

# AABP FACT SHEET

## QUESTIONS AND ANSWERS ON PASTEURIZATION OF MILK



Prepared by  
**THE FOOD QUALITY,  
SAFETY, AND  
SECURITY COMMITTEE**



**PASTEURIZATION** has been used extensively for over a century to make milk safer and extend shelf life. However, some people criticize pasteurization and advocate consuming raw milk instead. Raw milk sales have become more

common, in some cases in spite of laws intended to limit or prevent such practices. The American Association of Bovine Practitioners would like to ensure that consumers understand pasteurization so that they can make an informed decision when purchasing milk and dairy products. Below is a brief description of pasteurization and answers to some common questions regarding pasteurization.

### What does “pasteurization” mean?

**Pasteurization** is a process of heating a food to kill bacteria or other microorganisms, invented by the famous bacteriologist Louis Pasteur in 1862. Raw milk is milk that has not been pasteurized or treated in any way to reduce the presence of bacteria.

### How is milk pasteurized?

Most milk sold commercially is pasteurized by heating it to 161° F (72° C) for 16 seconds. This is referred to as high temperature short time (HTST) pasteurization. Occasionally higher temperatures for a shorter time, or lower temperatures for a longer time are used instead.

### Why pasteurize milk?

Milk is a very nutritious food, and it's just as nutritious to microorganisms as it is to people. Refrigeration slows the growth of most bacteria, but does not kill them. Pasteurization does not eliminate all microorganisms, but reduces their number and may completely eliminate some important disease-causing bacteria. Typically, 99.999% of the bacteria present are killed by pasteurization.

### What diseases are associated with consuming raw milk?

Many bacteria can be present in healthy cows (or cows that are currently showing no signs of illness). Pasteurization of milk was originally adopted to control tuberculosis and undulant fever (caused by *Brucella*). While these diseases are uncommon in modern US dairies, many other diseases have been associated with raw milk, including Q fever (*Coxiella*) and *Salmonella*, *E. coli*, *Campylobacter* and *Listeria* infections.

### Aren't these diseases attributable to poor hygiene on the dairy?

No. Even cows in the cleanest environments will have bacteria on their skin, and it is inevitable that some of these make it into the milk, despite careful washing and disinfecting at each milking. All commercially available milk must meet strict limits on bacterial and cell counts and is checked for harmful antibiotic residues; milk that does not meet strict government standards is discarded. In addition, dairy producers who produce milk that consistently exceeds quality standards are paid extra for their efforts. Despite these precautions, no practices can effectively eliminate all bacteria from milk. Sanitation is essential to improving milk quality, but it cannot be counted on to eliminate bacteria.

### Milk from operations certified for raw milk sale is free of disease causing bacteria, right?

Wrong. Some states have special stringent testing programs for herds, which (if they pass) are then licensed to sell raw milk. Despite these standards, numerous disease outbreaks have been associated with dairy products from certified herds.<sup>1</sup> Most doctors recommend that raw milk not be fed to infants, even if it is from herds licensed to sell it legally. Also, people with potentially compromised immune systems, such as the elderly or very young, pregnant women, those with HIV or those being treated for cancer or organ transplant should avoid drinking unpasteurized milk or eating unpasteurized cheese and yogurt products.

### How about organic milk—does it need to be pasteurized?

Organic milk has bacteria too, and presents the same risks if it is not pasteurized. No difference was found in the prevalence of a common disease-causing bacteria, shiga-toxin producing *E. coli* (STEC) in organic herds compared to conventional herds.<sup>2</sup> Health regulations regarding pasteurization apply to both conventional and organic milk, and do not conflict with rules for organic production. This means organic producers can employ pasteurization for increased safety and still market their milk as organic.

### Does pasteurization reduce the quality and taste of milk?

Pasteurization does not boil the milk and has minimal effect on taste and nutritional value. Some report a change in taste, but this is subtle for most people. And since pasteurization has been in force in the United States for many years, most people are accustomed to the flavor of pasteurized milk. There is

Photographs courtesy of Dr. Danelle Bickett-Weddle, Iowa State University

# AABP FACT SHEET

## Pasteurization of Milk *continued*



no significant reduction in vitamins, minerals, or other nutrients.

### Is anything added to milk during pasteurization?

Nothing is added during pasteurization, but many states require addition of vitamins to milk afterwards, particularly Vitamins A and D. Vitamin D fortified milk is very successful in preventing rickets, a debilitating disease of children that was common before addition of Vitamin D was required.

Milk is also usually homogenized before bottling, though this is not required. Homogenization breaks up cream globules in milk, so they do not separate and rise to the top of the jug. Most milk sold in the United States is homogenized.

### Doesn't raw milk lead to stronger immunity?

Many farmers can drink raw milk and not get sick. This is because they have been exposed to disease agents many times over the years and have developed immunity to them. However, this may have involved getting sick one or more times, or it may have involved repeated small-dose exposures over many years. Consumption of raw milk is especially dangerous for those with impaired immune systems, such as children, the elderly, pregnant women, those with HIV or those being treated for cancer or organ transplant. However, raw milk can cause disease and occasionally death in even the healthiest of people.

### Isn't raw milk preferred for those with lactose intolerance?

Some bacteria that readily grow in milk produce enzymes to digest the milk, including lactose. Pasteurization kills these bacteria, and thus preserves lactose. For lactose-intolerant individuals, these enzymes can be purchased (in purified form, without the bacteria) to aid digestion. So while raw milk may reduce symptoms of lactose intolerance, the same results can be achieved, more safely, with pasteurized milk along with commercially available products.

### Aren't there many health benefits associated with drinking raw milk?

There are people who strongly advocate raw milk consumption and attribute a number of benefits to it. There has been little research done to assess these claims, and thus far there is no evidence to suggest that raw milk is substantially better than pasteurized milk in any attribute. It has consistently been shown that pasteurization reduces foodborne disease while maintaining the nutritious characteristics of milk.

### Can raw milk be sold legally?

Most governments have long recognized the public health benefits attributable to pasteurization. Thus, most milk available for commercial sale must be pasteurized. This includes all milk in Canada, and all milk shipped across state lines in the US. States have regulations governing sale of milk produced and marketed locally. Only a few states permit commercial sale of raw milk, although a variety of systems have been devised to circumvent the intentions of

laws in other states. States that permit sale of raw milk may require a disclaimer on the product informing consumers of the health risks associated with its consumption.

It is essential that consumers be aware of the facts and myths regarding pasteurization. Only then can informed decisions be made. It is strongly suggested that children, elderly, and others with weak immune systems should consume only pasteurized milk. Healthy adults should weigh the risks against the purported benefits before consuming raw milk. **AABP**

## References

1. Cornell University (2007) "Disease Outbreaks Associated with Milk Products." Accessed at: <http://www.milkfacts.info/Milk%20Microbiology/Disease%20Outbreaks.htm> on May 31, 2008
2. Kuhnert P, Dubosson CR, Roesch M, Homfeld E, Doherr MG, Blum JW "Prevalence and risk-factor analysis of Shiga toxin-producing Escherichia coli in faecal samples of organically and conventionally farmed dairy cattle." in *Vet Microbiol*. 2005 Aug 10;109(1-2):37-45.

## Other Resources

- Powell, D. (2007) Food Safety Network Fact Sheet. Accessed at: [http://www.foodsafetynetwork.ca/articles/987/Raw\\_milk\\_Jan\\_07.pdf](http://www.foodsafetynetwork.ca/articles/987/Raw_milk_Jan_07.pdf) on May 31, 2008
- United States Food and Drug Administration, Dept. of Health and Human Services (2003) "Sale/Consumption of Raw Milk-Position Statement (M-I-03-4)" accessed at: <http://www.cfsan.fda.gov/~ear/mi-03-4.html> on May 31, 2008
- Bren, L. (2004, Sep-Oct). "Got milk? Make sure it's pasteurized" in *FDA Consumer Magazine*. Accessed at [http://www.fda.gov/fdac/features/2004/504\\_milk.html](http://www.fda.gov/fdac/features/2004/504_milk.html) on May 31, 2008
- Alvarez, VB and Parada-Rabell, F. (2005) Ohio State University Extension Fact Sheet "Health Benefits, Risks, and Regulations of Raw and Pasteurized Milk." Accessed at: <http://ohioline.osu.edu/fse-fact/0003.html> on May 31, 2008
- Driessen, S. (2003). "Raw milk vs. pasteurization debate revisited." Accessed at <http://www.extension.umn.edu/foodsafety/components/columns/Oct29.htm> on May 31, 2008