

Research report

## Food fears and raw-milk cheese

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Received 10 December 2007; received in revised form 13 January 2008

### Abstract

This paper examines the debate over the safety of raw-milk cheese. Departing from Nestle's categories of "science-based" and "value-based" approaches to risk assessment, the author argues that raw-milk cheese advocates, as well as proponents of pasteurisation, invoke science to support their positions, and measure risk against potential costs and benefits. Additionally, the author argues, each position is animated by, albeit differing, values and their attendant fears. While artisan cheesemakers associations have successfully averted bans on raw-milk cheesemaking in various contexts in recent years, the author concludes that they remain vulnerable to future food scares unless consumer interest in raw-milk cheese is sustained.

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*Keywords:* Raw-milk cheese; Food scares; Pasteurisation; Food safety

In the wake of food scares in recent decades, raw-milk cheeses have often been categorised as "risky" food substances. While raw-milk cheeses have been associated with tuberculosis, *E. coli*, *Salmonella*, *Brucella melitensis*, *Staphylococcus aureus*, and campylobacteriosis, the greatest concerns have focused on *Listeria monocytogenes*. Only since the early 1980s has human susceptibility to *Listeria* been recognised (Gorman, 2002). Listeriosis in humans is typically characterised by flu-like symptoms, including headache, fever, abdominal pain, vomiting and diarrhoea. Effects may be worse among children, the elderly, and people with compromised immune systems who often develop pneumonia, meningitis or encephalitis. Pregnant women and their foetuses are particularly vulnerable (Stuttaford, 1995). The combined mortality rate for victims of listeriosis is an alarming 30%. Largely as a consequence of scares associating *Listeria* with raw-milk cheese, the young, the aged, people with compromised immune systems, and especially pregnant women are frequently advised to forego raw-milk products.

Advocates of raw-milk cheese offer an alternative perspective. David Grotenstein has asserted: "We know for a fact that the streets of Europe would be littered with bodies and [European] hospitals would be filled to capacity if there were a problem with unpasteurised products" (Soref, 2000). Indeed,

defendants of raw-milk cheese have suggested that pasteurised cheese presents its own perils. In layman's terms, according to Patrick Rance: "[Pasteurising milk] doesn't kill all the listeria bacteria. Some of them are merely stunned. And because other kinds of bacteria have been killed, the listeria bugs have a free run to breed" (Jeffrey, 1992). Fear, it would seem, works on both sides of the debate. According to Nestle:

Safety is relative; it is not an inherent biological characteristic of food. A food may be safe for some people but not others, safe at one level of intake, but not another, or safe at one point in time but not later. Instead, we can define a safe food as one that does not exceed an *acceptable* level of risk. Decisions about acceptability involve perceptions, opinions, and values, as well as science. When such decisions have implications for commercial or other self-interested motives, food safety enters the realm of politics (Nestle, 2003: p. 16).

Nestle further suggests that perceptions of food safety and risk are defined by two divergent "cultures", one "science-based" and the other "value-based" (pp. 16–22). She suggests that the scientific approach emphasises observation and empirical evidence and seeks to measure risk against potential costs and benefits. By contrast, the value-based approach contextualises risk within psychological, cultural and social contexts and balances risk against such difficult to measure entities as "dread" and "outrage." According to Nestle, a

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division of labour may emerge between these two approaches. She quotes Edward Groth, who writes: “What risks are involved? How big are they? Who is at risk? These are scientific questions. The central value question is: Given those facts, what should society do?” But Nestle subtly challenges this tidy divide between science- and value-based approaches. “The two approaches greatly overlap,” she warns. “Science-based approaches are not free of values, and value-based approaches also consider science” (p. 17).

Taking Nestle as a point of departure, I challenge the simplistic divide by which protagonists in the debate over raw-milk cheese safety have often been characterised or, in fact, characterised themselves. According to this divide, raw-milk cheese enthusiasts fall into the “value-based” category, while proponents of pasteurisation fall into the “science-based” category. Closer scrutiny reveals a more complex picture.

### Science-based perceptions of cheese safety and risk

Following food scares in the 1970s, 1980s and 1990s, a ban on raw-milk cheese was considered not only by the US Food and Drug Administration (FDA) (Wakin, 2000), but also by various European countries and, subsequently, the European Union (EU). In 1998, the London-based Institute of Food Science and Technology asserted:

“It is indisputable that some outbreaks of food-borne illness have been clearly linked with the consumption of cheese, the majority of those reported being associated with cheese made from unpasteurised or improperly pasteurised milk. Whilst pathogens can and do gain access to cheese after curd formation, it is clear that many food-borne pathogens are faecal in origin. . . , it not being possible to milk cows aseptically. . . . In addition to potential faecal contamination, pathogens may be excreted into the milk directly from the udder. . . . Correctly-controlled milk pasteurisation kills such bacteria. . . . Pasteurisation. . . provides the simplest means of ensuring the destruction of vegetative pathogens in raw milk” (IFST, 1998).

Despite occasional rhetorical flourishes – (the FDA has equated eating raw-milk cheese with playing Russian roulette, Newman, 2004) – consideration of a ban on raw-milk cheese has almost invariably been expressed in the language of science. In 2000, an FDA spokesperson told journalist Anna Soref, “We are always looking at the scientific evidence [regarding raw milk], and if that changes, so may our stance” (Soref, 2000). FDA safety analyst Dr. John C. Mowbray told a reporter that same year: “We’re reviewing our policy which requires 60-day aging for raw-milk cheese, to determine whether it’s sufficient to protect public health. We have some indications in the scientific literature that show that certain pathogens that are likely to be in raw milk would survive that aging process. Our allowance for aging as a substitute for pasteurisation is based out of (*sic*) the creation of our cheese standards, which was over 50 years ago. Our understanding of microbiology has progressed quite a bit since then” (Wakin, 2000). Even as Mowbray spoke, scientists at a federal lab were

making cheeses from raw milk inoculated with bacteria to determine whether various pathogens could survive in aging cheese more than 60 days (Kummer, 2000; Wakin, 2000).

The pro-pasteurisation camp has not been alone, however, in deploying science in support of its perspectives. In the face of calls for a ban on raw-milk cheese in various places at various times, raw-milk advocates have also articulated their positions in the language of science. Cheese, they point out, is produced through the fermentation of milk, a process that has historically depended upon bacteria naturally found in raw milk. These bacteria, they argue, hold potential pathogens in check by “out-competing” them. This measure of control, they admit, depends upon hygienic practices in the dairy and in the cheese room. Good quality raw milk from healthy, well-fed animals not only contains fewer pathogens, but also contains proteins (lactoferrin) and enzymes (lysozyme and lactoperoxidase) that inhibit or eliminate pathogens (Donnelly, 2005). The craft of cheesemaking, they suggest, lies precisely in creating conditions favourable to the growth of “good bacteria” and the elimination of “bad bacteria” through controlling variables such as temperature, moisture, and acidity.

Raw-milk advocates directly challenge the science of pasteurisation proponents. In a review of the scientific literature, food scientist Donnelly (2005) has concluded: “When outbreaks of human illness associated with consumption of raw-milk cheese are reviewed, it is clear that in the majority of instances factors other than the use of raw milk contributed to pathogens being present in cheese”. Gifford (1999–2003) has argued: “In experiments cited by the FDA to examine whether pathogenic bacteria could survive beyond a 60-day refrigerated aging process, technologists ‘inoculated’ cheese milks and also made cheeses with ‘toxic cocktails’ of multiple strains of *E. coli* bacteria. It is not likely that these conditions would occur naturally”.

Raw-milk advocates have also invoked science to suggest that pasteurised cheese presents its own risks. The enzymes in raw milk not only aid in the digestion of sugars, fats and minerals in the milk, but also those in other foods. By destroying these enzymes, raw-milk enthusiasts assert, pasteurisation renders such nutrients more difficult to digest, contributing to osteoporosis and lactose intolerance. Pasteurisation, they argue, also destroys the naturally occurring cortisone-like factor in milk, meaning that whereas raw-milk products help control allergies, pasteurised milk products do not. Similarly, whereas raw-milk products contain beneficial bacteria that colonise the digestive tract and fortify the immune system, pasteurisation diminishes or eliminates these benefits (Cowan, 1999–2003; Schmid, 2003).

The destruction of indigenous bacteria, enzymes and proteins through pasteurisation has even more sinister effects, raw-milk advocates assert. “Starter cultures” used to make cheese with pasteurised milk must alone fight off pathogens to which the cheese is subsequently exposed (Donnelly, 2005; Style, 2006). A study by Rudolph and Scherer (2001) in fact shows “a higher incidence of *Listeria monocytogenes* in cheese made from pasteurised milk (8 percent) than in cheese made from raw milk (4.8 percent)” (in Donnelly, 2005).

Based upon this alternative view of the science of cheesemaking, the Specialist Cheesemakers Association (UK) has developed and published a Code of Best Practice (SCA, 2004) instructing members how to produce safe raw-milk products, and the American Cheese Society has advocated the use of Hazard Analysis Critical Control Points (HACCP) to insure product safety (Kummer, 2000). These protocols outline good practice from pasture to packaging, advising cheesemakers, for example: to work with premium quality milk (if possible from their own herd, or at least a single herd, of animals fed on grass as much as possible, treated with antibiotics only when necessary, and strictly removed from the milking parlour when ill); to monitor milk quality through the measure of microbial levels and somatic cell counts, and to make cheese within the shortest possible time of milking (36 h maximum); to maintain clean cheesemaking and aging environments, and to practice good personal hygiene; to closely monitor relevant times, temperatures, and acidity levels throughout cheesemaking, and to take periodic sanitary measures of end products to detect emergent problems; and to keep good batch records from production to point of sale. Through such proposals, artisan cheesemakers have asserted that they understand, scientifically, the means by which their products may be hygienically produced and that they are capable of monitoring their own productive practices, with minimal government oversight, to assure consumer safety.

### Measuring risk against potential costs and benefits

If proponents of pasteurisation cannot lay exclusive claim to a scientific approach, neither can they alone be described as evaluating risk in the light of cost/benefit calculations. Despite the fact that raw-milk cheesemakers often command a higher price for their cheese than their industrial counterparts, most produce in small volume and must constantly watch their bottom line to stay in business. The expanding market for raw-milk cheese in recent years has been associated with consumer desires for greater traceability in the food system and producer accountability. The corollary of this is that raw-milk cheesemakers survive only on good reputation. A single case of food-borne illness associated with a raw-milk producer's cheese may mean the end of his/her business. Industrial cheesemakers generally operate on much higher volume, but with narrower profit margins. Consequently, they too must pay attention to the bottom line, albeit in different ways. Their competitiveness depends upon low price at the till. To achieve this, they must source milk at the lowest possible price, which can generally be had only by buying from large and/or numerous factory dairies where animals are confined and fed silage. The quality of the milk such animals give is generally poorer, and the time from milking to cheesemaking longer, making pasteurisation a necessity.

Differential factors of production therefore give rise to differential risk scenarios, as well as differential cost/benefit equations in risk management. Few raw-milk cheesemakers could afford the purchase of pasteurisation equipment even if

they wished to acquire it (Kummer, 2000; Lichfield, 1999). Offsetting such investment costs would require expansion of volume, effectively transforming them into industrial producers. By contrast, such forms of capital investment are easily amortised by high volume industrial cheesemaking. What would not be viable for industrial cheesemakers are the dairying practices outlined above by artisan cheesemakers associations, which would raise the price of fundamental factors of production, pricing the industrial producer out of the market. Industrial cheesemakers thus focus risk management on variables they can affordably control, just as raw-milk producers do.

With tangible economic interests at stake, industrial cheesemakers have battled against raw-milk on numerous fronts. With varying success, industrial producers have often sought to control Geographical Indication regimes and to mandate the use of pasteurised milk within them. As a consequence, cheeses such as Stilton can legally be made only with pasteurised milk. Pressure has also been brought against raw-milk producers at national levels. In 1998, a trade group representing American industrial cheesemakers began actively lobbying the FDA to require that all cheese produced and marketed in the US be pasteurised (Halweil, 2000; Kummer, 2000). Big cheesemakers also lobbied the EU to ban raw-milk cheese production and sales (Lichfield, 1999). The campaign against raw-milk cheese has also taken on international proportions. Beginning in the late 1990s, industrial cheesemakers focused attention on institutions governing international trade, including the Codex Alimentarius. Once charged merely with establishing and propagating a code of good practice for foodstuffs, the Codex became the recognised standard for goods traded under the rubric of the World Trade Organisation in 1995, meaning that if a product satisfied Codex standards it could not be excluded from trade by member nations without penalty (Newman, 2004). Because US standards for cheese safety were more exacting than European standards, the US became vulnerable in 1995 to having a dispute brought against it for barring the importation of raw-milk cheeses that met existing Codex standards (Stoffers, 2000). US cheese industry representatives therefore pressed the Codex to harmonise standards with the FDAs.

### Value-based perceptions of cheese safety and risk

Despite the impressive growth of artisan cheesemaking in recent years, raw-milk cheese today, even in Europe, constitutes a market niche that scarcely threatens industrial cheesemakers. To explain industrial cheesemakers' concerns over raw-milk cheese requires looking as closely at "values" as at science and calculating interest. Douglas and Wildavsky have written: "[J]udgements of risk and safety must be selected as much on the basis of what is valued as on the basis of what is known. . ." (in Nestle, 2003: p. 20). This, I would argue, applies to both raw-milk and industrial cheesemakers. Further, what each group values is intimately bound up with, and revealed by, what each fears. Industrial producers worry about liability in cases of

food-borne illness. Pasteurisation affords a widely recognised means through which producers may exercise “due diligence” by “identifying and eliminating” hazards (Stoffers, 2000). Pasteurisation ostensibly allows the industrial producer to eliminate external risk factors and to focus on factors under their control. Pasteurised milk also affords predictability and controllability in the productive process, allowing industrial cheesemakers to reduce wastage, maximize output, and insure price competitiveness.

These fears, and related values, explain why industrial producers work with pasteurised milk, but not why they seek to make pasteurised milk mandatory for all cheesemakers. Here too it is instructive to examine industrial producers’ fears. Food scares may damage a particular brand, but may also damage the entire sector. To the industrial producer, who focuses more on market share than on product differentiation, the viability of the sector is of paramount concern. Industrial producers have therefore sought to universalise what they consider appropriate risk management to prevent other producers doing them harm. Tellingly, calls for a ban on raw-milk cheese have invariably arisen in the aftermath of cheese-related food scares regardless of whether problems were traced to raw-milk or pasteurised cheese. Such calls themselves are intended to reassure the public of the safety of “properly made” cheese, while those who issue them – whether industrial producers or government officials – seek to disassociate themselves from risk.

Raw-milk cheesemakers’ values – and those of their consumers – are markedly different. They are, nonetheless, similarly revealed through examination of attendant fears. Halweil has written: “Mandatory pasteurisation would eliminate the highly distinctive aromas, textures, colours, and flavours that raw-milk cheeses afford—all made possible by bacteria which is specific to the breed of cow that produced the milk and the sort of grass the cow munched” (Halweil, 2000). For many, protection of diverse micro-cultures in raw-milk cheeses is bound up with the protection of diverse macro-cultures in the form of human communities and component livelihoods. Raw-milk cheese enthusiasts also relate distinctive flavour to diverse natural ecologies. American cheesemonger Steve Jenkins has said that banning raw-milk cheese would “wipe out one of the most beautiful and romantic links between human beings and the earth that we will ever know” (Wakin, 2000). In these ways, the spectre of homogenisation – of natural landscapes, of human communities, of foodways and foodstuffs, including cheese – haunts raw-milk cheesemakers and consumers alike. Such fears weigh far more heavily in the minds of most than food-borne illness.

### Recent developments

In recent years, the EU has been persuaded that raw-milk cheese constitutes an important economic niche in which its producers enjoy competitive advantage. In 1998, the EU began enforcement of two Directives (92/46 and 92/47) establishing the parameters in which raw-milk cheese production would

continue to be permitted (Dixon, 2000; Newman, 2004), and mandating cheese producers themselves to play a significant role in monitoring the safety of their products. The EU subsequently lobbied the Codex Alimentarius to underwrite raw-milk production, contrary to US proposals. As *The Wall Street Journal* reported in 2004: “The code’s latest wording recognizes that pasteurisation isn’t the only way to keep cheese germ-free.”

While continuing to tolerate the trade in contraband cheese in specialty shops in cities like New York, the FDA has given no indication that it will modify its position (McLaughlin, 2003). Just as the US has brought cases against the EU for banning importation of hormone-fed beef and genetically modified grains, the EU is now poised to bring suit against the US for prohibiting the importation of raw-milk cheeses (Newman, 2004). Raw-milk cheesemakers’ victory rests on shaky ground, however. Food scares have driven the debate over raw-milk cheese for decades, and may well again. Raw-milk cheeses today enjoy a wider and more loyal consumer base than they have in decades. Should such enthusiasm wane, however, raw-milk cheese may once more become vulnerable to food fears.

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