

Controversy on the use of raw milk and dairy products in North America

Editorial

Debates on the benefits and risks of raw milk consumption have been going on in North America for decades. There are results of numerous studies and reports that raw milk has many health benefits. Milk and dairy products provide nutrients essential for bone growth and teeth development; they help reduce high blood pressure and decrease risk for colorectal and breast cancer,¹ and cardiovascular diseases.^{1,2} Cow milk contains proteins, minerals (including calcium, phosphorus, and magnesium), vitamins (such as B-group vitamins, vitamins A and D), sugars, lipids, and water.^{3,4} According to studies carried out in Europe, consumption of raw farm milk may decrease prevalence of asthma, atopy, and hay fever, while boiled farm milk did not protect against those conditions. It was shown that higher levels of the whey proteins, such as BSA, alpha-lactalbumin, and beta-lactoglobulin, were inversely associated with asthma.⁵

At the same time, unpasteurized milk is known to pose health risks. Raw milk can be a source of such harmful bacteria as *Salmonella*, *Escherichia coli*, and *Listeria*,^{6,7} which are especially dangerous for people with weakened immune systems, older adults, pregnant women, and children.⁶ Milk can also contain such microorganisms as *Staphylococcus aureus*, *Yersinia enterocolitica*, *Bacillus cereus*, *Clostridium botulinum*, *Mycobacterium bovis*, *Brucella abortus*, *Brucella melitensis*,⁷ and *Campylobacter jejuni*.⁸

According to the study by Mungnai et al.,⁹ in 2007–2009, 30 outbreaks caused by un-pasteurized milk were registered in the USA, while in 2010–2012 their number increased to 51. These outbreaks resulted in 979 illnesses and 73 hospitalizations. Of the 78 outbreaks with a single etiologic agent, most outbreaks were caused by *Campylobacter* spp. (62 cases), followed by Shiga toxin-producing *E. Coli* (13 cases), *Salmonella enterica* serotype *Typhimurium*, and *Coxiella burnetii* (2 and 1 outbreaks, correspondingly). Pasteurization is known to kill most pathogens,^{6,10} although post-pasteurization contamination is reported in some cases.^{8,11} According to the Centers for Disease Control and Prevention,¹² between 1993 and 2006, in the USA 1571 people became sick from drinking raw milk or consuming cheese made from unpasteurized milk (of 121 outbreaks caused by dairy products with a known pasteurization status, 60% involved unpasteurized products). Those outbreaks led to 202 hospitalizations and two deaths. Hospitalization rate in outbreaks related to raw dairy products was 13 times higher than in cases caused by consumption of pasteurized dairy products. Of all the outbreaks, 55(75%) outbreaks occurred in 21 states where sales of raw milk products were allowed.¹²

Raw-milk advocates claim that pasteurization decreases protein quality, destroys minerals, vitamins, beneficial bacteria and natural antimicrobial substances, such as lactoferrin, lactoperoxidase, lysozyme, bacteriocins, and others.^{13,14} Laboratory studies showed that pasteurization causes minor losses of most vitamins,^{15,16} while, as milk contains high amounts of vitamin B2, the impact of heat treatment should be studied better.¹⁶ Also, pasteurization does not cause changes in the concentrations of minerals.¹⁵ Probiotic bacteria are present in

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raw cow milk at low levels, and the presence of *Bifidobacteria* in raw milk can indicate fecal contamination.^{15,17} Studies show that during thermal treatment concentration of lysozyme is reduced by 15%, of immunoglobulins by 12.3%.¹⁸

Currently, in the USA the sale of raw milk for human consumption is illegal in 20 states. 13 states allow sales of raw milk in retail stores and require a permit which also allows for sales on/off farm and at farmers' markets. 17 states permit sales of raw milk only on the farm on which it was produced. 8 states allow herdshare/cowshare programs which, in those states, are legal by statute, regulation, court decision, or written policy.^{19,20} In a herdshare, or cowshare, program people buy shares of a cow or herd, and pay the farmer to care for the animal and milk it. Animal owners can use raw milk from their cows. Shares are usually sold based on a milk amount expected; owners can buy the number of shares they need to have the milk supply they want.²¹ Recently, a campaign has started in Canada to sign a petition to permit the legal sale or access to raw milk and milk products through small-scale certified herdshare programs, or other programs, capable of managing any associated health risks.²²

At the same time, control of pathogens in all milk supplied by farms is difficult; in many cases it can be done only sporadically. Moreover, modern large-scale farms purchase high numbers of live animals and large volumes of feeds, which complicates traceability along the whole chain. Also, it is difficult to provide rapid testing for all types of pathogens. Considering all this, milk pasteurization provides a safer option for the customer. Education of general public on the risks of consumption of unpasteurized milk and dairy products can help to make a weighed decision, especially by people at greater risk or when such decision is made in respect to children.

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Conflict of interest

Author declares that there is no conflict of interest.

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