the tightening of meat inspection regulations, likely also exposing many fewer consumers and meat cutters to tuberculosis. Farmer mistrust, however, persisted for years afterward.[25]

A Safer Milk Supply

Resistance to milk safety measures were just momentary blips in the push of technology, however. Even as Vermont farmers insisted that pasteurized milk was killing their animals, some of the milk bound for Boston and New York City was pasteurized or sterilized before it was sold, and urban public health officials were advocating for ordinances that would require all milk entering those cities to be heat-treated.

Philanthropist Nathan Straus was one of the major forces behind the adoption and widespread acceptance of pasteurization. Straus was a department store magnate, one of a number of wealthy businessmen who devoted themselves to charity. In 1892, he set out to provide free milk to the urban poor and discovered brand new pasteurization technology. Soon after, he opened his first milk depot in New York City and began distributing free and low-cost pasteurized milk. Straus quickly became one of the most vocal pasteurization advocates in the country.

Though initially he faced mistrust from citizens and public health officials who questioned the new technology, by 1910, Straus was operating seventeen depots in low-income neighborhoods in New York, and he had founded or inspired milk depots in many

[25] Olmstead, A. L., & Rhode, P. W. (2004). The "Tuberculous Cattle Trust": Disease contagion in an era of regulatory uncertainty. *The Journal of Economic History*, *64*(4), 929–963. doi: 10.1017.S0022050704043049.

other cities, domestic and international. Public health officials noted a decrease in infant mortality rates wherever pasteurized milk was widely available.[26]

In 1912 the New York City government got on board, passing a full pasteurization mandate. The new law was met with much greater success than in Chicago, since the pasteurization depots had already gained widespread acceptance from consumers in the city. Within the next three years four other large cities also passed pasteurization mandates.[27]

By the 1920s, pasteurization ordinances had in large part replaced city inspection. Dairy farms were (and are) still subject to inspections from state and federal agencies and milk distributors, but the inspections became fewer and the reasons and requirements behind them inspections more straightforward with time.

While farmers and governments had spent their time negotiating state-run inspections and testing, however, a shift was happening in the private sector: Large urban distributors were investing in pasteurizers, buying up milk from many farmers and testing the success of a pasteurized product. Well before most cities passed pasteurization ordinances, members of the urban population had begun to seek out pasteurized milk as a way to guarantee safe, clean milk.

The technology was meeting with pushback from many quarters, though. Part of the resistance was the cost of installing machinery, though particularly in larger plants

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[26] Philanthropist Gives Up Pasteurizing Milk. (1910, August 25). *Burlington Free Press and Times*. Burlington, VT.

[27] Czaplicki, A. (2007). "Pure Milk Is Better Than Purified Milk": Pasteurization and Milk Purity in Chicago, 1908-1916. *Social Science History*, *31*(3), 411–433. doi: 10.1215/01455532-2007-004

one study noted that pasteurization added only three tenths of a cent per gallon.[28] Some felt pasteurized milk tasted cooked, likely the result, in part, of imprecise heating temperature. Some — including Harvey Wiley, chief of the U.S. Bureau of Chemicals — said (with little scientific backing) that pasteurization depleted milk's nutritional content.[29] And some feared that pasteurization removed the milk its natural state, killing the good bacteria with the bad, "devitalizing" it and making it a less wholesome drink.[30]

For others, the fear was economic — that pasteurization would serve as a way for companies to disguise dirty and old milk and dupe the consumer. At a meeting about a municipal pasteurizing plant in Boston in 1914, one man argued against the plant, complaining that pasteurization allowed companies to use milk anywhere from 4 to 20 days old.

"Fresh milk is what Boston needs and fresh milk Boston can have if it goes about getting it the right way," he told the city officials.[31]

But pasteurization came at the right price for city governments, who no longer had to employ the inspectors to visit tens of thousands of farms. And pasteurization put no additional work onto the farmers, who simply had to ship their milk to a processor for pasteurization and distribution. Instead, the bulk of the new regulatory requirements went

[28] Letter. (1914, July 3). *Middlebury Register*. (p. 6)

[29] Wiley, A. (2011). *Re-Imagining Milk*. New York: Routledge.

[30] Velten, H. (2010). *Milk: A Global History*. Reaktion Books.

[31] Uphold Boston Milk Inspection. (1914, April 9). *Boston Daily Globe*. Retrieved from http://pqasb.pqarchiver.com/boston-sub/doc/502545159.html

to the middlemen. When faced with the steep cost of pasteurization equipment, small local milk distributors got out of the business or combined forces.[32]

Smaller cities in more rural areas took longer to mandate pasteurization; though Burlington led Vermont with a mandatory tuberculin testing ordinance in the early 1910s, the city did not adopt a pasteurization ordinance until 1943. Rutland followed in 1944. At that point, however, the mandate was more of an afterthought, as processors were already doing the work of pasteurization. All of the milk sold in Burlington and more than 80 percent of it in Rutland was already being pasteurized.[33]

In officially mandating pasteurization, cities put the onus of technical investment and milk safety onto the distributor. Both distributors and farmers — who now had access to bulk tanks and vacuum milking machines — faced pressure to mechanize, and many of those who couldn't got out of the business. The number of dairy farms in the nation declined, and the output on those farms grew steadily.

Historian Daniel Block frames the debate between certification and pasteurization as "a clash between faith in personal connections and faith in technology."[34] The pasteurization solution had this symbolic effect: It served to separate the producer from the consumer by substantially changing the raw milk product that left the farm. The milk that eventually landed on grocery shelves was a very different substance, mixed with milk from many other farms and heat-treated for the protection of the consumer.

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[32] Levenstein, H. (2003). Revolution at the Table: The Transformation of the American Diet (p. 304). Berkeley: University of California Press.

[33] Vermont Department of Agriculture. (1944). *Agriculture of Vermont: Twenty-Second Biennial Report of the Commissioner of Agriculture for the State of Vermont, 1943-44*. Montpelier.

[34] Block, D. R. (2002). Protecting and Connecting: Separation, Connection, and the U.S. Dairy Economy 1840-2002. *Journal for the Study of Food and Society, 6*(1), 22–30. doi: 10.2752/152897902786732699

At the time, New York Agricultural Department officer Julius Moldenhauer asserted that, "A properly controlled consolidation of the city milk supply is of equal benefit to producers and consumers."[35] For better or worse, that consolidation transformed the dairy system and mirrored similar transformations happening in almost every area of the American food system.

Moldenhauer may have had a clear idea of the kind of dairy system he wanted to see, but the regulatory process as it happened was — as large-scale change tends to be — the scattershot result of reform attempts on political, economic and personal levels. Pasteurization was an easy solution to public fear and outrage over bacteria in milk, but its repercussions echoed through the ages, steering the dairy industry toward the highly centralized one that exists today.

Pasteurization wasn't the only factor that drove centralization in the dairy industry. Refrigeration and shifting patterns of production and consumption also pushed the rise of the processor. But pasteurization made milk more shelf-stable and thus more able to be transported long distances and distributed far afield from its origin on the farm, allowing processing companies to buy milk from and sell milk within large regions of the country.[36]

Earlier this year, three major milk processors settled out of court with northeast dairy farmers who accused them of colluding to fix prices on the regional milk markets,

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[35] DuPuis, E. M. (2002), p. 85

[36] DuPuis, E. M. (2002)

forcing farmers to accept lower prices. In this and similar class-action suits in other regions, the processors admitted no fault but agreed to pay a settlement.[37]

Meanwhile, the Vermont state legislature legalized on-farm raw milk sales in 2009. At the time, lawmakers noted that allowing farmers to sell small amounts of raw milk gave them alternatives other than the commodity market — though state health officials have questioned the safety of allowing raw milk sales.[38] What the law did, though, was create a small-scale reversal of the pasteurization laws of the early 1900s. Some Vermont consumers now travel to the farm to purchase raw milk directly from a farmer they know — reconnecting those connections between the farmer and the consumer that urbanization ruptured.

[37] Astley, M. (2014). "DFA to pay $50m to settle Northeast US milk price lawsuit." *Dairy Reporter*. Retrieved from http://www.dairyreporter.com/Manufacturers/DFA-to-pay-50m-to-settle-Northeast-US-milk-price-lawsuit.

[38] Sawyer, S., Calderwood, L., Bothfeld, D., & Perkins, K. (2010). *Farm to Plate Strategic Plan: Appendix B: Revitalizing Vermont's Dairy Industry*. *Farm to Plate Strategic Plan*. Retrieved from http://www.vsjf.org/assets/files/Agriculture/Strat_Plan/Appendix B_Revitalizing Vermonts Dairy Industry_Small file_4-18-12.pdf

GOING ROGUE FOR RAW MILK: EXPERIENCE AND VALUES AS CONSUMER FILTERS FOR CONFLICTING RAW MILK RISK DISCOURSES

INTRODUCTION

> Raw milk "is nature's perfect food, especially good for growing children and those who are recovering from serious illnesses."
>
> (Weston A. Price Foundation, 2000)

> Drinking raw milk is "like playing Russian roulette with your health."
>
> John Sheehan, Food and Drug Administration
>
> (Hannon, 2009)

> Raw milk "provides a viable market niche for dairies"
>
> (National Farmers Union, 2013)

> "Any foodborne illness outbreak related to dairy products damages consumer perception of milk in general, even when the source of the problem is clearly attributed to raw milk or raw milk products"
>
> (American Farm Bureau, 2013)

The debate over raw milk is polarizing, with parties speaking passionately both in support of and in opposition to the availability and consumption of the substance. Those on each side of the discussion make broad — and sometimes dire — knowledge claims regarding the values and risks associated with raw milk consumption. As illustrated in the quotes above, advocacy groups, agricultural associations, and various governmental authorities all voice divergent opinions regarding the safety and health benefits of raw milk consumption. As such, consumers navigate these contests of voices when deciding whether or not to drink raw milk.

In Vermont, consumer access to raw milk exists in a contested legal context as well. The Vermont state legislature in 2009 allowed dairy farmers to sell their

unpasteurized product against the express recommendation of the federal government, which forbids interstate transport of raw milk and strongly recommends that states outlaw raw milk (Sawyer, Calderwood, Bothfeld & Perkins, 2010; Weisbecker, 2007). Vermont is now one of 30 states that allows raw milk sales in some capacity, and advocates within the state cite consumer demand and high prices of raw milk as advantages of allowing farmers to sell raw milk (Rural Vermont, 2009). A 2013 statewide survey found that 11.6 percent of Vermonters had consumed raw milk in the past year, and called for more research into how those consumers evaluate conflicting recommendations surrounding raw milk consumption (Leamy, Heiss & Roche, 2014).

In this paper, we touch upon extant literature from a range of disciplines spanning the sciences, the social sciences and the humanities, but our approach is ultimately a social constructionist one. Social constructionist frameworks suggest that "knowledge … is bound to the sociocultural contexts in which this knowledge is generated" (Lupton, 1999, p. 29). Thus, "the worlds in which we all live are not just there … but are constructed by a whole range of different social arrangements and practices" (Potter, 1996, p. 12). In particular, we examine how raw milk consumers integrate widely varied health and risk discourses into personal understandings of their consumption habits.

Using interviews with 25 raw milk drinkers in Vermont, we explore how raw milk consumers negotiate contested risk and health discourses in order to reach the decision to drink raw milk. Further, we explore the personal experiences, relationships and values that offer a lens by which to interpret and filter these contested voices. In doing so, we address the ways in which raw milk consumers redefine and complicate their understandings of risk. Specifically, we ask:

Through what means do consumers receive and understand information about the benefits and risks of raw milk? And:

How do consumers make sense of conflicting narratives of risk surrounding raw milk consumption?

Voices of raw milk consumers themselves are often drowned out amidst conflicting governmental and advocacy group recommendations. Yet raw milk consumers are not simply passive recipients of governmental, advocacy and media messaging — rather, they are consumers making decisions based on research, experience and values. In examining how raw milk consumers understand their actions and decisions, we bring this perspective to bear on the larger discussion of the risks and benefits of raw milk consumption.

LITERATURE REVIEW

Raw Milk in Vermont

Raw milk drinkers in Vermont occupy conflicted legal territory. Federal governmental discourses assert that raw milk is dangerous and forbid raw milk sales across state borders, while Vermont's laws permitting on-farm raw milk sales are more permissive. With the 2009 law that legalized raw milk sales, the state became part of a small-scale reversal of the early 20th century push for sanitization and standardization of the milk supply (National Association of State Departments of Agriculture, 2011). Pasteurization — heat treatment to kill bacteria — came into widespread practice in the U.S. between 1900 and 1940, along with a variety of other sanitary measures, most aimed at addressing urban disease epidemics that had been traced back to the rural milk supply (DuPuis, 2002). These measures in turn enabled greater production and distribution of dairy products. With state and local governments leading the charge to demand clean milk, over a 30-year time period pasteurization became nearly universal, bringing an accompanying decline of foodborne illnesses like typhoid and cholera (DuPuis, 2002). Producers and distributors favored the practice once they noted that pasteurized milk had a longer shelf life and thus could be distributed further (U.S. Food and Drug Administration, 2011).

Resistance to pasteurization in the early 1900s made up a small but vocal minority, and some of those voices are reflected today in raw milk advocacy, as well as in state policies regarding the sale of raw milk. The recent pushback against pasteurization has been spurred, in part, by groups arguing that raw milk benefits farmers, as they can sell it directly to consumers and at a higher cost, and by groups arguing that raw milk

offers health benefits that pasteurized milk does not. The Weston A. Price Foundation is a national organization that runs the site "realmilk.com;" it distributes information to consumers about health benefits of raw milk and participates in national policy discussions surrounding the legalization of raw milk (Weston A. Price Foundation, 2000). Closer to home, Rural Vermont is a farmer advocacy group that has played a large role in policy discussions that surround loosening the state's laws restricting raw milk sales (Rural Vermont, 2009). As of 2011, 30 states allowed raw milk sales in some capacity. Although all have in place stricter standards for raw milk sales than for pasteurized, these state policies allow access to a substance that the federal government says is categorically dangerous. Regulations vary widely by state, with some states allowing raw milk sales only from the farm, some enforcing stringent quality and testing standards, some allowing only raw goat's milk sales, and two states — Kentucky and Rhode Island — allowing sales of raw milk only with a doctor's prescription (NASDA, 2011).

In Vermont, producers may only sell fluid raw milk — that is, they may not process it into yogurt, cheese, butter or any other substance. Producers face strict limits on the total quantity of milk they are allowed to sell, and larger producers face strict bacterial testing requirements. Producers who sell raw milk must also post a sign that reads, "This product has not been pasteurized and therefore may contain harmful bacteria that can cause illness particularly in children, the elderly and persons with weakened immune systems, and in pregnant women can cause illness, miscarriage or fetal death, or death of a newborn" (Sawyer et al., 2010, p. 59). In this way, the state frames raw milk as a "risky" substance and reduces its own responsibility for any illnesses caused by raw milk consumption.

Social Construction of Risk

Both federal and state health agencies consider raw milk to be risky, and strongly discourage its consumption. This perspective is an actuarial one, in which risk is calculable and clearly defined, and in which the best approach to risk is to minimize it in any way possible. Beck (1992, 1999) links this view of risk with modern society. He argues that whereas pre-industrial societies were primarily guided by tradition, the rise of an industrial, globalized society has spurred personal, corporate and governmental entities to make decisions that aim to minimize risk and responsibility for risk. Yet those risks (for example, pollution) are results of the industrial society, created by those very entities that seek to control risk. This, he argued, is the modern-day "risk society" (p. 11), which imbues governmental decisions, private life, as well as public thought and behavior with a constant preoccupation with risk.

A sociocultural perspective on the matter, however, reveals that the concept of "risk" as it functions in society is far more complex and far less quantifiable (Lupton, 1999). Beck and other social constructionist theorists tend to define risk itself based not on the actual potential for catastrophe, but as an anticipation or fear created by "cultural perception and definition" that then comes to determine public thought and behavior (1999, p. 135). Governments, companies and people all make decisions based on subjective understandings of what is "risky," which is not always linked to actual potential for catastrophe. Douglas and Wildavsky (1982) further argue that "substantial disagreement remains over what is risky, how risky it is, and what to do about it" (p. 1). Thus, risk is not a known quantity but rather a subjective concept that may vary by society, region or even from person to person.

While technology and science have been presented as solutions to perceived societal risks, this understanding has become more complex over time, as these fields now "are targeted not only as a source of solutions to problems, but also as a cause of problems" (Beck, 1992, p. 156). Beck cites pollution and other human influences on the natural world as ways in which solutions have also become problematic. In the field of health, too, the solutions presented by modern medicine and scientific research have also created new problems and preoccupations. Lupton (2003) argues that "as the effectiveness and benevolence of medicine began to be challenged, so too was its claim to inaccessible and arcane knowledge based on objectivity and political neutrality" (p. 5).

Social Construction of Food Risk

Since eating is a routine universal to all humans, food provides an ideal lens through which to examine a broad variety of topics, including science, health, economics, tradition and personal choice. Blue (2010) notes that food is "profoundly absorbed in the relations that touch many areas of life, from the well-being of our personal bodies, to the integrity of ecological systems, to broader discursive issues such as trust in governance" (p. 147). Further, it is "an arena in which risk is negotiated; first, by the various claims put forth by industry, governmental agencies and consumer groups who aim to persuade consumers of the safety of food products and production methods, and second by consumers who control, at an individual level, what they let into their bodies" (p. 148). Despite the fact that food often escapes scholarly notice, the topic offers a frame which to examine and interpret social structures and patterns (Lupton, 1996).

Food stands as a deeply personal substance, since it enters the body and, in a sense, becomes a part of the eater (Lupton, 1996). Food choices thus become forms of

action, or political consumerism, that may reflect concern over health or agricultural processes or imply a "dissatisfaction with the ability of governmental institutions to meet the needs and demands of citizens" despite governmental reassurances of safety, as in the consumer distrust surrounding GMOs, cloning and hormones in animal feed (Blue, 2010, p. 149).

Yet as Östberg (2003) asserted, food is not inherently healthy or unhealthy, though it is often spoken of in terms of health and risk. The meanings and relative health value of various foods are built by cultural contexts, informed by history and politics, and defined and altered by medical and health texts, popular culture and personal experiences (Lupton, 1996). Östberg (2003) argued that the modern, consumerist relationship with food is fraught with perceived risks, received through "an endless stream of headlines suggesting dos and don'ts" (p.1). These constantly shifting — and sometimes conflicting — messages regarding food mean that "consumers are experiencing anguish, obsession, anxiety and suspicion, as they no longer can look at the traditional and authoritative external rules about what should be eaten" (p. 179). Today, a plethora of voices compete to define healthful, pleasurable or dangerous eating habits. Dairy products serve to illustrate shifts in health and risk messaging, with a wide variety of low-fat, fortified and probiotic products — representing the latest ways to minimize food risk and optimize health — available to the consumer on supermarket shelves.

Discourse and Food Risk

In the midst of shifting and omnipresent messages regarding food and health, consumers are faced with a plethora of discourses on any given topic. These discourses may be those of scientists or dietary professionals, where proponents of these systems

seek validity "independent of the practitioners and clients who use them" (Giddens, 1991, p. 18). The scientific discourse is often offered up as a universal truth and a lens through which to view all knowledge claims. Yet "non-traditional social scientists have come to realize that science always exercises judgement, even when it claims it is not doing so" (Condit, 1990, p. 324). Watson-Verran and Turnbull (1995) advocated for a contextual view of these systems, arguing that "contemporary technosciences, rather than being taken as definitional of knowledge, rationality, or objectivity, should be treated as varieties of knowledge systems" (p. 116). Thus, scientific messaging is located within the cultural context of those scientists, just as all other discourses are created within a local context.

As information access and interest in food has increased, so too have conflicting messages from many sources, with many groups vying for audience and credibility. Blue (2010) argued that "the contemporary politics of food can also be read as a politics of discourse as more and more groups have the power to set agendas, frame debates, and grant voice to different concerns" (p. 148). In this landscape, advice on eating habits and health may come from scientists and dietary professionals, but it may also come from members of the media or general public, or from any number of advocacy or trade groups. For example, following widespread attacks on high fructose corn syrup, the Corn Refiners Association ran a widely publicized campaign combining expert advice and argument to downplay the perceived risks of the substance (Heiss, 2011).

Within this information-rich and highly conflicted environment, the very designation of "expert" knowledge is contested. Even expert claims are subject to contestation and re-evaluation by other expert voices. Giddens (1991) noted that within

health-oriented self-help texts, which purport to offer definitive ways to minimize the risks of modern life, advice is often self-consciously conflicted about food risk. Giddens cited Coleman, in his self-help book Bodysense, for an example of frustration over lack of definitive nutritional statements: "the information being offered now frequently conflicts with last week's data … so what is the truth about the food we eat? … What is good for you and what is bad for you?" (Coleman, 1984, as cited in Giddens, p. 101). The frustration over finding "the truth" about food highlights what Babrow (2006) terms the "inherent uncertainty in human knowledge" (p. 201).

Discourse and Dairy Risk

Shifting discourses on nutrition and health have thrust pasteurization, once hailed as the ultimate way to mitigate dairy risk, into a newly contested space. In the early 20th century, municipal and state governments turned to pasteurization as a way to insure a clean and disease-free milk supply for their population. The switch to pasteurization was not nearly so monolithic a switch as it seems today, but the prevailing discourse of dairy safety throughout the 20th century has held that pasteurization is necessary for the safety of the milk supply (See "Milk at a Turning Point," this volume). More recently, certain advocates and scholars have problematized this discourse within the dairy arena, driving the rise of what Heather Paxson (2013) termed "Post-Pasteurian" beliefs, which question the push to rid bacteria from the food system. The post-Pasteurian view, Paxson explained, "emphasizes the potential for cooperation among agencies of nature and culture, microbes and humans" (p. 161). This idea has become widespread in popular food press, including a recent New York Times Magazine cover story, "Some of My Best Friends Are Germs," in which Michael Pollan (2013) discusses the so-called "good

bacteria" that help the human body to function, noting that this bacteria may be supplemented or stimulated by vegetables and certain fermented and raw foods (like milk).

Many food and animal scientists, on the other hand, adopt what Paxson termed "Pasteurian" attitudes, citing the dangers and offering strong opposition to the practice of drinking raw milk. Donnelly and Pritchard (2010) stated that "despite claims of health benefits associated with raw milk consumption, raw milk is a well documented source of bacterial pathogens which can cause human illness, and, in some instances, death" (p. 2). They noted that particularly in the past two decades, bacterial pathogens have become stronger, and that pasteurization laws were put in place specifically to address diseases like Salmonella, Listeria and E. Coli. Particularly since reducing the cost of health care is a high priority in both Vermont and the U.S., "increased raw milk exposure will only contribute to the economic burden of increased health care costs due to this and other pathogens (Donnelly & Pritchard, 2010, p. 5).

In the U.S., the most severe cautions come from the U.S. Food and Drug Administration (FDA) and the Centers for Disease Control (CDC). These government authorities generally do not count fostering a healthy microbiome of bacteria among their priorities. The FDA's (2011) raw milk informational page clearly stated its concern regarding the public health costs of the substance, leading off with "Is it safe to consume raw milk?" to which it bluntly responded, "No." (para. 1). The FDA cites the Centers for Disease Control and the American Academy of Pediatrics as agencies and organizations that agree with its stance that unpasteurized milk is unsafe, citing E. coli, listeria, brucella and salmonella as just some of the pathogens that occur in raw milk. John Sheehan,

director of the FDA Division of Dairy and Egg Safety, put it more succinctly: "It's like playing Russian roulette with your health" (Hannon, 2009, para. 4).

Despite severe governmental warnings against raw milk consumption, however, Paxson (2013) argued that "the contraindication of experiential knowledge may lead laypeople to dismiss the authoritative knowledge of scientific experts as overreaching, or even beholden to industry interests" (p. 165). That is, consumers' experiences may outweigh cautionary and scientific and governmental discourses. Enticott (2003) found that instead of accepting the health-based portrayal of raw milk risk, consumers he interviewed in a small town in England framed health as only one of a variety of important factors in their decision to drink raw milk. In the face of warnings about bacteria in milk, he noted, "consumers may over-ride them with concerns for their community and locality" (p. 414). Enticott's interviewees were aware of presiding risk discourses, but chose other measures as the final arbiter of their behavior.

Enticott's research dealt with a different regulatory structure and population profile; in the U.S., a limited body of research suggests that people are choosing to consume raw milk despite governmental warnings, but there is a gap in the literature when it comes to the meaning or rationale behind these choices. In one of the few recent surveys of a state, a 1994 survey of California residents found that out of 3,999 respondents, approximately 3.2 percent had consumed raw milk in the past year (Headrick, Timbo, Klontz & Werner, 1997). A 2011 survey in Michigan looked only at raw milk drinkers, and found a great deal of mistrust of government recommendations among the 56 people interviewed: Only 4 respondents said they "generally trusted recommendations made by state health officials regarding what foods are safe to eat"

(Katafiasz & Bartlett, 2012, p. 125). Both Michigan and California have raw milk regulatory structures and overall population demographics that are very different from Vermont, however.

More recently within Vermont, Leamy et al. (2014) found that in 2013, 11.6 percent of Vermont consumers had obtained raw milk within the past year. The statistically significant poll found that the majority of raw milk drinkers lived in a rural area of the state, and the average raw milk drinker had a bachelor's degree or higher and was middle-aged. That study also noted that raw milk drinkers get information about raw milk primarily through farmers and personal networks. Since that study was a brief phone survey, the authors called for further research to go deeper into how consumers evaluate information they receive on raw milk and how they "make sense of divergent recommendations regarding raw milk" (p. 224).

Our research seeks to fill that gap, drawing on the voices of raw milk consumers to examine how consumers evaluate information they receive surrounding raw milk and how they make sense of those external recommendations and their own experiences. Specifically, we asked: How do consumers receive and understand information about the benefits and risks of raw milk? And: How do consumers make sense of conflicting narratives of risk surrounding raw milk consumption?

METHODS

Interview Data Collection

Our research team conducted 25 interviews of Vermont raw milk consumers in November and December of 2012. We used a snowball strategy (Polkinghorne, 2005) to gather participants, producing a "pool of possible participants" (p. 141) by contacting acquaintances people within our own networks as well as one raw milk producer who gave us starting contacts. We added new contacts to our list as we asked each interviewee for further references. Through this process, we reached 25 people who regularly purchase and drink raw milk and who were willing to sit down and participate in an approximately 45-minute-long, one-on-one interview. For the interviews, we purposefully selected raw milk drinkers only within Vermont in order to maintain consistency in our discussions of state-specific raw milk policies, since policies vary greatly from state to state. We recorded audio of each interview, which we later had transcribed verbatim.

Prior to our interviews, we determined the concepts we hoped to draw on and constructed a script by which to conduct our interviews, as informed by literature on the social construction and politics of risk, as well as public understandings of science and health. We aimed to draw on a variety of topics concerning raw milk: how consumers understand policies surrounding raw and pasteurized milk; what knowledge systems inform consumer understanding of risk and health; what the health and taste differences are between raw and pasteurized milk; what political and social identities consumers associate with raw milk; and where responsibility falls in the choice to drink raw milk. We chose to pursue a semi-structured interview format, allowing us the "freedom to

digress" (Berg, 2004). The semi-structured format was crucial to our research aims, since it allowed interviewers to go off-script in order to probe the meanings of words and phrases.

Our research group developed the script together after several months of research, where we delved into the structural, political and theoretical context for raw milk sales in Vermont. Each week, we met to discuss and share what we had learned. Many of the questions that went into the script arose from this collective research process. Together, we developed a series of eleven broad questions, each with sub-prompts (see appendix A). Rather than use the questions as rigid guidelines for the progression of the interview, we used each question as a starting point from which to delve into our interviewees' understanding of raw milk and risk.

Having multiple interviewers conducting semi-structured interviews can present an issue for validity, as Barriball and White (1994) acknowledge: "Adjusting each interview, for example, in order to obtain accurate and complete data yet maintaining sufficient standardization to secure the validity and reliability of data is a major challenge to interviewers and depends upon thorough training" (p. 333). Barriball and White note that common research, training and feedback over the course of the script development and interview process can minimize issues of validity. We worked to address this issue by developing our script and training to use it as a group, insuring that we had common goals for the interviews and common understandings of themes. The three researchers who conducted interviews rehearsed and observed using the script in practice interviews with the research team in order to develop a common strategy for probing concepts. Interviews lasted between 30 minutes and an hour and were audio-taped so as to have a

record of how each interview progressed, and the research team continued to meet weekly as researchers progressed through the interviews in order to share observations and address any questions or difficulties that had come up during the interview process. We also used these weekly meetings to decide when to stop conducting interviews; at the point where we all agreed that we had conducted several interviews without hearing concepts we hadn't heard before, we ended the interview process.

Characteristics of the Interview Study Population

Out of our 25 interviewees, 17 were female and 5 were male. Two did not respond to our initial data collection survey. Of the survey respondents, nine had a bachelors or associates degree, while 14 had a masters or doctorate degree. Seven had a household income of $50,000 or less per year, while 15 had a household income of more than $50,000 per year. One did not answer.

All of our interviewees were regular raw milk drinkers, with only one person reporting consumption of less than one glass of raw milk per month. Thirteen said they drank more than eight glasses of raw milk per month. Nineteen reported having also consumed pasteurized milk within the last year.

Interview data analysis

For our analysis we used transcripts prepared by Capitol Typing, Inc., since the text format provided an easier way to organize and examine the interviews. We entered the interview text into HyperRESEARCH (ResearchWare, 2012) qualitative research software in order to code the data for emergent themes and patterns. At this point, we also assigned pseudonyms to each interviewee.

We employed techniques of discourse analysis, which Gee (2011) defines as "the study of language at work in the world, not just to say things but to do things" (p. xi). Thus, discourse analysis looks not only at words and language, but the ways in which those words create and reference social, cultural and political meanings (Gee, 2011). Discourse analysis reveals ideas, meanings and understandings rather than seeking empirical truths.

We developed our aims and research focus using a "constant comparative" process described by Glaser and Straus (1967), whereby various parts of the research process happen simultaneously, guided by constant examination and comparison of the data to reveal recurring themes. In its most common form, "categories, properties, and dimensions as well as different parts of the data are constantly compared with all other parts of the data to explore variations, similarities and differences in data" (Hallberg, 2006, p. 143).

Our process followed that of inductive thematic analysis, in which the research has "a descriptive and exploratory orientation" (Guest, MacQueen, & Namey, 2012, p. 7) as opposed to a process "guided by specific ideas or hypotheses the researcher wants to assess" (p. 8). Given the lack of research within the field, we pursued an inductive approach in order to discover emergent themes within the broader theme of social construction of risk. As we began crafting our research interests and exploring theoretical frameworks while simultaneously conducting interviews, this method allowed us to explore themes and, in some cases, alter our approach to questions in order to draw on emerging concepts, particularly in the area of informants' understanding and evaluation of contested voices and risk discourses. While the interviews focused on risk as a broader

topic, the ways in which interviewees integrate contested discourses into their own understandings began to emerge while reviewing transcripts, at which point we further focused our theoretical and background reading. The recurring themes that emerged through background reading and interview coding formed the structure for our analysis.

As we examined the interview transcripts, we focused on how consumers receive and understand information about the benefits and risks of raw milk, and how they make sense of conflicting narratives of risk surrounding raw milk consumption. We argue that while consumers sought out information on raw milk, the information found in mediated sources often conflicted. Instead, interviewees relied on the filters of personal experience and personal networks to create consumption priorities that were not specifically risk-related.

ANALYSIS

Interviewees identified a range of competing governmental, scientific and advocacy discourses that presented raw milk as anywhere from high-risk and dangerous to healthy and beneficial. Almost all had done extensive research as part of their decision to drink raw milk. Many brought literature and citations to interviews, and counted Internet sources, books, videos, educational events and official publications among their sources of information. This information generally separated into three perspectives on raw milk consumption: federal, state and advocacy. Interviewees described federal and mainstream health discourses as coming from "the government," or by organizational acronyms such as the FDA, the CDC or the USDA. These agencies state that raw milk is a risky substance and caution against consumption in any context. Vermont governmental discourses, meanwhile, are permissive of raw milk purchase and consumption, but within strict parameters (milk must be purchased on the farm and it must not be processed in any way). Advocacy discourses often promote raw milk consumption as a healthful and beneficial action.

Interviewees perceived a "contest of voices" between these three perspectives, taking this as an indication that raw milk existed in an ambiguous space. They drew on personal experience and interpersonal sources in order to prioritize and filter these voices, ultimately concluding that raw milk was safe or beneficial for them to consume. In doing so, interviewees defined concepts of raw milk risk to fit their own value systems and consumption decisions, both reflecting and challenging mainstream risk discourses.

These responses to contested voices guide the first focus of this analysis, in which I examine how interviewees interpreted tensions between U.S. health, governmental, and

advocacy discourses. I then discuss the ways in which interviewees acknowledged these competing discourses and applied their own experiences and observations in order to draw their own conclusions about raw milk.

Evaluating the Contest of Voices

Interviewees generally recognized various opinions and opposing recommendations surrounding raw milk, health and risk in mediated sources. As they discussed their perspectives on these voices, however, they also tended to treat the voices as being distanced from themselves. Individual responses ranged from those who sought to explain recommendations within the context of the national agricultural system to those who were unequivocally supportive or critical of these recommendations.

Interviewees tended to have strong opinions regarding prohibitive federal discourses on raw milk consumption. While interviewees had various perspectives on the need for these prohibitions on a national scale, none felt that this discourse applied directly to their own consumption habits. Walter stated that he views federal governmental discourses on the health risks of raw milk as completely wrong. “I have people that I trust who I think are on the right side of the issue, and I totally ignore what the government says because they have no credibility,” he said. “I do my own research.” To him, there was no reason for the federal government to play a role in his dairy consumption choices. He felt that political and lobbying forces influenced governmental restrictions on raw milk, and that the federal government was not a trustworthy source of information on the probability of risk.

Sibyl had similar skepticism of federal warnings, but she moderated her statements by introducing scale as a factor in milk safety:

Truthfully, I think it's stupid. I think that in a lot of cases the USDA … makes rules that are one-size-fits-all for situations that aren't one-size-fits-all. People get sick from drinking pasteurized milk too, you know. There are issues, and I think that a lot of it comes down to scale and size and operation of farm and that kind of thing. And so I think just blanketly saying that you shouldn't drink raw milk kind of misses the whole point.

Sibyl, like Walter, did not feel that federal representations of risk were relevant to her, but she suggested that there were certain scenarios where federal regulations would be applicable. To her, the scale of milk production changed the probability of risk, and raw milk from a smaller raw milk farm presented a very small amount of risk. While she allowed that there were instances in which raw milk might be risky to consume, Sibyl used scale as a criterion to filter the federal risk discourse.

Kate, too, was skeptical of the federal risk discourse regarding raw milk, but noted that she understood why these recommendations were in place. Of pasteurized milk from the grocery store shelf, she said, "I know that it's been in so many places and done so much traveling through so many hands and so much equipment." To Kate, this meant that the national milk supply was potentially unsafe, so pasteurization within this type of system made sense. Yet she understood these cautions to be primarily relevant within one type of agricultural system, whereas she felt that different rules applied within Vermont's system. "In my particular case," she said, "I have the luxury to ignore their recommendation because I feel like for me, where we live, I have another option." Kate concluded that her own purchases at a small Vermont farm fell outside of the large-scale system to which federal risk discourses applied. She filtered those risk discourses through

a systemic lens and concluded that her own raw milk consumption required different risk considerations than a purchase of milk at the grocery store.

Most interviewees felt that Vermont's laws regarding raw milk were more in accordance with their own beliefs about risk. When Kate and others discussed the need for alternate recommendations, they often referred to Vermont's regulations allowing for consumption of raw milk. Shannon, like most interviewees, said she felt Vermont's regulations allowed her the leeway she wanted in her decisions to drink raw milk. She said, "I don't really see [my decisions] as pushing back against Vermont's policies, because Vermont's policies are not so strict that I have to circumvent or go around them." Shannon was in compliance with Vermont laws in her raw milk consumption. Her statement, however, implied that even if state policies forbade consumption of raw milk, she would still "circumvent" those policies in order to drink raw milk. Hers was not an unusual sentiment: Indeed, many interviewees said they had been regularly drinking raw milk before the state instituted laws allowing raw milk consumption in 2009, and some were only vaguely aware that the laws had changed. The primary frustration with Vermont's raw milk laws were the requirements in place forbidding on-farm sales of anything but unprocessed fluid milk (including skim milk, cream, raw milk cheeses and yogurt), which many felt were needlessly restrictive. Interviewees were only aware of Vermont's risk discourses insofar as they restricted their behavior; for the most part, interviewees voiced support for Vermont's laws. Some highlighted the discrepancy between federal recommendations and Vermont laws, however, noting that it muddied the definition of "official" health and risk recommendations and institutionalized directly conflicting advice.

Official discourses do not lie exclusively within the legal or political system, however: interviewees noted that health practitioners often echo the federal risk discourses regarding raw milk. Some interviewees noted that they had had difficulties finding doctors who were permissive of their raw milk habits, particularly during pregnancy. Holly, who felt drinking raw milk kept her healthy, wanted to continue drinking it throughout her pregnancy and took this into consideration while searching for a doctor. "We sort of gravitated towards healthcare providers that said, 'We have to tell you that you shouldn't, but we also support you doing what you feel is right.'" Although the doctor she chose still echoed the official discourse that raw milk was too risky to drink, Holly felt they also were acknowledging that the issue was more complex. Olivia, on the other hand, chose not to tell her doctor that she consumed raw milk while pregnant. "I go to a fairly progressive doctor. I don't think they would have an issue with it, or maybe they would … but I didn't talk to them about it," she said. Both Holly and Olivia chose to consume raw milk because it was, they felt, the healthiest option for them, rather than what the probabilistic risk discourse of the medical establishment said would keep them healthiest.

Beyond regulatory and medical advice on raw milk, interviewees gathered much of their information from a variety of sources including books and other publications, videos, educational lectures and the Internet. The most prominent sources that interviewees discussed were advocate voices like Rural Vermont and the Weston A. Price Foundation, which both offer information regarding raw milk on their websites. The Weston A. Price Foundation, founded in 1999, is dedicated to spreading the nutritional theories of Dr. Weston Price, an Ohio dentist who practiced in the late 1800s and early

1900s and theorized that nutrient-rich diets like those consumed in pre-industrial societies are the healthiest diets (Weston A. Price Foundation, 2000). As an international organization, the group that bears his name has a great deal of information available to the general public, including founder Sally Fallon Morell's cookbook Nourishing Traditions, several documentaries and books, the website realmilk.com, which the organization maintains, and for some, Morell's talk in Burlington in June 2012. Interviewees referred to the foundation, which advocates nationally for raw milk access and consumption, as "really good source of information" (Hannah), and described the organization as "the biggest proponent of raw milk" (Maggie). In nearly all of the interviews, the foundation and its work came up either directly or indirectly. Many cited the group's website and publications as the most complete resource on raw milk available on the Internet, citing information from the foundation as a rebuttal to federal risk discourses.

Despite the information available through advocacy groups and online information, however, some interviewees noted a dearth of accurate, easily accessible information available regarding the health and safety of raw milk. Some had theories as to why they felt that gap existed. Kate, who recently completed a correspondence program in holistic nutrition, said she thinks much of the research critical of raw milk consumption "is coming out of vested interests," and noted that she has seen "newer research that really dispels [mainstream risk claims] pretty convincingly." Kate felt that there were motives behind federal risk discourses, and through this filter these discourses were untrustworthy and the risks they warned of were not as extreme as they claimed. On the other hand, she preferred to trust research that questioned mainstream risk discourses,

and that viewed raw milk as minimally risky. Bridget theorized that, "the mainstream journals are so conservative that they don't even publish these sorts of things … that wouldn't support a big industry standpoint." To Bridget, the gatekeepers of mainstream risk discourses, those who were ensuring a dearth of information questioning those discourses, were academic journals. She said she circumvented these issues by turning to online communities to share less-publicized resources. By contrast, Henry, a graduate student, felt that the information available online in support of raw milk consumption was rarely accurate or reliable. In the course of searching the web, he said he has found "not very credible sources — a lot of blogs. What I have found has been just mainly people's opinions."

Ultimately, many interviewees noted that the sheer number of voices offering conflicting claims about raw milk created a great deal of uncertainty. Jessie said before she started drinking raw milk she did some research on it, but that she was overwhelmed by what she found. "There's a lot of information that … you have to take with a grain of salt," she said. Jessie managed this plethora of information by turning to her own personal experiences and values: she went out and purchased raw milk to form her own understanding of raw milk's health risks and benefits.

Interviewees had strong opinions regarding conflicting of voices, but were more reluctant to give their trust to any one discourse. Instead, many interviewees, like Jessie, said they pursued personal experience in order to form their own evaluations of raw milk consumption, seeking ways to integrate problematic and conflicting discourses into their own contextual understanding.

Interviewees expressed frustration with the divergent discourses they found, and with what many felt were overly cautionary governmental warnings. They cited a variety of alternative voices, but many also acknowledged that conflicting voices were overwhelming and made it difficult to decide one way or the other about raw milk consumption. Instead, consumers turned to community networks and personal experiences to vet their decision to drink raw milk.

Trust Yourself

While Jon had explored a variety of mediated discourses on raw milk, he felt the claims made by federal and state agencies did not line up with his own experiences with raw milk:

> I've gone on the FDA website, and even though I've been drinking raw milk for five or more years, it still kind of scares the shit out of you when they say, 'You should never drink this under any conditions. It's a poison.' But that's just not my experience. I've never gotten ill from drinking raw milk, and I don't know anybody that has.

To Jon and other interviewees, the severe risk discourses promoted by the federal government simply did not resemble what he saw of raw milk consumption. He acknowledged that there were certain sicknesses that were connected to raw milk consumption, yet these anecdotes did not cause him to change his behavior.

Kate, too, was aware of the potential risks of drinking raw milk, yet she was a regular raw milk drinker. She described a friend who held many of the same values as she did, but refused to drink raw milk:

> We're very similar in terms of our food and health decisions, making food decisions more from an ecological perspective … with the exception of raw milk because her grandfather's brother died, it is believed, from raw milk. She says … 'Having that in the back of my mind just does not allow me to pour a glass of milk for my child.'

Kate went on to note that if she, like her friend, had known someone who had died or gotten seriously ill from their consumption of raw milk, she might feel that drinking raw milk carried more of a risk. But her lack of any direct personal experience with raw milk's negative effects allowed her to choose to drink it, and to feed raw milk to her own daughter. Raw milk aligned with her ecological values, she enjoyed the health benefits of her raw milk consumption, and she had no personal experience to convince her that raw milk was unsafe, so she chose to drink raw milk. In so doing, she was making her decision based on a variety of factors she felt were important, contrary to the risk-based decision that governmental discourse would advocate.

Trust Your Farmer

Beyond personal experience, consumers also looked to the producer from whom they got their milk for guidance on purchasing and consuming raw milk. Since most farms in Vermont must sell milk directly from the farm, part of the experience of raw milk consumption is interaction with the farmer. All of our interviewees had relationships with the farmer, and many knew friends or acquaintances who purchased milk from the same farm. Kate and her husband, who run a music company, offered a barter arrangement when they first began buying raw milk. "She loved the idea of having some more music, something that wasn't really in her budget, and so we traded milk for music

for several months," she explained, highlighting a unique consumer relationship that she would not have formed buying milk from a supermarket. Though Kate has since switched to paying cash, that experience with the barter system launched a friendship with the farmer that she said has now lasted more than six years. Pauline and her family also had a strong personal connection to the raw milk they consume: Her husband picks up raw milk for her family along his milk truck-driving route, and counts many of those farmers among his friends. She noted the value of his interpersonal interactions with the farmers producing the milk. "A lot of our friends are farmers. My husband was a farmer for 20 years … So where else can you go to but directly to the source?" To Pauline, knowing the farmer and being closely acquainted with his or her practices was important as a way to determine which farm to get her milk from.

In visiting the farms or receiving milk shares, interviewees regularly interacted with the farmer and valued those interactions over a supermarket-type experience. When Matt was looking for a place to buy raw milk, he chose a farm with overwhelmingly positive recommendations, both in person and online. The first time he purchased it, he went to the unoccupied farm store, took some milk and left too much money. Within minutes, he received a call asking him to come back to the farm and retrieve his change or take more milk. "I hadn't seen anybody, but there's no disconnect between the farmer and the consumer," he said. "It just shows the types of characters these … farmers are, willing to follow through and stand behind what their practices are." He contrasted this experience with a supermarket transaction, where the service might have been less personal — and where they might not have tracked him down to give him his money back. Holly, too, reported a similar feeling about the farmstand where she purchases milk

by dropping money into a box and taking her milk. “They’re trusting … that people are going to do the right thing. I think that goes both ways. The farmer needs to trust the consumer and the consumer needs to know and trust that the farmer’s doing the right thing.” Personal relationships and the trust interviewees felt for their farmers figured prominently into their understandings of their consumption choices. Their interpretation of trustworthy raw milk hinged on personal bonds and experiences rather than on risk.

Trust arose as a key variable even when the raw milk did not meet expected standards. Barbara noted that on a couple occasions, her neighbor’s milk “has almost seemed like it was soapy.” On those occasions, she called her neighbor to report the taste, and her neighbor explained that milk from cows nearing the end of their lactation phase tastes different and contains different bacteria that give it an off flavor. “And so on both occasions, she’s apologized profusely, giving me more milk, and actually finished drying off that cow,” said Barbara. For a consumer purchasing a grocery product at the store, this might be grounds to stop purchasing that product. Yet Barbara said these two experiences never made her reconsider patronizing her neighbor’s farm for milk. She explained, “I guess maybe it’s because of the neighbor factor, the fact that we know her, that we trust her, and that we know she runs a very clean shop, that we’re going to continue to buy milk from her,” she said. For Barbara, the farmer’s accountability and honesty added to her personal loyalty and trust in the farmer, which in turn kept her on as a customer.

Trust Local Farm Practices

Interviewees trusted not only the farmer, but the transparency of the production and distribution system the farmer ran. They could go to the farm and watch every step,

from the cow to the bottle. This system allowed interviewees to keep an eye on the aspects of the farm business that they prioritized. “At least when I’m buying [raw] local, organic milk from people I know, I know exactly how they’re raising the cows. I know exactly what their on-farm practices are. I know exactly how they use their profits,” said Bridget. The topic of animal treatment came up in multiple interviews, and Eliza voiced support not only for the farmer she purchased her milk from but also for the cows: “I like having that relationship and knowing that the cows are being treated well,” she said. Jessie took an economic approach, discussing the impact of her dollars on the individuals within the system. “I’m paying them directly … That’s keeping our money here and it’s supporting someone that lives in [town] and they’re going to hopefully spend that money elsewhere.” To Jessie, purchasing raw milk directly allowed her to see not only where her food was coming from, but also where the money she paid for it was going.

Many interviewees said they chose to drink raw milk in support of their local food system or economy. This did not mean, however, that risk of illness did not play a role in consumer decisionmaking. Within the framework of local raw milk choices, risk avoidance emerged as one criterion for selecting which farm to support. Many noted that they had sought information on bacteria counts and dairy management practices before settling on a farm to patronize. Farms that sell raw milk to consumers in Vermont must post bacteria testing results publicly, and many said their farmers offered more information on their own operation and on raw milk in general at the farmstand. Pauline, whose husband drives a milk truck, said her family specifically chose farms to patronize based on the ones with the lowest bacteria counts. Juliana said, “The reason I trust [the farm where I buy raw milk] so much is because the owner has a degree in cellular

biology. She's a scientist and so I feel pretty confident that she understands how it all works and the importance of testing." Juliana had examined the information available, and she also felt that the farmer's background helped to maintain a clean and safe operation.

In fact, many interviewees said that due to the large number of steps between farm and supermarket shelf, pasteurized milk products actually presented the greater risk and raw milk presented a means to mitigate that risk. Sibyl said, "I think that there's always risks in eating food that you haven't grown, so for me knowing as much of the food chain and value chain in between me and the farm is really important." To her, transparency was the best way to mitigate the constant risk of consumption. Interviewees placed the most value, and perceived the least risk, in the raw milk supply chain because they could see both where their food was coming from and where their money was going. Whereas federal governmental discourses advocate for pasteurization as a means to minimize risk, our interviewees conceptualized a values system where knowing the source and the process by which the food arrived on their plate was the most important factor in minimizing the risks involved in eating.

DISCUSSION

Our aim with this paper is primarily to bring attention to a group whose voice has been relatively quiet in the scholarly discussion surrounding raw milk: the consumers of raw milk. We discovered that interviewees did not conceive of their decisions as being in direct opposition to governmental warnings against raw milk consumption. Instead, our interviewees were making decisions using on a variety of other, community-based priorities. Both national and Vermont-based numbers suggest that a small but not insignificant minority of the population chooses to drink raw milk, particularly in states that have created legal way to obtain the substance Yet the limited existing research on the topic tends to frame these consumers as aberrant, for example noting that although consumers interviewed claimed that raw milk had health benefits, "there is little scientific evidence to support the beliefs regarding raw milk's health benefits" (Katafiasz & Bartlett, 2012, p. 126). Much of the scholarly research conducted in the U.S. focuses on animal science, health and safety and quantitative consumption perspectives of raw milk, while very little research delves into consumer understandings of raw milk consumption — that is, why people choose to disregard a recommendation that governmental sources frame as highly important. Despite clear cautions, our interviewees regularly consumed raw milk, most stating that they did not feel they were partaking in risky behavior. Rather, they drew on personal experiences and local networks to develop priorities that reflected their belief systems and concepts of community.

Theoretical Implications

Sociocultural risk theorists might theorize that raw milk consumers are seeking ways to offset a risk they feel modernity and mechanization — in this case, pasteurization

— have created. Beck would posit that the turn to unpasteurized milk is a reaction to new technologies that serve as "solutions to problems, but also as a cause of problems" (1992, p. 156). Others, like Giddens, would look to the conflicting authority voices arguing over risk — the voices that are speaking directly to raw milk consumers.

Some interviewees did express mistrust or frustration with pasteurization and its impact on their health, the taste of the milk or the structure of the food system. Many, too, were aware of the conflicting voices arguing for and against pasteurization of milk. But we found that the discussion was not based solely around a preoccupation with risk. While consumers were aware of contested risk discourses and governmental warnings, their decisions were not driven by those discourses. Most interviewees acknowledged that there was food risk associated with raw milk, but they also saw risks associated with other types of consumption. Their strongest convictions about raw milk came not from mediated sources or risk discourses, but from the personal, face-to-face experiences they had with farmers and other citizens in their communities. Among the many priorities interviewees balanced to make consumption decisions, risk did not figure heavily.

Practical Implications

Although interviewees were not making their consumption decisions based on risk, risk remains the primary form of communication for governmental authorities hoping to discourage raw milk consumption. State regulations in Vermont permit consumption of raw milk, yet public health and governmental warnings remain severe — for example, the sign that must hang where producers sell raw milk.

This results in a portion of the population that willingly disregards governmental warnings and advice, and thus receives no further guidance for vetting the safety of a raw

milk source. In Vermont, some 11.6 percent of people have ignored those recommendations and received advice through alternative and personal communication channels.

This is not to say that these public health warnings don't serve a purpose; they limit government and producer liability if consumers get sick. Public health warnings are intended to keep the maximum number of people as safe as possible, however, and in this case they are missing more than one-tenth of Vermont's population. For those organizations and governmental agencies that discourage raw milk consumption, this research may help these agencies to understand why consumers are choosing to ignore those recommendations, and perhaps allow them to communicate more effectively with raw milk drinkers. A greater understanding of consumer decision-making could help state and federal governments, advocacy organizations and researchers to understand why raw milk consumers are choosing not to listen to warnings.

Limitations

Though the words of our interviewees resonated with each other, our sample size of 25 was relatively small and comprised primarily people in the northwestern corner of the state. Our interview subjects tended to be highly educated, and those who volunteered to be interviewed had the time and ability to travel to an urban area — usually Burlington — to meet with a researcher, which may have limited the cross-section of people we were able to reach. Additionally, the scope of our research was limited to current raw milk drinkers, eliminating the perspective of those who consciously choose not to drink raw milk.

Future Research

Our research illuminated consumer decisions surrounding raw milk. We complicate the notion that consumers are simply flouting risk recommendations, instead revealing that interviewees were making informed decisions based on information that was not specifically risk-related, like personal experience and community networks. Further research could establish the generalizability of these findings, delve deeper into consumer understandings of health and science discourses, or further examine the ways in which raw milk consumers vet information sources.

Additionally, Vermont raw milk consumers operate under the permissions and restrictions of state-specific laws, and further research could examine the ways in which state regulations affect consumer relationships with farm, farmer and product. For example, Leamy et al. found that the most common trait among raw milk consumers was that they lived in a rural area; many of our interviewees also lived in a rural area, but as Vermont's urban areas are fairly small, most of those who lived in urban areas also routinely traveled to the farm where they purchased raw milk. Further research could investigate how consumer rationale for purchasing and consuming raw milk differs in states where fewer raw milk consumers have relationships with the farmers — for example, in California, where inspected raw milk is available for sale in stores (California Department of Public Health, 2014).

Concluding Thoughts

In many ways, the raw milk movement in Vermont has echoed a rise in support statewide for local food production. State agencies collaborated to write Vermont's Farm to Plate Strategic Plan — which sets goals for localizing agricultural production — in

2009, the same year that the legislature voted to allow on-farm raw milk sales (Vermont Sustainable Jobs Fund, 2009). Vermont's many farm-to-plate restaurants and highest number of farmers markets, farm stands and community supported agriculture (CSA) farms per capita also highlight a push to localize agricultural production, distribution and sales (Vermont Agency of Agriculture Food and Markets, 2014).

The reasons our interviewees gave for consuming raw milk echoed many of those arguments for local food production and consumption, and many of the arguments the legislature considered when legalizing raw milk sales. Consumers wanted to know — and see firsthand — that their food was ethically produced, wanted to support farmers with whom they had a personal relationship, and wanted to directly support their local economy. Raw milk is more expensive and more difficult to obtain than pasteurized milk from the grocery store, yet more than one-tenth of the state's population consumed it last year. Based on our research, we believe consumers value raw milk not just because of the personal and health benefits they feel it provides, but because they place a premium on the symbolic and practical impacts of their consumer decisions within Vermont's food system.

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CONCLUSION

The past century has brought radical shifts in the American food system as a whole, and the dairy industry has seen some of the biggest shifts in production, processing and distribution. Pasteurization was just one of the many new technologies that changed dairying over the past century: widespread refrigeration technology kept milk fresh longer at each stage of distribution, vacuum milking machines allowed farmers to milk more cows more efficiently, and tractors and hay balers in the fields made it easier to harvest more food for larger dairy herds. Innovations like mechanization and refrigeration, however, affected the food system as a whole. Pasteurization specifically affected the dairy industry. Pasteurization was developed for and is still used to treat many other types of foods and beverages, but the technology over the past century has became so widespread in the U.S. dairy system that it's redefined the public definition of milk itself. Today "milk" is, in most cases, understood to be pasteurized milk, whereas unpasteurized milk requires a qualifier: "raw milk."

My research delved into both the historical perspective and the current perspective, in one case looking at how pasteurization won out over other options for milk safety in the early 20th century, and at the way Vermont farmers reacted to new food safety and public health demands placed on them. In the other case, I looked at the small population of Vermonters today who choose to drink raw milk, and at their rationales for consuming a product that many public health officials say is dangerous.

A century ago, the dairy industry was in flux, facing pressure to change due to population shifts and rising year-round demand for the product. In lieu of food that could be traced to a neighbor or to a farm on the other side of town, urbanization meant that

food could travel hundreds of miles before it reached its destination, and was virtually untraceable to its source once it got there. The same nutritional benefits that caused urban consumers to seek out milk — the plentiful fat, protein and many vitamins and minerals — also made milk an especially good host for tuberculosis, typhoid and other diseases. Not only was it difficult to trace foodborne illnesses back to their sources, but as farmers scaled up their operations, infected food could now reach hundreds or thousands of people all over a region. To manage this distancing and this new larger-scale system, governmental bodies stepped in. Rather than sending inspectors to thousands of dairy farms — and in doing so, assuming responsibility for the public health risks that milk presented — city governments mandated pasteurization. To handle these new requirements, small distributors banded together to build pasteurizing plants or went out of business, soon resulting in a few powerful processing companies controlling the milk supply for each region. This pattern of centralization continued throughout the remainder of the century and shifted much of the power in the dairy industry to the milk processor and distributor.

This centralization has resulted in a system with monopsonistic tendencies, where a few processors purchase most of the milk sold by many dairy farmers, allowing those processors to dictate prices in the regional dairy market and giving dairy farmers little bargaining power (Monopsony issues in agriculture, 2003). In 2009, northeast dairy farmers filed a class action suit against Dairy Farmers of America and Dean Foods, accusing the two companies of collusion to fix milk prices. At the time, Dean Foods bottled 70 percent of the milk in the northeast U.S., while HP Hood bottled 20 percent. The suit accused the two companies of colluding to make Dairy Farmers of America their

exclusive supplier, effectively cutting out any processor or price competition on the northeast milk market. The companies settled out of court and agreed to a payout, though they admitted no wrongdoing (Cohen Milstein, 2012). Still, the prices most Vermont dairy farmers receive for their product remains out of their control. Bulk milk is a commodity with prices set on the Chicago Mercantile Exchange, though pricing varies slightly by region. These bulk milk prices are cyclical and do not reflect the prices consumers see on the grocery store shelves, which hold generally steady, rising and falling in small increments. By contrast, dairy farmers may receive anywhere from $10 to $25 per hundredweight (one hundred pounds of bulk milk) for their product when selling to major milk producers. In 2009, U.S. dairy farmers received $12.80 per hundredweight on average, the same price they received in 1980 (Parsons, 2014). And though I specifically focused on dairy for this paper, processor and distributor consolidation has happened throughout the U.S. food system over the past century.

This highly consolidated food system is a central systemic critique many of the present-day raw milk drinkers we interviewed focused on. The solution they offered was to remove both the central distributors and the governmental regulations that oversee those distributors. These raw milk drinkers felt proximity was the best answer to the problems they saw in the system. Instead of milk from many cows combined, pasteurized, homogenized and set on grocery store shelves many miles from its origins, consumers found trust in their relationship with the farmer and in a personal knowledge of the farm and its cows. To these consumers, then, proximity provides a simplified measure of milk's trustworthiness, just as pasteurization in the early 20th century, became a simple way to certify that milk was safe.

This presents a problem for the regulatory agencies that have developed policies based on what's safest for the largest number of people. Agencies and lawmakers make policies that privilege the most efficient route to reduce what they see as foodborne illness risks for the most people. Policies that win out often provide the simplest, least costly option. Pasteurization, in the early 20th century, was the most efficient route: It lowered the pressures of constant surveillance and testing of the milk supply, providing a public health safety net, in a way that placed a limited burden on farmers and governmental entities. Though pasteurization did not do away with testing or other safety precautions, it did remove some of the pressure — and expense — of other forms of milk safety surveillance.

Pasteurization laws required major structural changes, and they required unprecedented government intervention into the food system, so it is only to be expected that there would be pushback. Today, the American food system is overseen by many governmental agencies and subject to many regulations. A century ago, by contrast, government regulation was relatively new. The first major federal law governing the food system was the Pure Food and Drug Act of 1906; prior to that act, food production and distribution was so limited that widespread food safety and labeling regulations were not necessary (Velten, 2010). Though the federal government did not immediately step in on the milk issue, state and municipal governments across the U.S. became proxies for the personal connection to food that growing urban populations had lost.

Since the early 1900s, the number of farmers of all types in the U.S. has declined precipitously, meaning each farm produces more and more food, and farmers now make up only a tiny fraction of the U.S. population, producing food for millions of non-

farmers. In recent years, foodborne outbreaks in spinach, peanut butter and cantaloupe have affected people in multiple states (Centers for Disease Control and Prevention, 2014). Sometimes spanning thousands of miles, these outbreaks demonstrate just how far-flung our food system is. Federal and state governments conduct surveillance in order to detect outbreaks like these before they have sickened many people. Yet the raw milk drinkers we interviewed noted that these types of foodborne illness outbreaks convinced them that all food is risky. That outbreaks occurred in such a wide variety of items offered a reason not to trust the national food system. Publicity surrounding foodborne illnesses did not make our interviewees feel more reliant on governmental public health surveillance to avoid food risk; interviewees preferred instead to purchase food from farmers who they knew or who were close to their homes, as this minimized their interaction with the large processing and distribution systems that stand between farmers and the food on the grocery store shelves.

On the whole, foodborne illnesses have declined substantially since the early 1900s, and this changes the nature of regulatory battles. There is an ongoing fight for access to imported raw milk cheeses, and some argue that young raw milk cheese, by virtue of the bacterial cultures it contains, is safe to eat. Yet the Food and Drug Administration says it's not worth the risk. Producers recently fought back against a recent apparent food safety rule that would have restricted cheesemakers' use of wooden boards for aging, which helps to culture the cheese rind with bacteria from past batches. In the face of widespread protest, the U.S. Department of Agriculture clarified (Egan, 2014). And, as in Vermont, raw milk consumers in many states argue that they should be allowed to partake of the substance if they want to, with little to no government

intervention. Debates like these illuminate a contest between protecting the health and safety of the U.S. population and allowing people the freedom to choose their actions and their foods.

Vermont's own permissive raw milk laws are recent, and state lawmakers continue to amend the law to give consumers easier access to raw milk and to give raw milk farmers easier access to markets. Pasteurization offered a legislative compromise between an unregulated dairy system and a system where city or state governments monitored every step of the way, and state legislatures across the country continue to grapple with the balance between personal freedom and government interventions in the name of public health.

The food system is not driven only by policymakers and governmental authorities, though. Absent the context of public discussion and debate, policy offers only a narrow window into happenings both historical and present-day. A major theme of public discussion in both 1900 and today is technology in the food system. Though we as a culture might embrace new computing technologies with excitement, with some waiting hours in line for the latest iPhone or new video game, we are far more circumspect about technology in our food system. In the early 1900s it was pasteurization that for a time became the bogeyman of technological advancement; today, genetic modification fits that bill. We approach new things that will enter our bodies — that will, in a way, become us — with extreme skepticism.

Vermont farmers in 1909 did not trust the new pasteurization techniques that the state had thrust upon them, pushing back against a technology they claimed was killing their animals. They were not alone in their resistance. There were prominent voices on

either side of the aisle, with even the chief of the U.S. Bureau of Chemicals expressing skepticism about pasteurization's health benefits. Meanwhile, many public health officials argued that in addition to being harmless, pasteurization was the only economical way to guarantee the safety of the U.S. milk supply.

Many of the anti-pasteurization arguments of the time echo today's arguments against genetically modified foods — a topic very much on the minds of Vermonters, as the state legislature this year passed a bill requiring the labeling of genetically modified foods. Those who testified prior to the bill's passing attributed a wide array of health problems to genetic modification, and expressed frustration with a regulatory structure that was allowing this new technology to proliferate in the food system with what they felt were minimal precautions. Now, as in the early 1900s, in order for us to understand the proliferation of these new technologies, it's not enough to look at the political structures surrounding them. Political moves mingle with larger economic, cultural and systemic pressures to produce changes in the food system. While in retrospect these changes may seem like a natural outcome, closer investigation almost always reveals a host of conflicting and nuanced solutions to any given problem.

A historical perspective on dairy offers those views into alternative milk cleanliness methods and the political and social context that drove the pasteurization solution, and contextualizes alternative narratives raw milk drinkers cite today. In turn, the implementation of new technologies like pasteurization helps to explain the policy decisions and public conversation that drove consolidation in the dairy industry and in other areas of the food system. And an examination of dairy producer-consumer relations in the early 1900s offers insights into how Vermont raw milk consumers today are

intentionally creating close bonds to milk producers, bridging the gap that opened as urbanization became the norm in the U.S. That choice to purchase raw milk is informed — and is often a response to — the structure and realities of the existing dairy system. Critiques of a normative system do not exist independently of that system; they are constantly reflecting on and grappling with that system. Examining farmer resistance to pasteurization in the early 1900s and consumer resistance to pasteurization in the present day helped to illuminate patterns and recurring themes, with each section ultimately providing context for the other.

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APPENDIX A: INTERVIEW PROTOCOL

INTRODUCTION TO INTERVIEW

Thank you for taking the time to speak with us today about raw milk and your motivations for drinking raw milk. You are one of 30 individuals my research team will be speaking with, so your participation is very important.

It is important for you to know that your participation is voluntary. If you don't want to answer a question, let me know and we can move on. Also, if may change your mind about participating, we can stop at any time.

Also, this interview is confidential—for yourself and for any farm, business, or other individual you mention. You will not be asked to provide information that could be used to uniquely identify our responses from those of other participants. Further, you will not be identified in any written reports or publications associated with the study.

To protect your identity we have decided not to ask you to sign a consent form. Instead, by participating in the interview from this point forward you are implying consent. Is that alright with you?

I would like to audio-record our conversation, so I can be sure I correctly represent your opinions in our paper. Is it okay if I turn on the audio-recorder now?

***

1. **Can you tell me about the first time you drank raw milk?**

2. **I see from the survey you took earlier this week that you currently drink raw milk _____ per month. Tell me about how you currently go about obtaining raw milk. [**who, what, when, where]
   - How did you decide to get your raw milk from this farm?
   - How far do you travel to purchase raw milk? Pasteurized milk?
   - How much do you buy? How much does it cost?
   - Is this method convenient for you? If so/not, why do you do it?

3. **Why do you drink raw milk?**
   - Why is _____ so important to your when buying milk?
   - When or how did _____ become important to you?
   - How did you learn this? Who did you learn it from?
   - How do issues related to health and safety influence your decision to drink raw milk?

4. **Do you ever have conversations with others about drinking raw milk?**

- Tell me a story about a recent conversation that you have had. (who, when, where, what, why)
- In general, how other raw milk drinkers react when they hear that you drink raw milk products.
- In general, how *non* raw milk drinkers react when they hear that you drink raw milk products.

- Have you ever been praised for drinking raw milk? Is so, can you tell me about what happened?
- Have you ever been criticized for drinking raw milk? Is so, can you tell me about what happened?

5. **Let's take a step back, can you tell me about the differences between "pasteurized milk" and "raw milk"?** [draw on technology/science/policy]
   - What do the words "raw milk" and "pasteurized milk" mean to you? [draw on lay personal meanings]
   - Overall, how does the health or safety of raw milk compare to pasteurized milk?

6. **In the past, where have you gotten information about the differences between "pasteurized milk" and "raw milk"?** [draw on issues of credibility (expertise & trustworthiness), channel, and message]
   - Can you tell me a story about how something you learned impacted your decisions to or not to drink?
   - Based on today's conversation, where do you plan to get information from in the future?

7. **Who do you think is responsible for making sure that people make good choices regarding raw milk consumption? (Individuals, policy makers, or others?)**
   - What role does the farmer play?
   - Policy makers? Government?
   - Experts / scientists?
   - Individuals? Others?

8. **Tell me about some of the policies that Vermont has put into place to regulate raw milk.**
   - How did you learn about Vermont's policies regarding raw milk?
   - Why do you think did Vermont adopt these policies?
   - How do Vermont's raw milk policies help or hinder consumers?
   - How do your decisions to buy and consume raw milk coincide or challenge Vermont's policies?
   - Would you like to see changes in Vermont's guidelines or policies regarding raw milk? And, if so, what changes would you like to see? Have you done anything to try to make these changes happen?

9. **According to the Center for Disease Control and Prevention, raw milk can pose serious health risks. They actually recommend that people avoid drinking raw milk. They tell people to choose pasteurized milk instead.**
    - Did you know about the CDC's recommendation? If so, how did you learn about it?
    - Why do you think the CDC made this recommendation?
    - How do the CDC's recommendations help or hinder consumers?
    - How do your decisions to drink raw milk fit within the CDC's recommendations?
    - Would you like to see changes in the CDC's raw milk recommendations? And, if so, what changes would you like to see? Have you done anything to try to make these changes happen?

10. **This is my final set of questions. I would like to hear your thoughts on two topics other interviewees have talked about. First, some of our interviewees said that they were trying to send a message when they bought and drank raw milk. Are you trying to send a message by drinking raw milk? And, if so, what message are you trying to send?**
    - Who or what are you supporting when you drink raw milk?
    - In what ways does your decision to purchase and consume raw milk support or go against main stream messages about raw milk?

11. **Second, some of our interviewees said that many raw milk drinkers fit into a particular stereotype or, in other words, are thought to project a particular identity. Do you agree? And, if, so, what does this raw milk identity look or sound like?**
    - Is there a label that you use to describe this identity or stereotype?
    - Tell me a story about a time you saw people adopting this identity?
    - Do you or someone you know fit into this identity? How so?

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+ Before we end the interview is there anything else you would like to share with me about your experiences with raw milk?

+ Do you know anyone else who drinks raw milk who may be interested in being interviewed? _____ (or write your name and email on the exit sheet for them to pass on. Emphasize that you would need them to contact you asap.)

+ This is a piece of paper with some information about this study. It includes information about who you could contact if you had questions about this interview or our study. [Give paper].

Again, thank you for your time and the great conversation. [Turn off recorder]