

Examples of pathogens isolated from raw milk or linked to outbreaks/illnesses

Brucella
Campylobacter
Coxiella burnetii (Q fever)
Cryptosporidium
E. coli O157/EHEC
Listeria monocytogenes
Mycobacterium bovis (Bovine tuberculosis)
Rabies virus*
Salmonella enterica
Salmonella typhi (Typhoid fever)
Shigella
Staphylococcal enterotoxins
Streptococcus
Tick-borne encephalitis virus**
Toxoplasma
Yersinia enterocolitica

*Milkborne transmission of rabies virus has not been documented, but post-exposure prophylaxis (rabies shots) have been recommended for persons that drank raw milk from a rabid cow

**This disease is not endemic in the United States

Quantifying the number of raw milk consumers

Prior to considering the relative importance of raw milk associated outbreaks in the literature, it is worthwhile to consider the prevalence of raw milk consumption in the population. Headrick et al (1998) estimated raw milk comprised <1% of the total milk sold in states where raw milk was legal. In an earlier survey of 3,999 persons in California, 3.2% reported drinking raw milk (Headrick et al, 1997). Thus, the number of persons in the general population that consume raw milk appears to be very low, which makes the relatively large number of published outbreaks more striking.

1997. M. L. Headrick, B. Timbo, K. C. Klontz, and S. B. Werner. Profile of raw milk consumers in California. Public Health Rep. 112:418-22.

Review of outbreaks and raw milk

No recent (last 5 years) comprehensive review of raw milk outbreaks in the US or other countries could be found. A 1998 study by Headrick et al is among the most frequently cited reviews of the epidemiology of raw milk associated outbreaks. Below are other highlights from the paper.

1998. Headrick, M. L., S. Korangy, N. H. Bean, F. J. Angulo, S. F. Altekrose, M. E. Potter, and K. C. Klontz. The epidemiology of raw milk-associated foodborne disease outbreaks reported in the United States, 1973 through 1992. *Am J Public Health* 88:1219-21.

- The purpose of the study was to describe the epidemiology of outbreaks associated with raw milk reported to CDC from 1973-1992 and analyze the legal status of raw milk sales.
- 46 raw milk associated outbreaks were reported from 21 states during the study period; the median number of illnesses per outbreak was 19 (range 2 to 190); the total number of illnesses over the 20-year period was 1,733.
- 40/46 (87%) of outbreaks occurred in jurisdictions where the intrastate sale of raw milk was legal
- The majority of outbreaks were due to campylobacteriosis (57%) and salmonellosis (26%) followed by staphylococci food poisoning (2%) and *E. coli* O157:H7 (2%).
- The estimated volume of raw milk sold relative to pasteurized milk was less than 1%

Below are highlights of outbreaks published in the literature (peer-reviewed and public health reports such as MMWR). It should be noted that there are many potential variables that could impact whether or not an outbreak is published such as novelty, timeliness, and resources or motivation by the agency that conducted the investigation. Therefore, it is difficult to quantify the problem based on a literature review alone.

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E. COLI O157/EHEC

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