

Raw Milk Issue Brief

Public Health Implications and Considerations

Public health agencies are seeing an increased number of outbreaks related to the consumption of raw milk.

Unpasteurized milk, also known as raw milk, may contain pathogens such as *Salmonella*, *Listeria monocytogenes*, *Campylobacter* and disease-causing strains of *Escherichia coli*, which can lead to serious illness. According to the Centers for Disease Control and Prevention (CDC), from 1998 through 2008, 86 outbreaks due to consumption of raw milk or raw milk products were reported. These resulted in 1,676 illnesses, 191 hospitalizations, and two deaths. Most of these illnesses were caused by *E. coli* O157, *Campylobacter*, or *Salmonella*.ⁱ According to a recent CDC study, the rate of raw-milk-associated outbreaks was higher in states where the sale of raw milk is legal, compared to the rate in states where the sale of raw milk is illegal.^{iii,ii} The same study states that 13 percent of patients in raw milk outbreaks were hospitalized, compared to 1 percent in pasteurized milk outbreaks.

Table 1 displays a sample of raw-milk-associated outbreaks in the past three years. CDC asserts that “unpasteurized product outbreaks are more common and cause more severe illness than pasteurized product outbreaks.”ⁱⁱⁱ Symptoms of foodborne illness include vomiting, diarrhea, abdominal pain, and flu-like symptoms. Pregnant women are at a higher risk of foodborne illness, particularly from the bacteria *Listeria*, which can cause miscarriage, fetal death or illness, or death of a newborn. Other high-risk groups include the elderly, infants, children, and those with compromised immune systems. According to a recent 13-year review by CDC of dairy-product-associated outbreaks from 1993 to 2006, it was found that the rate of outbreaks caused by raw milk was 150 times greater than outbreaks linked to pasteurized milk.ⁱⁱⁱ

Overall, foodborne illnesses have had a profound impact on the economy. According to a 2012 study, it is estimated that the cost of foodborne illnesses in the United States is

\$77.7 billion annually, inclusive of medical costs, lost productivity, illness-related mortality, and monetized quality-adjusted life year estimates.^{iv} Outbreaks associated with raw milk consumption are no exception. For example, according to an economic impact study, a 2008 outbreak of *E. coli* linked to raw milk purchased in Connecticut resulted in estimated medical expenses of \$413,402.^v A high proportion of the patients affected by the outbreak were young children who experienced serious medical complications. In addition, after any type of milk-borne disease outbreak, there can be negative economic impacts on the industry as a whole, not just the farm in question,

Table 1. Recent Raw-Milk-Associated Outbreaks

Jurisdiction	Incident	Month
Oregon	<i>E. coli</i> O157:H7 outbreak linked to raw milk caused 19 people (15 children, 4 adults) to fall ill.	April 2012
Missouri	<i>E. coli</i> O157:H7 outbreak with 17 cases linked to unpasteurized dairy products from a Missouri farm.	March-April 2012
California	<i>Campylobacter</i> outbreak linked to raw milk from a California-based producer causing 10 people from 5 counties to fall ill.	January-April 2012
Maryland, Pennsylvania, New Jersey, and West Virginia	<i>Campylobacter</i> outbreak linked to raw milk from a Pennsylvania dairy farm caused 43 people to fall ill in multiple states.	January 2012
Washington	Shiga toxin-producing <i>E. coli</i> (STEC) outbreak linked to raw cow's milk caused 3 people to fall ill.	August-November 2011
Colorado	<i>E. coli</i> O157:H7 and campylobacter outbreak linked to raw goat milk from a dairy farm caused 24 people to fall ill.	July 2010
Michigan	12 confirmed cases of illness from <i>Campylobacter</i> infections in consumers who drank raw milk.	March 2010

* To see a more complete list of disease outbreaks associated with milk products, please visit <http://www.realrawmilkfacts.com/outbreak-tables>

Raw Milk Advocates

Some consumers are keen on drinking raw milk, for reasons such as a desire to buy locally-produced food or a belief in raw milk's purported health benefits. Raw dairy advocates believe unpasteurized milk is safe because small-batch farmers maintain hygienic facilities and that pasteurizing milk, or heating it to above 160 degrees Fahrenheit, destroys most of its health promoting features.^{vi} Advocates also prefer raw milk for its perceived sweeter taste and nutritional and probiotic benefits. According to the U.S. Food and Drug Administration (FDA), pasteurization does not significantly change the nutritional properties of milk, and there is no scientific evidence that raw milk products have greater health benefits.^{vii} Licensing, government inspections, and testing of raw milk help monitor sanitation but are not a guarantee of safety.

It is also reported that raw milk production and sale provides economic benefits to dairy farmers. For example, consumers can pay anywhere from \$6 to \$20 per gallon for raw milk, which is higher than commercially available pasteurized milk. Raw milk producers usually have a direct marketing approach, which sometimes results in an increased profit margin.

Pasteurized Milk Ordinance

In 1924, the United States Public Health Service (USPHS) developed the Standard Milk Ordinance, known today as the Pasteurized Milk Ordinance (PMO). This is a model regulation helping states and municipalities voluntarily implement an effective program to prevent milk-borne disease. The PMO contains provisions to certify Grade A milk and milk products. The Grade A Milk Certification Program certifies that all Grade A milk and milk products are produced, transported, processed, sampled, quality tested, and labeled in accordance with Grade A PMO standards and requirements. The USPHS/FDA's recommended Grade A PMO is the basic standard used in the voluntary Cooperative State-USPHS/FDA Program for the Certification of Interstate Milk Shippers, a program participated in by all 50 States, the District of Columbia and U.S. Trust Territories. Federal regulation promulgated

in 1987 also bans interstate sales of raw milk.^{viii} Despite the federal ban on sale of raw milk across state lines, raw milk is still available for sale in many states.

Overview of State Laws

Section 9 of the PMO (Milk and Milk Products Which May Be Sold) states in part that "only Grade A pasteurized, ultra-pasteurized, or aseptically processed milk and milk products shall be sold to the final consumer, to restaurants, soda fountains, grocery stores, or similar establishments." States legalizing raw milk sales or distribution have done so by not adopting Section 9 of the PMO. In addition, consumers in states where the sale of raw milk is illegal sometimes still purchase raw milk through a "cow-share" or "herd-share" agreement, where members pay a fee to purchase a cow and use the raw milk.^{vii, ix}

According to a 2011 National Association of State Departments of Agriculture survey conducted in cooperation with the National Association of Dairy Regulatory Officials, **30 states authorize the legal sale of raw milk for direct human consumption.** The remaining 20 states prohibit the sale of raw milk to consumers.^{ix} The following provides more detail on the 30 states where raw milk sales are allowed in some form and are restricted by point of sale.

Sale of raw milk restricted to the farm

Thirteen states restrict legal sales to the farm where the milk is produced (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 of these (KY, RI) also requiring a prescription from a physician for the consumption of the milk. The seller would be required to make the prescription available to the state department of agriculture if it is valid for an extended amount of time.

- Four states have a coliform standard for milk sold only on-farm (MA, NY, OR, TX).

Sale of raw milk at retail stores

Twelve states allow the sale of raw milk at retail stores *separate* from the farm (AZ, CA, CT, ID, ME, NH, NM, NV, PA, SC, UT, WA).

- Utah requires the store to be owned by the producer, even though it can be located off of the farm.
- South Carolina allows the sale of raw milk both on and off the farm at farmers’ markets if a permit is obtained.
- Of these 12 states, all have a total coliform standard. Inspections are carried out by the state departments of agriculture.

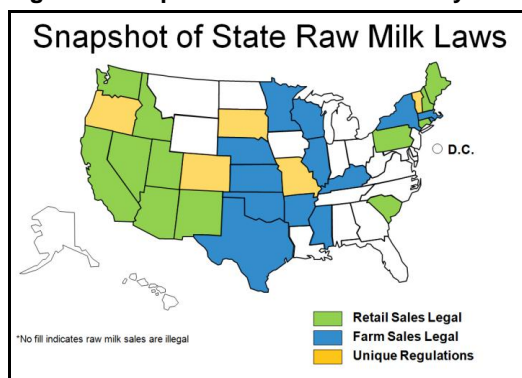
Sale of raw milk at farmers’ markets and states with compound regulations

Five states have unique regulations that do not fit in either of the categories above (CO, MO, OR, SD, VT).

Sale of raw milk prohibited

The sale of raw milk is prohibited in 20 states (AL, AK, DE, FL, GA, HI, IN, IA, LA, MD, MI, MT, NJ, NC, ND, OH, TN, VA, WV, WY).

Figure 1: Snapshot of Raw Milk Laws by State



Conclusion

Many public health experts consider pasteurization one of public health’s most effective food safety interventions. Milk and other dairy products provide a variety of nutrition benefits. However, raw milk can harbor dangerous microorganisms that can pose serious health risks. Research shows no meaningful difference in the nutritional values of pasteurized and unpasteurized milk. The CDC and FDA support and recommend the pasteurization of animal milk products consumed. Other agencies with similar positions include the American Academy of Pediatrics, the American Academy of Family Physicians, the American Veterinary Medical Association, the National Association of State Public Health Veterinarians, and many other medical and scientific organizations.^x

While the sale of raw milk is authorized from specific outlets in more than half of the states, it is important for the public to understand the benefits, risks, and economic impacts associated with raw milk consumption, especially for high-risk groups. In states where the sale of raw milk is legal, regulators should continue to readily enforce the policies and procedures in place to prevent the sale of products from prohibited entities. Regardless of a state’s law governing the sale of raw milk, public health, medical, and consumer protection professionals should continue to educate their communities on the potential dangers of raw milk consumption and ensure that consumers make informed decisions when choosing their milk products.

Resources

- [Association of Food and Drug Officials](http://www.afdo.org) (www.afdo.org)
- [CDC Raw Milk Website](http://www.cdc.gov) (www.cdc.gov)
- [FDA Raw Milk Website](http://www.fda.gov) (www.fda.gov)
- [Marler Clark Real Milk Facts](http://www.realrawmilkfacts.com) (www.realrawmilkfacts.com)
- [Milk, Cheese, and Dairy Products](http://www.foodsafety.gov) (www.foodsafety.gov)



This is a living document, which will be updated as new information becomes available.

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ⁱ Centers for Disease Control and Prevention. *Raw (Unpasteurized) Milk*. April 2010. Available at <http://www.cdc.gov/Features/RawMilk/>.

ⁱⁱ Harvard School of Public Health. *HSPH Student Helps Mass. Department of Public Health Analyze Consequences of Raw Milk Distribution*. February 2012. Available at <http://www.hsph.harvard.edu/news/features/features/raw-milk-distribution.html>.

ⁱⁱⁱ Centers for Disease Control and Prevention. *Majority of Dairy-Related Disease Outbreaks Linked to Raw Milk*. February 2012. Available at http://www.cdc.gov/media/releases/2012/p0221_raw_milk_outbreak.html.

^{iv} Scharff R. "Economic Burden from Health Losses Due to Foodborne Illness in the United States." *Journal of Food Protection*. 2012. 75:123-131.

^v Guh A, Phan Q, Nelson R, et al. "Outbreak of *Escherichia coli* O157 Associated with Raw Milk, Connecticut, 2008." *Clinical Infectious Diseases*. 2010. 51: 1411-1417.

^{vi} Weston A. Price Foundation. *A Campaign for Real Raw Milk*. April 2010. Available at <http://www.realmilk.com>.

^{vii} Food and Drug Administration. *Raw Milk May Pose Health Risk*. April 2010. Available at <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm232980.htm>.

^{viii} Food and Drug Administration. *Pasteurized Milk Ordinance 2011 Revision*. July 2012. Available at <http://www.fda.gov/downloads/Food/FoodSafety/Product-SpecificInformation/MilkSafety/NationalConferenceonInterstateMilkShipmentsNCIMSMModelDocuments/UCM291757.pdf>

^{ix} National Association of State Departments of Agriculture (NASDA). *Raw Milk Survey*. July 2011. Available at <http://www.nasda.org/cms/31031.aspx>.

^x Centers for Disease Control and Prevention. *Raw Milk Questions and Answers*. February 2012. Available at <http://www.cdc.gov/foodsafety/rawmilk/raw-milk-questions-and-answers.html>