

# **RAW MILK LEGISLATION PACKET**

## TABLE OF CONTENTS

I.	Executive Summary.....	1
II.	Pending and Current Laws Related to Raw Milk.....	3
III.	Outbreaks and Illnesses from Dairy Products.....	4
IV.	Cost of Raw Milk Regulation and Outbreak Investigation.....	6
V.	Evidence-Based Review of Health Claims by Raw Milk Advocates.....	7
VI.	Position Statements by Professional Organizations and Agencies.....	8
VII.	Recommendation.....	10
VIII.	Attachments and Links.....	11

## EXECUTIVE SUMMARY

The use of heat is central to the culinary arts and dates back to the beginning of human civilization. Heat enhances the flavor of animal- and plant-based foods. Heat is also a way to destroy harmful germs that can cause disease or spoil the food. Pasteurization is the term used to describe the use of heat to kill harmful pathogens and spoilage organisms in beverages, especially milk and juices. Pasteurization is not the same as sterilization, so eventually pasteurized milk will spoil and must be kept in the refrigerator. Pasteurization was introduced over 100 years ago to combat diseases and reduce infant mortality from contaminated raw milk.

Despite widespread acceptance of the pasteurization process to reduce the possibility of foodborne infection acquired from dairy products, and scientific opinion that pasteurized dairy products are equally nutritious as compared to their raw counterparts, a segment of the population continues to consume and support the sale of raw milk.

Raw milk and products such as cheeses made from raw milk are proven vehicles for many foodborne illnesses including salmonellosis, yersiniosis, *E. coli*-associated hemolytic-uremic syndrome (HUS), brucellosis, listeriosis, typhoid fever, *Campylobacter* enteritis, Q fever, and cryptosporidiosis. Although some of the diseases acquired from raw are mild and/or self-limited, others can be deadly or have long-term debilitating consequences. Notably, *E. coli* O157 causes afflictions of the kidneys of young children and if not fatal, the survivors will risk lifetime kidney disease and may require dialysis or kidney transplants. *Listeria* infections are most profound among pregnant women, often causing loss of the fetus, and the very old where death is a frequent consequence. *Campylobacter* and other bacteria can cause lifetime complications such as paralysis, joint afflictions, and chronic digestive disorders that debilitate their victims. Q-fever often results in infections of the heart that may require surgical intervention. Brucellosis is often difficult to diagnose and may progress to complications that are costly to society as well as to the afflicted.

Today, there is a vast amount of information available to the consumer about the consumption of raw milk through electronic media and the Internet. There is no guarantee that all information is validated through science and research. Many public health agencies, academia, and the medical community offer valid information based on sound science and research. There are just as many other entities that provide undocumented testimony and information that may be dangerous and can mislead the consumer into believing raw milk/products are safe to consume and provide for their families, including infants and small children. Through these mistaken beliefs in the healing properties of raw milk and products, many families have suffered, and had children exposed to life-threatening diseases, that can possibly lead to life-long health issues including kidney disease. These families have provided their experiences to the public on [video](#) in an effort to save other families from the pain of going through this experience. One mother, Mary McGonigle-Martin, writes about her

experience of buying raw milk in hope of finding relief for her son's allergies, but instead almost lost him due to an *E. coli* O157:H7 infection linked to commercial raw milk in California. Read the whole story: "[Raw Milk: A Mother's Story.](#)"

While some states have achieved improvements in hygiene through regulation to make raw milk safer, the risk of pathogens present in raw milk remains higher than other foods. For this reason, many states require a warning label about risk of disease from raw milk/products on the bottle, or at the point-of-sale. Although illnesses from pasteurized milk and other dairy products have resulted from inadequate pasteurization or post-processing contamination (for example, contaminated milk containers), the frequency of outbreaks and illnesses is much lower compared with raw milk/products. In particular, the most severe illnesses from any dairy products are among children given raw milk. In just the first half of 2012, there have been 6 publicized outbreaks due to raw milk consumption in 8 states resulting in 152 illnesses and 4 hospitalizations (all children). In comparison, there were 7 raw milk outbreaks and 60 illnesses during all of 2011 as shown in this [table](#). No outbreaks have been described from [pasteurized milk](#) in 2012. In 2011, one outbreak with 16 illnesses was linked to pasteurized milk from a dairy in Pennsylvania.

The primary purpose of this Legislation Packet is to demonstrate the risk of raw milk/raw cheese and other raw dairy product consumption as compared to pasteurized dairy products, and recommend against expanding the availability of raw milk/dairy products for retail sales. Materials were drawn from the literature and information provided by [Real Raw Milk Facts](#), a website created by a working group comprising scientists and public health advocates around the country. The website is supported in part by Marler Clark, the nation's foremost law firm with a practice dedicated to representing victims of food poisoning. The firm works actively with academia, industry, government, and consumer groups to end foodborne illness.

Our recommendations occur at the end of this document. Briefly, they call for:

- Limits on the sale of raw milk in grocery stores and other retail outlets
- Producers to carry insurance sufficient to cover damages sustained by individuals who become ill with foodborne illness as a result of consuming their raw milk products
- Warning labels regarding the health consequences of raw milk

## **Pending and Current Laws Related to Raw Milk**

According to the National Association of Departments of Agriculture (NASDA), 30 states allow the legal sale of raw milk for human consumption in some form. However, since 2010, legislation to change existing raw milk laws has been introduced in at least 23 state or local jurisdictions. The majority of new bills propose the curtailment of current food safety regulations and/or expanding allowed sales. A federal bill was introduced in 2011 (Paul) to authorize the interstate traffic of unpasteurized milk and milk products packaged for direct human consumption. In the United States, the interstate sale or shipment of unpasteurized milk and dairy products for direct human consumption is a violation of Federal Law. There is one exception to this law, allowing for sale of cheese which has been aged for 60 days under legally regulated conditions.

### **Current State-by-State Raw Milk Laws in the US:**

- Sales of raw milk prohibited in 20 states: AL, AK, DE, FL, GA, HI, IN, IA, LA, MD, MI, MT, NJ, NC, ND, OH, TN, VA, WV, WY) prohibit the sale of raw milk in any form.
- Sales of raw milk restricted to the farm in 13 states: AR, IL, KS, KY, MA, MN, MS, NE, NY, OK, RI, TX, WI)
  - Four of these states (MN, WI, OK, IL) further restrict sales to only incidental occurrences (i.e., occasional; not as regular course of business; no advertising)
  - Kansas allows sales directly to the consumer on the farm with minimal on-farm advertising.
  - Four states (AR, KY, MS, RI) restrict sales to goat milk only, with two states (KY, RI) also requiring a prescription from a physician
  - AR allows 100 gallons of raw, liquid goat milk to be sold from the farm each month.
  - 5 states have a coliform standard for milk sold only on-farm (ID, MA, NY, OR, TX)
- Sales of raw milk at retail stores separate from farm: AZ, CA, CT, ID, ME, NH, NM, NV, PA, SC, UT, WA
  - One of the 12 (UT) requires the store to be owned by the producer, even though it can be located off of the farm.
  - Another state (SC) allows the sale of raw milk both on and off the farm and at farmers markets if a permit is obtained. Further, farmers must provide retail stores with a warning plaque to be displayed in front of the raw milk.
  - Of these 12 states, all 12 have a total coliform standard.
    - 9 states have a coliform standard of < 10/mL (AZ, CA, ME, NH, NV, PA, SC, UT, WA)
    - 1 state has a coliform standard of < 25/mL (ID)
    - 2 states have a coliform standard of < 50/mL (CT, NM)

- Sales of raw milk restricted to farmers markets and states with compound regulations: OR, CO, VT, SD, MO
  - One state (OR) allows on-farm sales of raw cow's milk only from farms with no more than two producing cows, nine producing sheep and/or 9 producing goats; Only goat milk is allowed at retail off farm.
  - Of the 6 states, one state (CO) prohibits all sales of raw milk; however, raw milk may be legally obtained through "share" operations.
  - Another state (VT), allows raw milk to be sold on the farm and if farmers comply with further standards they are also allowed deliver to retail stores. Raw milk sales are prohibited at farmers' markets and advertising is not restricted.
  - Two states (SD, MO,) allow farmers to deliver to farmers' market but not to stores.
  - Of these 6 states, 5 have minimum standard requirements (MO, OR, SD, VT)
  - 3 states have a coliform standard of < 10/mL (VT, OR)
  - 1 state has a coliform standard of < 100/mL (MO)
  - 1 state requires the same standards for raw milk as pasteurized milk (SD)

**Sources:**

[NASDA 2011 Raw Milk Survey](#) (Press Release)  
[Recently Proposed Raw Milk Legislation](#) (Table)  
[State-by-State Regulations by Point-of-Sale](#) (Table)  
[State-by-State Raw Milk Regulations](#) (Table)

**1. Outbreaks and Illnesses from Dairy Products**

- Raw milk and other raw products made from raw milk contribute to significantly more outbreaks than pasteurized milk and milk products. CDC estimates that the risk of an outbreak from raw milk is 150 times greater than the risk from pasteurized milk. Although only 1-3% of the US population is believed to drink raw milk, more than half of all dairy outbreaks can be attributed to raw milk/products.
- States that restrict sales of raw milk/products have fewer outbreaks and illnesses, which suggests that legal raw milk sales cause more of a public health burden than "black market" raw milk and raw milk products.
- Since 1998, a total of 119 outbreaks, 2,147 illnesses, and 2 deaths have been attributed to consumption of raw milk, raw colostrum and raw milk products. Outbreaks are associated with raw cows' milk and raw goat's milk, as well as cheese made from raw milk. Herd-shares, retail sales, and direct farm sales have been implicated in outbreaks.
- Top pathogens implicated in raw milk outbreaks in the United States include *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Listeria monocytogenes*, and *Brucella*.

However many other pathogens have been identified in raw milk, including causes of shigellosis, toxoplasmosis, yersiniosis, Q fever, and bovine tuberculosis. Mycobacterium paratuberculosis—the organism responsible for Johne’s and suspected etiological agent of Crohn’s disease in humans—has also been found in raw milk.

- Proportionally, [pasteurized milk/products](#) account for far fewer outbreaks. Since 1998, a total of 26 outbreaks have occurred. One outbreak accounted for 1,644 illnesses in a single contained population at a prison in California due to *Campylobacter jejuni*. Cross-contamination of the pasteurized milk was suspected. Genetically identical pathogens were found in samples taken from water used to flush the cow alleys in the cattle housing areas.
- In addition, 1,142 other illnesses and 4 deaths have occurred, due to improper pasteurization, or cross-contamination of properly pasteurized milk. The pathogens most commonly implicated were *Salmonella*, *Listeria monocytogenes*, Norovirus, *Campylobacter jejuni*, and *Staphylococcus*.
- It must be noted again, that when statistically comparing the number of illnesses/deaths attributed to pasteurized products consumed versus raw milk/products consumed, the chance of disease acquisition is much greater when consuming raw dairy products (See above CDC estimate).

**Sources:**

[Unpasteurized \(Raw\), Dairy Outbreaks and Recalls, 1998 to Present](#) (table)

[Pasteurized Dairy Outbreaks and Recalls, 1998 to Present](#) (table)

[Comparing the Food Safety Record of Pasteurized and Raw Milk Products](#) (article)

[The Raw Milk Beat Goes On: A Look at the Literature and the 60---Day Raw Milk Cheese Aging Rule](#) (article)

[Foodborne disease outbreaks and recalls linked to raw milk from grassfed and pastured cows, United States, 2005-present](#) (Table)

[Herdshares linked to foodborne disease outbreaks and illnesses from raw milk, United States, 2001-present](#) (Table)

**Children Most Likely to Suffer Severe Illness from Raw Milk**

Young people under 20 years old represent approximately 60% of raw milk illnesses during outbreaks reported to CDC. This is approximately three times more than pasteurized milk. Raw milk is also more likely to cause hospitalization from the most dangerous foodborne pathogens such as *E. coli* O157:H7. In contrast, *E. coli* O157 outbreaks have not been attributed to pasteurized milk in the US.

Several families offered to share their stories after experiencing severe illness when they tried raw milk for its reported health benefits. One little girl, Nicole Riggs, developed an *E. coli* O157:H7 infection in May 2008. She drank contaminated raw goat’s milk from a Missouri

farm. She was nine years old at the time. Nicole suffered from symptoms typical of *E. coli* O157:H7 infections—bloody diarrhea, cramping, and nausea—that quickly intensified and led to her hospitalization on May 8, 2008. Once hospitalized, Nicole developed renal failure, anemia, and thrombocytopenia (low platelet count) indicating that she was developing hemolytic-uremic syndrome (HUS). She was transferred to a Children’s hospital and started on dialysis in order to save her life. She received dialysis for 18 days. Nicole’s renal function slowly returned to the point that she was deemed healthy enough for discharge on June 1. After discharge, she remained under the care of a nephrologist. In addition, damage suffered during her HUS required that her gall bladder be removed.

Larry Pedersen, a one-year-old infant, developed an *E. coli* O157:H7 infection after drinking raw goat’s milk from the same farm as Nicole. When his diarrhea turned bloody, his parents took him for medical treatment. He was admitted to the hospital on May 8. Shortly thereafter, Larry developed HUS and was transferred to a specialty care facility. As is typical of HUS patients, Larry was then suffering from acute renal failure. He was started on dialysis, which was necessary at that point for his survival. He required 15 days of dialysis before his kidneys recovered enough to function on their own. Larry was discharged on May 29, to continue recovery and treatment on an outpatient basis. The Missouri Department of Health wrote a [final \*E. coli\* outbreak report](#).

On the other side of the country, another young child, Chris Martin, then age seven, developed an *E. coli* O157:H7 infection in September 2006 following consumption of raw milk. He was hospitalized beginning on September 8, suffering from severe gastrointestinal symptoms, including bloody diarrhea. Shortly thereafter, he developed hemolytic-uremic syndrome (HUS). In an effort to properly treat his rapidly deteriorating condition, Chris was moved to multiple medical facilities, twice by life-flight. His HUS was remarkably severe, marked by prolonged renal failure, pancreatitis, and severe cardiac involvement. He required 18 days of renal replacement therapy. On two occasions his cardiac problems became so severe that he was placed on a ventilator. At several junctures, the possibility that he might not survive was very real. The [final report on the raw milk and raw colostrum \*E. coli\* outbreak](#) Chris was a part of was written up in the July 13, 2008 Morbidity and Mortality Weekly Report from the Centers for Disease Control and Prevention. His mother also wrote a [moving story](#) about her family’s experience.

**Sources:**

[Real Raw Milk Facts: Real Life Stories](#) (videos)  
[CDC: Real Stories of the Dangers of Raw Milk](#) (videos)  
[Raw Milk: A Mother’s Story](#) (article)  
[Scientific References](#) (literature review)

## **2. Cost of Raw Milk Regulation and Outbreak Investigation**

Medical costs associated with Nicole's E. coli infection and HUS described above exceeded \$180,000. As the result of damage to her kidneys suffered during her bout with HUS, Nicole is at significant risk for severe renal complications in the future. The medical bills associated with Larry's care approached \$90,000. As the result of damage to his kidneys suffered during his bout with HUS, Larry is at significant risk for severe renal complications in the future. These complications include end stage renal disease (ESRD) and kidney transplant. Chris Martin in California was hospitalized through November 2, and incurred over \$550,000 in medical bills.

There is limited information related to the costs incurred by state health and agriculture departments, and the medical care system, associated with legalized raw milk in the United States. Costs fall into two categories: 1) expenses to administer and enforce a regulatory program (e.g., licensing, inspection, testing) and 2) costs associated with outbreak investigation including public health expenses for investigation. There are also direct and indirect costs for an individual's medical care.

Because a disproportionate number of outbreaks are caused by raw dairy products (150 times more than pasteurized dairy products), and very few people consume raw milk (approximately 1-3% of the US population), it is very likely that the regulatory and public health costs are substantial compared with the purported benefits of raw milk sales. For example, Investigators in Connecticut estimated costs from an E. coli O157 outbreak in 2008 linked to raw milk sold at Whole Foods amounted to \$413,402. Whole Foods has since stopped selling raw dairy products, in part due to liability concerns.

The total estimated outbreak cost during an approximate 3-month period was \$413,402. The average medical cost for a hospitalized case patient was \$72,904; notably, 1 patient with TTP contributed \$209,571 to the total medical expense. The average cost per case-patient incurred by investigative and response activities was \$3,491. (Guh et al., 2011)

## **3. Evidence-Based Review of Health Claims by Raw Milk Advocates**

Raw milk advocates claim that unpasteurized milk provides substantial health benefits that cannot be obtained from pasteurized products. Health claims associated with raw milk include:

- **Lactose Intolerance**: Lactose intolerance occurs when a person's pancreas produces low levels of lactase, an enzyme needed to digest lactose. According to [researchers at Stanford University](#), some individuals who believe they are lactose intolerant have reported experiencing fewer symptoms after drinking raw milk relative to pasteurized

milk. To test this hypothesis, they conducted a controlled study to determine whether there was validity to these anecdotal claims. The authors concluded:

*These results, collected under standardized and controlled conditions, do not support the widespread anecdotal claims by proponents that raw milk has benefits over pasteurized milk regarding the symptoms of lactose intolerance. (Vu et al., 2010)*

- Allergies: In a Michigan survey (Katafiasz et al., 2012) raw milk drinkers cited relieving allergies as a benefit of drinking raw milk. Studies (Barnes et al., 2001) have shown that differences between atopy and associated allergy diseases exist between rural and urban children, and may be associated with consuming unpasteurized milk products. The literature acknowledges that there is a growing body of epidemiological evidence suggesting that the consumption of unpasteurized cow's milk may decrease the risk of atopic sensitization, however the mechanism is unknown and there are documented health risks associated with the pathogens present in unpasteurized milk. Thus, the general consensus among authors is that the consumption of unpasteurized dairy products cannot be recommended as a preventative measure for allergies.
- Probiotics: the term probiotic is a specific term that is used only for products that meet the "scientific criteria" for the term. Sanders (2008) states that probiotics are "...products that contain an adequate dose of live microbes that have been documented in target-host studies to confer a health benefit." Raw milk does not meet this definition.
- Antibacterial properties: Doyle (1982) demonstrated that the survival times of *Campylobacter jejuni* strains were longer in sterile milk as compared to raw milk at refrigerated temperatures. However, the author concluded that the presence of the pathogen and possible persistence in infectious doses in Grade A raw milk demonstrates the need for pasteurization.
- Nutrition: Numerous studies in the current literature have demonstrated that the nutritional differences (including iodine, vitamin A and other fat-soluble vitamin content) between pasteurized and raw milk are either non-existent or negligible. Older studies such as Pottenger (1946) and Hess (1916) that propose nutritive differences between raw and pasteurized milk have not been substantiated by later research/nutrition studies. In the current literature, Rajakumar (2001) detailed a possible link between infantile scurvy and "heated milk". This paper is misleading and it is likely deficiencies of vitamin C, a nutrient not found in meaningful quantities in either raw or pasteurized milk, better explains the infantile scurvy observations.

- Autism: No papers could be found correlating an increased risk of autism due to pasteurized milk, or a decreased risk with the consumption of raw milk.

**Sources:**

[Effect of Raw Milk on Lactose Intolerance Symptoms: A Randomized Controlled Trial, Stanford University, October 2010](#) (poster)  
[Raw Milk Pros: Review of the Peer-Reviewed Literature](#) (article)  
[Scientific References](#) (literature review)

**4. Position statements by Professional Organizations and Agencies**

Noted academic institutions and professional, industry, veterinary, government, and medical organizations have published their [position statements](#) on raw (unpasteurized) milk. Each organization expresses concerns about human illness associated with the consumption of raw milk. Notable medical associations and excerpts from their positions are included below.

American Academy of Pediatrics (AAP)

- “Children...should never drink raw milk or consume products made from raw milk, such as cheese or yogurt”

American Association of Public Health Veterinarians (AAPHV)

- Recommend against the sale of raw milk

American Medical Association (AMA)

- “The AMA reaffirms its policy that all milk sold for human consumption should be required to be pasteurized”

American Veterinary Medical Association (AVMA)

- “Because apparently healthy cows and goats can shed in their milk organisms which are pathogenic to human beings and may cause diseases...only pasteurized milk and milk products should be sold. Furthermore, the AVMA supports laws requiring pasteurization of all milk to be sold...”

### Association of Food and Drug Officials (AFDO)

- “AFDO supports mandatory pasteurization for all milk and milk products intended for direct human consumption except where alternative procedures to pasteurization are provided (i.e. curing of certain cheese varieties) to ensure the safety of finished products”

### Food and Drug Administration (FDA)

- “In light of research showing no meaningful difference in the nutritional value of pasteurized and unpasteurized milk, FDA and CDC have also concluded that the health risks associated with the consumption of raw milk far outweigh any benefits derived from its consumption...The U.S. Food and Drug Administration...strongly advises against the consumption of raw milk.”

### International Association for Food Protection (IAFP)

- “We hereby join the numerous other associations 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.”

### Vermont Veterinary Medical Association

- “Only pasteurized milk and pasteurized fresh milk products should be sold for human consumption. Putative benefits of raw milk consumption on human health are either unsupported by scientific evidence, or cannot be separated from the potential hazards associated with raw milk consumption. Therefore, consumption of raw milk cannot be recommended as a preventive or protective human health measure.”

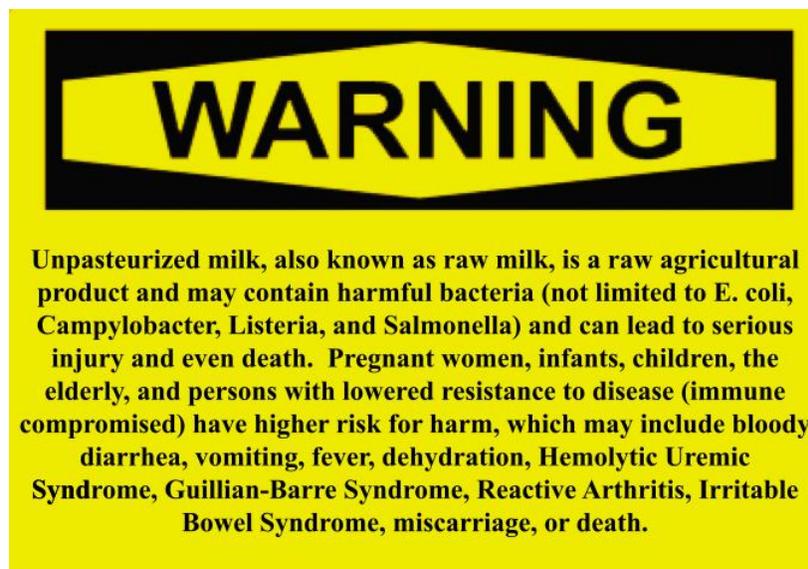
### **Recommendation**

The evidence shows that pasteurized dairy products are safer than raw dairy products, and children are the most at risk from contaminated raw milk. We recommend pasteurized dairy products for consumers and their families. In lieu of banning raw milk products, some states have adopted regulations that attempt to protect public health and allow for consumer choice. We suggest the following:

1. Raw milk and products should be sold only on farms (“Know your farmer, know your food.” “I know my food is safe, because I can look the farmer in the eye.”) that are certified by the state and inspected and tested regularly. Make ambiguous black market

raw milk and products and "pet food sales" meant for human consumption clearly illegal;

2. Raw milk and products should not be sold in grocery stores or across state lines - the risks of mass production and transportation are too great; the risk of a casual purchase by someone misunderstanding the risks is too great, as well;
3. Farms should be required to have insurance coverage sufficient to cover reasonable damages to their customers;
4. Practices such as outsourcing (buying raw milk or colostrum from farms not licensed for production of dairy products such as raw butter and cheese ) should be illegal;
5. Colostrum should be regulated as a dairy product, not a nutritional supplement;
6. Warning signs on products and at point-of-purchase should be mandatory. An example:



## **Attachments and Links**

[Comparing the Food Safety Record of Pasteurized and Raw Milk Products](#)

[Effect of Raw Milk on Lactose Intolerance Symptoms: A Randomized Controlled Trial, Stanford University, October 2010](#)

[Foodborne disease outbreaks and recalls linked to raw milk from grassfed and pastured cows, United States, 2005-present](#)

[Herdshares linked to foodborne disease outbreaks and illnesses from raw milk, United States, 2001-present](#)

[NASDA 2011 Raw Milk Survey](#)

[Pasteurized Dairy Outbreaks and Recalls, 1998 to Present](#)

[Raw Milk: A Mother's Story](#)

[Raw Milk Position Statements by Professional Organizations and Agencies](#)

[Raw Milk Pros: Review of the Peer-Reviewed Literature](#)

[Real Raw Milk Facts: Real Life Stories \(CD\)](#)

[Recently Proposed Raw Milk Legislation](#)

[Scientific References](#)

[State-by-State Regulations by Point-of-Sale](#)

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[The Raw Milk Beat Goes On: A Look at the Literature and the 60---Day Raw Milk Cheese Aging Rule](#)

[Unpasteurized \(Raw\), Dairy Outbreaks and Recalls, 1998 to Present](#)