



5. Adjusting for bias, pasteurized milk is from 1.1 to 15.3 times more dangerous as raw milk on a per serving basis
6. According to FDA documents (based on exaggerated data on illness from raw milk), deli meats and uncooked hotdogs are 10 times more likely to cause foodborne illness than raw milk. Yet deli meats and hotdogs are freely sold in the state of Alaska.
7. FDA insists that there are no health benefits from raw milk compared to pasteurized, yet the very studies they cite clearly show that raw milk is superior. Enzymatic components in raw milk ensure assimilation of nutrients, kill pathogens and strengthen the immune system. These components are largely inactivated by pasteurization.
8. Pasteurized milk is now one of the eight top allergens; a survey carried out in Michigan indicates that 90% of individuals diagnosed as lactose-intolerant or allergic to milk can drink raw milk without problem.
9. The recent PARSIFAL study in Europe found that the most important factor in protecting children against asthma and allergies was raw milk consumption; the younger the children were when introduced to raw milk, the more protection it conferred. Asthma kills more than 5,000 people in the US yearly; raw milk has killed no one.
10. According to FDA data, out of a total of 437 million servings of raw milk in the US per year, 137 people got some sort of illness. On a per serving basis, that is 3.18×10^{-7} . Put another way, you would have to drink 3.18 million glasses of raw milk before you might expect to get an illness of any kind due to that milk. By contrast, 16.5 percent of all broiler chickens tested by the FDA in 2006 contained salmonella bacteria. The rate of human salmonellosis in the US was 14.7 cases per 100,000 people in 2004. This is 4200 cases per year. Yet the citizens of Alaska are free to purchase poultry, but not raw milk.

HB 367 – Sale of Raw Milk Products

HB 367 allows the sale of raw milk. The Alaska Departments of Environmental Conservation (DEC), Natural Resources (DNR), and Health and Social Services (DHSS) do not support HB 367 and believe mandatory pasteurization for all commercially sold milk and milk products is necessary to protect human health.

Consumption of raw milk poses serious health risks

- Human pathogens commonly found in raw milk include *Campylobacter jejuni*, *E. coli*, *Listeria monocytogenes*, *Salmonella* species, and *Yersinia* species. Introduction of these pathogens into raw milk cannot be eliminated by standard disinfection and sanitation procedures or good animal handling practices alone.
- Numerous federal agencies, including the American Medical Association, the American Public Health Association, the Federal Food and Drug Administration (FDA), and the U.S. Centers for Disease Control and Prevention (CDC) support prohibiting the sale or distribution of raw milk because of the danger it poses to human health.
- CDC has traced more than 1000 illnesses, 104 hospitalizations, and 2 deaths to consumption of raw milk or cheese produced from raw milk from 1998–2005. A list of some of the most recent outbreaks is attached.
- Frequent consumers of milk - children, the elderly, and people with weakened immune systems are at the greatest risk for illness and death from bacteria found in raw milk.

Existing State regulations (18 AAC 32) prohibit the sale of raw milk

- The State of Alaska dairy and public health experts agree that raw milk should not be sold commercially. This prohibition was codified over 10 years ago.

Pasteurization has not been shown to substantially alter the nutritional value

- The pasteurization process uses heat to destroy harmful bacteria without significantly changing milk's nutritional value. In addition to killing disease-causing bacteria, pasteurization destroys bacteria that cause spoilage, extending the shelf life of milk.
- Pasteurization does not result in an appreciable loss of protein
- Pasteurization does not result in an appreciable loss of fat-soluble vitamins (A, D, E and K)
- Pasteurization results in a loss of B-complex vitamins on the order of 0-10%
- Pasteurization results in a loss of vitamin C on the order of 0-10%
- According to FDA, raw milk does not contain compounds that will kill harmful bacteria, making the product safe.
- Pasteurized milk does not cause lactose intolerance or allergic reactions any more than raw milk.

Outbreaks happen in states with regulatory programs that allow sale of raw milk

- Between 1973 and 1992, raw milk was associated with 46 outbreaks; 87% of these outbreaks occurred in states where commercial distribution of raw milk was legal.
- In 2001, Wisconsin banned cow-leasing programs after 75 people became infected with *Campylobacter jejuni* bacteria from drinking unpasteurized milk obtained through such a program.

Selected recent outbreaks of human illness associated with raw milk consumption

- **July 2007**—Public health officials in Pennsylvania stopped Stump Acres Dairy raw milk sales due to an outbreak of *Salmonella* infection. The first outbreak occurred earlier in 2007; however, raw milk was put back on sale after the dairy farm passed the state's regulatory testing. Raw milk sales were again prohibited several weeks later after a second outbreak of *Salmonella* infection was identified. The dairy was allowed to re-open its raw milk market until a third outbreak of *Salmonella* occurred in July. Even with testing and the utmost care by the producer the raw milk product could not be kept safe for public consumption.
- **December 2005**—Public health officials in Clark County, Washington were notified of four county residents with laboratory confirmed *Escherichia coli* O157:H7 infection. All four residents reported having consumed raw milk obtained from a Cowlitz county farm.
- **July 2004**—The Indiana Public Health Department advised consumers to check their refrigerators and freezers for raw milk cheese that may be contaminated with *Salmonella*. Routine product sampling found *Salmonella* in "Natural Raw Milk Cheese" made by Meadow Valley Farm after the cheese was distributed to farmers' markets and specialty food stores in parts of Indiana and Wisconsin.
- **2002–2003**—Two children were hospitalized in Ohio for infection with *Salmonella* Typhimurium. These children and 60 other people in Illinois, Indiana, Ohio, and Tennessee developed bloody diarrhea, cramps, fever, chills, and vomiting from *S. Typhimurium* that was tracked to consuming raw milk.
- **2000–2001**—In North Carolina, 12 adults were infected with *Listeria monocytogenes* linked to homemade, Mexican-style fresh soft cheese produced from contaminated raw milk sold by a local dairy farm. Ten of the 12 victims were pregnant women, and infection with the bacterium resulted in five stillbirths, three premature deliveries, and two infected newborns.

Current Regulation of Raw Milk – Alaska

Code of Federal Regulations - 21 CFR 1240.61 “No person shall cause to be delivered into interstate commerce or shall sell, otherwise distribute, or hold for sale or other distribution after shipment in interstate commerce any milk or milk product in final package form for direct human consumption unless the product has been pasteurized or is made from dairy ingredients (milk or milk products) that have all been pasteurized.....”

“The final rule does not apply to the interstate transportation of raw (unpasteurized) milk to dairy processing plants for pasteurization or to raw milk products in intrastate commerce”. 52 Fed. Reg. 29509 (1987) at 29509

[DEC interpretation – raw milk cannot be sold across State lines but States have the choice of adopting legislation allowing it to be sold intrastate

State Statute: 17.20.005 “...The commissioner may issue orders, regulations, permits, quarantines, and embargoes relating to (4) Grading of milk and milk products and standards of sanitation for dairies offering to the public or selling milk or milk products to at least the minimum of current recommendations of the United States Public Health Service pasteurized milk ordinance as it may be periodically be revised.”

[DEC interpretation – At a minimum, DEC is to comply with the U.S. Pasteurized milk ordinance (PMO) and apply it to all milk products sold or offered in the State. Raw milk would not meet the PMO standards and thus this subsection effectively prohibits the sale of raw milk in Alaska.]

State Regulations 18 AAC 32:

The State of Alaska has adopted the federal regulations outright so the exact same rules apply as directed by the Statute. You can access the current pasteurized milk ordinance at <http://www.cfsan.fda.gov/~car/pmo03toc.html>

18 AAC 32.060

...A milk producer may not allow raw milk or a raw milk product, including cream from raw milk, to be removed from the dairy farm unless

- (1) the product is being transported directly to a milk processing plant with a permit issued under 18 AAC 32.030 or by another state; or
- (2) the product has been decharacterized with an approved denaturant and labeled “FOR ANIMAL FOOD NOT FOR HUMAN CONSUMPTION” in letters at least three inches high on each container; for the purposes of this paragraph, “approved denaturant” means
 - a. finely powdered charcoal;
 - b. FD & C Blue No. 1, FD & C Blue No. 2, Ultramarine Blue; or
 - c. FD & C Green No.3, FD & C Red No. 3, or FD & C Red No. 40

[DEC prohibits the removal of raw milk from a dairy farm unless the raw milk is being transported for processing or the milk is intended for animal food and has been denatured through the addition of food coloring.]

DHSS Raw Milk Talking Points

DHSS Position

- The Alaska Department of Health and Social Services takes the firm position that the health risks associated with legalizing the sale of raw milk substantially outweigh the benefits because
 - unpasteurized milk is far more likely to contain human pathogens than pasteurized milk and thereby increases the risk of serious, sometimes fatal, infectious illness among milk consumers, and
 - those who are at increased risk for serious health outcomes include the developing fetus, young children, and the elderly who may be incapable of making an informed decision, and
 - the potential health benefits of raw milk consumption are largely unsubstantiated by empirical scientific evidence.

Statistics

- Many human pathogens are commonly found in raw milk, including *E. coli O157:H7* and *Salmonella*
 - Also *Listeria monocytogenes*, *Campylobacter jejuni*, *Mycobacterium* and *Yersinia* species
- These pathogens may be shed directly from the animal (cow, goat, etc) or contaminate the product during the collection and handling process.
- Multiple studies have illustrated a dramatic increase in the incidence of multi-drug resistant bacteria present on farms (livestock operation, dairy farms, vegetable and fruit farms), which results in increased health risks among infected persons.
- In 1995, raw milk accounted for approximately 1% of all milk sales in states that permit the sale of raw milk (Headrick)
- Raw milk contamination
 - A study performed by the USDA Agricultural Research Service and published in the Journal of Dairy Science in 2004 collected raw milk samples from 861 farms in 21 states. They found *Salmonella* in 2.6% and *Listeria monocytogenes* in 6.5% of samples.
 - Another study was conducted in 2002 at Penn State. In this study samples were collected from 248 dairy herds from 16 counties in Pennsylvania. *Campylobacter jejuni*, Shiga toxin-producing *Escherichia coli*, *Listeria monocytogenes*, *Salmonella*, and *Yersinia enterocolitica*, were present in anywhere from 2 to 6 % of the samples.
 - A third study sampled milk from 131 dairies in Minnesota and South Dakota. *Campylobacter jejuni*, Shiga toxin-producing *Escherichia coli*, *Listeria monocytogenes*, *Salmonella*, and *Yersinia enterocolitica*, were present in anywhere from 4 to 9 % of the samples.
 - A fourth study was reported in 2005 in the Journal Emerging Infectious Diseases. Raw milk samples were collected over 3 years from 316 farms in the USA, from the Northeast, Midwest and West. The raw milk was tested for the presence of *Coxiella burnetii*, which causes Q-Fever in people. (The symptoms of Q Fever range from malaise, muscle soreness, fever, hepatitis, endocarditis.) Domestic livestock (cows, sheep, and goats) are the primary reservoirs for *Coxiella burnetii*. In this study over 94 % of the samples tested positive for *Coxiella*. This disease is endemic not only in the US but other studies have shown it to be a world wide problem.
- Between 1973 and 1992, raw milk was associated with 46 outbreaks; 87% of these outbreaks occurred in states where commercial distribution of raw milk was legal (American Journal of Public Health 1998;88:1219-1221).
 - 6 outbreaks were reported during 476 state-years for states in which the intrastate sale of raw milk was not legal (1.26 outbreaks per 100 state-years), compared with 40 outbreaks during 544 state-years for states in which the intrastate sale of raw milk was legal (7.35 outbreaks per 100 state-years).
 - The number of reported outbreaks per 10 million person-years in states that permitted the intrastate sale of raw milk was 0.14, compared with 0.03 outbreaks per 10 million person-years in states where the intrastate sale of raw milk was illegal.
- Between 1998 and 2005, CDC traced more than 1000 illnesses, 104 hospitalizations, and 2 deaths to consumption of raw milk or cheese produced from raw milk.
- In 2001, Wisconsin banned cow-leasing programs after 75 people became infected with *Campylobacter jejuni* bacteria from drinking unpasteurized milk obtained through such a program

- CDC's FoodNet Survey was performed in 9 US states in 2002. It showed that of >8,000 people surveyed, 81.6% reported consuming any milk in the past 7 days, and 3.5% reported consuming raw milk
- New data from CDC show that between 1998-2006, 92% (46 of 50) of outbreaks linked to liquid milk consumption for which the pasteurization status of the milk was known were due to the consumption of unpasteurized milk (unpublished data)

Pasteurization

- High Temperature/Short Time (HTST) pasteurization heats the milk to at least 161° for at least 15 seconds
- The milk is immediately cooled to below 40° and packaged into plastic jugs or plastic-coated carton
- Pasteurization must be sufficient to destroy all human pathogens that may be carried in the milk from the cow
- Pasteurization temperatures are sufficient to destroy all yeasts, mold, and many of the spoilage bacteria
- Microbiological standards for milk as recommended by the U.S. Public Health Service:
 - Grade A raw milk for pasteurization should not to exceed 300,000 bacteria per ml
 - Grade A pasteurized milk should not exceed 20,000 bacteria per ml

Need to Focus on Comparing Raw vs. Pasteurized Milk

- Most foods run the risk of being contaminated with human pathogens; the risk varies depending on the origin of the food product, how it is raised, and how it is handled by the producer, distributor, and consumer
- One of the primary duties of government involves protecting the public's health by making the food supply safer
- Each food group is assessed independently
- This bill is not about the legality of selling raw beef, chicken, oysters, or honey—it is about the legality of selling raw milk
- Therefore, we need to focus on comparing the risks and benefits associated with a new law that would legalize the sale of raw milk in Alaska, and use regulations to protect the public's health
- The risks of serious and potentially lethal infectious illness associated with raw milk products are substantially greater than the risks associated with pasteurized milk products
- Pasteurized milk can become contaminated after pasteurization during handling or packaging (just as any processed food) and result in outbreaks; however, raw milk sold to the consumer starts out with higher bacterial loads and is far more likely to be contaminated with human pathogens than pasteurized milk
- The developing fetus, young children, the elderly, and immune-compromised persons are at highest risk for severe health outcomes resulting from infections commonly associated with contaminated milk consumption

Duty to Protect

- Duty to protect the food supply
- Duty to protect those who do not have the capacity or sufficient information needed to make a well informed decision
 - The developing fetus, young children, the elderly
 - This bill would allow the sale of raw milk to restaurants, but provides no mandate to inform restaurant customers that they might be served raw milk or to ensure products are not distributed incorrectly

Potential Raw Milk Costs

- DEC costs for testing, monitoring, and inspections
- DISS costs for outbreak investigations
- Costs to state government associated with outbreak investigations are substantial (time, money, resources)
- Direct and indirect costs involved resulting from the persons who become ill (and their family members)
 - A study of E. coli O157:H7 infections in the US showed that the average cost per case ranged from <\$100 for an individual who does not obtain medical care to \$6.2 million for a patient who died from hemolytic uremic syndrome (JFP 2005)
- Loss of public trust in product and in government officials
- Cost to industry if an outbreak occurs

Benefits of Raw Milk Consumption

- Possible financial benefit to struggling small dairy farmers and consumers
- Taste
- Minimal scientific evidence of possible health benefits
 - Possible beneficial impact on allergy, asthma, and digestive health
 - Negligible evidence of nutritional benefits--pasteurization may inactivate a small percentage of B vitamins, particularly thiamine, and up to 20 % of the vitamin C in milk but milk is not a major source of either one of these nutrients

The Pleural of Anecdote is not Data

- Need to use available scientific data to drive health policy decisions
- Just because someone grew up on a farm and does not remember getting sick from drinking raw milk, does not equate to proof that passing a law to legalize the sale of raw milk is okay. That's like saying that because someone has driven their entire life without ever wearing a seatbelt and has not been injured in a car accident that seatbelt laws are unfounded.

Summary

The Alaska Department of Health and Social Services strongly opposes this bill on grounds that allowing the sale of raw milk poses a substantial risk to the health of Alaskans.

Testimony of
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Resources Committee
Alaska House of Representatives
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Mr. Chairman and Members of the Committee, thank you for the opportunity to submit written testimony in which we will discuss the public health and food safety concerns of consuming raw milk and the importance of pasteurization. There is and has been a lot of misinformation published or otherwise communicated by various parties to the general public at large about raw milk and pasteurized milk. We very much welcome this opportunity to discuss the reality about the dangers of raw milk consumption and the safety and healthfulness of pasteurized milk consumption with this Committee.

Much of what I will present here today has been stated previously in our testimony provided to several other states.

RAW MILK IS INHERENTLY DANGEROUS

Raw milk is inherently dangerous and may contain a whole host of pathogens including Enterotoxigenic *Staphylococcus aureus*, *Campylobacter jejuni* (*C. jejuni*), *Salmonella* species, *Escherichia coli* (*E. coli* 0157H:7, Enterohemorrhagic *E. coli* - EHEC, Enterotoxigenic *E. coli* - ETEC), *Listeria monocytogenes*, *Mycobacterium tuberculosis*, *Mycobacterium bovis* (*M. bovis*), *Brucella* species (*B. abortus* being mainly associated with cattle and *B. melitensis* being mainly associated with goats), *Coxiella burnetii* and *Yersinia enterocolitica* to name but a few. Incidence rates for the presence of these pathogens in raw milk reported in the literature are

variable. As one might expect, there are variations in incidence rates between countries and even within regions of countries. There are also variations in incidence rates reported for the three main commercial milks (bovine [cow], ovine [sheep] and caprine [goat]). Van Kessel et al. (1) reported in 2004 on the prevalence of *Salmonellae* and *Listeria monocytogenes* in bulk tanks on U.S. dairies. They reported a 2.6% incidence rate for *Salmonellae* and a 6.5% incidence rate for *Listeria monocytogenes*. They commented that "although the prevalence of these organisms was low, inappropriate handling of raw milk could result in bacterial growth and substantially increase the potential risk to consumers of raw milk and raw milk products." These incidence rates were reported even with very low standard plate counts (total bacterial counts) at <5000 cfu's/ml (less than 5000 colony forming units per milliliter) being reported for the vast majority of samples analyzed for the pathogens. This is important to note because it is clear illustration of the fact that a simple standard plate count (or "bacteria count") is not an indication of the safety of milk. A low standard plate count clearly does not mean that milk will be pathogen-free.

Many of the above-mentioned microorganisms can cause very serious, sometimes life altering and sometimes even fatal disease conditions in humans. With pregnant women, *Listeria monocytogenes*-caused illness can result in miscarriage, fetal death, or illness or death of a newborn infant. Enterohemorrhagic *E.coli* (EHEC) infection has been linked to hemolytic uremic syndrome (HUS), a condition that can cause kidney failure and death. If infected with EHEC, young children are particularly susceptible to contracting HUS as unfortunately has recently happened in this country.

Raw milk should not be consumed by anyone, at any time, for any reason. FDA's opinion in this matter is entirely consistent with that of the American Medical Association, which holds as policy the position that "all milk sold for human consumption should be required to be pasteurized" (H-150.980, Milk and Human Health). The aged, infirm, young and immuno-compromised are most at risk for severe infections from pathogens that may be present in raw milk. Yet, oftentimes, we hear arguments made by raw milk advocates that these are the very people who should consume raw milk because of its alleged curative or medicinal properties. Claims that raw milk has miraculous disease-curing properties are not supported by the scientific literature. The scientific literature is, however, rife with reports of foodborne illness attributed to

the consumption of raw milk, including an article by Werner et al. (2) which reported on the incidence of *Salmonella* Dublin infections in California between 1971-1975. During that time, the mean annual incidence of *Salmonella* Dublin infections in California increased five-fold. Investigations of the cases showed an association with raw milk consumption and that all of the implicated raw milk came from just one dairy. Eighty-nine of the 113 victims were hospitalized and 22 of them died. Almost half of the patients had serious underlying, non-infectious diseases such as leukemias and lymphomas. As we know, the immune system with such persons is often compromised as a result of the treatments they are receiving.

In 1997, Keene et al. (3) reported on a prolonged outbreak of *E.coli* O157:H7 which was caused by the consumption of raw milk sold at Oregon grocery stores. Outbreaks began in 1992 and continued until June of 1994. When the dairy that was the source of the raw milk was identified, it was discovered that 4 of the 132 animals in the herd were initially positive for *E.coli* O157:H7. Despite public warnings, new labeling requirements and increased monitoring of the culprit dairy, illnesses continued until June 1994, when retail sales were finally stopped. The authors concluded that without restrictions on distribution, *E.coli* O157:H7 outbreaks caused by raw milk consumption can continue indefinitely, with infections occurring intermittently and unpredictably.

Proctor and Davis (4) reported on *E.coli* O157:H7 infections in Wisconsin between 1992-1999. During that timeframe, there were 1333 cases, even though the disease only became reportable in Wisconsin in April 2000. The highest age-specific mean annual incidence, at 13.2 cases per 100,000 population, occurred in children aged 3-5 years old. Among case patient identifiable exposures, consumption of raw milk/milk products was among the top three causes most frequently noted. Kernland et al. (5) reported on the causes of HUS in childhood in Switzerland. Among the causes was the consumption of raw milk, which resulted in the authors concluding that pasteurization of raw milk is likely to have a positive influence on the incidence of HUS. Allerberger et al. (6) reported on a specific incident in Austria in which two children contracted *E.coli* O157:H7 infection and subsequently developed HUS after consuming raw milk. The authors concluded that "it is prudent to remind them (parents and teachers) that children should not be given unpasteurized milk."

When one reads all the literature available on the association between *E.coli* O157:H7, HUS and raw milk, one wonders whether children themselves would choose to drink raw milk if they knew that raw milk might make them very ill, cause them to lose their kidney, or even kill them. Given a child's enthusiasm for life, I doubt very much that they would. Since children cannot and do not know about such matters, however, it is incumbent upon those of us who do know and are responsible for protecting them to ensure that the likelihood of their contracting foodborne disease from any food, including the milk that they drink, is an ever-diminishing prospect. Our collective actions should tend to make the food supply safer overall and not result in a lessening of the level of protection which we afford ourselves as a society. Permitting raw milk sales, or the operation of so-called "cow-share" schemes to occur within any given jurisdiction, will not result in the maintenance or further strengthening of our food safety systems. On the contrary, permitting such sales and schemes will inevitably result in an increased incidence of foodborne illness. Indeed, a farm operating a cow-sharing scheme in the state of Washington and which was engaged in the unlawful interstate distribution of raw milk, was relatively recently determined to have produced milk which was adulterated with *E.coli* O157:H7 and to have caused an outbreak of foodborne illness. There were eighteen victims identified in that outbreak, which represented 13% of those who reported consuming raw milk originating from the culprit farm. Unfortunately, the median age of the victims was just 9 years. Five of these victims, aged between 1-13 years, were hospitalized and four of these unfortunate children had HUS. Seventeen of the victims were farm "shareholders" or the children of "shareholders" and one other victim, a child of ten years of age, was a friend of a "shareholder." The Centers for Disease Control and Prevention (CDC) issued, on March 2, 2007, a report on this outbreak in its Morbidity and Mortality Weekly Report (MMWR). That MMWR report may be found at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5608a3.htm>

On the day of the publication of this MMWR, March 2, 2007, the state of Pennsylvania issued a press release announcing that a Pennsylvania farm engaged in the practice of selling raw milk had been determined to be responsible for an outbreak of Salmonellosis in that State. The CDC has since issued an MMWR describing the Pennsylvania outbreak in 2007. It may be found at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5644a3.htm>

An outbreak of foodborne illness involving *E.coli* O157:H7 also occurred in California last year. This outbreak was determined by California to likely be caused by a dairy owned by a raw milk advocate. The evidence linking these illnesses to this dairy was strong enough to prompt California authorities to order the milk to be recalled. According to California authorities, all of the victims in this outbreak were children. FDA had previously issued a warning letter to this same dairy farm on February, 24, 2005, for the unlawful distribution of unpasteurized milk, buttermilk, butter, cream and colostrum in interstate commerce, in finished form for human consumption, actions which were in violation of the Public Health Service Act, Title 42, U.S. Code, Sections 264 (a) and 271 (a) and Title 21, Code of Federal Regulations, Section 1240.61 (a). A copy of this warning letter is available at http://www.fda.gov/foi/warning_letters/archive/g5215d.pdf.

E.coli O157:H7 is not the only pathogen of concern for the very young. Schmid et al (7) reported on *Campylobacter jejuni* infections in Dubuque, Iowa over a twelve-month period. Forty-six of 53 victims participated in the case control study performed. Twenty-one of the 46 cases occurred in children less than ten years of age. The age-specific attack-rate was highest for children aged one to four years. Fifteen of the 46 had consumed raw milk in the week before the onset of their illness. Twelve of the 15 who had consumed raw milk were less than 10 years old. The authors concluded "eliminating the consumption of raw milk will depend on educational efforts."

FDA agrees that continued educational efforts are needed to impart an understanding of the dangers of raw milk to all, but educational efforts alone will not suffice. In order to protect the public health, raw milk should not be permitted to be sold for human consumption, nor should people be allowed to attempt to skirt laws banning direct raw milk sales by operating so-called "cow share" schemes. The CDC agrees with FDA in this regard. In the March 2, 2007, MMWR discussed above, CDC stated that "State milk regulations and methods for their enforcement should be reviewed **and strengthened** to minimize the hazards of raw milk" (emphasis added). Alaska House Bill 367, which is now before this body for consideration, would operate to relax Alaska laws governing raw milk sales by allowing sales of raw milk from farmers directly to consumers, restaurants and grocery stores. While allowing raw milk sales

directly to consumers will increase the probability of serious harm occurring to Alaskan consumers, allowing raw milk sales to restaurants and grocery stores will maximize the possibility that a raw milk adulterated with pathogens will cause a large outbreak of foodborne disease within Alaska. Alaska House Bill 367 is a measure directly contrary to the advice being given by the CDC, FDA, and many notable others. In a press release issued jointly by both CDC and FDA on March 1, 2007, the agencies noted that in addition to CDC and the FDA, "the American Medical Association, the American Academy of Pediatrics, the National Conference on Interstate Milk Shipments, the National Association of State Departments of Agriculture, the Association of Food and Drug Officials and other organizations have endorsed the pasteurization of milk and prohibition of the sale of raw milk and products containing raw milk," FDA urges that the state of Alaska maintain its current strong public health protection posture on the matter of raw milk sales and continue to prohibit them.

It is not only the very young, the aged, infirm and immunocompromised that can fall victim to the pathogens which may be present in raw milk. Anyone can be a victim, including healthy young adults, as was reported by Blaser and Williams (8) when they described how 19 of 31 college students developed an acute gastrointestinal illness caused by *C. jejuni* infection after a visit to an Oregon farm. It was determined that 3 others had an asymptomatic infection. Twenty-two of 25 students who had consumed raw milk for the first time became infected.

Raw milk advocates have claimed "It is not even clear that tuberculosis (TB) can be contracted from milk products" (Weston A. Price Foundation PowerPoint presentation available on-line entitled "Raw Milk and Raw Milk Products"). These advocates are wrong. It is clear to the medical community, to scientists, food technologists and those otherwise familiar with milk and milk products and the history of pasteurization that TB can be contracted from raw milk and raw milk products. Prior to the advent of pasteurization, *M. bovis* was reported to cause between 6-30% of all TB cases in the United States. (Karlsen and Carr) (9). De la Rúa-Domenech has also recently produced a very useful review on human *M. bovis* infections (in press; available on-line) (10) which might be of further interest to this Committee.

STATISTICS ON DISEASE OUTBREAKS ASSOCIATED WITH RAW MILK

OR RAW MILK PRODUCTS

CDC's MMWR for the week of March 2, 2007, which I discussed above, reported that from 1998 to May 2005, 45 outbreaks of foodborne illness implicated unpasteurized milk, or cheese made from unpasteurized milk. Those outbreaks accounted for 1,007 illnesses, 104 hospitalizations, and two deaths. The CDC also noted that between 1973-1992, 87% of the raw milk outbreaks occurred in those states which allowed for raw milk sales to consumers while consumption of raw milk was estimated to have been less than 1% of the total milk sold in those states.

Raw milk advocates have claimed that "between 1984 and 2002, reports of outbreaks associated with raw milk produced in the U.S. are almost non-existent". (Weston A. Price Foundation PowerPoint presentation available on-line entitled "Raw Milk and Raw Milk Products") This is not the case. FDA's review of outbreaks for this period indicates that there were 35 outbreaks attributed to raw milk, an average of two outbreaks per year.

When considering these statistics, it is important to consider that not all outbreaks are actually recognized and that, even when they are recognized, not all of them are reported to CDC. Additionally, it is impossible to capture all of the incidents of individual illness that occur. Generally, outbreaks indicate a much greater incidence of unreported sporadic illness from a food, such as raw milk.

PASTEURIZATION

Pasteurization is required for all milk and milk products in final package form intended for direct human consumption which move in interstate commerce. (21 CFR 1240.61) The only exceptions to this requirement are for certain cheeses and those exceptions are not absolute but come with certain other requirements relative to the manner by which any raw milk cheese must be ripened. In promulgating this regulation, FDA made a number of findings relative to raw milk, including the following: "Raw milk, no matter how carefully produced, may be unsafe" (52 FR 29514, Aug. 10, 1987).

The case that prompted FDA to promulgate 21 CFR 1240.61 was Public Citizen v. Heckler, 653 F. Supp. 1229 (D.D.C. 1986). In its holding, the federal district court concluded

that the record presented "overwhelming evidence of the risks associated with the consumption of raw milk, both certified and non-certified." *Id.* at 1238. The court stated that the evidence FDA has accumulated concerning raw milk has "conclusively shown.... raw milk is unsafe" and that "[t]here is no longer any question of fact as to whether raw milk is unsafe". *Id.* at 1241.

Pasteurization will destroy all of the pathogens that I have mentioned thus far and others that I have not mentioned. For example, pasteurization is also destructive of *Mycobacterium paratuberculosis*, the causative organism of Johne's disease in cattle. Clearly, pasteurized milk rationally can never be considered more hazardous than raw milk, contrary to the claims of raw milk advocates. In fact, it is universally agreed within the scientific community that pasteurization has made milk a much safer food for human nutrition.

Raw milk advocates have mentioned that *Bacillus cereus* and *Clostridium botulinum* spores may survive pasteurization, labeling these microbes as "heat-resistant pathogens." Microbial endospores are indeed very resistant to heat and chemical treatments, but the vegetative cells of these microbes are not heat resistant and will be destroyed by pasteurization.

B. cereus spores are quite common in milk, raw or otherwise and are thus a common cause of spoilage concerns within the dairy industry. However, the presence of *C. botulinum* spores in milk is not a very common occurrence. Before either of these microbes can pose food safety concerns with milk or milk products, very high population levels must be reached, a condition that does not ordinarily occur in the collection and processing of milk and milk products. Interestingly, in alleging that consumers are avoiding commercial milk because it is pasteurized (which is not true insofar as FDA is aware), raw milk advocates also claim that consumers do not like the fact that cows are allegedly kept in confinement, and fed rations designed to enhance milk production, a situation which they claim causes poor health and disease. In support of such a notion, raw milk advocates claim that Dutch researchers found much lower rates of *Salmonella* infections in dairy herds and cows with access to pasture, but they neglect to mention, or are perhaps unaware, of other Dutch research (Slaghuis et al.) (11) that indicates that cows fed on pasture during the summer had higher levels of *B. cereus* spores in their milk than cows which were housed during the summer. Thus, it appears that raw milk advocates are somewhat selective about the research which they choose to discuss when it comes

to the subject of cattle feeding and its impact upon milk microflora.

CLAIMS ABOUT RAW MILK AND PASTEURIZED MILK

Raw milk advocates are wont to claim that pasteurization, in addition to killing any pathogens which might be present, also destroys the nutritive value of milk. Nothing could be further from the truth.

Because there is so much misinformation currently circulating about raw milk and pasteurized milk, I developed a presentation which was given at the biennial meeting of the National Conference on Interstate Milk Shipments at Columbus, Ohio in May 2005 by Ms. Cynthia Leonard, M.S., who is a member of my Division. In that presentation, we addressed several of the more common and egregious fallacies about pasteurization that one is presently likely to encounter. Due to the constant and heavy demand for that presentation, we have recently placed it on the FDA website. It can be found at: <http://www.cfsan.fda.gov/~ear/milksafe.html>.

In addition to the fallacies that we addressed in the presentation, we have been made aware of several other erroneous statements being made by raw milk advocates about raw milk and pasteurized milk and it may be useful for me to address some of these here:

The claim that raw milk per se kills pathogens and thus is safe is simply incorrect. Milk contains certain indigenous enzymes to which antimicrobial properties have been ascribed, and milk may contain certain strains of bacteria which might be able to produce anti-bacterial compounds known as bacteriocins, but these enzymes and microbes (if present) do not render raw milk safe. With raw milk, the temperature of storage coupled with the nature and composition of the microflora initially present and simple microbial competition and outgrowth all play an important part in the determination of which microbes will grow and which will not. Some micro-organisms are more fastidious than others. Some do not grow well in cold temperatures, whereas others do. Some pathogens can survive and grow at refrigeration temperatures.

Another version of the claim that raw milk kills pathogens is that "pathogens can multiply in pasteurized milk and other foods but not in raw milk." That too is untrue. In support of this claim, we have seen raw milk advocates cite a 1982 study by Doyle and Roman (12) and

selectively present data from that study which, at first glance, appears to support raw milk advocates' claim. However, the authors of that study found and reported in that same article that "[s]urvival of the eight *Campylobacter* strains in refrigerated unpasteurized milk varied greatly." Furthermore, the authors stated that "one strain of *C. jejuni*, bovine isolate FRI-CF147B, survived exceptionally well in unpasteurized milk at 4° C. A less than 2-log reduction in cells occurred after 14 days, indicating that under the appropriate conditions, large numbers of campylobacters may survive in raw milk for several days." The authors also determined that "[i]nactivation of *Campylobacter* strains in unpasteurized milk paralleled but was greater than the inactivation of strains in sterile milk." Note that the authors report **an inactivation** in sterile (not merely pasteurized) milk. Finally, the authors concluded: "The presence and possible persistence of *C. jejuni* in raw Grade A milk reaffirms the need for pasteurization." Thus, far from providing a support for raw milk advocates, the Doyle and Roman study clearly advocates pasteurization of raw milk. The claim that pasteurization destroys all the "built-in safety systems" or "enzymes that kill pathogens" also is simply not supported by the scientific literature. For example, it has been claimed that pasteurization inactivates lactoferrin. Lactoferrin is an iron-binding protein believed to have dual roles; the one being a facilitator of iron absorption and the other a bacteriostatic role. Paulsson et al (13) determined that "unheated and pasteurized bLf (bovine lactoferrin) preparations showed similar antibacterial properties and caused an effective metabolic inhibition with a moderate bacteriostasis." They further stated that "pasteurization seems to be the method of choice (when making a lactoferrin product) because it did not alter either the bacterial interactive capacity or the antibacterial activity of bLf." Tomita et al (14) discussed how a pasteurization process was developed for lactoferrin in order to apply active lactoferrin usage to various products. Plainly, lactoferrin is not destroyed or inactivated by pasteurization.

Similarly, lactoperoxidase, an enzyme which is integral to the lactoperoxidase system of milk preservation, has been described as being "inactivated" by pasteurization, when actually lactoperoxidase is a very heat stable enzyme which is not destroyed by minimum legal pasteurization conditions, although some literature indicates moderate inactivation. In fact, because it will survive pasteurization intact, measurement of residual lactoperoxidase activity has

been proposed as a means of indicating if a heat treatment applied to milk has exceeded high temperature short time (HTST) pasteurization conditions. Contrary to the claim that the lactoperoxidase system can be an alternative to pasteurization, the lactoperoxidase system is not, and could never be an alternative to pasteurization. (Some researchers do consider that it might possibly be used synergistically with pasteurization to extend the shelf life of dairy products).

The lactoperoxidase system, which requires the addition of hydrogen peroxide and thiocyanate ion to milk to be activated, functions as a bacteriostatic mechanism generally, i.e., it serves to keep microbial populations from growing and spoiling milk. It is used in regions of the world where it is difficult, if not impossible, to cool milk, due either to a lack of electricity or cooling equipment or both. It is reported by some researchers to be bactericidal to certain enteric pathogens. Seifu et al (15), in 2005, published an excellent review article on lactoperoxidase, which may be of further interest to this Committee. The claim that lysozyme, which, in conjunction with lactoferrin does have a bactericidal effect, is destroyed by pasteurization is also simply not true. In excess of 70% of bovine milk lysozyme will survive normal HTST conditions, as reported by Griffiths (16).

With respect to indigenous dairy enzymes in general, Stepaniak (17), in 2004, published an excellent review article of the literature available to which I would refer anyone interested in learning what the current science is on the effect of pasteurization on milk enzymes.

Claims have been made by raw milk advocates that Immunoglobulin G (referred to as "IgG antibodies" by raw milk advocates) is destroyed by pasteurization. However, Kulczycki (18) reported in 1987 that his research on bovine IgG suggested "the possibility that pasteurization of milk (and condensed milk) may not destroy the receptor-binding ability of IgG, but instead might enhance its binding by causing aggregation of the bovine IgG."

Raw milk advocates have also claimed that pasteurized milk causes lactose intolerance, (which is an inborn error of metabolism), despite the fact that all milks, raw or pasteurized, contain lactose and that pasteurization does not change the concentration of lactose. A person who is lactose intolerant has a reduced ability to synthesize the enzyme Beta-galactosidase, which hydrolyzes the disaccharide lactose into its monosaccharide constituents, glucose and

galactose. Any such person might be expected to experience the symptoms of lactose intolerance when consuming either raw or pasteurized milk.

Recently, a new version of this fallacy has been brought to our attention. A raw milk advocate has begun to claim that raw milk does not cause lactose intolerance because it contains bacteria (which he describes as being "bifido and lacto") which he believes create their own lactase (beta-galactosidase) when consumed, thus allegedly preventing the symptoms of lactose intolerance. Among the numerous difficulties with this proposition is the fact that the Bifidobacteria in the gastrointestinal tracts of humans are different to those found in animals (Gavini et al) (24) and thus the milk from animals. Furthermore, if Bifidobacteria consumed as a therapeutic or prophylactic measure are to be of any benefit, they must be consumed in appreciable quantities (as might be found, for example in a fermented milk product containing an adjunct Bifidobacteria culture) as well as be of human origin, in order to withstand transit through the intestinal tract (Arunachalam) (25). Finally, it has actually been proposed that the Bifidobacteria present in bovine milk be used as indicator organisms to gauge the extent of fecal contamination of milk.(Beerens et al.) (26). Thus, far from being of any health benefit, the Bifidobacteria present in raw milk are considered by scientists to be an indication of the extent to which it has been contaminated with manure.

Although many potential health benefits have been ascribed to Bifidobacteria in the literature, curing lactose intolerance is not among them. (Arunachalam) (22). De Vrese et al (27) published a useful paper entitled "Probiotics- compensation for lactase insufficiency" wherein they synopsise some of the research done on the utility of Bifidobacteria as promoters of lactose hydrolysis and state that Bifidobacteria "affected lactose digestion less than did lactobacilli or had no effect at all."

Although we are uncertain just what the raw milk advocate in question is referring to when he mentions "lacto bacteria," if we assume that he is referring to *Lactobacillus* species, it is true that several *Lactobacillus* species are generally considered to be probiotic and that among the possible benefits suggested as being conferred by consumption of fermented dairy products containing appreciable quantities of Lactobacilli are reduced symptoms of lactose intolerance, as

reported by De Vrese et al, Holzapfel and Schillinger, McBean and Miller, Savaiano et al. (27, 28, 29, 30) However, *Lactobacilli* typically are but a small portion of the microflora in milk.

While making the above claims and perhaps because of them, this same raw milk advocate has recently been describing his milk as being "probiotic." Raw milk is certainly not a probiotic food, as that term is defined within the FAO/WHO Guidelines for the Evaluation of Probiotics in Food, which was published in 2002 (31), and it is scientifically improper to describe raw milk as being probiotic. That document defines probiotics as being "[l]ive microorganisms which when administered in adequate amounts confer a health benefit on the host." According to FAO/WHO, in order for that term to be used, stringent requirements must be met, including strain identification, functional characterization, a safety assessment, efficacy studies, and comparison with standard treatments as well as labeling requirements. None of that has been done for raw milk.

Raw milk advocates claim that pasteurization either destroys the proteins of milk or that it renders milk proteins more allergenic, even though the milk proteins that cause allergic reactions (including lactoferrin) in dairy-sensitive people are present in raw milk as well as pasteurized milk. Interestingly, these same sorts of claims were addressed directly over twenty years ago by Coveny and Darnton-Hill (19) when they wrote in their article entitled "Goat milk and infant feeding" that "there are some who feel that pasteurization is unnecessary and even detrimental. Concern appears to centre (sic) on possible increased allergenicity and nutrient losses. However, studies show that the sensitizing capacity of cow's milk is retained or – more usually – reduced after heat treatment (cites) while pasteurization minimizes the heat destruction of nutrients (cite). There would appear to be little advantage therefore in the use of raw milk."

Caseins, the major family of milk proteins, are largely unaffected by pasteurization (Farrell and Douglas) (20). Any changes which might occur with whey proteins are barely perceptible.

With respect to vitamins, the claims about the destructive capacity of pasteurization have been many and varied and virtually none of what has been said is accurate. Milk is a good source of the B-complex vitamins thiamine, folate and riboflavin. Pasteurization will result in losses of each of these of anywhere between zero to 10 percent, which most would

consider to be merely a marginal reduction (17), (21). Pasteurization does not cause appreciable losses of the fat-soluble vitamins, A, D, E and K (21). Milk does contain a small amount of Vitamin C, but it is not considered to be a good dietary source of that vitamin. Pasteurization will result in a loss of anywhere from 0-10% of the Vitamin C present (21). Most vitamin C losses in milk occur during storage and such will occur whether milk is pasteurized or not.

With respect to the minerals present in milk, raw milk advocates have made several different claims about the allegedly destructive impact of pasteurization. FDA has not been able to substantiate any of these claims. In fact, the scientific literature that we have reviewed thus far contradicts most of the claims being made. Where raw milk advocates indicate that "no significant change" occurs with sodium, potassium and magnesium, FDA would agree, however. Williamson et al. (22) and Zurera-Cosano et al. (23).

Finally, raw milk advocates have recently begun to claim that only raw milk produced at large commercial dairy farms, which is intended to be subsequently pasteurized, is unsafe and that raw milk produced at small farms is safe. The history of raw milk outbreaks, however, does not support such claims. Additionally, literature indicates that somatic cell counts, which are a measure of dairy herd health (with lower counts being better), tend to be lower in larger, high intensity dairy farming operations as reported by Windig et al., Norman et al., Berry et al. and Oleggini et al. (32, 33, 34, 35).

Another variation on this theme that we sometimes encounter is the claim that raw milk is safe if it originates from "certified" dairies. That is simply not correct. As was stated above, in Public Citizen v. Heckler, 653 F Supp. 1229 (D.D.C. 1986), the court was clear in its holding that there existed "overwhelming evidence of the risks associated with the consumption of raw milk, both certified and non-certified." Id. at 1238.

SUMMARY

Raw milk is inherently dangerous and should not be consumed. Raw milk continues to be a source of foodborne illness and even a cause of death within the United States. Despite the claims of raw milk advocates, raw milk is not a magical elixir possessing miraculous curative properties. Pasteurization destroys pathogens and most other vegetative microbes which might be expected and have been shown to be present in milk. Pasteurization does not appreciably alter the nutritive value of milk. Claims to the contrary by raw milk advocates are without scientific support. FDA encourages everyone charged with protecting the public health to prevent the sale of raw milk to consumers and not permit the operation of so-called "cow-sharing" or other schemes designed as attempts at circumventing laws prohibiting sales of raw milk to consumers. To do otherwise would be to take a giant step backwards with public health protection.

We would like to thank the Committee for affording us the opportunity to provide this information to the Committee and trust that the above will prove useful to you in your deliberations. If we may be of any further assistance to the Committee, we will be happy to do so.

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The Epidemiology of Raw Milk-Associated Foodborne Disease Outbreaks Reported in the United States, 1973 Through 1992

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ABSTRACT

Objectives. This study describes the epidemiology of raw milk-associated outbreaks reported to the Centers for Disease Control and Prevention from 1973 through 1992.

Methods. Surveillance data for each reported raw milk-associated outbreak were reviewed. A national survey was conducted to determine the legal status of intrastate raw milk sales for the period 1973 through 1995.

Results. Forty-six raw milk-associated outbreaks were reported during the study period; 40 outbreaks (87%) occurred in states where the intrastate sale of raw milk was legal.

Conclusions. Consumption of raw milk remains a preventable cause of foodborne disease outbreaks. (*Am J Public Health*. 1998;88:1219-1221)

Introduction

The hazards of drinking raw milk are evident from the list of infectious diseases that may be acquired from this product; these include campylobacteriosis,¹ salmonellosis,² yersiniosis,³ listeriosis,⁴ tuberculosis,⁵ brucellosis,⁶ staphylococcal enterotoxin poisoning,⁷ streptococcal infections,^{8,9} and *Escherichia coli* O157:H7 infection.¹⁰ Additionally, raw milk has been implicated as a vehicle in the transmission of Brainerd diarrhea.¹¹

The purpose of this study was 3-fold. First, we produced a description of the epidemiology of raw milk-associated outbreaks reported to the Centers for Disease Control and Prevention (now called the Centers for Disease Control and Prevention; CDC) from 1973 through 1992. Second, we determined whether rates of reported raw milk-associated outbreaks differed between states in which the sale of raw milk was legal at the time of the outbreak and states where the sale of raw milk was illegal. Finally, we investigated whether the mean annual number of outbreaks reported for the period prior to 1987 differed from that beginning in 1987, when the US Food and Drug Administration implemented a ban on the interstate sale of raw milk.

Methods

We reviewed all outbreaks of foodborne disease reported to the CDC from 1973 through 1992 for which the implicated vehicle was raw milk. A foodborne disease outbreak was defined as an incident in which 2 or more persons experienced a similar illness after ingestion of a common food. Raw milk was defined as unpasteurized milk or milk not pasteurized according to recognized standards required by the Code of Federal Regulations (21 CFR 1240.61). A descriptive analysis of foodborne disease report data was conducted with SAS.¹²

In early 1995, we mailed a survey to regulatory officials in all 50 states, Puerto Rico, and the District of Columbia to determine the legality of raw milk sales within each state during the period 1973 to 1995. States that reported that raw milk sales became either

legal or illegal during this period were asked to specify the date of the change. State milk officials were also asked to estimate the quantity of both pasteurized milk and, if legal, raw milk sold in their state for the most recent year such information was available.

To assess the impact of state regulations concerning intrastate raw milk sales on reported raw milk-associated outbreaks, outbreak data were combined with state survey results. To calculate the rate of reported raw milk-associated outbreaks during the study period (1973-1992) for states where the intrastate sale of raw milk was legal, we used the number of outbreaks reported from such states as the numerator and the number of state-years during which the intrastate sale of raw milk was legal as the denominator. Similarly, to calculate the rate of reported raw milk-associated outbreaks for states where the intrastate sale of raw milk was not legal at the time of the outbreak, we used the number of outbreaks reported from such states as the numerator and the number of state-years during which the intrastate sale of raw milk was not legal as the denominator. The results of the survey were used to determine the legal status of intrastate raw milk sales for each state at the time of occurrence of each reported outbreak. We also compared the number of reported outbreaks per 10 million person-years between those states in which the intrastate sale of raw milk was legal at the time of the outbreak and those states in which such sale was not legal.

Results

Forty-six raw milk-associated outbreaks were reported to the CDC from 21 states dur-

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ing the study period (Table 1). The median number of persons who became ill in the outbreaks was 19 (range, 2 to 190). Thirty-eight reported outbreaks occurred prior to 1987 (mean, 2.7 outbreaks per year), compared with 8 outbreaks after 1987 (mean, 1.3 outbreaks per year). In 38 reported outbreaks (86%), the implicated raw milk was produced at a commercial dairy.

Survey responses regarding the legal status of raw milk sales were received from all 52 jurisdictions (the 50 states plus Puerto Rico and the District of Columbia). At the time of the survey, 28 states (54%) permitted the intrastate sale of raw milk (Figure 1). In all states where the sale of raw milk was legal, the estimated volume of raw milk sold as a percentage of the total milk sold (i.e., pasteurized and unpasteurized milk) was less than 1%.

Forty (87%) of the 46 reported raw milk-associated outbreaks occurred in states in which the intrastate sale of raw milk was legal at the time of the outbreak. Specifically, 6 outbreaks were reported during 476 state-years for states in which the intrastate sale of raw milk was not legal (1.26 outbreaks per 100 state-years), compared with 40 outbreaks during 544 state-years for states in which the intrastate sale of raw milk was legal (7.35 outbreaks per 100 state-years). The number of reported outbreaks per 10 million person-years in states that permitted the intrastate sale of raw milk was 0.14, compared with 0.03 outbreaks per 10 million person-years in states where the intrastate sale of raw milk was illegal. Of the 8 reported outbreaks that occurred after implementation of the 1987 ban on the interstate sale of raw milk, 7 occurred in states where the sale of raw milk was legal.

Discussion

Consumption of raw milk is far less prevalent than consumption of pasteurized milk in the United States; we found that raw milk accounted for less than 1% of total milk sold in states that permit the sale of raw milk. Nevertheless, despite implementation in 1987 of the ban on the interstate sale of raw milk, raw milk consumption has continued to cause outbreaks of illness. With one exception, all outbreaks reported after 1987 occurred in states that permitted the intrastate sale of this product. We found that the rate of raw milk-associated outbreaks reported during the study period was far higher for states in which the sale of this product was legal than for states in which it was not legal. This suggests that banning the intrastate sale of raw milk could reduce the number of raw milk-associated outbreaks.

We also found that the mean annual number of reported outbreaks during the study

TABLE 1—Etiology of Raw Milk-Associated Foodborne Disease Outbreaks Reported to the Centers for Disease Control, 1973–1992

Pathogen	No. of Outbreaks (%)	No. of Cases
<i>Campylobacter</i>	28 (57)	1100
<i>Salmonella</i>	12 (26)	331
Staphylococci	1 (2)	15
<i>Escherichia coli</i> O157:H7	1 (2)	6
Unknown	6 (13)	281
Total	46 (100)	1733

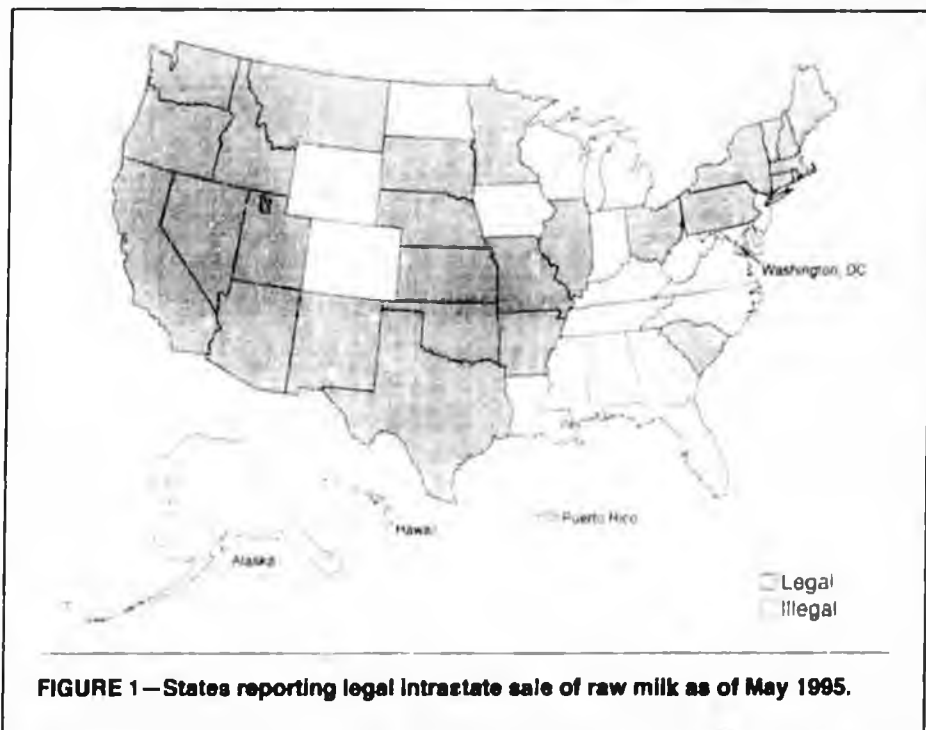


FIGURE 1—States reporting legal intrastate sale of raw milk as of May 1995.

period after 1987 was much lower than that for the period prior to 1987 (1.3 vs 2.7). However, because the outbreak surveillance data collected by the CDC did not specify the state where the implicated raw milk was produced, we were unable to determine whether each outbreak resulted from interstate or intrastate sales of raw milk. Consequently, we could not draw any firm conclusions about what role the ban on interstate sale of raw milk implemented in 1987 may have had in contributing to the observed reduction in the mean annual number of outbreaks reported from 1987 through 1992.

An additional limitation of this study is that it most likely captured only a fraction of the number of outbreaks that actually occurred in the study period. A review by Wood and others of *Campylobacter* enteritis outbreaks in the United States associated with drinking raw milk during youth activities indicated that only 60% of outbreaks identified by states between 1981 and 1988 were reported to the CDC.¹³ Furthermore, sporadic cases of milk-borne illness are not reported as part of this surveillance system. Historically, many more

cases of sporadic foodborne disease have been reported than cases associated with outbreaks.¹⁴ Despite these limitations, the results of this study illustrate the dramatically higher rate at which raw milk-associated outbreaks are reported from states that allow the sale of this product compared with states where the sale of raw milk is illegal, highlighting the continuing role of raw milk as a vehicle for infectious disease agents. □

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ABSTRACT

Objectives. The purpose of this study was to identify individual characteristics associated with types and frequency of milk consumption in older American adults.

Methods. A national probability-based sample (response rate = 91%) completed a telephone survey. Generalized logit and cumulative logit analyses were used to identify predictors of and barriers to fluid milk consumption in 494 elderly people.

Results. The likelihood of drinking skim or 1% milk rather than whole milk increased with nutrition knowledge, income, trying to reduce cholesterol intake, and being female ($P < .05$). Frequency of milk consumption was higher with nutrition knowledge, frequency of milk consumption during adolescence, and following a diabetic diet but was lower with milk intolerance.

Conclusions. The present results could be used to develop intervention strategies for improving milk consumption rates among older adults. These strategies might focus on increasing elderly people's awareness of milk intolerance and lactose-reduced milk products and their concern about cholesterol. The relationship between current and adolescent milk consumption suggests that intervention strategies should begin early in life. (*Am J Public Health*. 1998; 88:1221-1224)

Milk Consumption in Older Americans

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Introduction

Failure to consistently consume the recommended 2 or more servings of milk products per day¹ is a major indicator of low calcium intake and poor nutritional status in older people² and is associated with increased risk of osteoporosis.^{3,4} Conversely, an adequate intake of calcium has been implicated as a potential factor in the risk reduction of calcium-sensitive hypertension⁵ and colon cancer.⁶

The current recommended intake for maximum calcium retention in individuals 51 years of age or older is 1200 mg per day.⁷ However, phase I data from the Third National Health and Nutrition Examination Survey (NHANES III)⁸ indicate that mean daily dietary intakes of calcium are only 721 to 875 mg in men and 626 to 711 mg in women.

One objective of *Healthy People 2000* is to increase calcium intake; the goal is for at least 50% of people 25 years of age and older to consume 2 or more servings of foods rich in calcium per day.⁹ A second objective is to reduce the current national average of 36% total calories from fat to the recommended 30%.⁹ Skim or 1% milk provides essential calcium but less fat than whole milk.

Although socioeconomic status,¹⁰ physiological factors,¹¹ nutrition knowledge,¹² health-seeking behaviors,¹³ nutritional attitudes,¹⁴ and food patterns established during youth¹⁵ influence eating patterns, limited information exists relating these factors to milk consumption in older adults. Thus, our goal was to determine the predictors of and barriers to the type and frequency of fluid milk consumption among older adults.

Methods

Survey Instrument

All procedures were approved by the Institutional Review Board on Human Subjects of the University of Georgia. Data on age, gender, ethnicity, income, and education were obtained with closed-ended questions. Dietary health behaviors were assessed according to Bausell,¹³ and milk consumption was measured according to NHANES III.¹⁶ Lactose maldigestion was inferred from a self-report of perceived milk intolerance (defined as experiencing a stomachache, gas, or diarrhea after consuming milk). A 12-item nutrition knowledge instrument was adapted from a 17-item instrument.¹⁷ Attitudes toward convenience, packaging, the shelf life of milk, and milk and sleep were investigated via original questions. The final survey instrument was constructed after input from the University of Georgia Survey Research Center and the National Dairy Council and pilot testing in a pencil-and-paper format in a local sample of 50 adults.

National Telephone Survey

A telephone survey was conducted in 1994 by the University of Georgia Survey Research Center. Respondents were randomly selected from an enumerated listing of 74 mil-

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Great American Smokeout — November 15, 2007

In 2006, approximately 45.3 million (one in five) U.S. adults were current smokers (1). November 15, 2007, marks the American Cancer Society's 31st annual Great American Smokeout, an event designed to encourage cigarette smokers to quit smoking for at least 1 day so that they might quit permanently. Smoking cessation has substantial and immediate health benefits for men and women of all ages (2).

Smokers who use effective cessation aids such as clinician assistance, pharmacotherapy approved by the Food and Drug Administration, and behavioral counseling (e.g., quitlines) can increase their likelihood of quitting permanently (3). All 50 states, the District of Columbia, and certain U.S. territories have quitlines that can be reached at 800-QUIT-NOW (800-784-8669). Other interventions that increase cessation include implementing sustained media campaigns, reducing patient out-of-pocket treatment costs, increasing the price of tobacco products, and establishing smoke-free environments (4).

Information on the Great American Smokeout is available at http://www.cancer.org/docroot/ped/ped_10_4.asp or by telephone: 800-227-2345. Advice on how to quit smoking is available at <http://www.smokefree.gov>.

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Cigarette Smoking Among Adults — United States, 2006

One of the national health objectives for 2010 is to reduce the prevalence of cigarette smoking among adults to $\leq 12\%$ (objective 7-1a) (1). To assess progress toward achieving this objective, CDC analyzed data from the 2006 National Health Interview Survey (NHIS). This report summarizes the results of that analysis, which indicated that in 2006, approximately 20.8% of U.S. adults were current cigarette smokers. This prevalence had not changed significantly since 2004 (2), suggesting a stall in the previous 7-year (1997–2004) decline in cigarette smoking among adults in the United States. In addition, the findings indicated that persons with a diagnosis of a smoking-related chronic disease have a significantly higher prevalence of being a current smoker than persons with other chronic diseases or persons with no chronic disease. To reduce smoking prevalence further in the United States, comprehensive, evidence-based approaches for preventing smoking initiation and increasing cessation, including clinical interventions for populations at high risk, need to be fully implemented (3).

The 2006 NHIS adult core questionnaire, containing questions on cigarette smoking and cessation attempts, was administered by in-person interview to a nationally representative sample of 24,275 persons in the noninstitutionalized U.S. civilian population aged ≥ 18 years; the overall response rate was 70.8%. To classify smoking status, respondents were asked, "Have you smoked at least 100 cigarettes in your entire life?"; Those who

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In 2006, an estimated 20.8% (45.3 million) of U.S. adults were current cigarette smokers; of these, 80.1% (36.3 million) smoked every day, and 19.9% (9.0 million) smoked some days. Among current cigarette smokers, an estimated 44.2% (19.9 million) had stopped smoking for more than 1 day during the preceding 12 months because they were trying to quit. Of the estimated 91 million persons who had smoked at least 100 cigarettes during their lifetimes (i.e., ever smokers), 50.2% (45.7 million) had quit smoking at the time of the interview.

The prevalence of current cigarette smoking varied substantially among population subgroups. By sex, prevalence was higher among men (23.9%) than women (18.0%) (Table 1). Among racial/ethnic groups, Asians had the

* Cigarette smoking has been identified by the Surgeon General as a cause of selected malignant neoplasms, cardiovascular diseases, and respiratory diseases (1). Smoking-related chronic diseases include 1) cancers: lung, bladder, cervix, esophagus, kidney, larynx, windpipe, mouth, tongue, or lip, pancreas, stomach, and throat/pharynx; 2) cardiovascular diseases: coronary heart disease, angina pectoris, heart attack, and stroke; and 3) respiratory diseases: emphysema and chronic bronchitis.

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TABLE 1. Estimated percentage of persons aged ≥ 18 years who were current smokers,* by sex and selected characteristics — National Health Interview Survey, United States, 2006

Characteristic	Men (n = 10,715)		Women (n = 13,560)		Total (N = 24,275)	
	%	(95% CI) [†]	%	(95% CI)	%	(95% CI)
Race/Ethnicity[§]						
White, non-Hispanic	24.3	(23.0–25.6)	19.7	(18.6–20.8)	21.9	(21.0–22.8)
Black, non-Hispanic	27.6	(24.2–31.0)	19.2	(17.3–21.1)	23.0	(21.1–24.9)
Hispanic	20.1	(17.8–22.4)	10.1	(8.5–11.7)	15.2	(13.7–16.7)
American Indian/Alaska Native, non-Hispanic [¶]	35.6	(18.7–52.5)	29.0	(15.7–42.3)	32.4	(19.7–45.1)
Asian, non-Hispanic**	16.8	(13.1–20.5)	4.6	(3.0–6.2)	10.4	(8.4–12.4)
Education (yrs)^{††}						
0–12 (no diploma)	30.6	(27.9–33.3)	23.0	(20.7–25.3)	26.7	(25.0–28.4)
<8	22.3	(18.5–26.1)	12.3	(9.7–14.9)	17.4	(15.1–19.7)
9–11	40.1	(35.7–44.5)	31.4	(27.7–35.1)	35.4	(32.5–38.3)
12	27.9	(21.5–34.3)	23.3	(17.5–29.1)	25.6	(21.2–30.0)
GED ^{§§} diploma	51.3	(43.4–59.2)	40.2	(33.2–47.2)	46.0	(40.5–51.5)
High school diploma	27.6	(25.3–29.9)	20.4	(18.7–22.1)	23.8	(22.3–25.3)
Associate degree	25.4	(22.1–28.7)	17.8	(15.2–20.4)	21.2	(19.1–23.3)
Some college	26.1	(24.2–28.0)	20.0	(18.3–21.7)	22.7	(21.4–24.0)
Undergraduate degree	10.8	(9.0–12.6)	8.4	(7.0–9.8)	9.6	(8.5–10.7)
Graduate degree	7.3	(5.4–9.2)	5.8	(4.1–7.5)	6.6	(5.3–7.9)
Age group (yrs)						
18–24	28.5	(24.7–32.3)	19.3	(16.7–21.9)	23.9	(21.7–26.1)
25–44	26.0	(24.3–27.7)	21.0	(19.7–22.3)	23.5	(22.4–24.6)
45–64	24.5	(22.7–26.3)	19.3	(17.9–20.7)	21.8	(20.6–23.0)
≥ 65	12.6	(10.6–14.6)	8.3	(7.0–9.6)	10.2	(9.2–11.2)
Poverty status^{†††}						
At or above federal poverty level	22.9	(21.6–24.2)	17.8	(16.8–18.8)	20.4	(19.6–21.2)
Below federal poverty level	34.0	(30.0–38.0)	28.0	(25.2–30.8)	30.6	(28.0–33.2)
Unknown	23.3	(21.0–25.6)	14.2	(12.6–15.8)	18.3	(16.9–19.7)
Total	23.9	(22.8–25.0)	18.0	(17.2–18.8)	20.8	(20.1–21.5)

* Persons who reported smoking at least 100 cigarettes during their lifetimes and who, at the time of interview, reported smoking every day or some days. Excludes 315 respondents whose smoking status was unknown.

[†] Confidence interval.

[§] Excludes 266 respondents of unknown race or multiple races.

[¶] Wide variances in estimates reflect small sample sizes.

** Does not include Native Hawaiians or Other Pacific Islanders.

^{††} Among persons aged ≥ 25 years. Excludes 305 persons whose educational level was unknown.

^{§§} General Educational Development.

^{†††} Based on family income reported by respondents and 2005 poverty thresholds published by the U.S. Census Bureau.

lowest prevalence (10.4%). Hispanics had a significantly lower prevalence of smoking (15.2%) than American Indians/Alaska Natives (32.4%), non-Hispanic blacks (23.0%), and non-Hispanic whites (21.9%).

Prevalence also varied by level of education. Smoking prevalence was highest among adults who had earned a General Educational Development (GED) diploma (46.0%) and those with 9–11 years of education (35.4%); overall, smoking prevalence decreased as education level increased. By age group, adults aged 18–24 years and 25–44 years had the highest prevalence of smoking (23.9% and 23.5%, respectively). The prevalence of current smoking was higher among adults living below the federal poverty level (30.6%) than among those at or above this level (20.4%).

Before 2006, certain population subgroups already had achieved smoking prevalences that were lower than the

national health objective of 12%, and the prevalences remained low in 2006. These included Hispanic (10.1%) and Asian (4.6%) women, women with undergraduate (8.4%) or graduate (5.8%) degrees, men with undergraduate (10.8%) or graduate (7.3%) degrees, and women aged ≥ 65 years (8.3%).

In 2006, the age-adjusted prevalence of current smoking was 36.9% among persons with a smoking-related chronic disease and 19.3% among those without a chronic disease (Table 2). Current smoking prevalence was higher among persons with smoking-related cancers (other than lung cancer) (38.8%), coronary heart disease (CHD) (29.3%), and stroke (30.1%) than among persons without chronic diseases, and nearly half (49.1%) of U.S. adults with emphysema and 41.1% of those with chronic bronchitis were current smokers. With the exception of persons who had a stroke, persons with any smoking-related chronic disease

TABLE 2. Estimated age-adjusted prevalence of current smokers,* former smokers,† and never smokers‡ among U.S. adults aged ≥18 years, by chronic disease status — National Health Interview Survey, United States, 2006

Disease	Current smokers		Former smokers		Never smokers	
	%	(95% CI) [¶]	%	(95% CI)	%	(95% CI)
Any smoking-related chronic disease**	36.9	(34.2–40.0)	26.0	(23.6–28.5)	37.1	(34.3–40.0)
Malignant neoplasms						
Lung	20.9	(9.5–39.8)	61.2	(41.5–77.9)	17.9	(8.0–35.6)
Other cancers ^{††}	38.8	(32.0–46.1)	33.2	(26.3–40.9)	28.0	(22.2–34.7)
Cardiovascular disease						
Coronary heart dise. ^{§§}	29.3	(23.2–36.2)	31.8	(25.7–38.6)	38.9	(33.7–44.4)
Stroke	30.1	(22.6–38.8)	23.0	(17.8–29.1)	47.0	(38.4–55.8)
Respiratory disease						
Emphysema	49.1	(40.1–58.2)	28.6	(21.8–36.5)	22.3	(13.6–34.3)
Chronic bronchitis	41.1	(37.4–45.0)	20.0	(17.4–23.0)	38.9	(34.9–43.0)
Other chronic disease^{¶¶}	23.0	(21.9–24.1)	23.5	(22.5–24.5)	53.5	(52.2–54.9)
No chronic disease	19.3	(18.4–20.2)	16.4	(15.4–17.4)	64.3	(63.1–65.6)

* Persons who reported smoking at least 100 cigarettes during their lifetimes and who, at the time of interview, reported smoking every day or some days.

† Persons who reported smoking at least 100 cigarettes during their lifetimes but who currently did not smoke.

‡ Persons who reported never smoking 100 cigarettes during their lifetimes.

¶ Confidence interval.

** Includes smoking-related malignant neoplasms, cardiovascular diseases, and respiratory diseases. Cigarette smoking has been identified by the Surgeon General as a cause of these diseases (US Department of Health and Human Services. The health consequences of smoking: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, CDC; 2004).

†† Includes cancers of the bladder; cervix; esophagus; kidney; larynx-windpipe; mouth; tongue; or lip; pancreas; stomach; and throat-pharynx.

§§ Includes coronary heart disease, angina pectoris, and myocardial infarction.

¶¶ Includes chronic diseases that were not smoking related.

were significantly less likely to have never smoked than those with other chronic diseases (53.5%) or no chronic disease (64.3%). Persons with lung cancer (17.9%) and emphysema (22.3%) were least likely to be never smokers.

Reported by: VJ Rock, MPH, A Malarcher, PhD, JW Kabende, PhD, K Asman, MSPH, C Husten, MD, R Caraballo, PhD, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Cigarette smoking remains the leading preventable cause of disease and death in the United States, resulting in approximately 438,000 deaths annually (5). The prevalence of cigarette smoking remained relatively unchanged during the early 1990s but gradually decreased from 1997 (24.7%) to 2004 (20.9%) (Figure). This report indicates that the prevalence of current smoking among U.S. adults in 2006 (20.8%) was not significantly different from the prevalence in 2004 (20.9%), suggesting a stall in previous declines. This lack of a decrease in cigarette use during 2 years might be a result of several factors. Most notably, funding for comprehensive state programs for tobacco control and prevention decreased by 20.3% from 2002 to 2006 (6), and tobacco-industry marketing expenditures nearly doubled from 1998 (\$6.7 billion) to

2005 (\$13.1 billion) (7). In 2005, approximately 81% (\$10.6 billion) of tobacco-industry marketing expenditures were related to discounting strategies (e.g., coupons, two-for-one offers, or promotional discounts for retailers or wholesalers) (7) that reduce the impact of increases in the unit price of tobacco, which are effective in preventing initiation of smoking and increasing cessation.[†]

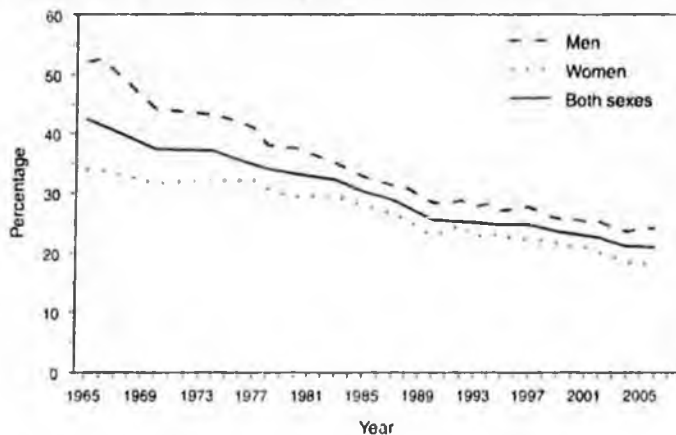
Among smokers who already have a smoking-related chronic disease, those who quit have a lower risk for death from the disease than those who continue smoking (8). Smokers who quit have a slower rate of decline in lung function and a lower incidence of bronchitis, emphysema, and other respiratory conditions than persons who continue to smoke (8). Among smokers with CHD, those who quit have a lower risk for further CHD-related morbidity and mortality than those who continue to smoke (8). In addition, smokers who have cancer and who continue smoking during

treatment decrease treatment effectiveness, overall survival prognosis, and quality of life and increase the risk for having another malignancy or comorbid condition (9). The continuation of smoking among those who have smoking-related chronic diseases described in this report highlights the need for health-care providers to emphasize the importance of quitting. Health-care providers should repeatedly offer intensive smoking-cessation interventions to all of their patients, especially those with smoking-related chronic diseases who continue to smoke.

The findings in this report are subject to at least three limitations. First, estimates of cigarette smoking are based on self-report and are not validated by biochemical tests. However, self-reported population-based data on current smoking status have high validity when compared with measured serum cotinine levels (10). Second, the NHIS questionnaire is administered in English and Spanish only, which might have resulted in imprecise estimates for certain racial/ethnic subgroups because of language barriers. Third, the small NHIS samples for certain population groups (e.g.,

† CDC. The guide to community preventive services: tobacco. Available at <http://www.thecommunityguide.org/tobacco>.

FIGURE. Estimated percentage of persons aged ≥ 18 years who were current smokers,* by sex — National Health Interview Survey, United States, 1965–2006



* During 1965–1991, current smokers were defined as persons who reported smoking at least 100 cigarettes during their lifetimes and who, at the time of interview, reported smoking (“Have you smoked at least 100 cigarettes in your entire life?” and “Do you smoke cigarettes now?”). In 1992, the definition changed to more accurately assess intermittent smoking (i.e., smoking on some days) and included persons who reported they smoked either every day or some days (“Do you now smoke cigarettes every day, some days, or not at all?”)

American Indians/Alaska Natives) resulted in unstable single-year estimates with large confidence intervals.

Since the 1960s, smoking prevalence in the United States has decreased substantially (Figure); however, recent data suggest that declines in both adolescent and adult smoking prevalence might be stalling. Cigarette smoking continues to result in substantial costs. The economic costs of smoking in the United States are estimated at \$167 billion annually (\$92 billion in productivity losses from premature death and \$75.5 billion in health-care expenditures) (5). In 2007, the Institute of Medicine concluded that funding comprehensive tobacco-control programs at levels recommended by CDC and regulations designed to foster policy innovations are essential strategies that should be implemented to reduce tobacco use (3).

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Salmonella Typhimurium Infection Associated with Raw Milk and Cheese Consumption — Pennsylvania, 2007

In February 2007, the Pennsylvania Department of Health received reports, through routine electronic laboratory disease reporting, of two persons with recent laboratory-confirmed infections with *Salmonella enterica* serotype Typhimurium. Both persons had reported drinking raw (unpasteurized) milk from the same York County, Pennsylvania, dairy (dairy A). *S. Typhimurium* isolates from these persons had pulsed-field gel electrophoresis (PFGE) patterns that were indistinguishable by use of the *Xba*I restriction enzyme. The same month, the Pennsylvania Department of Agriculture (PDA) received reports of illness from raw-milk customers of dairy A. PDA obtained milk samples from the raw-milk bulk tank at dairy A, which yielded *S. Typhimurium* with a PFGE pattern that was identical to the pattern from patient isolates. On February 26, the Pennsylvania Department of Health and PDA launched an investigation to determine the source and scope of the outbreak. This report summarizes the findings of that investigation, which determined that 29 cases of diarrheal illness caused by *S. Typhimurium* were associated with consumption of raw milk or raw-milk products from dairy A. The findings underscore the need to inform policymakers and the public of the potential health risks associated with raw-milk consumption.

Epidemiologic and Laboratory Investigation

In Pennsylvania, raw-milk sales are legal at farms that hold a PDA permit, and vendors must display public notices regarding the potential hazards of consuming raw milk (1). Dairy A owned 120 cows and sold raw milk for pasteurization and by PDA permit directly to consumers. In February 2007, PDA estimated that dairy A was selling 200–300 gallons of raw milk weekly to 275 regular customers.

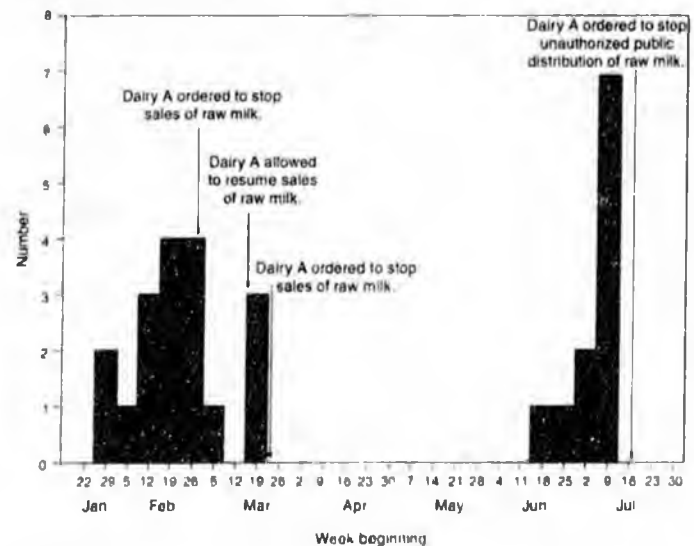
A case of salmonellosis was defined as a diarrheal illness with onset since February 1, 2007, in a Pennsylvania resident who provided a stool specimen that tested positive for *S. Typhimurium* with a PFGE pattern that matched the outbreak pattern by use of the *Xba*I restriction enzyme. Nationally notifiable disease reports from Pennsylvania since January 2005 were reviewed for PFGE-matched *S. Typhimurium* isolates to identify cases and risk factors. To locate additional cases, ill household contacts of persons with confirmed cases were asked to provide food histories and submit stool specimens for testing. Raw milk for testing was obtained from dairy A milk tanks on five dates (February 20, February 28, March 27, May 14, and July 19) and from households of two ill persons on two dates (February 28 and July 20). In addition, PDA conducted multiple dairy A inspections during February–July 2007.

Investigative Findings

A total of 29 cases were identified, with illness onset occurring in three temporal clusters during February 3–July 14, 2007 (Figure). The first cluster consisted of 15 cases with onsets of illness from February 3 to March 5. Raw-milk samples were collected February 20 from a dairy A bulk milk tank and February 28 from the home of an ill person. Both sets of samples yielded the outbreak strain of *S. Typhimurium*. On March 2, PDA ordered dairy A to stop raw-milk sales and advised the public not to consume raw-milk products from dairy A.

On March 19, PDA allowed dairy A to resume sales of raw milk after PDA conducted inspections and recorded two consecutive negative cultures from milk-tank samples. However, a second cluster of three cases was detected when the outbreak strain of *S. Typhimurium* was identified in another patient, whose diarrheal illness began on March 21 and who had consumed raw milk from dairy A after sales resumed. The two additional cases were identified in persons with onsets of illness on March 19 and March 22. The first of these occurred in one of six ill persons who primarily spoke Spanish and who told investigators they

FIGURE. Number of cases* of diarrheal illness caused by infection with *Salmonella* Typhimurium, indistinguishable by pulsed-field gel electrophoresis, by week of illness onset — Pennsylvania, 2007



* N = 29.

had not consumed raw milk. However, when reinterviewed in early April, three of these six persons reported consuming queso fresco (a type of soft cheese) they bought at a grocery store serving the local Hispanic community. PDA learned that the queso fresco had been made by an unlicensed producer who purchased approximately 20 gallons of raw milk weekly from dairy A. Sale of raw-milk cheeses aged <60 days is illegal in Pennsylvania. Subsequently, in April, PDA inspectors seized 18 unlabeled retail containers of queso fresco from the grocery store. The cheese tested positive for alkaline phosphatase, indicating the cheese was produced from unpasteurized milk (2). Bacterial cultures were negative for pathogens.

On March 27, PDA again ordered dairy A to halt raw-milk sales and suspended its raw-milk permit. No additional cases were noted until June–July 2007, when a third cluster of 11 PFGE-matched *S. Typhimurium* cases was detected through routine electronic laboratory reporting. Of these, 10 occurred among residents of three counties near dairy A. On July 19, PDA confirmed that dairy A had been distributing raw milk to the public despite its suspended permit; the date when illegal milk distribution began could not be determined. The outbreak strain of *S. Typhimurium* was isolated from dairy A raw milk collected from a bulk milk tank on July 19 and from the home of an ill person on July 20. PDA ordered dairy A to halt distribution of raw milk on July 20 and subsequently revoked the raw-milk permit for this dairy.

Among the 29 persons identified with diarrheal illness and PFGE-matched *S. Typhimurium*, 17 (59%) were male, and the median age was 6 years (range: 5 months–76 years). Fourteen (48%) patients reported drinking raw milk from dairy A, four (14%) consumed unregulated queso fresco (three linked to dairy A raw milk and one from an unknown source), and two (7%) consumed raw milk but did not identify the source. Two (7%) other patients were unrelated infants aged 5 months and 7 months. The parents of these infants acknowledged that raw milk from dairy A was present in their households but told investigators the milk was not consumed by the infants. For seven (24%) patients who did not reside with any of the other patients, no source of exposure to *S. Typhimurium* could be determined. Two of the 29 patients were hospitalized; no deaths were reported.

Environmental Inspections

Eight PDA inspections of dairy A conducted during January–April 2007 revealed improper cleaning of milking equipment, insufficient supervision of workers, unspecified illness among lactating cows, and bird and rodent infestation. On at least two inspections, the required public notice regarding the potential hazards of drinking raw milk was not visible at the dairy A retail store.

S. Typhimurium matched by PFGE to the outbreak pattern was isolated from dairy A raw-milk tank samples collected on three different dates (February 26, May 14, and July 19); an *S. Typhimurium* isolate collected from a milk tank February 28 was unavailable for PFGE typing. In addition to *Salmonella*, dairy A raw-milk tank samples also yielded *Listeria monocytogenes* (February 28, May 14, and July 19) and *Campylobacter jejuni* (February 28 and May 14). Although a stool specimen from one patient with February 28 illness onset yielded both *S. Typhimurium* and *C. jejuni*, the *Campylobacter* isolate was unavailable for subtyping. No *Listeria* infections were associated with dairy A.

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Editorial Note: Raw milk is a well-documented source of infections from *Salmonella*, *Escherichia coli* O157:H7, *Campylobacter*, *Listeria*, *Mycobacterium bovis*, and other pathogens (2–6). In 1938, before widespread adoption of milk pasteurization in the United States, an estimated 25% of all foodborne and waterborne outbreaks of disease were associated with milk (7). By 2001, the percentage of such outbreaks associated with milk was estimated at <1% (7).

During 1998–2005, a total of 45 outbreaks of foodborne illness were reported to CDC in which unpasteurized milk (or cheese suspected to have been made from unpasteurized milk) was implicated. These outbreaks accounted for 1,007 illnesses, 104 hospitalizations, and two deaths (CDC, unpublished data, 2007). Because not all cases of foodborne illness are recognized and reported, the actual number of illnesses associated with unpasteurized milk likely is greater.

In the investigations described in this report, the evidence indicating raw milk from dairy A as the source of this outbreak included the 1) high percentage of ill persons who reported consuming either raw milk (48%) or queso fresco traced to raw milk (10%) from dairy A, 2) temporal associations between clusters of illnesses and starts and stops of distribution of raw milk by dairy A, and 3) repeated isolation of the outbreak strain of *S. Typhimurium* from dairy A raw-milk tanks. The PFGE pattern of the outbreak strain (*Xba*I JPXX01.0022) is rare, previously identified only 24 times in isolates from 11 states in 3 years, in a national PulseNet database of approximately 43,000 *S. Typhimurium* isolates.

Consumers have reported consuming raw milk for convenience, taste preference, or perceived health benefits. Although some advocates claim health benefits from raw milk compared with pasteurized milk, including decreased risks for atherosclerosis, arthritis, and lactose intolerance, such claims are not supported by scientific evidence (8). Unsubstantiated claims of health benefits of raw milk for infants and children are particularly concerning for caregivers because infants and children are dependent on their caregivers to make safe dietary decisions for them. Sixteen of the 29 ill persons in this outbreak were aged <7 years.

Pathogens that infect humans are shed in the feces of cows, can be present in or on the udders of cows, and can contaminate their milk. Standard hygiene practices during milking can reduce but not eliminate the risk for milk contamination. In a 2001–2002 survey of Pennsylvania dairy farms, pathogenic bacteria, including *Salmonella*, were isolated from 13% of samples from raw-milk bulk tanks (9). Pasteurization decreases the number of pathogenic organisms, prevents transmission of pathogens, and has been determined to improve the safety of milk more than other measures, including certification of raw milk (4,5).

Farms in Pennsylvania that hold PDA raw-milk permits undergo twice-monthly milk testing for coliforms and standard plate counts and monthly testing for growth inhibitors and somatic cell counts; annual PDA inspection and culture of raw milk for *Salmonella*, *Campylobacter*, *E. coli* O157, and *L. monocytogenes*; and annual herd skin testing

for *Mycobacterium bovis* and *Brucella* (1). Despite these measures, consumers cannot be assured that certified raw milk is free of pathogens.

As of 2004, at least 27 states permitted some form of raw-milk sales to the public, including sales at dairies, farmers' markets, or through purchase of "cow shares." Certain states also allow public sales of raw milk but for pet food only (10). In Pennsylvania, the number of dairies with raw-milk permits increased from 42 in 2005 to 75 in 2007. During 2006–2007, three clusters of illness from *Campylobacter* were associated with consumption of raw milk from three different Pennsylvania dairies (Pennsylvania Department of Health, unpublished data, 2007). During the same period, PDA announced raw-milk recalls from three other dairies after finding *L. monocytogenes* in milk samples; no human illness was associated with these findings.

Given the continued interest in raw-milk production, policymakers, parents, and the public need to be informed regarding the potential health risks posed by raw-milk consumption. The only sure way for consumers to prevent raw-milk-associated infection from *Salmonella* or other pathogens is to refrain from consuming raw milk.

Acknowledgments

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Syringe Exchange Programs — United States, 2005

Syringe exchange programs (SEPs) provide free sterile syringes* in exchange for used syringes to reduce transmission of bloodborne pathogens among injection-drug users (IDUs) (1). SEPs in the United States began as a way to prevent the spread of human immunodeficiency virus (HIV) and other bloodborne infections such as hepatitis B and hepatitis C. The National Institute on Drug Abuse recommends that persons who continue to inject drugs use a new, sterile syringe for each injection (2). Monitoring syringe exchange activity is an important part of assessing HIV prevention measures in the United States. As of November 2007, a total of 185 SEPs were operating in 36 states, the District of Columbia (DC), and Puerto Rico (North American Syringe Exchange Network [NASEN], unpublished data, 2007). This report summarizes a survey of SEP activities in the United States during 2005 and compares the findings with previous SEP surveys (3–7; Beth Israel Medical Center [BIMC], unpublished data, 2000 and 2004). The findings indicated an increase in overall funding for SEPs, including an increase in public funding, and a stabilization in both the number of SEPs operating and the number of syringes exchanged since 2004. This report also documents an expansion of services offered by SEPs, a trend that resulted from an increase in state and local funding. These expanded services are helping protect IDUs and their communities from the spread of bloodborne pathogens and are providing access to health services for a population at high risk. Monitoring of syringe exchange activity should continue.

In March 2006, staff members from BIMC and NASEN mailed surveys to directors of all 166 SEPs registered with NASEN at that time (compared with 68 known SEPs for the 1994–1995 survey, 101 for 1996, 113 for 1997, 131 for 1998, 154 for 2000, 148 for 2002, and 174 for 2004) (3–7; BIMC, unpublished data, 2000 and 2004). Registration with NASEN provides important benefits to SEPs and does not involve any cost; thus, nearly all SEPs in the

* For this report, the term "syringes" refers to both syringes and needles.

United States are likely to be registered. The surveys included questions regarding the number of syringes exchanged, the types of services provided, and budgets and funding during 2005. Data for 2005 were collected during March–August 2006. Telephone interviews were conducted to clarify responses received on surveys. The methods were similar to those used in previous SEP surveys, except for an Internet-based option that was used in the 2002 survey only.

Of the 166 SEPs contacted, 118 (71%) completed the survey. These 118 SEPs reported operating in 91 cities[†] in 28 states/territories[‡] and in DC. A total of 79 (67%) SEPs were operating in six states: 22 in California, 17 in New Mexico, 15 in Washington, 10 in Wisconsin, nine in New York, and six in Connecticut.

SEP size was determined by the number of syringes exchanged during 2005 (Table 1); 117 SEPs reported exchanging a total of 22,472,168 syringes (one SEP did not track the number of syringes exchanged in 2005). The 12 largest programs exchanged 11,863,932 (53% of all the syringes exchanged).[§]

In addition to exchanging syringes, SEPs provided various supplies, services, and referrals in 2005 (Table 2). Nearly all SEPs provided alcohol pads (117 [99%]), male condoms (115 [97%]), and referrals to substance-abuse treatment (102 [86%]). Certain medical services also were offered by SEPs, including counseling and testing for HIV (96 [81%]) and hepatitis C (66 [56%]). Vaccinations for hepatitis B were provided by 46 (39%) SEPs, and hepatitis A

TABLE 1. Number of syringes exchanged by syringe exchange programs (SEPs), by program size — United States, 2005

SEP size	No. of syringes exchanged per SEP	No. of SEPs	Total no. of syringes exchanged	% of total syringes exchanged
Small	<10,000	≤4	89,626	0.4
Medium	10,000–55,000	33	810,953	3.6
Large	55,001–499,999	48	9,707,657	43.0
Very large	≥500,000	12	11,863,932	53.0
Total		117*	22,472,168	100.0

* One of the 118 programs responding to the survey did not track the number of syringes exchanged in 2005.

TABLE 2. Number and percentage of syringe exchange programs (SEPs),* by selected supplies and services provided — United States, 2005

Supplies and services	No.	(%)
Prevention supplies		
Male condoms	115	(97)
Female condoms	98	(83)
Alcohol pads	117	(99)
Bleach	82	(69)
On-site medical screenings and services		
HIV counseling and testing	96	(81)
Hepatitis C counseling and testing	66	(56)
Hepatitis B counseling and testing	44	(37)
Hepatitis A counseling and testing	28	(24)
Hepatitis B vaccination	46	(39)
Hepatitis A vaccination	43	(37)
Sexually transmitted disease (STD) screening	57	(49)
Tuberculosis screening	33	(28)
On-site medical care	34	(29)
Referrals		
Substance-abuse treatment	102	(86)
Education		
HIV/AIDS prevention	116	(98)
Hepatitis A, B, and C prevention	114	(97)
Safer injection practice	113	(96)
Vein care	110	(93)
STD prevention	110	(93)
Abscess prevention	107	(91)
Male condom use	112	(95)
Female condom use	97	(82)

* N = 118.

vaccinations were provided by 43 (37%). Thirty-four (29%) SEPs offered other on-site medical care.

In 2005, many SEPs operated multiple sites, including fixed sites and mobile van routes. The total number of hours that clients were served by SEPs was summed for all sites operated by each program. This total number of hours per program ranged from 1 to 168 hours per week (mean: 26 hours per week; median: 20 hours per week). Delivery of syringes and other risk-reduction supplies to residences or meeting spots was reported by 56 (47%) SEPs. A total of 110 (93%) SEPs allowed persons to exchange syringes on behalf of other persons (i.e., secondary exchange).

[†] Cities with more than one SEP: Eureka, Los Angeles, Oakland, and San Francisco, California; Detroit, Michigan; Minneapolis, Minnesota; Albuquerque and Farmington, New Mexico; New York, New York; Burlington, Vermont; Bremerton, Seattle, and Tacoma, Washington; and Madison and Milwaukee, Wisconsin.

[‡] States/territories with SEPs: California (22), New Mexico (17); Washington (15); Wisconsin (10); New York (nine); Connecticut (six); Illinois (four); Massachusetts, Michigan, Minnesota, Oregon, and Vermont (three each); Louisiana, Maine, and Texas (two each); and Alaska, Colorado, Georgia, Hawaii, Indiana, Kansas, Missouri, New Jersey, North Carolina, Oklahoma, Pennsylvania, Puerto Rico, and Utah (one each). In addition, DC has one SEP.

[§] States with SEPs that exchanged ≥500,000 syringes in 2005: California (four SEPs); Washington (three); Illinois, New Mexico, Oregon, Pennsylvania, and Wisconsin (one each). The largest-volume SEPs were San Francisco AIDS Foundation HIV Prevention Project (2.3 million syringes exchanged per year), Chicago Recovery Alliance, Chicago, Illinois (2.3 million); Street Outreach Services, Seattle, Washington (1.0 million); HIV Education and Prevention Project of Alameda, Oakland, California (0.9 million); Public Health – Seattle & King County Needle Exchange, Seattle, Washington (0.9 million); Point Defiance AIDS Project, Tacoma, Washington (0.8 million); San Diego Clean Needle Exchange Program, San Diego, California (0.8 million); SANA Needle Exchange Program/HIV Alliance, Eugene, Oregon (0.6 million); Prevention Point Pittsburgh, Pittsburgh, Pennsylvania (0.6 million); Lifepoint, Milwaukee, Wisconsin (0.5 million); Homeless Healthcare, Los Angeles, California (0.5 million); and Project De Sida, Albuquerque, New Mexico (0.5 million).

A total of 114 SEPs reported budget information for 2005; four SEPs lacked budget information for this period. The reported budgets for these 114 SEPs totaled \$15.2 million (Table 3). Some SEPs received funding from a common source, and allocating funds from the common source to individual programs was not always possible. For the 97 SEPs for which individual budget information could be generated, the 2005 budgets ranged from \$648 to \$1,516,375. The mean SEP budget increased from \$131,301 in 2004 to \$133,450 in 2005. In 2005, a total of 30 (31%) SEPs operated with a budget of <\$25,000, 29 (30%) with \$25,000–\$100,000, and 38 (39%) with >\$100,000. SEPs reported multiple sources of financial support in 2005, including individuals, foundations, and state and local governments. In 2005, a total of 72 (61%) of the 118 SEPs that responded to the survey received public funding totaling nearly \$11.3 million from city, county, and state governments,** accounting for approximately 74% of total funding. The total amount of public funding increased by nearly \$2 million in 2005, and the mean public funding budgets increased by nearly \$10,000 (\$145,633 in 2004 versus \$157,273 in 2005). Federal law prohibits the use of federal funds to support SEPs.

From the period 1994–1995, when the first national survey of SEPs was conducted, to 2002, the number of SEPs and the number of syringes exchanged by these programs increased consistently. However, in 2005, a reduction was observed in the number of SEPs and syringes

exchanged. In 2005, eight fewer SEPs were operating than previously indicated by results from the 2004 survey (BIMC, unpublished data, 2004), and two fewer states had SEPs operating. However, four additional cities had SEPs operating in 2005, compared with 2004. The number of syringes exchanged decreased from approximately 24.0 million in 2004 to 22.5 million in 2005.

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Editorial Note: Compared with data from previous national SEP surveys, the findings in this report indicate an overall stabilization in the number of SEPs operating in the United States. Total funding of SEPs increased in 2005 despite a reduction in the number of SEPs. Increases in funding, particularly public funding, provided opportunities for SEPs to expand the types of services they provide. As a result of these increases, many SEPs have evolved into larger, community-based organizations that provide numerous social and medical services to IDUs and their communities (e.g., testing for HIV and hepatitis A, hepatitis B, and hepatitis C; vaccinations for hepatitis A and hepatitis B; and general medical care). These more costly services have been added to many SEPs during the past several years, and continued increases in funding might make these services more available. By expanding such services, SEPs are becoming part of a comprehensive approach to the prevention of bloodborne infections among IDUs and their communities.

The findings in this report are subject to at least three limitations. First, the extent of SEP activity in the United States is likely underestimated because 48 (29%) of the SEPs known to NASEN did not complete the survey. Other

** State/territorial governments providing public funding: California, Connecticut, Georgia, Hawaii, Illinois, Massachusetts, New Mexico, New York, Oregon, Puerto Rico, Washington, and Wisconsin. County governments providing public funding: Clark, King, Pierce, and Skagit, Washington; Alameda, Humboldt, Los Angeles, and Santa Clara, California; Dane and Eau Claire, Wisconsin; Boulder, Colorado; Cook, Illinois; and Lane and Multnomah, Oregon. City governments providing public funding: Inglewood, Los Angeles, Rededa, and San Francisco, California; Seattle and Vancouver, Washington; Chicago, Illinois; Milwaukee and Madison, Wisconsin; New York, New York; and Bridgeport, Connecticut.

TABLE 3. Characteristics of syringe exchange programs (SEPs) — United States, 1994–1998, 2000, 2002, 2004, and 2005

Characteristic	1994–1995	1996	1997	1998	2000*	2002	2004*	2005
No. of SEPs known to NASEN ¹	68	101	113	131	154	148	174	166
No. of known SEPs participating in survey (%)	60 (88)	87 (86)	100 (88)	110 (84)	127 (82)	126 (85)	109 (63)	118 (71)
No. of cities with known SEPs participating in survey	46	71	80	81	106	102	87	91
No. of states ⁵ (territories) with known SEPs participating in survey	20 (1)	28 (1)	30 (2)	31 (2)	33 (2)	31 (1)	30 (1)	28 (1)
No. of syringes exchanged (millions)	8.0	13.9	17.5	19.4	22.6	24.9	24	22.5
Total SEP budgets (in millions of dollars)	6.2	6.5	8.4	8.6	12.1	13.0	13.5	15.2
Total public funding budget (in millions of dollars)	2.3	4.5	4.2	6.0	8.9	7.3	9.5	11.3

* Based on unpublished data from 2000 and 2004 surveys of SEP activities, Beth Israel Medical Center, New York, New York.

¹ North American Syringe Exchange Network.

⁵ Includes District of Columbia.

SEPs might exist but are not known to NASEN. Second, certain SEPs operating within larger organizations were not able to report exact budget information because of difficulties in allocating shared costs across administrative units. Finally, data collected were based on self-reports by program directors and were not verified independently.

Although the number of SEPs in the United States has stabilized, many SEPs are providing a wider range of services than initially offered. On-site medical services are being provided by an increasing number of SEPs. IDUs often encounter problems in accessing health care, and offering these services in SEP locations increases the likelihood that IDUs will receive these services.

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Notice to Readers

Satellite Broadcast and Webcast: Cutting-Edge Legal Preparedness for Chronic Disease Prevention

Public Health Grand Rounds, a project sponsored by CDC in collaboration with the University of North Carolina School of Public Health, will air a satellite broadcast and webcast, "Cutting-Edge Legal Preparedness for Chronic Disease Prevention," on November 29, 2007, at 2:00 p.m. EST. CDC's Public Health Law Program and National Center for Chronic Disease Prevention and Health Promotion will present the broadcast, which describes innovative use of public health laws in New York City, such as posting caloric information on restaurant menus, phasing out use of trans fats, requiring laboratory reporting of blood-glucose test results, and prohibiting smoking in nearly all workplaces.

Additional information and broadcast registration are available at <http://www.publhealthgrandrounds.unc.edu>. Continuing education credit will be offered to participants.

Notice to Readers

World COPD Day — November 14, 2007

Chronic obstructive pulmonary disease (COPD) describes a group of slowly progressive diseases (e.g., chronic bronchitis or emphysema) characterized by airflow obstruction that interferes with normal breathing (1). COPD is the fourth leading cause of death in the United States and a major cause of morbidity and disability, resulting in substantial costs to persons and society. Smoking is the most common cause of COPD, accounting for approximately 80% of COPD cases (2). Other causes include exposure to occupational hazards, air pollution, and secondhand smoke. To increase global awareness of COPD and the importance of early diagnosis, the Global Initiative for Chronic Obstructive Lung Disease (<http://www.goldcopd.com>) is sponsoring World COPD Day on November 14, 2007.

Early diagnosis of COPD is important for better outcomes. The National Heart, Lung, and Blood Institute (NHLBI) recommends that persons at risk for COPD who have cough, sputum production, or shortness of breath should be tested for the disease using spirometry, a simple breathing test for assessing lung function (3). Persons who smoke or those at risk for COPD should stop smoking and avoid areas with tobacco smoke. Resources to help smokers quit are available at <http://www.smokefree.gov>, at the National Cancer Institute website (<http://www.cancer.gov>), or by telephone (800-QUIT-NOW [800-784-8669]).

NHLBI and the COPD Foundation also have initiated the Learn More, Breathe Better Campaign to heighten awareness of COPD as a serious lung disease, increase the understanding that COPD is treatable, and encourage those at risk for COPD to talk with their physicians and get a breathing test. A tool kit has been developed to help partner organizations share campaign information with their communities (2).

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TABLE 1. Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending November 3, 2007 (44th Week)^a

Disease	Current week	Cum 2007	5-year weekly average ^b	Total cases reported for previous years					States reporting cases during current week (No.)
				2006	2005	2004	2003	2002	
Anthrax	—	—	—	1	—	—	—	2	
Botulism:									
foodborne	—	16	0	20	19	16	20	28	
infant	—	70	1	97	85	87	78	69	
other (wound & unspecified)	—	19	1	48	31	30	33	21	
Brucellosis	1	101	3	121	120	114	104	125	FL (1)
Chancroid	2	30	1	33	17	30	54	67	TX (2)
Cholera	—	5	0	9	8	5	2	2	
Cyclosporiasis ^c	—	88	1	136	543	171	75	156	
Diphtheria	—	—	0	—	—	—	1	1	
Domestic arboviral diseases ^d :									
California serogroup	—	27	1	67	80	112	108	164	
eastern equine	—	3	0	8	21	6	14	10	
Powassan	—	1	—	1	1	1	—	1	
St. Louis	—	4	0	10	13	12	41	28	
western equine	—	—	—	—	—	—	—	—	
Ehrlichiosis ^e :									
human granulocytic	5	433	10	646	786	537	362	511	NY (1), MN (4)
human monocytic	4	550	7	578	506	338	321	216	NY (1), NC (1), OK (2)
human (other & unspecified)	2	141	1	231	112	59	44	23	NC (1), TN (1)
Haemophilus influenzae ^{f,g} :									
invasive disease (age <5 yrs):									
serotype b	—	14	0	29	9	19	32	34	
nonsertotype b	1	115	3	175	135	135	117	144	IN (1)
unknown serotype	5	181	3	179	217	177	227	153	OH (2), GA (2), UT (1)
Hansen disease ^h	2	51	2	66	87	105	95	96	FL (1), CA (1)
Hantavirus pulmonary syndrome ⁱ	—	22	0	40	26	24	26	19	
Hemolytic uremic syndrome, postdiarrheal ^j	4	183	4	288	221	200	178	216	NY (1), OH (1), TN (1), CA (1)
Hepatitis C viral, acute	3	554	19	802	652	713	1,102	1,835	FL (1), TX (1), CA (1)
HIV infection, pediatric (age <13 yrs) ^k	—	—	6	52	340	436	504	420	
Influenza-associated pediatric mortality ^l ^m	—	73	0	43	45	—	N	N	
Listeriosis	5	5.7	18	875	896	753	696	665	OH (1), IN (1), TN (1), TX (1), CA (1)
Measles ⁿ	—	30	1	55	66	37	56	44	
Meningococcal disease, invasive ^o :									
A, C, Y, & W-135	3	234	4	318	297	—	—	—	PA (1), MN (2)
serogroup B	2	110	2	193	156	—	—	—	TX (2)
other serogroup	1	26	1	32	27	—	—	—	OH (1)
unknown serogroup	7	497	12	651	765	—	—	—	NY (1), OH (1), NC (1), FL (2), CA (2)
Mumps	13	635	10	6,584	314	258	231	270	NY (1), OH (1), MN (6), MO (3), WA (2)
Novel influenza A virus infections	—	4	—	N	N	N	N	N	
Plague	—	6	0	17	8	3	1	2	
Poliomyelitis, paralytic	—	—	—	—	1	—	—	—	
Poliovirus infection, nonparalytic ^p	—	—	—	N	N	N	N	N	
Psittacosis ^q	—	6	0	21	16	12	12	18	
Q fever ^r	1	142	1	169	136	70	71	61	FL (1)
Rabies, human	—	—	0	3	2	7	2	3	
Rubella ^s	—	11	—	11	11	10	7	18	
Rubella, congenital syndrome	—	—	—	1	1	—	1	1	
SARS-CoV ^t	—	—	—	—	—	—	8	N	
Smallpox ^u	—	—	—	—	—	—	—	—	
Streptococcal toxic-shock syndrome ^v	—	83	2	125	129	132	161	118	
Syphilis, congenital (age <1 yr)	3	378	8	380	329	353	413	412	NY (1), VA (1), TX (1)
Tetanus	—	16	1	41	27	34	20	25	
Toxic-shock syndrome (staphylococcal) ^w	2	66	2	101	90	95	133	109	PA (1), CA (1)
Typhoid fever	—	6	0	15	16	5	6	14	
Tularemia	—	103	2	95	154	134	129	90	
Typhoid fever	4	291	6	353	324	322	356	321	OH (1), NC (1), AZ (1), CA (1)
Vancomycin-intermediate <i>Staphylococcus aureus</i> ^x	—	19	0	6	2	—	N	N	
Vancomycin-resistant <i>Staphylococcus aureus</i> ^y	—	—	0	1	3	1	N	N	
Vibriosis (noncholera <i>Vibrio</i> species infections) ^z	3	318	2	N	N	N	N	N	FL (1), AZ (1), CA (1)
Yellow fever	—	—	—	—	—	—	—	1	

— No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts.

^a Incidence data for reporting year 2007 are provisional, whereas data for 2002, 2003, 2004, 2005, and 2006 are finalized.

^b Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, and the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at <http://www.cdc.gov/epo/dphsi/phs/files/5yearweeklyaverage.pdf>.

^c Not notifiable in all states. Data from states where the condition is not notifiable are excluded from this table, except in 2007 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at <http://www.cdc.gov/epo/dphsi/phs/infdis.htm>.

^d Includes both neuroinvasive and nonneuroinvasive. Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for West Nile virus are available in Table II.

^e Data for *H. influenzae* (all ages, all serotypes) are available in Table II.

^f Updated monthly from reports to the Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Implementation of HIV reporting influences the number of cases reported. Updates of pediatric HIV data have been temporarily suspended until upgrading of the national HIV/AIDS surveillance data management system is completed. Data for HIV/AIDS, when available, are displayed in Table IV, which appears quarterly.

^g Updated weekly from reports to the Influenza Division, National Center for Immunization and Respiratory Diseases. A total of 71 cases were reported for the 2006–07 flu season.

^h No measles cases were reported for the current week.

ⁱ Data for meningococcal disease (all serogroups) are available in Table II.

^j No rubella cases were reported for the current week.

^k Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases.

TABLE 11. Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting Area	Chlamydia ¹					Coccidioidomycosis					Cryptosporidiosis				
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max				Med	Max		
United States	10,911	20,512	25,327	865,097	867,973	122	144	558	6,298	6,699	139	83	964	9,152	4,896
New England	187	699	1,357	28,932	28,421	—	0	1	2	—	2	5	39	283	346
Connecticut	—	217	829	8,684	8,404	N	0	0	N	N	—	0	39	39	38
Maine ¹	45	50	74	2,168	1,919	—	0	0	—	—	—	1	6	45	40
Massachusetts	—	301	480	12,943	12,735	—	0	0	—	—	2	2	11	107	169
New Hampshire	52	39	74	1,801	1,359	—	0	1	2	—	—	1	5	47	41
Rhode Island ¹	78	62	106	2,587	2,721	—	0	0	—	—	—	0	3	8	14
Vermont ¹	12	20	45	749	983	N	0	0	N	N	—	1	3	37	44
Mid. Atlantic	1,263	2,735	4,284	119,255	106,340	—	0	0	—	—	8	10	113	1,201	575
New Jersey	—	399	528	16,859	17,201	N	0	0	N	N	—	0	6	41	42
New York (Upstate)	730	515	2,758	22,820	20,558	N	0	0	N	N	6	3	20	218	145
New York City	—	951	1,982	41,123	34,999	N	0	0	N	N	—	1	6	79	134
Pennsylvania	533	754	1,760	38,453	33,582	N	0	0	N	N	2	4	103	863	254
E.N. Central	317	3,135	6,220	139,299	145,187	—	1	3	26	39	21	18	130	1,537	1,220
Illinois	—	945	1,367	39,704	45,773	—	0	0	—	—	—	2	13	145	185
Indiana	—	397	646	17,179	16,797	—	0	0	—	—	4	1	12	92	86
Michigan	124	705	1,059	29,181	30,227	—	0	3	17	33	1	3	11	155	128
Ohio	69	750	3,647	37,564	34,938	—	0	1	9	6	12	5	61	519	318
Wisconsin	124	367	443	15,671	17,452	N	0	0	N	N	4	6	58	626	503
W.N. Central	631	1,212	1,465	51,522	52,674	—	0	54	7	1	22	13	123	1,345	786
Iowa	120	162	252	7,376	7,108	N	0	0	N	N	—	2	61	574	164
Kansas	148	154	294	6,847	6,726	N	0	0	N	N	3	1	15	87	76
Minnesota	—	256	314	10,254	10,932	—	0	54	—	—	17	3	34	254	193
Missouri	321	455	551	19,688	19,579	—	0	1	7	1	2	2	13	130	177
Nebraska ¹	—	92	183	3,956	4,566	N	0	0	N	N	—	1	21	132	89
North Dakota	—	27	61	1,209	1,558	N	0	0	N	N	—	0	11	15	9
South Dakota	42	49	85	2,192	2,205	N	0	0	N	N	—	2	15	154	78
S. Atlantic	3,199	3,921	6,760	169,595	166,982	—	0	1	3	4	41	20	68	1,069	1,018
Delaware	122	64	140	2,899	3,052	—	0	0	—	—	—	0	4	20	13
District of Columbia	—	103	166	4,627	2,641	—	0	0	—	—	—	0	2	3	15
Florida	1,261	1,141	1,767	49,730	41,934	N	0	0	N	N	20	11	35	577	462
Georgia	9	640	3,822	20,966	30,387	N	0	0	N	N	8	4	22	202	243
Maryland ¹	477	393	696	17,131	18,008	—	0	1	3	4	1	0	2	29	16
North Carolina	296	550	1,905	23,672	28,721	—	0	0	—	—	—	1	18	101	86
South Carolina ¹	531	506	3,030	27,231	19,308	N	0	0	N	N	12	1	5	73	124
Virginia ¹	486	479	621	20,836	20,465	N	0	0	N	N	—	1	4	54	52
West Virginia	17	60	94	2,503	2,460	N	0	0	N	N	—	0	5	10	9
E.S. Central	1,283	1,458	2,044	61,277	64,390	—	0	0	—	—	4	4	63	552	152
Alabama ¹	54	367	577	14,209	19,946	N	0	0	N	N	3	1	14	105	52
Kentucky	242	150	691	7,011	6,844	N	0	0	N	N	—	1	40	240	38
Mississippi	455	342	959	16,607	16,074	N	0	0	N	N	—	0	11	91	24
Tennessee ¹	532	506	721	23,450	21,576	N	0	0	N	N	1	1	19	116	38
W.S. Central	1,786	2,294	2,966	103,091	98,268	—	0	1	1	1	6	5	41	304	356
Arkansas ¹	311	173	328	8,112	7,044	N	0	0	N	N	1	0	8	30	20
Louisiana	128	361	853	16,114	15,389	—	0	1	1	1	—	1	4	39	82
Oklahoma	156	263	467	11,087	10,508	N	0	0	N	N	5	1	11	113	35
Texas ¹	1,191	1,490	1,946	67,778	65,327	N	0	0	N	N	—	2	29	122	219
Mountain	184	1,205	1,710	50,944	58,901	96	94	293	4,086	4,591	35	7	572	2,735	366
Arizona	61	469	834	19,271	19,290	96	90	293	3,961	4,467	—	0	6	40	27
Colorado	—	208	358	7,581	13,899	N	0	0	N	N	—	1	25	140	65
Idaho ¹	—	56	253	2,883	2,639	N	0	0	N	N	25	0	71	420	35
Montana ¹	—	46	73	1,489	2,209	N	0	0	N	N	2	1	7	61	131
Nevada ¹	—	176	293	7,279	7,153	—	1	5	50	56	—	0	3	18	10
New Mexico ¹	—	149	393	6,918	8,287	—	0	2	17	18	—	1	8	93	39
Utah	123	104	209	4,567	4,205	—	1	7	55	48	8	0	198	1,913	15
Wyoming ¹	—	23	38	956	1,219	—	0	1	3	2	—	0	8	50	44
Pacific	2,061	3,368	4,362	141,182	146,810	26	45	311	2,173	2,063	—	2	19	125	77
Alaska	76	88	157	3,645	3,721	N	0	0	N	N	—	0	2	3	4
California	1,539	2,628	3,627	114,128	115,225	26	45	311	2,173	2,063	—	0	0	—	—
Hawaii	—	104	133	4,452	4,850	N	0	0	N	N	—	0	4	6	4
Oregon ¹	239	160	394	7,355	8,082	N	0	0	N	N	—	2	15	116	69
Washington	207	289	621	11,602	14,932	N	0	0	N	N	—	0	0	—	—
American Samoa	U	0	32	U	U	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	3	207	430	755	—	0	0	—	—	—	0	0	—	—
Puerto Rico	136	125	544	6,390	4,252	N	0	0	N	N	N	0	0	N	N
U.S. Virgin Islands	U	3	7	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.
 U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
 * Incidence data for reporting year 2007 are provisional. Data for HIV/AIDS, AIDS, and TB, when available, are displayed in Table IV, which appears quarterly.
 1 Chlamydia refers to genital infections caused by *Chlamydia trachomatis*.
 2 Contains data reported through the National Electronic Disease Surveillance System (NEISS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Giardiasis					Gonorrhea					Haemophilus influenzae, Invasive All ages, all serotypes [†]				
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max				Med	Max		
United States	212	305	1,513	14,060	15,200	3,730	6,716	8,941	281,491	302,746	26	44	184	1,899	1,929
New England	11	26	54	1,228	1,258	14	109	259	4,585	4,794	2	3	19	155	151
Connecticut	—	6	18	301	264	—	42	204	1,751	1,994	1	0	7	45	42
Maine [‡]	2	3	10	165	159	2	2	8	104	111	—	0	3	12	18
Massachusetts	6	10	29	521	548	—	51	96	2,202	2,039	1	2	6	74	68
New Hampshire	—	0	3	23	21	4	2	8	129	166	—	0	2	15	11
Rhode Island [‡]	—	0	15	71	100	7	8	18	351	426	—	0	10	7	4
Vermont [‡]	3	3	9	147	166	1	1	5	48	58	—	0	1	2	8
Mid. Atlantic	34	55	127	2,374	2,992	341	715	1,537	30,863	28,364	4	10	27	379	398
New Jersey	—	4	11	142	414	—	114	159	4,311	4,654	—	1	5	51	68
New York (Upstate)	26	23	108	977	1,041	171	111	1,035	5,770	5,308	3	2	15	109	128
New York City	3	15	25	663	826	—	201	363	8,561	8,773	—	2	6	83	73
Pennsylvania	5	14	29	592	711	170	241	586	11,821	9,629	1	3	10	136	129
E.N. Central	24	46	80	2,036	2,455	152	1,258	2,593	56,456	60,032	3	6	15	245	323
Illinois	—	12	24	522	614	—	350	498	14,786	17,121	—	2	6	73	97
Indiana	N	0	0	N	N	—	164	307	7,393	7,462	—	1	7	50	71
Michigan	—	11	20	469	619	39	263	747	11,842	12,777	—	0	5	22	23
Ohio	20	15	37	698	706	39	331	1,572	16,940	16,771	2	2	5	86	72
Wisconsin	4	8	20	347	516	74	126	206	5,495	5,901	—	0	2	14	60
W.N. Central	18	21	553	997	1,589	164	380	514	16,139	16,529	8	2	24	116	136
Iowa	1	5	23	261	253	18	39	60	1,618	1,611	—	0	1	1	2
Kansas	7	2	8	122	173	28	43	86	1,924	1,895	—	0	2	9	16
Minnesota	—	0	514	12	479	—	66	86	2,657	2,754	7	0	17	56	72
Missouri	5	8	22	380	484	114	196	266	8,504	8,630	—	1	5	34	32
Nebraska [‡]	5	2	8	125	102	—	38	57	1,140	1,192	1	0	2	11	8
North Dakota	—	0	16	18	19	—	2	7	78	127	—	0	2	2	6
South Dakota	—	1	6	79	79	4	6	11	218	320	—	0	0	—	—
S. Atlantic	50	57	106	2,432	2,360	1,415	1,575	3,209	66,298	75,088	3	11	34	490	478
Delaware	1	1	6	39	35	29	26	43	1,099	1,263	—	0	3	8	1
District of Columbia	—	0	7	34	55	—	47	71	1,906	1,526	—	0	2	3	7
Florida	35	24	47	1,099	949	528	478	717	20,340	20,529	—	3	8	139	145
Georgia	5	10	33	516	566	4	290	2,068	8,718	15,237	3	2	7	104	98
Maryland [‡]	5	4	18	216	206	84	118	227	5,235	6,115	—	1	6	70	68
North Carolina	—	0	0	—	—	408	248	675	11,641	14,939	—	0	9	48	49
South Carolina [‡]	2	2	8	87	92	186	204	1,361	11,394	8,995	—	1	4	1	30
Virginia [‡]	—	9	21	396	431	168	122	220	5,196	5,694	—	1	22	53	61
West Virginia	2	0	21	45	26	8	18	37	709	802	—	0	6	25	19
E.S. Central	9	10	23	463	372	462	562	750	23,754	26,363	1	2	9	104	98
Alabama [‡]	5	5	16	219	168	26	158	242	6,304	9,256	1	0	3	22	20
Kentucky	N	0	0	N	N	108	57	268	2,785	2,480	—	0	1	2	5
Mississippi	N	0	0	N	N	157	135	310	6,314	6,339	—	0	1	7	12
Tennessee [‡]	4	5	16	244	204	171	184	260	8,351	8,288	—	1	6	73	61
W.S. Central	3	7	55	299	309	763	981	1,200	42,788	43,292	1	2	34	86	74
Arkansas [‡]	1	2	13	102	117	119	78	120	3,478	3,670	—	0	2	8	8
Louisiana	—	1	9	74	80	81	220	384	9,374	9,296	—	0	2	8	19
Oklahoma	2	3	42	123	111	57	101	235	4,292	3,942	1	1	29	65	40
Texas [‡]	N	0	0	N	N	506	575	731	25,684	26,384	—	0	3	7	7
Mountain	30	30	66	1,387	1,459	56	250	346	10,219	13,145	2	4	12	210	182
Arizona	—	3	11	165	140	21	105	175	4,037	4,848	—	1	6	78	76
Colorado	—	3	24	383	485	—	50	93	1,945	3,162	—	1	4	45	44
Idaho [‡]	4	3	12	154	164	—	4	20	215	161	1	0	1	6	5
Montana [‡]	—	2	8	93	91	—	1	7	57	172	—	0	1	2	—
Nevada [‡]	—	2	8	89	99	—	44	87	1,781	2,439	—	0	2	9	13
New Mexico [‡]	—	2	6	89	72	—	30	58	1,432	1,521	—	1	4	34	27
Utah	26	7	32	380	376	35	17	34	687	733	1	0	3	32	14
Wyoming [‡]	—	1	4	34	32	—	1	5	65	109	—	0	1	4	3
Pacific	33	63	558	2,844	2,407	363	708	875	30,389	35,139	2	3	16	114	89
Alaska	1	1	5	63	101	10	10	27	411	517	—	0	4	14	10
California	16	45	93	1,902	1,914	302	605	734	26,375	29,006	—	0	10	34	25
Hawaii	—	1	4	59	45	—	12	22	527	807	—	0	2	10	15
Oregon [‡]	5	9	16	386	347	22	23	63	918	1,243	2	1	6	54	39
Washington	11	8	449	434	—	29	52	142	2,158	3,566	—	0	5	2	—
American Samoa	U	0	0	U	U	U	0	2	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	0	0	—	—	—	1	38	91	92	—	0	0	—	1
Puerto Rico	—	5	15	165	218	6	6	23	291	258	—	0	1	2	3
U.S. Virgin Islands	U	0	0	U	U	U	1	3	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Incidence data for reporting year 2007 are provisional.

† Data for *H. influenzae* (age <5 yrs for serotype b, nonserotype b, and unknown serotype) are available in Table 1.

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)^a

Reporting area	Hepatitis (viral, acute), by type ^b								Legionellosis						
	A				B				Previous 52 weeks			Cum 2007	Cum 2006		
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week			Med	Max
United States	24	52	201	2,342	3,002	65	77	405	3,342	3,748	26	43	106	1,931	2,343
New England	2	2	6	106	166	—	2	5	64	103	2	2	13	110	157
Connecticut	2	0	3	23	37	—	0	5	28	44	2	0	5	34	45
Maine ^c	—	0	1	3	8	—	0	2	11	21	—	0	1	5	9
Massachusetts	—	1	4	49	79	—	0	1	4	18	—	0	3	21	62
New Hampshire	—	0	3	12	22	—	0	1	5	8	—	0	2	7	13
Rhode Island ^d	—	0	2	11	12	—	0	3	13	9	—	0	6	34	21
Vermont ^d	—	0	1	8	8	—	0	1	3	3	—	0	2	9	7
Mid. Atlantic	—	8	18	360	413	1	9	21	379	460	8	12	35	617	851
New Jersey	—	2	6	89	—	—	1	8	73	148	—	1	11	75	107
New York (Upstate)	1	1	11	65	80	1	2	13	84	54	6	4	22	193	288
New York City	—	3	7	132	109	—	2	6	80	108	—	2	10	98	165
Pennsylvania	—	2	5	74	57	—	3	8	142	150	2	4	21	251	291
E. N. Central	3	5	13	251	309	1	9	23	370	431	5	8	27	429	520
Illinois	—	2	5	90	93	—	2	6	96	119	—	1	8	66	113
Indiana	1	0	7	30	23	1	0	21	47	46	—	1	7	45	40
Michigan	—	1	8	67	100	—	2	8	94	127	—	3	10	129	129
Ohio	2	1	4	57	47	—	2	7	113	107	5	3	17	181	197
Wisconsin	—	0	3	7	40	—	0	3	20	32	—	0	3	8	41
W.N. Central	1	2	18	144	120	1	2	15	112	127	—	1	9	83	74
Iowa	—	1	4	37	10	—	0	3	20	19	—	0	1	9	10
Kansas	1	0	1	4	26	—	0	2	7	10	—	0	1	2	7
Minnesota	—	0	17	62	17	—	0	13	18	18	—	0	6	23	23
Missouri	—	0	2	24	41	1	1	5	52	57	—	1	3	36	20
Nebraska ^e	—	0	2	12	17	—	0	2	10	18	—	0	1	9	9
North Dakota	—	0	3	—	—	—	0	1	—	—	—	0	1	—	—
South Dakota	—	0	1	5	9	—	0	1	5	5	—	0	1	4	5
S. Atlantic	9	10	21	438	479	16	19	56	827	1,043	4	7	25	314	422
Delaware	—	0	1	7	11	—	0	2	15	44	—	0	2	8	11
District of Columbia	—	0	5	14	7	—	0	2	1	7	—	0	4	1	27
Florida	—	3	7	133	186	9	7	14	297	355	3	2	10	130	138
Georgia	1	1	4	61	50	2	2	7	101	178	—	0	2	19	30
Maryland	1	1	5	69	56	2	2	6	95	132	1	1	4	57	93
North Carolina	7	0	11	56	83	3	0	16	120	142	—	1	4	37	31
South Carolina ^f	—	0	4	15	23	—	1	5	52	80	—	0	2	15	5
Virginia ^g	—	1	5	75	55	—	3	8	107	57	—	1	4	37	54
West Virginia	—	0	2	8	6	—	0	23	39	48	—	0	4	10	13
E. S. Central	—	2	5	90	112	—	7	17	302	270	1	2	6	83	94
Alabama ^h	—	0	3	16	12	—	2	10	106	72	—	0	1	9	9
Kentucky	—	0	2	19	31	—	1	7	60	63	—	1	4	43	39
Mississippi	—	0	4	8	8	—	0	8	25	10	—	0	1	—	4
Tennessee ^h	—	1	5	47	61	—	3	8	111	125	1	1	4	31	42
W. S. Central	—	4	43	181	324	41	17	169	715	758	—	2	16	93	57
Arkansas ⁱ	—	0	2	10	44	1	1	7	58	68	—	0	3	8	4
Louisiana	—	0	3	24	27	—	1	4	62	49	—	0	1	3	10
Oklahoma	—	0	8	11	6	38	1	24	103	58	—	0	6	5	1
Texas ^j	—	3	39	136	247	2	13	135	492	583	—	2	13	77	42
Mountain	2	4	15	214	233	1	3	7	142	120	1	2	7	93	111
Arizona	2	3	11	153	139	—	1	4	49	—	—	0	5	37	35
Colorado	—	0	3	21	35	—	0	3	24	31	—	0	2	14	24
Idaho ^k	—	0	1	4	9	—	0	1	11	12	—	0	1	5	11
Montana ^l	—	0	2	9	10	—	0	3	—	2	—	0	1	3	6
Nevada ^l	—	0	2	9	11	—	1	3	29	32	—	0	2	7	8
New Mexico ^l	—	0	2	9	14	—	0	2	10	21	—	0	2	8	5
Utah	—	0	1	6	13	1	0	4	17	22	1	0	3	16	22
Wyoming ^l	—	0	1	3	2	—	0	1	2	—	—	0	1	3	—
Pacific	6	13	92	558	916	4	10	106	431	436	5	2	11	109	77
Alaska	—	0	1	4	1	—	0	1	6	8	—	0	1	—	—
California	6	10	40	482	869	3	7	31	318	349	4	1	11	79	77
Hawaii	—	0	2	4	11	—	0	2	6	7	—	0	1	2	—
Oregon ^m	—	1	2	25	35	—	1	4	55	72	—	0	1	9	—
Washington	—	0	52	43	—	1	1	74	46	—	1	0	3	19	—
American Samoa	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	1	10	45	53	—	1	9	44	55	—	0	2	3	1
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I., Commonwealth of Northern Mariana Islands.
 U, Unavailable. —, No reported cases. N, Not notifiable. Cum, Cumulative year-to-date counts. Med, Median. Max, Maximum.
^a Incidence data for reporting year 2007 are provisional.
^b Data for acute hepatitis C, viral are available in Table I.
^c Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Lyme disease				Malaria				Meningococcal disease, Invasive [†] All serogroups						
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max				Med	Max		
United States	219	255	1,194	17,257	17,285	7	21	105	912	1,227	13	21	87	867	949
New England	47	41	296	3,166	3,969	—	1	5	48	47	—	1	3	36	46
Connecticut	6	11	214	1,555	1,618	—	0	3	1	10	—	0	1	6	9
Maine [‡]	40	3	53	406	231	—	0	2	7	4	—	0	3	7	7
Massachusetts	—	3	27	211	1,402	—	0	3	29	22	—	0	2	19	22
New Hampshire	1	6	81	722	595	—	0	4	8	9	—	0	1	—	4
Rhode Island [‡]	—	0	93	151	31	—	0	1	—	1	—	0	1	1	2
Vermont [‡]	—	1	13	121	92	—	0	2	3	1	—	0	1	3	2
Mid. Atlantic	78	108	615	8,779	8,891	—	5	14	227	322	2	3	8	118	140
New Jersey	—	26	143	1,859	2,283	—	0	2	—	82	—	0	2	13	18
New York (Upstate)	66	49	426	2,922	3,325	—	1	5	56	40	1	1	3	31	31
New York (City)	—	1	22	168	285	—	3	7	135	157	—	0	4	26	53
Pennsylvania	12	40	298	3,830	2,998	—	1	4	36	43	1	1	5	48	38
E.N. Central	1	8	136	1,164	1,654	—	2	6	93	148	2	3	9	126	145
Illinois	—	1	12	111	107	—	1	6	41	76	—	1	3	40	39
Indiana	—	0	7	41	21	—	0	2	9	11	—	0	4	24	21
Michigan	—	1	5	53	51	—	0	2	15	17	—	0	3	23	24
Ohio	—	0	3	16	42	1	0	2	19	27	2	1	2	30	42
Wisconsin	1	6	123	943	1,433	—	0	2	9	17	—	0	3	9	19
W.N. Central	57	4	195	520	716	—	0	12	28	46	2	1	5	55	58
Iowa	—	1	11	100	94	—	0	1	3	2	—	0	3	12	17
Kansas	—	0	2	9	4	—	0	1	2	7	—	0	1	1	4
Minnesota	57	1	188	374	601	—	0	12	11	26	2	0	3	18	13
Missouri	—	0	6	29	5	—	0	1	5	6	—	0	3	14	14
Nebraska [‡]	—	0	1	6	11	—	0	1	—	3	—	0	2	5	6
North Dakota	—	0	7	2	—	—	0	1	—	1	—	0	3	2	1
South Dakota	—	0	0	—	1	—	0	1	1	1	—	0	1	3	3
S. Atlantic	33	57	175	3,358	1,893	3	4	13	215	301	3	3	11	145	164
Delaware	1	12	34	631	439	—	0	1	4	5	—	0	1	1	4
District of Columbia	—	0	7	13	55	—	0	2	3	3	—	0	1	—	1
Florida	—	1	11	77	19	1	1	7	52	52	2	1	7	56	64
Georgia	—	0	1	2	7	1	0	5	30	82	—	0	5	22	14
Maryland [‡]	32	27	111	1,803	1,067	1	1	5	53	60	—	0	2	20	13
North Carolina	—	0	8	42	27	—	0	4	20	28	1	0	6	17	24
South Carolina [‡]	—	0	2	23	18	—	0	1	6	9	—	0	2	14	19
Virginia [‡]	—	12	61	700	248	—	1	4	45	51	—	0	2	13	17
West Virginia	—	0	14	67	13	—	0	1	2	2	—	0	2	2	8
E.S. Central	—	1	5	47	31	—	0	3	31	23	—	1	4	42	39
Alabama [‡]	—	0	3	11	7	—	0	1	5	9	—	0	2	7	5
Kentucky	—	0	2	5	7	—	0	1	8	3	—	0	2	10	10
Mississippi	—	0	0	—	3	—	0	1	2	6	—	0	4	9	5
Tennessee [‡]	—	0	4	31	14	—	0	2	16	5	—	0	2	16	19
W.S. Central	3	1	6	60	22	1	1	29	74	91	2	2	15	87	84
Arkansas [‡]	—	0	1	1	—	1	0	1	2	4	—	0	2	9	10
Louisiana	—	0	1	2	1	—	0	2	14	8	—	0	4	25	34
Oklahoma	—	0	0	—	—	—	0	3	5	7	—	0	4	15	8
Texas [‡]	3	1	6	57	21	—	1	25	53	72	2	0	11	38	32
Mountain	—	0	4	36	27	—	1	6	50	68	—	1	4	53	64
Arizona	—	0	1	2	9	—	0	3	12	22	—	0	2	12	15
Colorado	—	0	1	2	—	—	0	2	16	17	—	0	2	17	20
Idaho [‡]	—	0	2	7	6	—	0	2	2	1	—	0	1	3	3
Montana [‡]	—	0	2	4	—	—	0	1	3	2	—	0	1	2	4
Nevada [‡]	—	0	2	8	3	—	0	1	2	4	—	0	1	4	6
New Mexico [‡]	—	0	1	4	3	—	0	1	4	5	—	0	1	2	6
Utah	—	0	2	6	5	—	0	3	11	17	—	0	2	11	6
Wyoming [‡]	—	0	1	3	1	—	0	0	—	—	—	0	1	2	4
Pacific	—	2	16	127	82	2	3	45	146	181	2	4	48	205	209
Alaska	—	0	1	7	3	—	0	1	2	23	—	0	1	1	3
California	—	2	9	114	73	—	2	7	106	139	2	3	10	146	162
Hawaii	N	0	0	N	N	—	0	1	2	8	—	0	2	8	8
Oregon [‡]	—	0	1	3	6	—	0	3	13	11	—	0	3	29	36
Washington	—	0	8	3	—	2	0	43	23	—	—	0	43	21	—
American Samoa	U	0	0	U	U	U	0	0	U	U	U	0	0	—	—
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Puerto Rico	N	0	0	N	N	—	0	1	3	1	—	0	1	6	6
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	—	—

C.N.M.I., Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Includes data for reporting year 2007 are provisional.

† Data for meningococcal disease, invasive caused by serogroups A, C, Y, & W 135, serogroup R; other serogroup; and unknown serogroup are available in Table I.

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Pertussis					Rabies, animal				Rocky Mountain spotted fever					
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max				Med	Max		
United States	65	171	1,479	7,360	12,008	39	94	157	4,278	4,873	33	31	211	1,757	1,890
New England	6	28	77	1,172	1,529	7	11	22	504	418	—	0	10	4	11
Connecticut	—	2	5	59	102	4	4	10	202	182	—	0	0	—	—
Maine†	—	1	13	70	123	1	2	5	75	107	—	0	0	—	—
Massachusetts	4	24	46	928	966	—	0	0	—	—	—	0	1	4	10
New Hampshire	—	1	7	50	194	1	1	4	43	41	—	0	0	—	1
Rhode Island†	—	0	31	19	49	—	0	4	36	29	—	0	9	—	—
Vermont†	2	0	9	46	95	1	3	13	148	59	—	0	0	—	—
Mid. Atlantic	8	22	155	973	1,586	—	14	44	733	474	—	1	6	55	82
New Jersey	—	2	11	117	266	—	0	0	—	—	—	0	2	6	38
New York (Upstate)	6	12	146	498	716	—	—	—	—	—	—	0	1	3	—
New York City	—	3	6	105	86	—	1	5	40	31	—	0	3	24	22
Pennsylvania	2	6	15	253	518	—	13	44	693	443	—	0	3	22	22
E.N. Central	3	28	79	1,199	1,903	7	4	48	375	152	—	1	4	40	61
Illinois	—	3	23	112	478	1	1	15	112	46	—	0	3	23	25
Indiana	—	0	45	51	200	1	0	1	12	11	—	0	2	4	6
Michigan	1	7	20	248	521	—	1	27	175	44	—	0	1	3	4
Ohio	2	14	54	589	511	5	0	11	76	51	—	0	2	10	25
Wisconsin	—	3	24	199	193	—	0	0	—	—	—	0	0	—	1
W.N. Central	4	13	151	559	1,097	4	5	13	231	275	5	4	31	365	188
Iowa	—	2	16	116	272	—	0	3	30	56	—	0	4	13	5
Kansas	1	3	12	109	258	—	2	8	96	67	—	0	1	1	1
Minnesota	—	0	119	157	161	4	0	5	32	37	—	0	1	1	3
Missouri	2	2	9	68	277	—	0	3	39	63	5	4	25	333	154
Nebraska†	1	1	12	53	84	—	0	0	—	—	—	0	0	13	25
North Dakota	—	0	18	4	25	—	0	6	16	16	—	0	0	—	—
South Dakota	—	1	6	52	20	—	0	2	18	36	—	0	1	4	—
S. Atlantic	9	17	163	797	971	16	40	76	1,823	2,024	26	12	111	852	1,045
Delaware	—	0	2	11	3	—	0	0	—	—	—	0	2	1†	21
District of Columbia	—	0	1	2	6	—	0	0	—	—	—	0	1	1	1
Florida	4	4	18	194	189	—	0	29	107	176	—	0	4	20	14
Georgia	—	0	4	25	86	—	4	34	234	236	—	0	5	33	49
Maryland†	5	2	8	95	127	—	7	18	304	373	2	1	7	57	75
North Carolina	—	4	112	273	171	5	9	19	439	458	24	4	96	545	754
South Carolina†	—	2	9	66	161	—	0	11	46	154	—	1	7	60	36
Virginia†	—	2	11	99	185	11	13	31	629	535	—	2	11	117	92
West Virginia	—	0	19	28	43	—	0	10	64	92	—	0	3	5	3
E.S. Central	1	6	32	353	305	—	3	9	140	224	—	5	16	230	345
Alabama†	—	2	18	79	73	—	0	2	—	76	—	1	9	74	83
Kentucky	1	0	1	9	56	—	0	3	18	27	—	0	2	5	3
Mississippi	—	1	29	193	73	—	0	1	1	4	—	0	2	13	7
Tennessee†	—	1	7	72	143	—	3	7	121	117	—	2	10	138	252
W.S. Central	—	20	226	821	740	1	1	27	73	875	2	1	168	170	110
Arkansas†	—	2	17	130	82	1	0	5	28	26	—	0	53	90	49
Louisiana	—	0	1	14	24	—	0	1	—	6	—	0	1	2	4
Oklahoma	—	0	36	6	18	—	0	22	15	58	2	0	108	47	28
Texas†	—	17	174	671	616	—	0	20	—	785	—	0	7	31	29
Mountain	23	22	61	933	2,233	—	3	14	202	204	—	0	4	33	46
Arizona	—	4	13	179	457	—	2	12	141	133	—	0	1	7	11
Colorado	—	6	17	230	657	—	0	0	—	—	—	0	2	4	4
Idaho†	—	1	5	34	82	—	0	0	—	24	—	0	1	4	14
Montana†	—	0	7	36	108	—	0	3	17	14	—	0	1	1	2
Nevada†	—	0	5	12	66	—	0	1	2	5	—	0	0	—	—
New Mexico†	—	1	7	61	121	—	0	2	8	9	—	0	1	4	8
Utah	23	8	47	361	668	—	0	2	16	11	—	0	1	1	—
Wyoming†	—	0	4	20	74	—	0	4	18	8	—	0	2	12	7
Pacific	11	13	547	553	1,644	4	4	10	197	227	—	0	3	8	2
Alaska	—	0	8	43	88	—	0	6	39	16	N	0	0	N	N
California	—	3	167	152	1,377	4	2	8	147	188	—	0	3	6	—
Hawaii	—	0	2	18	34	N	0	0	N	N	N	0	0	N	N
Oregon†	—	2	14	102	95	—	0	3	11	23	—	0	1	2	2
Washington	11	2	377	238	—	—	0	0	—	—	N	0	0	N	N
American Samoa	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	0	1	—	61	—	0	0	—	—	N	0	0	N	N
Puerto Rico	—	0	1	—	3	—	0	5	37	74	N	0	0	N	N
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

† Incidence data for reporting year 2007 are provisional.

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Salmonellosis					Shiga toxin-producing <i>E. coli</i> (STEC) [†]					Shigellosis				
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max				Med	Max		
United States	535	869	2,338	36,973	37,563	55	80	336	3,765	3,500	262	348	1,287	13,975	11,824
New England	6	37	388	2,000	2,023	2	4	67	261	257	—	4	41	220	252
Connecticut	—	0	373	373	503	—	0	61	61	75	—	0	38	38	67
Maine [‡]	3	3	14	124	114	—	1	4	34	37	—	0	5	14	4
Massachusetts	2	24	57	1,196	1,063	1	2	10	130	94	—	3	8	144	156
New Hampshire	1	3	10	143	193	—	0	4	19	24	—	0	2	5	6
Rhode Island [‡]	—	2	20	90	83	—	0	2	6	8	—	0	9	16	13
Vermont [‡]	—	1	5	72	67	1	0	1	11	19	—	0	1	3	6
Mid. Atlantic	31	103	181	4,705	4,712	4	7	63	370	421	9	12	47	616	794
New Jersey	—	16	35	642	982	—	1	20	31	107	—	2	9	107	276
New York (Upstate)	24	28	112	1,263	1,133	4	3	15	183	151	7	3	42	137	202
New York City	2	24	50	1,179	1,110	—	0	5	37	42	—	5	10	223	239
Pennsylvania	5	33	69	1,621	1,487	—	3	47	110	121	2	1	21	149	77
E.N. Central	52	99	252	4,833	4,904	6	10	34	561	603	40	34	131	1,890	1,214
Illinois	—	30	186	1,488	1,377	—	1	10	84	100	—	11	32	430	546
Indiana	22	15	54	634	766	5	1	13	91	78	12	2	13	119	137
Michigan	1	18	41	780	883	—	1	8	82	83	—	1	7	62	142
Ohio	28	27	65	1,166	1,080	1	3	11	144	158	28	12	104	1,075	1,093
Wisconsin	1	16	50	765	798	—	3	10	160	184	—	4	13	204	233
W.N. Central	34	50	102	2,376	2,322	6	13	45	678	595	20	35	156	1,612	1,544
Iowa	1	9	19	400	407	1	2	38	160	116	—	2	14	76	99
Kansas	4	7	20	296	319	—	0	4	39	23	1	0	3	21	128
Minnesota	8	13	44	604	602	2	4	17	228	181	5	5	24	214	192
Missouri	18	15	29	671	669	1	2	12	130	149	14	22	72	1,166	602
Nebraska [‡]	3	5	13	226	169	2	1	6	75	72	—	0	7	20	118
North Dakota	—	0	23	36	29	—	0	12	2	6	—	0	127	5	92
South Dakota	—	3	11	143	127	—	0	5	44	48	—	1	30	110	313
S. Atlantic	251	222	427	9,928	9,862	14	15	37	610	538	51	88	177	3,904	2,808
Delaware	—	2	8	127	138	—	0	3	14	9	—	0	2	10	9
District of Columbia	—	0	4	16	54	—	0	1	1	2	—	0	5	4	15
Florida	181	85	176	4,020	4,028	13	2	8	133	78	33	43	76	1,988	1,290
Georgia	39	34	76	1,742	1,609	—	2	9	94	76	11	29	95	1,395	1,063
Maryland [§]	9	15	43	772	673	1	2	6	84	106	3	2	7	94	118
North Carolina	—	29	110	1,368	1,436	—	2	24	122	100	—	0	14	75	139
South Carolina [‡]	16	18	51	889	913	—	0	3	18	12	4	2	20	139	77
Virginia [‡]	1	19	38	834	887	—	3	8	126	143	—	3	11	139	93
West Virginia	5	2	31	160	124	—	0	5	18	12	—	0	36	60	4
E.S. Central	33	59	137	2,761	2,447	4	4	26	281	271	86	28	164	2,184	646
Alabama [‡]	13	16	78	791	651	—	1	19	60	28	15	12	67	584	197
Kentucky	8	10	22	497	402	1	1	12	105	90	11	3	35	417	224
Mississippi	1	13	101	765	717	—	0	1	5	10	47	9	107	960	86
Tennessee [‡]	11	17	34	708	677	3	2	10	111	143	13	3	27	223	139
W.S. Central	36	82	595	3,501	4,467	—	3	73	145	208	32	39	655	1,538	1,669
Arkansas [‡]	27	14	51	740	807	—	1	3	32	44	—	2	10	79	101
Louisiana	—	14	35	573	974	—	0	2	17	3	—	0	22	349	226
Oklahoma	9	9	102	557	440	—	0	8	17	35	4	2	63	112	116
Texas [‡]	—	41	470	1,631	2,246	—	2	68	93	112	23	24	580	998	1,226
Mountain	33	48	90	2,163	2,275	9	8	31	420	490	7	19	58	788	1,247
Arizona	20	17	44	821	762	4	2	8	97	97	6	10	33	474	625
Colorado	—	10	22	438	543	—	1	9	66	101	—	2	8	90	207
Idaho [‡]	2	3	9	121	156	3	1	16	118	92	1	0	2	11	14
Montana [‡]	1	2	6	87	115	—	0	0	—	—	—	1	13	21	37
Nevada [‡]	—	4	10	148	192	—	0	3	18	30	—	0	9	47	115
New Mexico [‡]	—	5	13	223	229	—	0	3	33	43	—	2	5	84	166
Utah	10	4	18	264	237	2	1	9	88	109	—	1	5	30	62
Wyoming [‡]	—	1	4	61	41	—	0	1	—	18	—	0	19	31	21
Pacific	59	113	890	4,706	4,551	10	7	164	439	117	17	29	256	1,223	1,650
Alaska	1	1	5	72	68	N	0	0	N	N	—	0	2	7	7
California	46	94	260	3,583	3,908	4	4	33	223	N	14	24	84	1,006	1,485
Hawaii	—	5	16	217	211	—	0	4	14	17	—	0	2	21	45
Oregon [‡]	1	7	15	270	362	3	1	11	78	100	—	1	6	67	113
Washington	11	10	625	564	2	3	1	162	120	—	3	1	170	122	—
American Samoa	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	0	0	—	—	N	0	0	N	N	—	0	0	—	—
Puerto Rico	—	11	68	446	527	—	0	0	—	—	—	0	4	18	36
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Incidence data for reporting year 2007 are provisional.

† Include *E. coli* O157:H7, Shiga toxin-positive, serogroup non-O157, and Shiga toxin-positive, not serogrouped.

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Streptococcal disease, invasive, group A					Streptococcus pneumoniae, invasive disease, nondrug resistant†				
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
		Med	Max				Med	Max		
United States	43	98	261	4,188	4,521	23	9	108	1,307	1,108
New England	—	5	28	343	307	5	2	11	108	102
Connecticut	—	0	23	111	80	—	0	6	15	30
Maine‡	—	0	3	23	17	—	0	1	2	—
Massachusetts	—	3	12	155	155	4	2	6	72	60
New Hampshire	—	0	4	32	35	1	0	2	9	8
Rhode Island‡	—	0	12	6	7	—	0	2	8	4
Vermont‡	—	0	2	16	13	—	0	1	2	—
Mid. Atlantic	1	17	41	769	813	4	4	37	225	159
New Jersey	—	3	10	108	131	—	1	4	26	55
New York (Upstate)	1	5	27	253	262	4	3	15	94	78
New York City	—	4	13	181	147	—	1	35	105	26
Pennsylvania	—	5	11	227	274	N	0	0	N	N
E.N. Central	7	16	33	695	857	1	5	14	192	289
Illinois	—	5	13	190	260	—	1	6	48	78
Indiana	3	2	12	105	102	1	0	10	18	47
Michigan	1	4	10	170	179	—	1	4	60	64
Ohio	3	4	14	200	214	—	1	7	54	58
Wisconsin	—	0	6	30	102	—	0	2	12	42
W.N. Central	8	5	32	286	303	6	2	8	100	98
Iowa	—	0	0	—	—	—	0	0	—	—
Kansas	1	0	3	29	50	—	0	1	1	11
Minnesota	7	0	29	144	136	4	0	6	68	61
Missouri	—	2	6	68	67	2	0	2	19	13
Nebraska‡	—	0	3	23	28	—	0	1	11	10
North Dakota	—	0	2	13	12	—	0	2	1	3
South Dakota	—	0	2	9	10	—	0	0	—	—
S. Atlantic	15	21	52	1,067	1,022	1	5	14	235	66
Delaware	—	0	1	10	10	—	0	0	—	—
District of Columbia	—	0	3	8	15	—	0	1	—	1
Florida	9	6	16	269	255	1	1	5	58	—
Georgia	—	5	13	212	217	—	0	5	44	—
Maryland‡	5	4	10	183	187	—	1	6	53	54
North Carolina	1	1	22	145	145	—	0	0	—	—
South Carolina‡	—	1	7	84	56	—	1	4	42	—
Virginia‡	—	2	11	131	112	—	0	4	31	—
West Virginia	—	0	3	25	25	—	0	4	7	11
E.S. Central	7	4	13	186	184	—	1	6	78	17
Alabama‡	N	0	0	N	N	N	0	0	N	N
Kentucky	—	1	3	35	41	—	0	0	—	—
Mississippi	N	0	0	N	N	—	0	2	3	17
Tennessee‡	7	3	13	151	143	—	1	6	75	—
W.S. Central	3	6	90	265	345	5	4	43	187	185
Arkansas‡	—	0	2	17	24	—	0	2	10	20
Louisiana	—	0	4	16	16	—	0	4	27	20
Oklahoma	2	1	23	63	90	2	1	13	45	47
Texas‡	1	3	64	169	215	3	2	27	105	98
Mountain	2	10	23	461	583	1	4	12	154	172
Arizona	1	4	11	180	302	1	2	7	92	94
Colorado	—	3	9	128	103	—	0	4	36	46
Idaho‡	—	0	2	16	8	—	0	1	2	3
Montana‡	N	0	0	N	N	N	0	0	N	N
Nevada‡	—	0	1	2	—	—	0	1	1	2
New Mexico‡	—	1	4	50	112	—	0	4	19	27
Utah	1	2	7	80	54	—	0	2	4	—
Wyoming‡	—	0	1	5	4	—	0	0	—	—
Pacific	—	3	9	116	106	—	0	4	28	20
Alaska	—	0	3	31	N	—	0	2	26	—
California	N	0	0	N	N	N	0	0	N	N
Hawaii	—	2	9	65	106	—	0	2	2	20
Oregon‡	N	0	0	N	N	N	0	0	N	N
Washington	N	0	0	N	N	N	0	0	N	N
American Samoa	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U
Guam	—	0	0	—	—	N	0	0	N	N
Puerto Rico	—	0	0	—	—	N	0	0	N	N
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Incidence data for reporting year 2007 are provisional.

† Includes cases of invasive pneumococcal disease, in children aged <5 years, caused by *S. pneumoniae*, which is susceptible or for which susceptibility testing is not available (NIDSS event code 11717).

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	<i>Streptococcus pneumoniae</i> , invasive disease, drug resistant†										Syphilis, primary and secondary				
	All ages					Age <5 years									
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Current week	Previous 52 weeks		Cum 2007	Cum 2006
	Med	Max				Med	Max				Med	Max			
United States	18	46	256	1,909	2,032	3	8	35	356	334	131	201	310	8,773	8,099
New England	—	2	12	87	108	—	0	3	11	3	2	5	13	223	172
Connecticut	—	1	5	50	82	—	0	2	4	—	—	0	10	28	37
Maine‡	—	0	2	9	6	—	0	2	2	1	—	0	2	9	8
Massachusetts	—	0	0	—	—	—	0	0	—	—	—	3	8	132	105
New Hampshire	—	0	0	—	—	—	0	0	—	—	1	0	3	26	11
Rhode Island‡	—	0	4	15	9	—	0	1	3	—	1	0	5	26	9
Vermont‡	—	0	2	13	11	—	0	1	2	2	—	0	1	2	2
Mid. Atlantic	—	2	9	102	125	—	0	5	22	19	6	28	44	1,274	983
New Jersey	—	0	0	—	—	—	0	0	—	—	—	4	8	170	148
New York (Upstate)	—	1	5	35	40	—	0	4	7	9	5	3	14	118	129
New York City	—	0	0	—	—	—	0	0	—	—	—	17	34	783	476
Pennsylvania	—	2	6	67	85	—	0	2	15	10	1	4	10	203	230
E.N. Central	3	9	40	444	432	1	2	7	65	72	6	15	27	650	745
Illinois	—	0	4	16	22	—	0	1	2	6	—	7	13	291	361
Indiana	—	3	31	121	119	1	0	5	23	19	—	1	6	45	79
Michigan	—	0	1	2	16	—	0	1	1	2	—	2	9	101	97
Ohio	3	5	38	305	275	—	1	5	39	45	6	4	9	166	150
Wisconsin	N	0	0	N	N	—	0	0	—	—	—	1	4	47	58
W.N. Central	—	2	124	119	87	—	0	15	9	13	1	7	14	297	250
Iowa	—	0	0	—	—	—	0	0	—	—	—	0	3	15	18
Kansas	—	0	11	63	—	—	0	2	5	—	—	0	2	18	22
Minnesota	—	0	123	—	51	—	0	14	—	10	—	1	4	62	43
Missouri	—	1	5	47	34	—	0	0	—	3	1	4	11	193	147
Nebraska‡	—	0	1	2	1	—	0	0	—	—	—	0	1	2	7
North Dakota	—	0	0	—	—	—	0	0	—	—	—	0	0	—	1
South Dakota	—	0	3	7	1	—	0	1	4	—	—	0	3	7	12
S. Atlantic	11	20	59	845	965	2	4	15	182	156	47	49	180	2,081	1,815
Delaware	—	0	1	8	—	—	0	1	2	—	3	0	3	15	16
Dist. of Columbia	—	0	1	5	24	—	0	0	—	2	—	3	12	141	102
Florida	9	11	29	487	514	1	2	8	104	100	25	17	44	787	626
Georgia	2	7	17	291	329	—	1	10	68	54	—	7	153	320	328
Maryland‡	—	0	1	1	—	—	0	0	—	—	7	6	15	263	255
North Carolina	—	0	0	—	—	—	0	0	—	—	3	5	23	279	257
South Carolina‡	—	0	0	—	—	—	0	0	—	—	—	2	11	83	58
Virginia‡	N	0	0	N	N	—	0	0	—	—	9	4	16	188	164
West Virginia	—	1	17	53	98	—	0	1	8	—	—	0	1	5	9
E.S. Central	2	3	9	137	163	—	0	3	30	29	18	17	30	754	617
Alabama‡	N	0	0	N	N	—	0	0	—	—	4	7	16	302	276
Kentucky	1	0	2	20	32	—	0	1	2	6	1	1	7	51	61
Mississippi	—	0	2	—	22	—	0	0	—	—	4	2	9	92	65
Tennessee‡	1	2	8	117	109	—	0	3	28	23	9	7	14	309	215
W.S. Central	1	2	12	123	70	—	0	3	17	7	25	35	55	1,547	1,333
Arkansas‡	1	0	1	3	10	—	0	0	—	2	2	2	10	107	64
Louisiana	—	1	4	52	60	—	0	2	7	5	—	9	23	391	270
Oklahoma	—	0	10	68	—	—	0	2	10	—	1	1	4	49	60
Texas‡	—	0	0	—	—	—	0	0	—	—	22	21	39	1,000	939
Mountain	1	1	6	52	82	—	0	3	17	35	22	7	19	316	423
Arizona	—	0	0	—	—	—	0	0	—	—	22	3	12	147	163
Colorado	—	0	0	—	—	—	0	0	—	—	—	1	5	31	60
Idaho‡	N	0	0	N	N	—	0	0	—	—	—	0	1	1	3
Montana‡	—	0	0	—	—	—	0	0	—	—	—	0	2	3	1
Nevada‡	—	0	3	18	16	—	0	2	5	2	—	2	6	87	116
New Mexico‡	—	0	0	—	—	—	0	0	—	—	—	1	7	38	65
Utah	1	0	6	20	34	—	0	3	10	23	—	0	2	6	15
Wyoming‡	—	0	2	14	32	—	0	1	2	10	—	0	1	3	—
Pacific	—	0	0	—	—	—	0	1	3	—	4	39	58	1,631	1,761
Alaska	—	0	0	—	—	—	0	0	—	—	—	0	1	7	10
California	N	0	0	N	N	—	0	0	—	—	4	36	55	1,488	1,564
Hawaii	—	0	0	—	—	—	0	1	3	—	—	0	2	7	16
Oregon‡	N	0	0	N	N	—	0	0	—	—	—	0	6	14	17
Washington	N	0	0	N	N	—	0	0	—	—	—	2	12	115	154
American Samoa	U	0	0	U	U	U	0	1	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	N	0	0	N	N	—	0	0	—	—	—	0	1	3	—
Puerto Rico	N	0	0	N	N	—	0	0	—	—	1	3	10	134	124
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Incidence data for reporting year 2007 are provisional.

† Includes cases of invasive pneumococcal disease caused by drug-resistant *S. pneumoniae* (DRSP) (NNDSS event code 11720).

‡ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending November 3, 2007, and November 4, 2006 (44th Week)*

Reporting area	Varicella (chickenpox)					West Nile virus disease [†]									
	Current week	Previous 52 weeks		Cum 2007	Cum 2006	Neuroinvasive			Nonneuroinvasive [‡]						
		Med	Max			Current week	Previous 52 weeks	Cum 2007	Cum 2006	Current week	Previous 52 weeks	Cum 2007	Cum 2006		
United States	333	778	2,813	28,751	37,810	—	1	130	1,064	1,485	1	2	290	2,201	2,764
New England	6	15	124	589	3,644	—	0	2	7	9	—	0	2	5	3
Connecticut	—	0	76	2	1,365	—	0	2	4	7	—	0	1	1	2
Maine [§]	—	0	7	—	204	—	0	0	—	—	—	0	0	—	—
Massachusetts	—	0	1	—	1,141	—	0	2	3	2	—	0	2	3	1
New Hampshire	2	7	14	281	347	—	0	0	—	—	—	0	0	—	—
Rhode Island [§]	—	0	0	—	—	—	0	0	—	—	—	0	1	1	—
Vermont [§]	4	6	66	306	587	—	0	0	—	—	—	0	0	—	—
Mid. Atlantic	1	98	195	3,308	4,192	—	0	3	18	26	—	0	1	5	12
New Jersey	N	0	0	N	N	—	0	1	1	2	—	0	0	—	3
New York (Upstate)	N	0	0	N	N	—	0	0	—	8	—	0	0	—	4
New York City	—	0	0	—	—	—	0	3	12	8	—	0	1	2	4
Pennsylvania	1	98	195	3,308	4,192	—	0	1	5	8	—	0	1	3	1
E.N. Central	101	214	568	8,101	12,237	—	0	18	100	244	—	0	11	57	174
Illinois	—	2	11	114	123	—	0	13	58	127	—	0	8	35	88
Indiana	—	0	0	—	—	—	0	4	12	27	—	0	2	10	53
Michigan	14	88	258	3,279	3,926	—	0	5	13	43	—	0	0	—	12
Ohio	87	91	449	3,870	7,312	—	0	4	12	36	—	0	3	7	11
Wisconsin	—	19	80	838	876	—	0	2	5	11	—	0	1	5	10
W.N. Central	21	33	136	1,383	1,485	—	0	40	233	223	—	0	114	705	484
Iowa	N	0	0	N	N	—	0	4	10	22	—	0	3	14	15
Kansas	6	8	52	456	281	—	0	3	11	17	—	0	7	26	13
Minnesota	—	0	0	—	—	—	0	11	42	31	—	0	11	57	34
Missouri	15	15	78	780	1,087	—	0	9	55	51	—	0	2	11	11
Nebraska [§]	N	0	0	N	N	—	0	5	18	44	—	0	15	126	219
North Dakota	—	0	60	84	45	—	0	11	49	20	—	0	47	312	117
South Dakota	—	1	15	63	72	—	0	9	48	38	—	0	32	159	75
S. Atlantic	56	97	239	4,176	3,832	—	0	12	40	18	—	0	6	32	14
Delaware	—	1	4	38	62	—	0	1	1	—	—	0	0	—	—
Dist. of Columbia	—	0	8	14	39	—	0	0	—	—	—	0	0	—	2
Florida	13	23	76	1,040	N	—	0	1	3	3	—	0	0	—	—
Georgia	N	0	0	N	N	—	0	8	23	2	—	0	4	23	6
Maryland [§]	N	0	0	N	N	—	0	2	6	10	—	0	2	4	1
North Carolina	—	0	0	—	—	—	0	1	3	1	—	0	1	2	—
South Carolina [§]	17	20	72	903	974	—	0	2	1	1	—	0	1	2	—
Virginia [§]	—	23	190	1,200	1,456	—	0	1	2	—	—	0	1	1	5
West Virginia	26	22	50	981	1,301	—	0	0	—	1	—	0	0	—	—
E.S. Central	10	8	571	483	28	—	0	11	64	118	—	0	13	87	98
Alabama [§]	10	8	571	480	26	—	0	2	16	8	—	0	1	4	—
Kentucky	N	0	0	N	N	—	0	1	3	5	—	0	0	—	1
Mississippi	—	0	2	3	2	—	0	7	41	89	—	0	11	80	91
Tennessee [§]	N	0	0	N	N	—	0	1	4	16	—	0	1	3	6
W.S. Central	122	156	1,640	8,537	10,019	—	0	27	195	370	—	0	13	81	234
Arkansas [§]	—	11	105	593	798	—	0	5	13	24	—	0	2	6	5
Louisiana	—	1	11	99	193	—	0	5	20	90	—	0	3	9	87
Oklahoma	—	0	0	—	—	—	0	10	50	27	—	0	7	38	21
Texas [§]	122	149	1,534	7,845	9,028	—	0	16	112	229	—	0	5	28	121
Mountain	16	54	131	2,140	2,373	—	0	35	254	389	—	1	139	993	1,483
Arizona [§]	—	0	0	—	—	—	0	6	35	64	—	0	12	48	78
Colorado [§]	—	21	62	825	1,248	—	0	17	96	66	—	0	65	459	279
Idaho [§]	N	0	0	N	N	—	0	2	8	139	—	0	19	101	857
Montana [§]	7	6	40	341	N	—	0	10	36	12	—	0	30	159	21
Nevada [§]	—	0	1	1	9	—	0	1	1	34	—	0	3	10	90
New Mexico [§]	—	5	37	309	327	—	0	8	38	3	—	0	6	22	5
Utah	9	13	73	630	734	—	0	8	25	56	—	0	7	29	102
Wyoming [§]	—	0	9	34	57	—	0	4	15	15	—	0	33	165	50
Pacific	—	0	9	34	—	—	0	17	153	88	—	1	22	236	262
Alaska	—	0	9	34	N	—	0	0	—	—	—	0	0	—	—
California	—	0	0	—	N	—	0	17	149	81	1	0	21	218	197
Hawaii	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Oregon [§]	N	0	0	N	N	—	0	1	4	7	—	0	4	18	62
Washington	N	0	0	N	N	—	0	0	—	—	—	0	0	—	3
American Samoa	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U
C.N.M.I.	U	—	—	U	U	U	—	—	U	U	U	—	—	U	U
Guam	—	5	30	168	219	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	11	30	467	504	—	0	0	—	—	—	0	0	—	—
U.S. Virgin Islands	U	0	0	U	U	U	0	0	U	U	U	0	0	U	U

C.N.M.I. = Commonwealth of Northern Mariana Islands.

U. Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

† Incidence data for reporting year 2007 are provisional.

‡ Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for California serogroup, eastern equine, Powassan, St. Louis, and western equine diseases are available in Table I.

§ Not notifiable in all states. Data from states where the condition is not notifiable are excluded from this table, except in 2007 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at <http://www.cdc.gov/epo/dphs/phs/infls.htm>.

¶ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE III. Deaths in 122 U.S. cities.* week ending November 3, 2007 (44th Week)

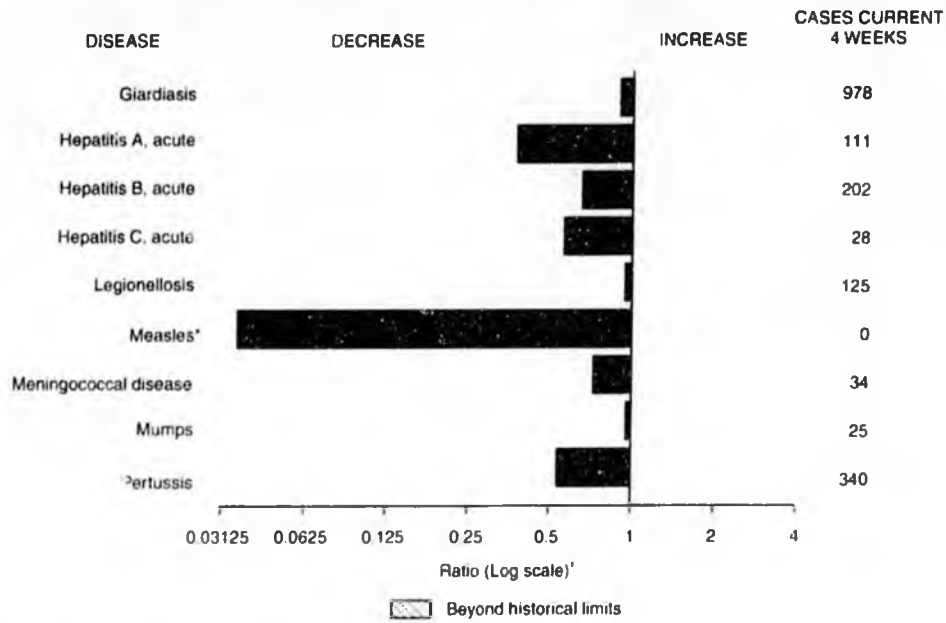
Reporting Area	All causes, by age (years)							P&I [†] Total	Reporting Area	All causes, by age (years)							P&I [†] Total
	All Ages	>65	45-64	25-44	1-24	<1	All Ages			>65	45-64	25-44	1-24	<1			
New England	502	345	109	30	7	11	47	S. Atlantic	1,069	640	263	85	37	44	58		
Boston, MA	117	78	22	7	6	4	10	Atlanta, GA	110	53	28	14	7	8	6		
Bridgeport, CT	26	11	13	2	—	—	2	Baltimore, MD	145	85	40	8	6	6	18		
Cambridge, MA	16	13	3	—	—	—	2	Charlotte, NC	115	66	27	13	5	4	12		
Fall River, MA	12	10	1	1	—	—	—	Orlando, FL	176	96	48	17	4	4	4		
Hartford, CT	61	42	16	3	—	—	10	Orlando, FL	105	69	20	9	4	3	4		
Lowell, MA	18	13	1	3	—	1	2	Norfolk, VA	53	39	11	—	—	3	2		
Lynn, MA	10	4	5	1	—	—	2	Richmond, VA	56	27	22	5	2	—	2		
New Bedford, MA	29	28	1	—	—	—	2	Savannah, GA	52	27	19	5	1	—	3		
New Haven, CT	19	13	4	—	1	1	4	St. Petersburg, FL	55	38	8	3	3	3	1		
Providence, RI	63	43	10	8	—	2	—	Tampa, FL	185	126	38	10	5	6	8		
Somerville, MA	5	4	1	—	—	—	—	Washington, D.C.	U	U	U	U	U	U	U		
Springfield, MA	52	33	14	3	—	2	5	Wilmington, DE	17	14	2	1	—	—	—		
Waterbury, CT	16	11	5	—	—	—	1	E.S. Central	761	506	172	52	18	13	55		
Worcester, MA	58	42	13	2	—	1	7	Birmingham, AL	162	121	29	4	8	—	18		
Mid. Atlantic	1,916	1,307	417	119	41	30	76	Chattanooga, TN	60	42	11	4	—	3	3		
Albany, NY	42	30	11	—	1	—	—	Knoxville, TN	120	85	26	8	—	1	10		
Allentown, PA	21	19	2	—	—	—	—	Lexington, KY	86	51	24	6	—	5	4		
Buffalo, NY	56	41	10	1	2	2	2	Memphis, TN	116	74	27	12	3	—	9		
Camden, NJ	23	11	5	4	3	—	—	Mobile, AL	25	17	3	4	1	—	2		
Elizabeth, NJ	17	15	2	—	—	—	3	Montgomery, AL	48	37	9	1	1	—	2		
Erie, PA	41	35	3	3	—	—	2	Nashville, TN	144	79	43	13	5	4	7		
Jersey City, NJ	19	10	5	4	—	—	2	W.S. Central	1,366	847	336	79	47	57	83		
New York City, NY	981	689	205	64	11	10	31	Austin, TX	75	48	20	3	2	2	6		
Newark, NJ	37	15	12	4	4	—	1	Baton Rouge, LA	61	29	10	12	10	—	—		
Paterson, NJ	30	11	9	4	1	5	3	Corpus Christi, TX	43	33	3	3	—	4	3		
Philadelphia, PA	276	155	81	20	15	5	11	Dallas, TX	186	95	57	12	7	15	8		
Pittsburgh, PA [†]	31	22	6	1	2	—	1	El Paso, TX	99	74	12	8	2	3	2		
Reading, PA	12	25	4	2	—	1	—	Fort Worth, TX	110	65	32	3	2	8	9		
Rochester, NY	116	111	25	8	—	2	11	Houston, TX	313	189	92	14	6	12	21		
Schenectady, NY	23	15	7	—	1	—	2	Little Rock, AR	64	33	22	4	4	1	—		
Scranton, PA	16	12	5	—	—	1	—	New Orleans, LA [†]	U	U	U	U	U	U	U		
Syracuse, NY	57	42	12	1	—	2	2	San Antonio, TX	221	151	44	11	8	7	20		
Trenton, NJ	30	20	7	3	—	—	1	Shreveport, LA	64	42	13	4	1	4	7		
Utica, NY	17	13	4	—	—	—	1	Tulsa, OK	130	88	31	5	5	1	7		
Yonkers, NY	19	18	2	—	1	—	3	Mountain	976	644	200	80	26	24	58		
E.N. Central	2,051	1,312	516	119	60	43	128	Albuquerque, NM	94	64	17	5	4	4	3		
Akron, OH	59	35	11	1	12	—	1	Boise, ID	59	37	16	3	1	2	3		
Canton, OH	44	32	11	1	—	—	3	Colorado Springs, CO	80	51	15	11	2	1	4		
Chicago, IL	323	181	87	31	12	11	28	Denver, CO	73	48	18	4	1	2	7		
Cincinnati, OH	90	52	24	8	—	6	14	Las Vegas, NV	275	189	58	20	6	2	15		
Cleveland, OH	212	144	50	11	5	2	6	Ogden, UT	28	18	5	4	1	—	5		
Columbus, OH	173	109	52	6	2	4	9	Phoenix, AZ	119	68	21	19	8	1	6		
Dayton, OH	126	97	17	6	4	2	7	Pueblo, CO	41	29	8	4	—	—	1		
Detroit, MI	166	77	66	11	7	5	9	Salt Lake City, UT	113	69	27	4	1	12	12		
Evansville, IN	45	35	6	4	—	—	4	Tucson, AZ	94	71	15	6	2	—	2		
Fort Wayne, IN	58	39	15	3	1	—	4	Pacific	1,215	811	274	76	22	31	83		
Gary, IN	12	5	5	2	—	—	1	Berkeley, CA	17	11	3	2	—	1	2		
Grand Rapids, MI	57	39	15	2	1	—	4	Fresno, CA	U	U	U	U	U	U	U		
Indianapolis, IN	174	108	45	8	6	7	10	Glendale, CA	U	U	U	U	U	U	U		
Lansing, MI	50	36	12	2	—	—	4	Honolulu, HI	64	51	9	3	—	1	5		
Milwaukee, WI	104	57	29	8	7	3	—	Long Beach, CA	61	41	12	4	2	2	8		
Peoria, IL	55	44	11	—	—	—	9	Los Angeles, CA	U	U	U	U	U	U	U		
Rockford, IL	39	29	8	1	1	—	—	Pasadena, CA	28	20	5	1	1	1	6		
South Bend, IN	74	53	17	3	—	1	4	Portland, OR	117	74	26	9	3	5	11		
Toledo, OH	116	80	24	9	1	2	5	Sacramento, CA	183	121	44	12	1	5	14		
Youngstown, OH	74	60	11	2	1	—	6	San Diego, CA	165	110	32	14	4	4	6		
W.N. Central	580	368	150	36	14	11	40	San Francisco, CA	113	64	34	6	3	6	9		
Des Moines, IA	58	48	8	2	—	—	5	San Jose, CA	173	122	35	11	3	2	12		
Duluth, MN	28	17	11	—	—	—	3	Santa Cruz, CA	32	25	7	—	—	—	3		
Kansas City, KS	22	11	7	1	3	—	—	Seattle, WA	114	67	37	5	1	4	5		
Kansas City, MO	78	49	19	5	3	2	9	Spokane, WA	53	39	13	1	—	—	2		
Lincoln, NE	39	31	7	1	—	—	6	Tacoma, WA	95	66	17	8	4	—	—		
Minneapolis, MN	61	32	20	4	1	4	5	Total	10,436**	6,780	2,437	676	272	264	628		
Omaha, NE	80	48	22	8	1	1	9										
St. Louis, MO	77	43	22	8	2	2	1										
St. Paul, MN	65	42	17	3	1	2	2										
Wichita, KS	72	47	17	4	3	—	—										

U: Unavailable. — No reported cases.

* Mortality data in this table are voluntarily reported from 122 cities in the United States, most of which have populations of $\geq 100,000$. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.[†] Pneumonia and influenza.[‡] Because of changes in reporting methods in this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.[§] Because of Hurricane Katrina, weekly reporting of deaths has been temporarily disrupted.

** Total includes unknown ages.

FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals November 3, 2007, with historical data



* No measles cases were reported for the current 4-week period yielding a ratio for week 44 of zero (0).

† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

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Dairy Foods Science Notes

BASIC DAIRY BACTERIOLOGY

DEFINITION

Bacteria are single celled organisms that can only be seen with the aid of a microscope ("microorganisms"). All processes needed for life occur within a single cell. Bacteria are considered *procarvotes*. Their basic cell structure differs from cells of plants and animals (*eucaryotes*); for example they lack a true nucleus and have a unique cell wall. Bacteria can be found wherever life exists; some are considered useful, such as those responsible for nutrient conversion (e.g., decomposition) and food fermentation (e.g., cheese), while others are considered harmful, such as those responsible for food spoilage and disease. Individual bacteria are named by *Genus* and *species* (e.g., *Bacillus cereus*), as are all living organisms. They are classified according to their appearance and general structure and by specific characteristics of their metabolism and growth, including nutrient requirements, growth temperatures, oxygen requirements, by their ability to use specific substrates (e.g., certain sugars), and by specific by-products of their metabolism. Currently, genetic profiling techniques have become standard tools in the identification/classification of bacteria, often beyond species level (e.g., *su1* -species, allelic types). There are literally thousands of species of bacteria, though only select groups are of concern to the dairy industry. The following will describe the general characteristics important for characterizing bacteria that are common in milk and dairy products. Although not specifically covered, comments pertaining to dairy fungi (yeast & molds) are included.

GENERAL CHARACTERISTICS

Appearance - Size and Shape:

To actually see bacteria, a microscope is required, generally one with a magnification of 1000X. Bacteria are measured in microns (1 micron = 1/1000 mm = 1/25,000 inch). When a standard light microscope is used, bacterial cells are normally stained to make them easier to see. Bacteria can be observed in milk by staining a dried milk smear on a microscope slide with a specific "milk-stain" (e.g., Levowitz-Weber Stain). Bacteria grown in a petri-dish (e.g., on a semi-solid nutrient "agar" media) or in a nutrient broth, can be smeared and dried on a slide and stained with a simple stain (e.g., methylene blue) or complex stain (see *gram-stain*, next page) for observation. Bacteria exist in a variety of shapes, sizes and arrangements, which are defining characteristics for most types. Typical shapes, sizes & arrangements of bacteria that might be seen in milk and dairy products are:

Cocci ----- Spherical cells, 0.4 - 1.5 microns. Occur as single cells, pairs, chains or clusters.
(e.g., Genera - *Streptococcus*, *Staphylococcus*).

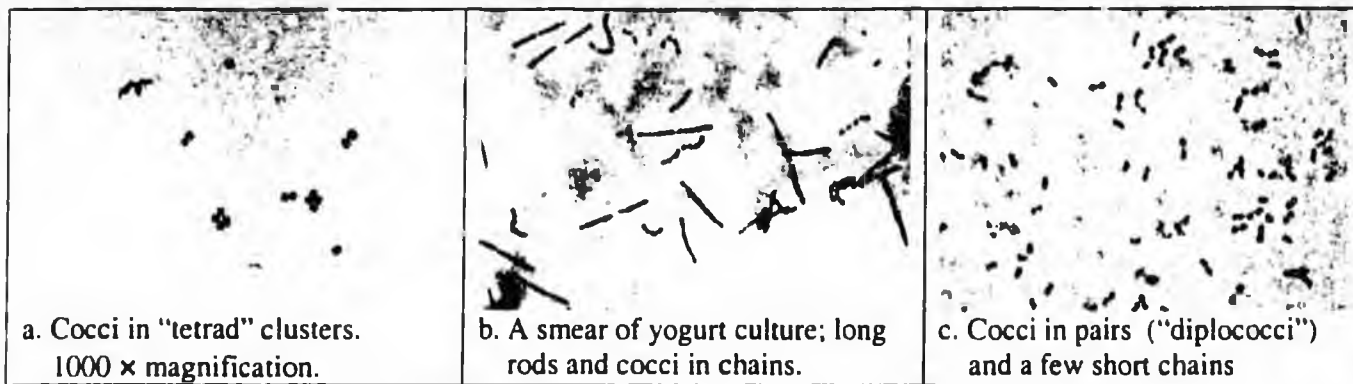


Bacilli ----- Rod shaped, 0.5 - 30 microns. Occur as single cells, pairs or chains (e.g., Genera - *Lactobacillus*, *Bacillus*, *Pseudomonas*).



Spirilla -- Spiral or helical shaped rods of varied size. Generally are not very common in milk.
(e.g., Genus - *Campylobacter*).

Milk smears under the microscope stained with Levowitz-Weber Stain:



Gram-Stain Reaction:

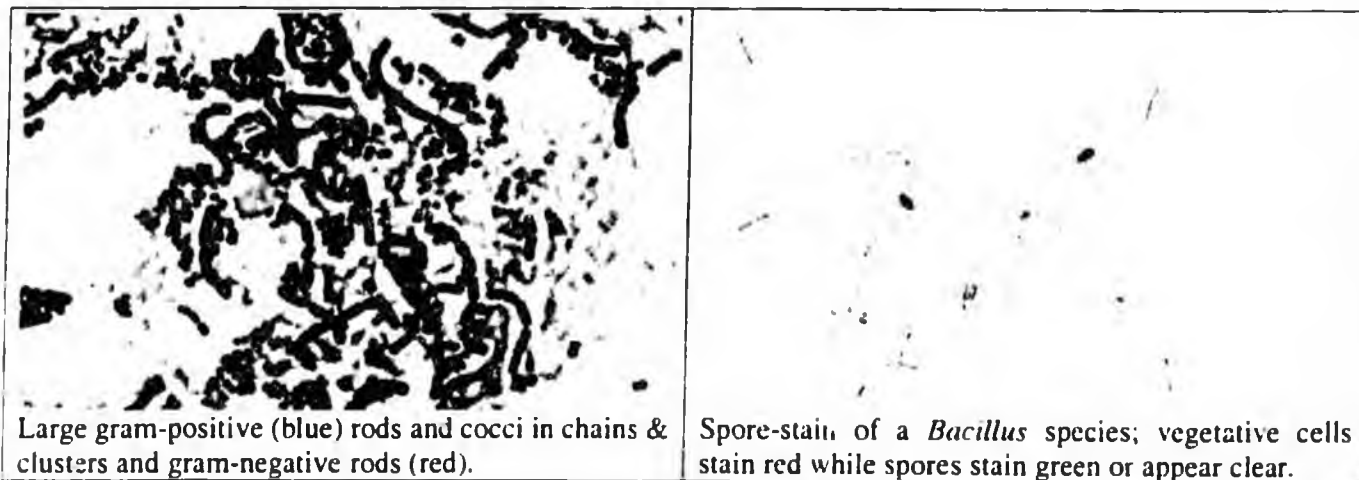
Most bacteria are classified as either "gram-positive" or "gram-negative." This is typically determined by the **gram-stain procedure**, which is used to view and differentiate bacteria under the microscope; it is one of the first steps used when classifying bacteria. The gram-stain is a four step procedure with Crystal Violet (blue) and Safranin (red) as the primary stains. Depending on the characteristics of the bacteria (e.g., cell wall structure), they will stain either blue (gram-positive) or red (gram-negative). In some cases an organism classified as "gram-positive" may stain red or appear grainy with blue and red shades. These organisms may be referred to as "gram-variable":

Gram-positive (blue) ... e.g., *Bacillus* (rod), *Streptococcus* (cocci), *Staphylococcus* (cocci)

Gram-negative (red) e.g., *Pseudomonas* (rods), *E. coli* & other coliform bacteria (rods)

Gram-variable Stain blue or red depending on conditions; most are truly Gram-pos.

There are a few generalizations based on the gram-stain reaction that can be made of microorganisms common to dairy products. For example, gram-negative bacteria do not survive pasteurization; bacteria that do survive are gram-positive (but not all gram-positive survive); certain gram-negative bacteria, if present, will spoil milk faster under refrigeration compared to gram-positive spoilage organisms; certain antibiotics are more effective against gram-positive than gram negative bacteria.



Endospore (Spore) Formation:



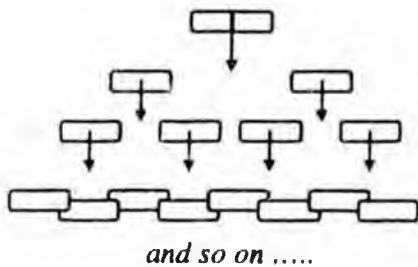
Endospores, or "spores," are protective, dormant structures that allow an organism to survive under adverse conditions. When conditions become unfavorable (e.g., lack of nutrients), vegetative growth ("multiplication") stops and "spores" begin to form within the cell. During sporulation a thick coating develops and encases the cell's genetic material. Spores forming inside a cell may be seen as swollen,

possibly clear, areas or may not be apparent at all. Special spore stains facilitate seeing spores under the microscope (see page 2). Bacterial spores released from the cell have increased resistance to heat, drying, nutrient deprivation, chemicals, sanitizers, and other conditions that would normally kill the vegetative, actively growing cell. Spores can remain dormant for extended periods of time (e.g., for years). When conditions become favorable, a spore can "germinate" and return to an actively growing state. Spores may be "activated" into growth by heat or some other "trigger." Spores are produced by only few select groups of bacteria. Bacteria in the genera *Bacillus*, *Paenebacillus*, *Geobacillus* and *Clostridium* are common gram-positive, spore-forming rods, which have some importance to dairy. Some strains stain gram-variable. Spores are commonly found in soil and other environmental sources.

BACTERIAL REPRODUCTION (GROWTH)

Bacteria reproduce by a process known as **Binary Fission**; one cell divides into two cells, each of which divides into two more cells and so on. **Bacterial Growth** is defined as an increase in cell numbers or cell mass. **Growth Rate** is the change in cell numbers per unit time. The time it takes for a bacterial population to double or go through one reproductive cycle is called the **Generation Time**. Generation times vary with each organism and are dependent on nutrient availability and environmental conditions (e.g., temperature). Under optimum conditions for growth, generation times may be as short as 10 to 20 minutes for some bacteria. When conditions are less favorable for growth, such as when temperatures are low, generation times will be longer (growth rate is slower), sometimes dramatically (e.g., it may take days for one cell division).

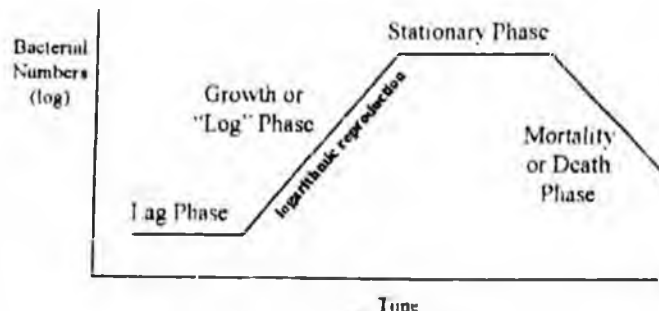
**If One Bacterial Cell Reproduced Every Hour
in 24 Hours There Would Be ~17,000,000 Cells**



Hour	Count	Hour	Count
0	1	9	512
1	2	10	1,024
2	4	11	2,048
3	8	12	4,096
4	16	:	:
5	32	18	262,144
6	64	:	:
7	128	:	:
8	256	24	~17,000,000

During cell division, bacteria may not totally separate from each other. Some bacteria divide in one specific direction. With cocci (spherical bacteria), this type of cell division can result in pairs (diplococci) or chains (streptococci) that are characterizing features of certain bacteria. Other bacteria divide in several directions, resulting in tetrads or clumps. Rods generally divide in one direction resulting in pairs or chains connected end to end. Examples of cell arrangements are on page 1 & 2.

Bacterial Growth Curve: When bacteria are presented into a new growth environment, they often first go through a **lag phase** or adjustment period where no growth is apparent. This is followed by the active **exponential or logarithmic growth phase**. As the environment changes (e.g., nutrients deplete, inhibitors develop), growth will level off to a **Stationary Phase**, after which cells will then begin to die off (**Death Phase**).



periods of time. Yeast and molds generally require less water for growth than bacteria, which is why foods such as jams and jellies are only spoiled by these types of microorganisms.

Oxygen Requirements:

Some bacteria require oxygen while other bacteria will not grow in its presence. In fact, oxygen may actually be toxic to certain bacteria. Bacteria are classified based on their requirement for the presence or absence of oxygen as follows:

Aerobic - requires the presence of oxygen for growth.

Anaerobic - requires the absence of oxygen for growth (oxygen may be lethal).

Facultative Anaerobic - can grow with or without oxygen.

Milk contains dissolved oxygen, thus it supports the growth of aerobic and facultatively anaerobic microorganisms. Rarely do strict anaerobes grow in milk. Cheese may have a reduced oxygen environment due to the growth of culture bacteria. An oxygen-free environment may occur in the center of some cheeses allowing the growth of certain anaerobic bacteria, some of which cause serious defects (e.g., late gas-blowing). *Clostridium botulinum* is an anaerobe that produces a deadly toxin that has rarely been associated with dairy foods. Some bacteria such as certain starter cultures are considered "microaerophilic," meaning they grow best in lower levels of oxygen.

The Presence of Inhibitors:

There are a number of chemical substances that can inhibit the growth of (*bacteriostatic*) or kill (*bactericidal*) bacteria. Some examples relevant to dairy microbiology are drugs or antibiotics, lactoferrin (natural in raw milk), carbon dioxide, lysozyme (an enzyme), sanitizers, organic acids, preservatives (e.g., potassium sorbate) and natural inhibitors formed by microorganisms (e.g., nisin).

Temperatures for Growth:

The optimum temperature for growth for a bacterium is the temperature where its generation time is shortest or it grows the fastest. Each bacterium has a minimum and maximum temperature for growth, which will vary between species and strains and with other environmental conditions. Outside of this range, growth does not occur. Bacteria are often grouped based on their optimum, minimum and maximum temperatures for growth. These are not rigid ranges as some bacterial species may overlap into adjacent groups. General groupings of bacteria and approximate ranges are as follows:

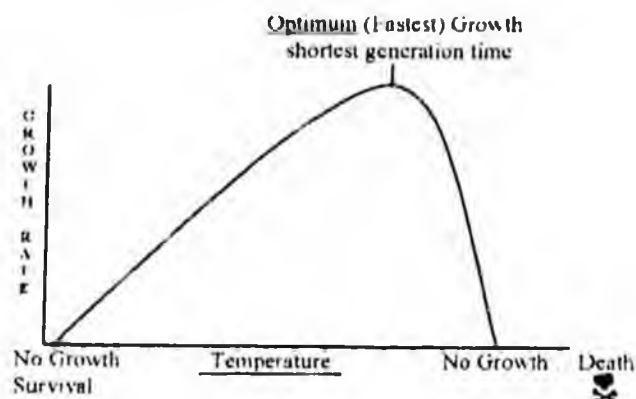
Thermophilic ... Min: 104°F (40°C)
 "Heat Loving" Max: 140°F (>60°C)
 Opt: 122-131°F (50-55°C)

Mesophilic Min: 41°F (5°C)
 Medium Temps Max: 122°F (50°C)
 Opt: 86-98°F (30-37°C)

Psychrophilic ... Min: 32°F (0°C) or less,
 "Cold Loving" Max: 77°F (25°C)
 Opt: <69°F (<20°C)

Psychrotrophs:

The types of bacteria that are of most significance to the dairy industry are those that can grow under refrigeration conditions. "Cold Tolerant" organisms capable of growth at temperatures at or below 7°C (44.6°F), regardless of their optimum temperatures are generally referred to as Psychrotrophs or Psychrotolerant (the term currently used by microbiologists to describe this group). "Mesophilic" bacteria (medium optimum temp.) that grow under refrigeration would be considered *psychrotrophs*.



Regardless of the range of temperatures for growth, temperatures colder than the optimum for an organism will generally increase the generation time or slow its growth. When temperatures approach the freezing point of water (32°F/0°C), growth of most microorganisms is prevented, although a few organisms will continue to grow very, very slowly at or even below freezing. Most microorganisms will survive freezing (without growth), depending on the medium that they are frozen in. When temperatures exceed the maximum growth temperature for an organism, growth stops. When temperatures are increased further, they eventually become lethal. Heat is often used to inactivate or kill microorganisms (e.g., as in pasteurization); generally, higher temperatures result in greater kill.

Temperature versus Generation Time

(example of one organism studied)

<u>Temperature</u>	<u>Generation Time</u>
37°C (100°F)	20 Minutes
32°C (90°F)	25 Minutes
27°C (80°F)	40 Minutes
21°C (70°F)	60 Minutes
16°C (60°F)	150 Minutes
10°C (50°F)	12 Hours
4.4°C (40°F)	>24 Hours

BACTERIA OF CONCERN IN FLUID MILK

Pathogenic/Foodborne Illness Bacteria:

Pasteurization was originally designed to destroy pathogenic bacteria that caused tuberculosis, brucellosis, typhoid and Q-fever, illnesses that were often associated with the consumption of raw milk. Milk pasteurization, coupled with improved animal husbandry procedures, has virtually eliminated most of these types of illnesses. Raw milk may also harbor other organisms associated with foodborne illness, including *Salmonella*, *Listeria*, *Campylobacter*, *Yersinia* and certain strains of *E. coli*. These organisms are also killed by pasteurization. However, cross-contamination of processed dairy products with raw milk and/or the direct consumption of raw milk have resulted in relatively recent outbreaks of foodborne illnesses involving these organisms. Pasteurized milk products can also be contaminated from poor processing and handling conditions and poor worker hygiene.

Pathogens of Historical Significance (currently rare)

<i>Coxiella burnetii</i>	Q-fever, flu-like
<i>Mycobacterium spp.</i>	Tuberculosis
<i>Brucella abortus</i>	Brucellosis, abortions
<i>Salmonella typhi</i>	Typhoid fever
<i>Streptococcus spp.</i>	Septic sore throat
<i>Corynebacterium diphtheriae</i> .	Diphtheria

Pathogens Associated with more Recent Outbreaks

<i>Salmonella spp.</i>	GI* illness, secondary**
<i>Campylobacter jejuni</i>	GI illness, secondary
<i>Yersinia enterocolitica</i> ...	GI, pseudo-appendicitis
<i>E. coli</i> (O157:H7)	GI (hemorrhagic), HUS (kidney failure)
<i>Listeria monocytogenes</i> ..	GI* illness, meningitis, sepsis, stillbirths

For more information on Foodborne Pathogens:
<http://www.cfsan.fda.gov/~mow/intro.html>

* GI = gastro-intestinal illness; symptoms may include nausea, vomiting, diarrhea, cramps & sometimes fever & chills.

** Secondary = non-GI symptoms may follow, e.g., arthritic rxn

Mastitis Causing Bacteria:

Bacteria that can cause *mastitis*, an infection of the mammary gland of dairy cattle, include contagious (e.g., *Staphylococcus aureus*, *Streptococcus agalactiae*) and environmental (e.g., coliforms) organisms. Mastitis can result in increased somatic cell counts (white blood cells) and in some cases, increased bacteria counts in the bulk milk, both of which result in decreased milk quality. For more information on mastitis visit the National Mastitis Council (<http://www.nmconline.org>).

Psychrotrophic (Psychrotolerant) Bacteria:

Psychrotrophic or psychrotolerant bacteria are capable of growing at 7°C (44.6°F) or less. Psychrotrophs are of primary concern to the dairy industry since they grow and cause spoilage in raw or processed dairy products commonly held under refrigeration.

- a) The most commonly occurring psychrotrophs in milk are gram-negative rods, many belonging to the genus *Pseudomonas*. Gram-negative psychrotrophs generally do not survive pasteurization, thus they occur in processed milk as post-pasteurization contaminants (PPC).
- b) Psychrotrophs are common in the dairy environment. Milk soils (e.g., on dirty equipment) can support the growth of psychrotrophs and other contaminants that can contaminate subsequent milk. Marginal cooling can result in relatively large numbers of these organisms in milk. Psychrotrophs may also be present in low numbers in untreated water supplies used for rinsing dairy equipment.
- c) Psychrotrophic bacteria produce a variety of enzymes that cause chemical deterioration of milk resulting in off-flavors. Some of these enzymes are not inactivated by pasteurization or by other heat treatments and may continue to degrade milk products, even when the bacterium is destroyed. This has been shown to be a concern with shelf-stable (Ultra-High Temperature) milk, but there is limited information relative to conventionally pasteurized milks.

Thermoduric Bacteria:

Thermoduric bacteria are a miscellaneous group of bacteria that are capable of surviving pasteurization or other heat treatments. As a general rule, all thermoduric bacteria are gram-positive. Spore-forming bacteria (e.g., *Bacillus*, *Paenibacillus*) comprise some of the most heat resistant bacteria.

- a) Chief sources of thermodurics in milk are poorly cleaned equipment including old rubber parts, areas of milkstone build-up, separators and other difficult to clean or neglected areas (soil build-up). They may contaminate milk at the farm or at the plant. Poor pre-milking hygiene procedures (e.g., dirty cows) may also influence thermoduric levels in raw milk, especially with spore-formers.
- b) High thermoduric counts in raw milk may result in counts that exceed legal limits in the pasteurized milk made from that raw milk (> 20,000 cfu/milliliter)
- c) Most thermodurics are not psychrotrophic, but some are. In the absence of gram-negative psychrotrophs, certain thermoduric bacteria may grow and cause spoilage of pasteurized milk. Heat Resistant Spore-Forming Psychrotrophs belonging to *Bacillus* & *Paenibacillus* are considered common thermoduric psychrotrophs that have become limiting factors in milk shelf-life.

Coliform Bacteria:

Coliform bacteria are defined as "aerobic or facultatively anaerobic, gram-negative rods, that ferment lactose with the production of acid and gas." These characteristics allow selective counting of these types of bacteria in milk and dairy products. They are considered "indicator organisms" because they are easy to detect and their presence in food & water indicate some form of contamination; e.g., the presence of "fecal" coliforms (*E. coli*) suggests the possibility of fecal contamination.

- a) They are called *Coliforms* because some members of the group are found in the intestines (colon) of warm-blooded animals (fecal coliforms). However, some coliform bacteria are common as environmental contaminants and/or are associated with other habitats (e.g., plant matter).
- b) Coliforms are almost always found in raw milk although with good production methods the numbers can be kept very low. Sources of coliform contamination can be dirty cows and manure, dirty equipment and, in some cases, cows with coliform mastitis.
- c) Coliforms do not survive pasteurization. When detected in processed milk or dairy products, they indicate recontamination after pasteurization (Post-Pasteurization Contamination).

SELECT ORGANISMS COMMON TO MILK & DAIRY PRODUCTS:

<u>Grouping/Organisms</u>	<u>General Characteristics and Importance to Milk or Milk Products</u>
<u>Gram-Positive Cocci:</u>	
<i>Enterococcus spp.</i>	Short chains or pairs of cells. "Fecal" streptococci (but are not coliform); common in fecal matter, but also in the dairy farm environment. Used as indicator organisms in some foods. Acid producers. Some strains have some heat resistance.
<i>Lactococcus lactis</i>	Short chains or pairs. "Lactic" streptococci; produce lactic acid. Some strains are used as "mesophilic" dairy starter cultures. Associated with raw milk poor cooling. Some strains produce a "malty" defect in milk as well as acid defect.
<i>Micrococcus spp.</i>	Irregular clusters or tetrads, cells tend to be larger. Associated with udder skin. Some strains are thermophilic and are associated with milk-stone on equipment.
<i>Staphylococcus aureus</i>	Single, pairs or irregular clusters. A cause of contagious mastitis. May cause food poisoning (toxin developed) if present in high numbers in foods.
<i>Streptococcus agalactiae</i>	Chains, often very long. May appear as chains of pairs or with oval cocci stretched with the chain. Cause of contagious mastitis.
<i>Streptococcus uberis</i>	Pairs and chains of moderate length. Considered a cause of environmental mastitis, though some evidence suggests that it may/can be spread cow to cow.
<i>Streptococcus salivarius</i> <i>sub-sp. thermophilus</i>	Chains, moderate to long. Dairy "thermophilic" starter culture (incubation ~110°F) used for making yogurt and certain cheeses.
<u>Gram-Positive Rods:</u>	
<i>Corynebacterium bovis</i>	Irregular shaped rods, some "club" shaped. Cause of bovine mastitis though some strains may be natural inhabitants of the skin and mucosal membranes.
<i>Lactobacillus delbrueckii</i> <i>sub-sp. bulgaricus</i>	Long rods, some chains. Dairy "thermophilic" starter culture (incubation ~110°F) used for making yogurt and certain cheese.
<i>Microbacterium lacticum</i>	Irregular rods, some "V-Forms." Thermophilic bacterium, some strains with relatively high heat resistance for a non-spore-former.
<u>Gram-Positive Rods, Spore-Forming:</u>	
<i>Bacillus cereus</i>	Relatively large, thick rods. Some strains are psychrotrophic. Some strains cause foodborne illness if allowed to grow to sufficient levels (toxin mediated).
<i>Bacillus spp.</i> (others)	Many different spore-forming <i>Bacillus spp.</i> in milk. Rods vary in size. Some are psychrotrophic, some are not. Some are gram-variable. Most are thermophilic in the spore state, but not as vegetative cells. Common in soil & dairy environment.
<i>Clostridium tyrobutyricum</i>	Anaerobic spore-former that causes "late gas blowing" defect in certain Swiss and Dutch style cheeses. Associated with poor silage and dirty cows.
<i>Paenibacillus spp</i>	Spore-former group with psychrotrophic strains that are important as a limiting factor to milk shelf-life. Most were previously classified as <i>Bacillus spp.</i>
<u>Gram-Negative Rods:</u>	
<i>Pseudomonas fluorescens</i> (also <i>P. putida</i> , <i>P. fragi</i>)	Rods, often in pairs end-to-end. Psychrotrophic bacterium that is a main cause of reduced shelf-life due to post-pasteurization contamination.
<i>Escherichia coli</i> (<i>E. coli</i>)	"Fecal Coliform" associated with manure/environmental contamination. Used as an indicator organism. Some pathogenic strains (e.g., O157:H7). May cause mastitis.
Coliform Bacteria	<i>Enterococcus</i> , <i>Citrobacter</i> , <i>Klebsiella</i> , <i>E. coli</i> . Associated with fecal & environmental contamination. Some strains are psychrotrophic. Some may cause mastitis.
Others - Psychrotrophs	A number of gram-negative psychrotrophs are reported in older literature, including <i>Acinetobacter</i> , <i>Achromobacter</i> , <i>Flavobacterium</i> .

For listing of potential human pathogens, see table on page 6 and refer to The Bad Bug Book (<http://www.cfsan.fda.gov/~mow/intro.html>)

BACTERIA IN RAW AND PROCESSED MILK

Bacteriological Standards:	Raw Producer Milk	100,000/milliliter (ml) total count
(For Grade "A" Milk)	Commingled Raw Milk	300,000/ml total count
	Pasteurized Milk	20,000/ml total count, 10 coliform

Raw Milk: Milk, when synthesized in the udder of a healthy cow is virtually sterile. As milk passes through the teat cistern and teat channel, it may be contaminated with low levels of bacteria (<1000/ml), which are generally not significant to milk quality & safety. Milk from a cow with mastitis (infection of the mammary gland) however, may harbor large numbers of the infectious bacteria. After it leaves the cow, milk may be contaminated from the exterior of the cow (dirty cows), the environment and poorly cleaned equipment. Poor cooling allows faster growth rates and can result in rapid increases in bacterial numbers in raw milk before it is processed. While the legal limit for bacteria in raw milk is 100,000/ml, the production of milk with bacteria counts less than 10,000/ml should be easily achievable for most farms.

Pasteurized Milk: Pasteurization, while designed to destroy potential pathogens in raw milk, substantially reduces the total numbers of bacteria present, increasing the shelf-life potential of the milk. Unless gross recontamination has occurred, bacterial numbers in fresh pasteurized milk generally reflect the organisms that survive pasteurization (thermoduric). The legal limit for bacterial numbers in pasteurized milk is 20,000/ml, though bacteria counts for most fresh pasteurized milks are generally less than 1,000/ml. Under proper refrigeration, the bacteria that become significant in the shelf-life and spoilage of milk are psychrotrophic in nature. These types of organisms generally occur as post-pasteurization contaminants, although a few thermophilic bacteria may be psychrotrophs.

Sources of Bacteria in Processed Milk:

- 1) Survive pasteurization (thermoduric).
- 2) Post-Pasteurization Contamination:
 - a) Insufficient cleaning/sanitizing - valves, pipelines, gaskets, pasteurized milk tanks, fillers.
 - b) Personnel - hands, clothing, sneezes, coughs.
 - c) Environmental - air, dust, water, condensate.

CONTROLLING BACTERIAL CONTAMINATION & DEFECTS IN DAIRY PRODUCTS

Preventing Contamination:

Bacteria are present in the environment both at the farm and at the dairy plant. Although total prevention of microbial contamination of milk at the farm is impossible, it can be minimized by milking clean, healthy cows; in a clean environment and by assuring that the milking system and storage equipment is properly cleaned, sanitized and maintained. Once raw milk leaves the farm (tank truck to plant storage) it must be properly handled to prevent further contamination before it is processed. Keeping the microbial load of raw milk to a minimum will increase the quality of the products made. At all stages of raw milk handling, milk must be rapidly and properly cooled with temperatures maintained below 40°F (4.4°C).

At the dairy plant, preventing contamination after pasteurization is critical for product shelf-life and safety. This requires that the processing equipment and the plant environment be thoroughly cleaned and sanitized such that the possibility of microbial growth and contamination is limited. Once cleaned and sanitized, recontamination should be prevented. Proper employee training in dairy and personal hygiene procedures should be an essential part of every plant's quality assurance program.

Preventing or Slowing Microbial Growth:

Microbial growth can be controlled by: 1) eliminating sources of "bacterial food" by thoroughly cleaning the milk handling equipment and the environment, thus eliminating milk residues and other sources of microbial nutrition, at the farm, during transit and at the plant; 2) holding raw milk and dairy foods well below the optimum growth temperature of bacterial contaminants, generally less than 40°F (4.4°C) without freezing; 3) lowering the pH such as in cultured dairy products; 4) reducing the moisture or water activity (A_w) such as in dry milk products; and 5) adding microbial inhibitors or preservatives such as is done with potassium sorbate addition to cottage cheese.

Eliminating or Killing Contaminants - Sanitation Procedures:

Chemical sanitizers are routinely used to reduce the load of microbial contaminants that may be present on milk/food contact surfaces. Most dairy sanitizers, when used correctly, kill off a broad spectrum of microorganisms. Sanitization procedures should be performed after washing and immediately before processing, although an additional sanitizing step after equipment washing procedures can be helpful. Most chemical sanitizers are inactivated by organic matter and are ineffective on poorly cleaned surfaces. Sanitizers commonly used in the dairy industry include chlorine and iodine compounds, quaternary ammonium compounds, acid anionics & peroxyacetic acid.

Hot water sanitization is commonly used in many dairy plants. Hot water sanitization involves circulating water of at least 170°F (determined at the outlet) for at least 5 minutes. Higher temperatures (>185°F) for longer times (10-15 minutes) are recommended to allow heat penetration into areas that are hard to reach. Hot water treatments should be followed by a cooling chemical sanitizer rinse or with cooled pasteurized water. Hot water will often provide greater kill and longer milk shelf-life than can be achieved with chemical sanitizers alone.

Eliminating or Killing Contaminants - Pasteurization:

Pasteurization procedures generally kill a large percentage of the bacteria commonly found in raw milk, including pathogenic organisms and those that rapidly cause spoilage. The higher the temperature used, the less time is required for equivalent kill. The most commonly used defined minimum temperature/time combinations are:

Batch Pasteurization: 63°C (145°F) for 30 minutes

High-Temperature/Short-Time: 72°C (161°F) for 15 seconds.

These procedures stand as legal definitions of pasteurization and are outlined in the "Pasteurized Milk Ordinance," the document of requirements for Grade "A" milk products. A majority of dairy plants use High-Temperature/Short-Time pasteurization, with temperature/time combinations often exceeding the stated minimum requirement (i.e., 170°F for 20 seconds). Most bacteria that survive pasteurization generally do not grow or else grow slowly at refrigeration temperatures, causing problems later in shelf-life. Contamination after pasteurization with psychrotrophic spoilage bacteria is not uncommon. When post-pasteurization contamination of a product occurs, both the quality and the safety of the product are jeopardized.

References:

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Prepared by S.C. Murphy (Sr. Extension Associate) as an update of a D. K. Bandier Extension Handout. Edited by N.R. Carey. July 2007

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Dairy Farmers dedicated to the production, manufacture & distribution of quality products.



Facts About Antibiotic Resistance

Disease-causing microbes that have become resistant to drug therapy are an increasing public health problem. Tuberculosis, gonorrhea, malaria, and childhood ear infections are just a few of the diseases that have become hard to treat with antibiotic drugs.

Other facts:

- Though food-producing animals are given antibiotic drugs for important therapeutic, disease prevention or production reasons, these drugs can cause microbes to become resistant to drugs used to treat human illness, ultimately making some human sicknesses harder to treat.
- About 70 percent of bacteria that cause infections in hospitals are resistant to at least one of the drugs most commonly used to treat infections.
- Some organisms are resistant to all approved antibiotics and must be treated with experimental and potentially toxic drugs.
- Some research has shown that antibiotics are given to patients more often than guidelines set by federal and other healthcare organizations recommend. For example, patients sometimes ask their doctors for antibiotics for a cold, cough, or the flu, all of which are viral and don't respond to antibiotics. Also, patients who are prescribed antibiotics but don't take the full dosing regimen can contribute to resistance.
- Unless antibiotic resistance problems are detected as they emerge, and actions are taken to contain them, the world could be faced with previously treatable diseases that have again become untreatable, as in the days before antibiotics were developed.

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Antibiotic Resistant Pathogens

In recent years, this issue of sale of raw milk has become more relevant than ever before due to the emergence of antimicrobial resistant food borne pathogens such as *Salmonella*, *Staphylococcus (MRSA)*, *Campylobacter* and *Escherichia coli*. Drug-resistant infections increase risk of death, and are often associated with prolonged hospital stays, and sometimes complications due to the lack of an effective antibiotic treatment.

These bacteria have developed this resistance due to a number of reasons and they are present in all areas of the environment: hospitals, schools, farms, in wildlife and our homes. These organisms are more prevalent in environments where animals (both wild and domestic) are located.

Pathogens resistant to the effects of antibiotics can occur in environments where antibiotics have never been used. Recently multidrug resistant strains of bacteria were isolated in normal healthy wild birds in the Arctic.

Animals and antibiotic use

The proper use of antibiotics as a treatment for a bacterial infection is a necessary tool in the management of the individual animal's health and the overall herd health of all livestock species. Antibiotic treatment may be required to provide the best animal care to individuals infected with a disease.

When antibiotics are chosen as the treatment for farm animals the producer and veterinarian are required to withhold any product from the treated animal until the medication is cleared from the animal's system. To assure the products are not adulterated with antibiotic residue, meat and dairy products are sampled on a routine basis.

Milk samples are collected at the farm prior to being pumped into the milk truck. The samples are tested for antibiotics by both the processing plant and by the state laboratory. If antibiotics are detected in the milk, the entire tank of milk is immediately discarded. The farmer responsible for the impure milk may have to pay the cost of the entire truckload of milk, so each farmer's incentive to maintain milk quality is high. Data from the FDA indicates that less than one tanker in 1,000 tests positive for animal drug residues, a sign that the regulatory system is working.

Mechanisms of antibiotic resistance

The increased prevalence of antibiotic resistance is an outcome of evolution, "survival of the fittest". Any population of organisms, bacteria included, naturally includes variants with unique traits—in this case, the ability to withstand an antibiotic's attack on a microbe. When a person takes an antibiotic, the drug kills the defenseless bacteria, leaving behind—or "selecting," in biological terms—those

that can resist it. The antibiotic does not technically cause the resistance, but allows it to happen by creating a situation where an already existing variant can flourish.

Bacterial antibiotic resistance is a natural phenomenon, but certain factors also contribute to the problem.

It is the mis-use of antibiotics that is one of the main reasons for the development of antibiotic resistant strains of pathogens.

Some examples of inappropriate antibiotic use:

- 1) Not finishing a full course of antibiotics prescribed (antibiotics are stopped too soon because symptoms improve, but resistant bacteria proliferate and the infection returns that is now resistant),
- 2) Sub-therapeutic dosing of an antibiotic (too low a dose to effectively kill the pathogen so the body can eliminate the infection),
- 3) Inappropriate prophylaxis and extended antibiotic dosing,
- 4) Improper disposal of antibiotics (antibiotics entering sewage disposal systems can enter waterways at low doses causing resistance in bacteria living in soil and water).
- 5) Use of low dose (sub-therapeutic) antibiotics in feeds or water to induce more rapid growth rates. (Antibiotics administered at low levels in feed for long durations can increase the rate of weight gain and improve the efficiency of converting animal feed to units of animal production.)

The use of antibiotics should follow the prescription and be used under the consultation of a physician.

Summary:

The proper use of antibiotics as a treatment for a bacterial infection is a necessary tool in the management of the individual animal's health and the overall herd health of all livestock species. Antibiotic treatment is required to provide the best animal care to individuals infected with a disease.

Scientists agree that antibiotic resistance is inevitable, but there are measures that can slow the development of these resistant pathogens: improving infection control, sanitation and simple hand washing, developing new antibiotics, and using drugs with consultation and guidance from physicians (veterinarians and MDs).

Rex Shattuck

From: Silveraurora [silvera@mtaonline.net]
Sent: Tuesday, February 26, 2008 7:17 PM
To: 'Silveraurora'; Rex Shattuck; Rep. Mark Neuman; Sen. Lyda Green; Sen. Charlie Huggins; safallon@aol.com; glfcstmrs@earthlink.net; rqw@mtaonline.net; 'Heather Fair'; 'Heather Christensen'; goatmilk@gci.net
Subject: RE: Raw milk should be legally available to the villages and small towns of Alaska

Follow Up Flag: Follow up
Flag Status: Completed

Sorry all, I forgot to add proper internet etiquette.
Permission to freely cross-post granted.
Suzanne Nevada

-----Original Message-----

From: Silveraurora [mailto:silvera@mtaonline.net]
Sent: Tuesday, February 26, 2008 7:16 PM
To: 'rex_shattuck@legis.state.ak.us'; 'rep_mark_neuman@legis.state.ak.us'; 'senator_lyda_green@legis.state.ak.us'; 'senator_charlie_huggins@legis.state.ak.us'; 'safallon@aol.com'; 'glfcstmrs@earthlink.net'; 'rqw@mtaonline.net'; 'Heather Fair'; 'Heather Christensen'; 'goatmilk@gci.net'
Cc: 'Silveraurora'
Subject: Raw milk should be legally available to the villages and small towns of Alaska
Importance: High

Regarding House Bill 367 in favor of raw milk sales in Alaska -

One of the important facets of Alaska life are those people in remote towns and villages who are supportive of producing their own fresh, raw milk. As a registered bloodstock producer of a particular small breed of dairy goat, I have sold goat kids to numerous families in the Southeast as well as remote bush locations throughout Alaska solely for the purpose of supplying their families with fresh raw milk. I have a couple in Aniak who have a number of goats so that their family and children can have fresh raw milk, as an example. Our Alaskans in these locations should have the right to produce raw milk and to sell any excess that those animals produce to other people in their locations who wish to purchase it. You can NOT get a fresher product to these villages and towns other than by air in most cases, which forces many Alaskans then to exist on low-fat powdered milk of questionable origin and age.

These people are NOT ignorant to the safe handling procedures of foodstuffs - freshly killed moose, caribou, salmon, or shellfish for examples. In fact, Alaskans are some of THE most educated when it comes to safe handling of any food item! It is in their best interest to take great care of the food they produce, harvest, and share amongst themselves. The ability for villages and small towns to have fresh raw cow or goats milk can mean the difference of a thriving, healthy child and adult population versus one raised on milk often flown in weeks after it was collected and processed in the lower-48 and of which goes sour in a few days if not already putrid on arrival. It is an atrocity to ever think that Alaskans are not intelligent enough or are not perfectly capable of milking a clean cow or goat and properly handling that milk for their own nutrition and enjoyment. We Alaskans are some of the most well-advised procurers of fresh raw products anywhere in the US. The DEC, on the other hand, is sure that Alaskans can not take responsibility for their own health and welfare when it comes to foodstuffs - hogwash! We ARE proud Alaskans regardless of where we live and are quite capable of securing fresh raw products and processing them as we see fit for consumption.

The raw milk bill is not just for those people in the Mat-Su Valley or Anchorage, nor is it just to benefit a few farmers! House Bill 367 is the opportunity for ALL Alaskans to have free access to fresh milk from any farmer or person they see fit. If someone in a remote village wants to raise dairy goats and sell the excess raw milk to others in their

community, they should have the RIGHT to start their own small dairy business and the RIGHT to provide their community with a fresh source of raw milk. It is preposterous to assume that Alaskans are too ignorant to safely handle raw milk, and just as preposterous to deny ANY Alaskan in ANY community the right to produce fresh milk and sell, give away, barter, or by any other means freely share their product with other family, friends, or community members.

Respectfully,
Suzanne Nevada
District 15
Wasilla, Alaska
Silveraurora Nigerian Dwarf Dairy Goats
907-373-2687

Bonnie Gruening

From: theider [tiani@mtaonline.net]

Sent: Wednesday, February 27, 2008 8:55 AM

To: cherie.rice@alaska.gov; dan.easton@alaska.gov; franci.havemeister@alaska.gov; jay.fuller@alaska.gov; joseph.mclaughlin@alaska.gov; kristin.ryan@alaska.gov; larry.hartig@alaska.gov; lt.governor@alaska.gov; rainy4279@aol.com; safallon@aol.com; goatmilk@gci.net; artemisdreaming@hotmail.com; Rep. Anna Fairclough; Rep. Carl Gatto; Rep. Craig Johnson; Rep. Mark Neuman; Rep. Scott Kawasaki; Rep. Bob Roses; Rep. Bryce Edgmon; Rep. David Guttenberg; Rep. Mike Kelly; Rep. Paul Seaton; 'representative_peggy_wilson@legis.state.ak.us; Sen. Charlie Huggins; Sen. Lyda Green; rqw@mtaonline.net'

Subject: HB 367

I wish to voice my support in favor of raw milk, and raw milk products sales.

There are a number of reasons for my wholehearted support-

Alaskans are already able to either grow, catch, or harvest quite a number of raw products (shellfish, fishes, berries, wild game, vegetables they grow, and other edibles from the wildlands) locally. From subsistence hunter/gatherers, to suburban residents who scour the forest for mushrooms, fiddle head ferns and edible greens to enhance a healthy diet, we are well versed in proper and safe food handling and preparation. Why would raw milk be any different?

In the stores are 100s of raw products from unknown locations that are subjected to tremendous shipping lengths- such as eggs, milk products, fruits, vegetables, fish, and of course grocery shelves brimming with "short shelf life" meats of all kinds. Also deli meats and foods prepared thousands of miles away and offered to Alaskans every day. On many of these products, there is no signage informing the consumer where the product came from, let alone when it was harvested or prepared. Just an "expiration date" on refrigerated items.

With fresh, local raw milk and milk products, I will *know* where the milk comes from. I will be able to see for myself the farming practises, examine the premises and make an informed decision about whether to purchase it for my family. I *cannot* do this with imported milk! Instead, I am forced to buy milk that often "goes off" in the gallon jug within days of opening. If the farm does not meet my personal criteria for safe handling, then I can chose another producer. I cannot do this as it is today. A "short shelf life" is of no concern to me, as raw milk will undoubtedly be *fresher and healthier* than what is shipped in currently. I have always supported Alaskan products in my purchases, why should fresh *local* dairy products be out of my reach?

As a mother and consumer, I cannot even identify produce in grocery stores that comes from countries whose production methods are questionable. When there is a recall of some type, we are at the "end of the food chain" and thus, most of the item has already been purchased and in many cases consumed. With local raw milk and raw milk products, we would indeed have dairy items "fresher by far" and people who have health concerns would have a *choice*. *I want this choice for myself and my family.*

Since I do not farm, or have dairy animals of any type, I am unable to provide this healthy alternative (raw milk) to my family. The decision to restrict sales seems to be based upon inaccurate and unproven reports of disease and/or illness in the Lower 48. Most were "attributed" to very large scale operations, which is not the situation we have here in Alaska. Here we have a handful of struggling dairies and small livestock owners, and I say we should let the Alaska consumer prove their viability, instead of choking off an entire market sector with unnecessary and outdated regulations.

As a person who has lived in several remote spots in Alaska in the 60s and 70s, I can firmly state that canned, powdered, and air shipped milk are inferior in quality to raw milk. I do recall times when "the barge" was either lost, or delayed....meaning no milk (or produce) available at all, sometimes for weeks. I have heard that there are dairy animals in the Bush....why restrict raw milk, which is healthier, and *fresh*, from those communities? Is that a wise "use" of community resources?

3/3/2008

In my mind, the issue of raw milk sales in Alaska is about choice. I want the *freedom to chose* for myself and my family! Having the choice to purchase direct from the farmer or producer supports not only Alaska agriculture, but the health of our residents.

In a time when diversifying our tiny agricultural base is crucial to our future, it would seem obvious that Alaska should join the other 28 states who allow raw milk sales.

I urge you to support sales of raw milk and raw milk products with HB 367

Respectfully

Tiani Heider
4457 S. Philie Drive
Wasilla, Alaska 99654
(907) 357-0542

Bonnie Gruening

From: cash joyce [cashin@mtaonline.net]
Sent: Saturday, January 19, 2008 1:16 PM
To: Rep. Carl Gatto
Subject: legalize it (raw milk)

Self sufficiency is what brought this borrowed beginning to the Matanuska valley. The transplants that broke ground here were for a purpose and forefront of what has evolved today.

I ask you to read a slice of Max Crawford's Bioregional Perspective.

"Sometimes it seems unlikely that a society as a whole can make wise choices. Yet there is no choice but to call for the recovery of the commons and this in a modern world that doesn't quite realize what it has lost. Take back like the night, that which is shared by all of us, that which is our larger being. There will be no tragedy of the commons greater than this if we do not recover the commons; regain personal, local, community, and peoples direct involvement in sharing the web of the wild world. Eventually our complicated industrial capitalist/socialist mixes will bring down much of the living system that supports us. It is clear the loss of the commons heralds the end of self-sufficiency and signals the doom of the vernacular culture of the region.

Cash joyce indigenous alaskan

Bonnie Gruening

From: Little Britain House Dairy [lbh@mtaonline.net]
Sent: Friday, January 18, 2008 1:30 PM
To: Rep. Carl Gatto
Subject: Raw Milk?
Attachments: Proposed Milk Law.abw



Little Britain House Dairy
12550 East Marsh Road
Palmer, Alaska 99645
(907) 746-3037

Dear Rep. Gatto,

I hope that you will remember speaking with me at the parade in Palmer this last year. Also I spoke with you the Havemiester Dairy Rally last fall also. My name is Lee Mayberry and I am trying to run a small dairy operation in Palmer.

I was speaking to you about the possibility of getting the sale of raw cow milk to the consumer from the farm. At the time I said that I would get some information together for you and send it your way but I have been rather tardy in doing that, and I must apologize for that. But I have had time recently to get down to business and I have attached a proposed rough draft for you to scan over. It is a combination of things and points from the laws in New York State, and North Carolina where both states allow the sale of raw milk to the consumer from the farm. I know that many at the State Capital have blocked some legislation in the past but I do not think to my knowledge any way that any has ever been introduced that carries a disclosure with it. What I like about the proposed copy that I sent is that the container will have a state approved label attached stating the danger of raw milk. But that doesn't turn me off because the consumer that really wants to purchase the milk will have already done their research and know all about the hazards if any. They would continue to purchase the product I believe. I just really think that it is not the governments place to participate in our families dinner each night buy legislating what we can and can not eat or drink. I think the small farmer like myself should have the opportunity to produce his products and sell them locally to try to put money in the bank so he can buy food for his family.

I am having to sell cows shares as many like myself are having to do in some other states. I know that there are a large call for raw foods and organic products. I see people every day of every week that are wanting to buy local raised produce. It is a really great way to support local farmers, and just buy local program in the first place. I would so very much appreciate a call so that I could discuss this with you further. I am ready and willing to do what I must to help get any legislation passed, if that means making trips to the capital then just call me.

Respectfully,

Lee Mayberry,
General Manager, Co-Owner
LITTLE BRITAIN HOUSE DAIRY
(907)746-3037

3/3/2008

Bonnie Gruening

From: Heather Fair [hoofingitnorth@hotmail.com]
Sent: Sunday, January 20, 2008 9:37 AM
To: hoofinitnorth@yahoogroups.com
Cc: Sen. Lyda Green; Rep. Wes Keller; Rep. Carl Gatto; Sen. Charlie Huggins; Rep. Mark Neuman; Rep. Bill Stoltze
Subject: Please support the legal sale of raw milk in Alaska
Importance: High

I had an interesting conversation last Friday with Kristan Cole of the Creamery Board. I asked her, "So, when's the state of Alaska going to legalize the sale of raw milk from small farmers?" She smiled and said, "Well that would sure make things a lot simpler, wouldn't it?" We chatted briefly about how she used to be able to buy raw milk in the 1960s and she knows even now there is a black market for it and seemed to wonder why it's not legal now. As an owner of a small dairy goat herd, I would like to have the opportunity to legally sell my milk to informed consumers, even if under regulations as is common in other states. I'm sure our dairy farmers at Point MacKenzie would like to have the same opportunity so they find themselves standing on the unemployment line with their farms in foreclosure in this awful economy. Please sponsor and support legislation modeled after another successful state such as Oregon or Washington to legalize the sale of raw milk in Alaska. For more information on where to begin, please see <http://realmilk.org> (to see summaries of the laws in other states, go to <http://www.realmilk.com/happening.html>).

Heather Fair
All I Saw Farm
Fair Skies Nigerian Dwarf dairy goats
Wasilla, Alaska
<http://FairSkiesAlaska.com>
<http://HoofinItNorth.com>

Need to know the score, the latest news, or you need your Hotmail®-get your "fix". Check it out.

Bonnie Gruening

From: flint brewer [flintb@gci.net]
Sent: Wednesday, February 13, 2008 9:21 PM
To: Rep. Carl Gatto
Subject: Please Support HB 367

Mr Gatto,

The Dairy farmers in Alaska could use this shot in the arm. It would be good for them and the consumers. It's in every ones best interest to keep a strong network of farmers both large and small.

Best Regards

Flint Brewer

720 W. Coville Circle

Palmer AK 99645

373-6016

Bonnie Gruening

From: Alisa Elliott [alisa@mountainmagictherapy.com]
Sent: Thursday, February 07, 2008 7:10 PM
To: Rep. Carl Gatto
Subject: legalize raw milk!

I wanted to add my name as one Alaskan resident and voter who wants raw milk available to me without legal ramifications for either me or the farmer providing it. I'd love to get into the amazing benefits of raw milk but I feel it is truly about individual rights. It is our right to feed our bodies and families with the healthful foods that we want to! The only, I repeat, ONLY reason it was ever pasturized was to increase the shelf life of milk hence increase the profit of milk producers at the time. It is time to make it a viable option for folks. If we can buy harmful products like Twinkies, cigarettes and soda (hello cancers, obesity and diabetes!) than why in the world can't we simply buy fresh milk??? Please Please Please pass legislation to legalize the sale of raw milk.
Alisa Elliott, Palmer



Alaska State Legislature

Please enter into the record my testimony to the

Resources

Committee name

Committee on

HB 367

Bill/Subject

dated

2-29-08

Please Support This Bill

I will give ALASKANS The freedom to Choose
if AND where they purchase their fresh milk.

AND maybe, just maybe it will help bring a
little more DAIRY out into the open

THANK YOU

Signed:

Rick Williams
Testifier

Rick Williams

Representing (Optional)

7948 W. Sunset Ave Wasilla

Address

373-2687 / 373-5000 / 232-8856

Phone number



Alaska State Legislature

Please enter into the record my testimony to the

Resources

Committee name

Committee on

HB 367

Bill/Subject

, dated

2-29-08

I ~~WAS~~ RISED IN OREGON
AND I HAD FRESH MILK EVERY DAY
OF MY CHILD HOOD.

Signed:

John L. Skull
Testifier

Representing (Optional)

1040 W-SHIRLEY-MNW-CIR WASILLA AK. 99687
Address

907-357-2064
Phone number



Alaska State Legislature

Please enter into the record my testimony to the

Resources

Committee name

Committee on

HB 367

Bill/Subject

, dated

2-28-06

I Grew up drinking Raw milk for years,
and never had any health issues regarding the use
and consumption of such.

Signed:

A handwritten signature in cursive script, appearing to read "M. R. Pershing".

Testifier

Marc R. Pershing

Representing (Optional)

7362 W Parks Hwy. #161 Wasilla, AK 99654

Address

907-357-0268

Phone number



Alaska State Legislature

Please enter into the record my testimony to the _____

Committee name

Committee on House Bill #367, dated _____

Bill/Subject

I, Rayna L. Fritcher, would like to express my full support for House Bill #367.

Signed: _____

Testifier

Representing (Optional)

3060 N. Lazy Eight Ct. Suite 2, PMB103, Wasilla, Ak 99654

Address

(907) 373-8082

Phone number



Alaska State Legislature

Please enter into the record my testimony to the

Resources

Committee name

Committee on

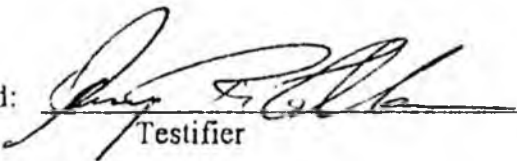
HB 367

, dated

Bill/Subject

I support this Bill on Raw milk.
by Farmer Sale. I was RAISE on A
FARM and I grow up drinking RAW milk.

Signed:


Testifier

Representing (Optional)

PO Box 877457 WASILLA AK

Address

907 373 4006

Phone number



Alaska State Legislature

Please enter into the record my testimony to the House Resources Committee
Committee name

Committee on House Bill #367, dated 2-2-08
Bill/Subject

I support House Bill 367. I want to buy local, fresh milk, in it's raw state, take it home, and prepare it for my own family's consumption in the manner I see fit. I don't want processed milk that comes from a farm that I have not personally been to and taken my own milk home from. I want fresh raw goats milk too - there hasn't been a creamy in this state that processes goats milk. I don't want 2 to 3 week old pasteurized milk from the lower-48 that came off some corporate farm from cows that have been fed antibiotics or hormones. I want to buy fresh raw milk from local farmers of my choice, I want to take my milk home and make my own milk products and do with that milk as I see fit. The MAJORITY of states allow raw milk sales, we should too. Alaskans need to legally purchase healthy, locally grown products including raw milk to take home and do with as they deem safe and best for their family. I am asking the state to allow all Alaskans the right to purchase raw milk directly from the local producer, support the state's agricultural economy, and preserve our right to choose what is best for myself and my family. I support House Bill 367!

Thank you!
Suzanne Nevada

Signed: Suzanne S Nevada / Suzanne S Nevada
Testifier

Representing (Optional)
7948 W. Sunset Ave, Wasilla, AK 99654 - Dist. 15
Address
907-373-2687 home (day & eve)
Phone number



Alaska State Legislature

Please enter into the record my testimony to the

Resources

Committee name

Committee on

HB 367

Bill/Subject

, dated

2-29-08

I support this bill. Since I grew up on fresh milk from the farm. It should be my right where to buy it from

Signed

Larry Fitch

Testifier

Representing (Optional)

PO Box 298125 Wasilla AK 99629

Address

907-376-4382

Phone number

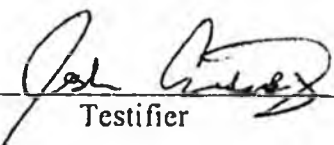


Alaska State Legislature

Please enter into the record my testimony to the Resources
Committee name
Committee on HB 367, dated 2-29-08
Bill/Subject

People have the right to choose
where they buy their food

Fresh milk is Good milk

Signed:  Josh Ewings
Testifier

Representing (Optional)

P.O. Box 870623 Wasilla AK 99687
Address

907-376-2229
Phone number



Alaska State Legislature

Please enter into the record my testimony to the RESOURCES
Committee name
Committee on HB 367, dated 2-29-08
Bill/Subject

THIS BILL REALLY NEEDS TO PASS.

Signed: *Earl P. Lackey*
Testifier EARL P. LACKEY

Representing (Optional)
3900 S. ENGLISH BAY DR. WASILLA, AK 99654
Address
376-1003
Phone number



Alaska State Legislature

Please enter into the record my testimony to the Resources Committee
Committee name
Committee on HB 367, dated 2/29/08
Bill/Subject

Signed: _____

A handwritten signature in black ink, appearing to be "John S. ...".

Testifier

Representing (Optional)

Po Box J20327, Big Lake AK 99687
Address 626 N Victor Rd.

907 301 7731

Phone number