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Do Raw Milk Sales Help or Harm Local Dairy Economies: The Case of Vermont H.125

Catherine W. Donnelly, Ph.D.
Department of Nutrition and Food Science, University of Vermont
Todd J. Pritchard, Ph.D.
Department of Nutrition and Food Science, University of Vermont

In June of 2009, the Vermont legislature passed H.125, a bill which expanded the sale of unpasteurized milk in Vermont. The purpose of the legislation was to allow farmers to sell larger quantities of unpasteurized milk while simultaneously creating new sanitary production, marketing and consumer education standards. The legislation stated that Vermont's current unpasteurized milk laws limit economic development, and that farmers can sell unpasteurized milk for $5.00 to $10.00 per gallon, representing an economic opportunity for farmers in these times of severe economic challenges for so many dairy farmers.

However, should economic opportunity be met at the expense of public health? Does pursuit of economic opportunity for some create the right to jeopardize the image of an entire industry which has built its reputation on the safety and wholesomeness of its products? Has this legislation created two standards for milk production in Vermont, and if so, what does this pose for the future of the Vermont dairy industry? How would overall dairy product sales be impacted if an outbreak of serious illness were traced to a Vermont farm selling raw milk? In this paper, we address these and other questions including the following key question: Has H.125 created economic opportunity or legal liability for farmers engaged in the sale of unpasteurized milk?

This paper concludes that the main impact of H125 will be increased raw milk sales which will result in increased consumer exposure to raw milk, and an increased risk for food borne illness.

Pathogens of concern associated with raw milk

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 (Oliver et al. 2009; Schmidt and Davidson, 2008). Consumers who choose to purchase and consume raw milk should understand that raw milk may contain dangerous bacterial pathogens. Consumers should also understand whether they are in a risk group which increases their chances of adverse health impacts from exposure to bacterial pathogens.

There are numerous dangers posed to public health by bacterial pathogens associated with raw milk consumption.

The dangers posed to public health by bacterial pathogens associated with raw milk consumption are numerous. *Listeria monocytogenes*, *Salmonella* Typhimurium, *Escherichia coli* O157:H7 and *Campylobacter* are just four of the pathogens of concern in raw milk. The bacterial pathogens posing a risk to consumer health have become more dangerous in the past two decades, and serious illness and death have occurred in Vermont farm families as a result of raw milk consumption (Vogt et al. 1990; Friedman et al. 1998). In addition to the pathogens posing more risk, the percentage of our population at risk for food borne illness has increased significantly. It is critically important to understand risks posed by raw milk consumption, why the pathogens have become so dangerous, who is at greatest risk for severe illness and death, and why we need public health policies which limit exposure and warn susceptible consumers about dangers posed by raw milk consumption. There are also important liability issues faced by individuals producing products causing harm to consumers.

Of all of the food commodity sectors in the United States, no sector is more committed to public health than the dairy industry. The reason for the absolute commitment to public health stems from early in the 1900's when raw milk was a major source of human disease, including tuberculosis and scarlet fever (Potter et al. 1984). Numerous deaths were linked to raw milk consumption. The public health response to this crisis was the crafting in 1924 of the Standard Milk Ordinance, which would later become known as the Pasteurized Milk Ordinance, a comprehensive document which governs all aspects of production, processing and marketing of milk and dairy products (U.S. FDA, 2007). Among numerous other sanitary guidelines, the PMO establishes standards for raw milk bacterial counts, and raw milk cannot be used to manufacture pasteurized fluid milk if it exceeds established microbiological standards. Each load of milk collected from a single farm is tested for bacteria and antibiotics prior to processing.

There are a number of consumers who have life threatening allergic reactions to antibiotics, so testing of each load of milk prior to processing assures that these potential allergens will be kept out of the food supply. Milk temperatures are monitored upon arrival at the processing plant. Milk which has been stored at elevated temperatures can support growth of bacterial pathogens, thus monitoring milk temperature helps assure safety. Milk processing plants are regularly inspected, and pasteurizer operators are trained and certified. Milk pasteurization equipment is inspected and must be designed and constructed according to rigorous public health standards. Pasteurized milk is not a safe product simply due to the heat treatment which milk receives; milk safety is achieved because the PMO outlines a comprehensive system to assure milk safety. The PMO is constantly updated, guided by scientific experts, farmers and dairy industry personnel working through the National Conference on Interstate Milk Shipments (NCIMS). The goal of the NCIMS is to "assure the safest possible milk supply for all the people" through enforcement of Grade A milk sanitation laws. The PMO has made pasteurized milk one of the safest food products available to consumers, and this ordinance has had a profound positive impact on public health. The PMO is the accepted operating guideline for the handling and production of milk and dairy products in the State of Vermont. Adherence to the

PMO importantly protects the Vermont milk market by enhancing consumer confidence in dairy product safety and reducing liability costs of this economically significant sector of the Vermont agricultural economy.

Pathogens in Raw Milk

We have routinely conducted microbiological examination of raw milk, and have provided assistance to the Vermont Agency of Agriculture and the Vermont Department of Health during milk borne illness investigations. Vogt and colleagues (1990) from the Centers for Disease Control (CDC) reported on a case of listeriosis in a raw milk drinker where identical strains were identified in the patient and the raw milk source. The woman, a 76 year old female with kidney disease who lived on a Vermont dairy farm, regularly consumed raw milk from her farm on her cereal each morning, but no other products from her farm. Because of her health, she rarely left her home. The patient was the only case of listeriosis reported to the Vermont Department of Health in the first quarter of 1987. Ironically, the farm had been recognized as the Vermont Dairy Farm of the Year because of the high quality of the milk produced and the low bacterial counts associated with milk produced at this farm. The patient died from listeriosis. This Vermont case highlighted the known risk for infection by consuming raw milk, especially for persons who may have compromised immune systems.

Listeria monocytogenes is an extremely dangerous pathogen which kills approximately a third of the patients which it infects. We have documented over the past 25 years that farm environments, silage, dairy cattle, and raw milk are all important sources of *L. monocytogenes*. Further, our research has shown that certain epidemic clones of *L. monocytogenes*, those with enhanced potential to cause human illness, can be regularly isolated from Vermont farm environments and have been involved in epidemics of human illness and death (Fleming at al. 1985; D'Amico and Donnelly, 2008). *L. monocytogenes* was virtually unknown to food microbiologists before 1980-now it is a leading cause of death due to a foodborne pathogen. This pathogen targets persons with compromised immune systems due to advancing age (>65 years), cancer treatment, diabetes, organ transplantation, kidney disease, and HIV/AIDS. Pregnant women and their fetuses are extremely susceptible to listeriosis, with each newborn/fetal case costing an estimated $48,000 in hospitalization and physician costs (Buzby et al. 1996). Each death due to listeriosis has an economic burden of approximately $6.5 million.

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Lovett et al. (1987) documented that extremely low levels of *L. monocytogenes* (0.5 to 1.0 *Listeria*/ml) exist in commercial bulk tank raw milk. Comprehensive studies conducted by the U.S. Food and Drug Administration and the United States Department of Agriculture (Bunning et al., 1988), and by Health and Welfare Canada (Farber et al. 1992) have shown that *Listeria* is unable to survive normal conditions of milk pasteurization. *Listeria* contamination of processed dairy products is a function of post-pasteurization recontamination from the dairy plant environment, and numerous surveys (Klausner and Donnelly, 1991; Pritchard et al. 1994; Arimi et al. 1997; D'Amico and Donnelly, 2008; 2009; 2010) document the presence of *Listeria* within the dairy plant environment. Sources of *Listeria* within the dairy plant environment include floors in coolers, freezers, processing rooms, particularly entrances; cases and case washers; floor mats and foot baths. (Klausner and Donnelly, 1991; D'Amico and Donnelly, 2009). Pritchard et al. (1994), in a study of dairy processing facilities, found that those processing plants having a farm contiguous to the processing facilities had a significantly higher incidence of *Listeria* contamination than those farms without an on-site dairy farm. Arimi et al. (1997) used ribotype analysis to demonstrate the link between on-farm sources of *Listeria* contamination (dairy cattle, raw milk and silage) and subsequent contamination of dairy processing environments.

A well publicized case of illness involving transmission of *Salmonella* Typhimurium (*Salmonella enterica* subsp. *enterica* serotype Typhimurium) DT104 from ill dairy cattle to humans via raw milk consumption occurred in Vermont in 1997(Friedman et al. 1998). This outbreak was the subject of intense media coverage. The November 24, 1997 issue of *U.S. News and World Report*, pictures a Vermont calf on the cover with a caption that reads "First, a calf on this Vermont farm got sick. Then the cows started dying. Then the people fell ill. Soon, federal scientists were hunting down a virulent new microbe." The outbreak occurred on a Franklin County, Vermont farm, where the family regularly consumed raw milk. Nine family members fell seriously ill, and one nearly died. The pathogen involved in the outbreak, *Salmonella* Typhimurium DT 104, carries resistance to major classes of antibiotics including ampicillin, chloramphenicol, streptomycin, sulfonamides and tetracycline.

Exposure to these pathogens can lead to secondary disease syndromes such as reactive arthritis.

Salmonella Typhimurium definitive type (DT) 104 emerged in the United Kingdom as an important source of human infection in the late 1980's (Threlfall et al. 1996). Subsequent outbreaks of human illness traced to dairy sources were reported in Vermont (Friedman et al. 1998), Nebraska, California (Cody et al. 1999) and Washington State (Villar et al. 1999). This organism is notable because it possesses resistance to multiple antimicrobial agents. Aceto et al. (2000) conducted a survey to assess the herd prevalence of S. Typhimurium DT 104 in Pennsylvania dairy herds. Of 51 farms surveyed, 11 were positive for *Salmonella* species, and 4 were positive for S. Typhimurium, 2 of which were DT-104 positive. A 1987 FDA survey revealed the presence of *Salmonella* in 32 of 678 (4.7%) samples of raw milk obtained from bulk tank trucks in Wisconsin, Michigan and Illinois with 10 of 16 (62.5%) collection sites also testing positive (McManus and Lanier, 1987). *Salmonella* spp. were isolated from 26 of 292 (8.9%) of farm bulk tank samples collected in eastern Tennessee and southwest Virginia (Rohrbach et al. 1992). Wells et al. (2001) examined recovery of *Salmonella* from fecal samples obtained from dairy cows representing 91 herds from 19 states. *Salmonella* spp. were recovered from 5.4% of milk cows.

Salmonella Typhimurium DT 104 is but one of the many pathogens which comprise the 76 million U.S. cases of foodborne illness and 5000 deaths per year (Mead, 1999). Some of the pathogens causing the problems in raw milk have been around for decades-*Salmonella*, Staphylococcus aureus, *Campylobacter*. Unlike previous decades when food borne illness was no more than a stomach ache at best, or diarrhea and vomiting at its worst, most often this was not a serious situation. Only in rare instances were outbreaks investigated. Today, the problems are much larger and far more serious. The pathogens *Campylobacter* and *Salmonella* account for the majority of the food borne illness in the U.S., these pathogens are on the increase, and raw milk is a known source of these pathogens. In addition to primary symptoms of gastroenteritis, exposure to these pathogens can lead to secondary disease syndromes such as reactive arthritis, a painful and debilitating condition that can persist for ten years or longer and may, in some cases, cause long term disability. This syndrome is most common in men of 20-40 years of age. Individuals who have the HLA-B27 antigen are genetically predisposed to developing reactive arthritis following exposure to Gram negative enteric pathogens (Colmegna et al. 2004).

Antibiotic resistance genes carried by many foodborne pathogens make the very antibiotics used for human disease treatment ineffective, and make death a likely result from foodborne illness. Bacteria which were innocuous years ago have acquired genes which turn them into extremely deadly and pervasive organisms which have infiltrated the food supply. *E. coli* O157:H7, an organism not seen prior to 1982, is such an example. In California in 2006, 6 children developed infection from *E. coli* O157:H7 and/or hemolytic uremic syndrome (HUS). Five of the affected children had consumed raw dairy products from a single dairy (Schneider et al. 2008). HUS is one of the most common

causes of sudden, short term kidney failure in children. Young children and the elderly are at greatest risk of developing HUS following infection with *E. coli* O157:H7. In 2005 in Texas, an infant developed *E. coli* O157:H7 infection and kidney failure from HUS. The infant was placed on a kidney transplant list and was on dialysis for two weeks. The infant had exhibited allergic reactions to several infant formulas so that parents fed the baby raw goat's milk.

Given the severity of consequences associated with *E. coli* O157:H7 illness, there is a need to alert consumers to the severe consequences of illness. Just a few cells of this particular pathogen can permanently inactivate kidney function in young children. Hemolytic uremic syndrome associated with *E. coli* O157:H7 is a very serious illness with severe economic consequences in terms of heath care costs. Each case of HUS has an economic burden of $30,000 in hospital and physician costs (Frenzen et al, 2005). At a time when the U.S. and the State of Vermont are trying to reduce health care costs through reduction of chronic disease, increased raw milk exposure will only contribute to the economic burden of increased health care costs due to this and other pathogens.

E. coli O157:H7 can readily contaminate raw milk on the farm with contamination rates of 4.2 to 10% reported in the U.S., and 2% reported in Canada (D'Aoust 1989, Padhye and Doyle, 1991). Over 70 cases of *E. coli* infection characterized by bloody diarrhea, HUS and kidney failure have been traced to consumption of raw milk (Borczyk et al. 1987, Martin et al. 1986; Bleem 1994) with a few additional cases in England linked to yogurt (Morgan et al. 1993).

E. coli O157:H7 was first characterized in 1982 during epidemiological investigations of two outbreaks which occurred in North America. Cattle are thought to be the principal reservoir for this important human pathogen, and in investigations where food has been identified as the vehicle of transmission, ground beef is the product most frequently linked to human illness. Shere et al. (1998) in a longitudinal study of *E. coli* O157:H7 dissemination on four Wisconsin dairy farms, identified contaminated animal drinking water as the most probable vehicle for infection of animals and a potential intervention vehicle for on-farm control of dissemination of this pathogen. Since shedding of this pathogen by cattle was found to be intermittent, data suggests that re-inoculation from an environmental source rather than colonization of the pathogen likely explained the intermittent shedding.

The emergence of deadly forms of Salmonella and other antibiotic resistant pathogens is a relatively new phenomenon.

The emergence of deadly forms of *Salmonella* and other antibiotic resistant pathogens is a relatively new phenomenon. Thus, individuals who regularly drank raw milk in the past were not exposed to these newly emerged pathogens. As stated by Dr. Michael Osterholm: "If you understood the epidemiology of foodborne illness 10 years ago, you don't necessarily understand it today." In 1996, the CDC implemented a system known as PulseNet, which tracks genetic fingerprints of bacterial isolates reported from State Health labs around the country. Public health officials can know quickly when foodborne disease outbreaks are happening because all State public health labs are networked with CDC and can quickly compare data on outbreak strains common to several states. PulseNet transformed foodborne disease surveillance from a passive system where most outbreaks went unrecorded, to an active system designed to rapidly remove contaminated foods from commerce. This system is saving lives and is certainly working to facilitate removal of contaminated foods from commerce.

Unfortunately, routine testing and quality assurance conducted by some food producers has not kept pace with this fundamental public health change. State and federal regulatory agencies are actively using scientific tools to precisely identify foodborne pathogens in foods which match genetic fingerprints from bacteria isolated from patients who have consumed contaminated products. The same genetic fingerprinting technology is being used to litigate cases where raw milk has caused consumer illness. This technology has transformed the world of legal liability regarding food production,

providing scientific certainty in attribution of causes of foodborne exposure and resulting human illness.

Why Vermont H.125 standards fail to achieve milk safety

H.125 purportedly offers three strategies for protecting consumers from the dangers associated with raw milk consumption: a) limiting exposure through limiting raw milk sales; b) posting on-farm signage warning the public of dangers associated with raw milk consumption and including warning labels on raw milk containers; and c) including requirements for testing and adoption of microbiological standards for raw milk. While a) and b) certainly afford some degree of consumer protection, the latter strategy c) is simply inadequate to provide public health protection and may create a false sense of security regarding raw milk safety.

Consumers of raw milk expect that the milk they are receiving is safe and free of pathogens.

H.125 requires producers selling 12.6 to 40 gallons of unpasteurized milk per day to perform microbiological testing of milk. Results of testing should be below the following limits: <15,000 cfu/ml aerobic plate count (APC); <10 cfu/ml coliforms; and < 225,000/ml somatic cell count (for cows). Unfortunately, these standards fail to assure the microbiological safety of unpasteurized milk.

When applied to pasteurized milk, these standards have meaning. Because pasteurization is designed to inactivate pathogens of public health significance associated with milk, bacterial counts of organisms obtained post pasteurization usually do not include pathogens, unless post-processing re-contamination has occurred. Thus, measurement of coliform levels in pasteurized milk following pasteurization is a useful and meaningful standard. Since coliforms are not heat resistant, the presence of even low coliform levels in a sample of pasteurized milk indicates some degree of post-pasteurization contamination from the processing environment. However, coliforms are not pathogens. Coliforms comprise a group of bacteria whose presence indicates the possible presence of pathogens. Coliform testing was used for many years in lieu of pathogen testing because testing for specific pathogens was either unavailable, or those test which became available were too costly and too time consuming. This is no longer the case, and DNA-based testing strategies offer reliable results in 24 hours or less. Coliform testing on raw milk offers no information about the potential presence or absence of pathogens. Even if specific testing for pathogens was performed on raw milk, testing is limited to the target pathogens tested, which may not encompass all potential disease causing bacteria. Further, testing must be statistically based to be representative of the entire lot. Standard plate count testing provides no useful information regarding the presence or absence of pathogens of concern to human health. Again, because milk is a raw product, APC counts could indicate the presence of 14,000 *Listeria*, or 5,000 *Salmonella*.

Coliform testing in other areas of food production, specifically the meat and poultry industry, is used to monitor the sanitary nature of the processing plant and the practices used during slaughter and processing. Companies are required to show that they are capable of producing food products under sanitary conditions through the use of a defined sampling plan. Samples are taken from those portions of the carcass which are most likely to have become contaminated during processing. Currently, processors are required to test product (i.e. carcasses) for coliform bacteria weekly, and continuing until such time as they have obtained thirteen continuous samples which meet the established compliance standards published by the USDA. Producers must show that, within a given set of 13 tests, they do not exceed the upper microbiological limit even once or that they are capable of producing product below the lower limit in 10 of the 13 samples. If the producer fails to meet the requirements they must continue to test until they can show they do meet the requirements (http://origin-www.fsis.usda.gov/PDF/FSRE-HACCP-Ecoli.pdf). Utilization of this process helps the producers use statistical

process control to rapidly identify when there has been an issue and therefore shorten the amount of time required to make changes in their process to achieve safety. As stated earlier, Grade A milk processors test each individual farm every time milk is obtained. This allows the processor to quickly alert the farmer of a potential safety issue, and for immediate corrective actions (i.e. cleaning/ sanitizing pipelines/milking machines and evaluating the compressor of the bulk tank cooler) to mitigate potential safety issues. H.125 only requires raw milk testing twice per month. This level of testing is neither sufficient to adequately evaluate the sanitary nature of the facilities, nor document the adequacy of the milk harvesting techniques. Furthermore a producer who chooses to test milk on days one and two of the month will have technically met the requirements of H.125, without the need to monitor their process over the remaining 28 days of the month.

H.125 only states that the SPC must be below 15,000 CFU/ml when it is tested (i.e. fresh). Raw milk producers are not required to hold their product from sale until test results have been completed to assure compliance with H.125 standards. Similar SPC standards were in place in California in 2006, yet failed to prevent the *E. coli* O157:H7 outbreak in which 2 children were hospitalized with HUS (Schneider et al. 2008). There are also no established procedures for a farm to address what measures they will take in those instances when the raw milk sample indicates that the microbial load was over the limit when tested. This issue could be addressed via the use of 'test and hold" procedures. These procedures are utilized in many other food production fields. Companies utilizing these procedures do not release product into commerce until they have obtained completed tests results and have documentation that the product has met the appropriate standards/regulations. There are no requirements in H.125 to inform customers of a failure on their part to meet standards and that the milk they were sold does not meet the sanitary requirements established under this legislation.

In cases where sanitary standards have been exceeded, there are no provisions requiring a raw milk producer to prove that they have brought their process back under sanitary control prior to resuming raw milk sales. As with coliform testing, the raw milk producer is only required to test their milk twice per month. A farm which opts to test on the first two days of the month could meet the requirements of H.125, but still be selling milk which is out of compliance over the next 28 days. The bill does not identify an acceptable upper limit over which it is no longer considered of adequate quality for consumption by the consumer. Setting an upper microbiological limit at which the milk is no longer fit for consumption would be helpful in determining the shelf life of the product. Currently there is no requirement for raw milk producers to evaluate the keeping quality of their product. Thus, the consumer is provided with no information concerning the safe and acceptable shelf life limits of this product.

The level of testing is not sufficient to adequately evaluate the sanitary nature of the facilities, nor document the adequacy of the milk harvesting techniques.

Consumers of raw milk expect that the milk they are receiving is safe and free of pathogens. H.125 only tangentially addresses this issue by requiring a label that raw milk may contain pathogens and that certain individuals may be more susceptible to food borne pathogens. The testing for pathogens in raw products and finished, ready to eat, products is mandated by law for many of the foods in our food supply. Companies must show either proper disposal or reworking of contaminated product to ensure the elimination of the target pathogen. There is no requirement for pathogen testing of raw milk in the current law and, because of this; there are no required corrective actions to be taken with milk which has been found to be contaminated with pathogens. Interestingly, prior versions of this bill recognized the importance of pathogen testing and included a requirement that if raw milk was found to contain pathogens, the farm in question would be prohibited from selling milk until they produced three consecutive pathogen negative milk samples. It is also worth noting

that a farm selling less than 12.5 gallons per day is not required to do any of the above noted testing. H.125 in effect exempts these establishments from having to prove that they are selling milk which meets established sanitary requirements.

While the bill identifies conditions under which milk must be cooled, stored and transported, there is no requirement for documentation that adequate temperature control was actually achieved. Temperature control is the absolute main factor which will work to minimize the growth of pathogens which may be present in raw milk. A notable exception to this is *L. monocytogenes* which can grow, albeit slowly, at refrigeration temperatures. The PMO recognizes the importance of rapid cooling of raw milk and has established time and temperature parameters to achieve proper cooling. The PMO also requires bulk tanks to be equipped with continuous recording thermometers to prove that the milk has been cooled properly and maintained at required temperatures. Documenting the time and temperature parameters should be part of the due diligence shown on the behalf of the farmer and should be required in any bill which is focused on the sale of raw milk. Such a requirement is consistent with requirements of other food industries.

What is the legal liability for farmers if unpasteurized milk from Vermont is linked to an outbreak of serious illness and death?

In addition to testing, the bill also purports to prescribe "reasonable sanitary standards" for milk production. Among these are a requirement for the farm to have a "potable water supply which is sampled for bacteriological examination according to agency standards every three years and whenever any alteration or repair of the water supply has been made." Work from our laboratory has documented that contaminated on-farm water supplies are frequently the source of microbiological problems with products produced on the farm. Testing once every three years to assure the microbiological quality of water is so infrequent that it is of little or no value. The bill further states that "milking equipment shall be of sanitary construction, cleaned after each milking, and sanitized prior to the next milking." In order for sanitizers to be effective, they must be compatible with the water supply on the farm. It is critical that water be tested frequently to assure that the pH and mineral content is compatible with the sanitizer being used. If it is not, the sanitizer will simply have no bactericidal efficacy. Cleanliness and sanitary nature are two different concepts. The issue of cleanliness, but not the sanitary nature, of the bottles/containers used for transporting raw milk is inadequately addressed. The bill only refers to the cleanliness of the containers used and not to their sanitary nature. It is in the best interest of raw milk sellers to address the sanitary nature of the containers. This could be addressed via requirements for use of chemical sanitizers or heat sanitization. In either case, it is important to note that the conditions used to ensure the sanitary nature of the containers must be verified and documented

Legal Liability and Risk

The main impact of H125 will be increased raw milk sales which will result in increased consumer exposure to raw milk, and an increased risk for food borne illness. There are important impacts of this legislation including increased legal liability for farmers, increased health care costs in Vermont, long term chronic illnesses as sequellae to primary gastroenteritis, and potential damage to the reputation of Vermont's dairy products as safe and nutritious foods. For instance, will increased raw milk sales help or harm milk markets and overall Vermont milk sales? A well publicized outbreak of illness from unpasteurized milk may have a potential negative impact on overall Vermont milk and dairy product sales if consumers perceive risks. Testing of milk does not assure safety. What is the legal liability for farmers if unpasteurized milk from Vermont is linked to an outbreak of serious illness and death? How do we know that the system described in H.125 can even function to protect public health? What is the mechanism to alert the public and conduct a product recall if unpasteurized milk is revealed as a source of dangerous bacterial pathogens? At the very

least, a credible, enforceable risk-reduction system must be implemented to achieve a level of public safety and regulatory oversight on par with, or exceeding, other branches of the food industry. And, even then, the risks in terms of personal health and the potential for harming the image of the Vermont dairy industry may be too great for some. *Caveat emptor* (buyer beware) has long been the position of agency of agriculture officials concerning the sale of raw milk. With respect to H.125, this may be sage advice.

In conclusion, the International Association for Food Protection (IAFP), the leading organization of food safety professionals in the U.S., recently issued a position statement on the consumption of raw milk (Schmidt and Davidson, 2008):

"We hereby join the numerous other organizations and agencies in warning consumers regarding the risk of raw milk consumption. It is overwhelmingly clear from scientific and epidemiological evidence that the risks of raw milk consumption far outweigh any perceived benefits…. In conclusion, scientific evidence is clear that there is an increased risk of serious milkborne illness and even death associated with the consumption of raw milk."

As professional members of IAFP, we endorse this position statement.

— Catherine W. Donnelly
& Todd J. Pritchard

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Center for Rural Studies
206 Morrill Hall
University of Vermont
Burlington VT 05405

Tel: (802) 656-3021
E-mail: crs@uvm.edu

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