

as other forms of raw milk tested; therefore, in this outbreak, the risk for human illness from consuming either product was probably similar. Exemption of colostrum from state dairy regulations is not supported by the findings in this outbreak investigation.

From 1998 to May 2005, raw milk or raw milk products have been implicated in 45 foodborne illness outbreaks in the United States, accounting for more than 1,000 cases of illness (CDC, unpublished data, 2007). Because illnesses associated with raw milk continue to occur, additional efforts are needed to educate consumers and dairy farmers about illnesses associated with raw milk and raw colostrum. To reduce the risk for *E. coli* O157 and other infections, consumers should not drink raw milk or raw milk products.

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References

1. CDC. Ongoing multistate outbreak of *Escherichia coli* serotype O157:H7 infections associated with consumption of fresh spinach—United States, September 2006. *MMWR* 2006;55:1045–6.
2. Hyytiä-Trees E, Smole SC, Fields PA, Swaminathan B, Ribot EM. Second generation subtyping: a proposed PulseNet protocol for multiple-locus variable-number tandem repeat analysis of Shiga toxin-producing *Escherichia coli* O157 (STEC O157). *Foodborne Pathog Dis* 2006;3:118–31.
3. CDC. Foodborne diseases active surveillance network (FoodNet): population survey atlas of exposures, 2002. Atlanta, GA: US Department of Health and Human Services, CDC; 2004:205. Available at <http://www.cdc.gov/foodnet/surveys/pop/2002/2002atlas.pdf>.
4. Rangel JM, Sparling PH, Crowe C, Griffin PM, Swerdlow DL. Epidemiology of *Escherichia coli* O157:H7 outbreaks, United States, 1982–2002. *Emerg Infect Dis* 2005;11:603–9.
5. Mead PS, Slutsker L, Dietz V, et al. Food-related illness and death in the United States. *Emerg Infect Dis* 1999;5:607–25.
6. Dundas S, Todd WT, Stewart AI, et al. The central Scotland *Escherichia coli* O157:H7 outbreak: risk factors for the hemolytic uremic syndrome and death among hospitalized patients. *Clin Infect Dis* 2001;33:923–31.
7. Food and Drug Administration. Grade “A” pasteurized milk ordinance: 2003 revision. Rockville, MD: US Department of Health and Human Services; 2004. Available at <http://www.cfsan.fda.gov/~ear/pmo03toc.html>.
8. Headrick ML, Korangy S, Bean NH, et al. The epidemiology of raw milk-associated foodborne disease outbreaks reported in the United States, 1973 through 1992. *Am J Public Health* 1998;88:1219–21.

Cutaneous Anthrax Associated with Drum Making Using Goat Hides from West Africa — Connecticut, 2007

On August 29, 2007, the Connecticut Department of Public Health was notified by a physician of suspect cutaneous anthrax involving a drum maker and one of his three children. The drum maker had been working with untreated goat hides from Guinea in West Africa. This report summarizes results of the joint epidemiologic and environmental investigation conducted by public health officials, environmental agencies, and law enforcement authorities. The investigation revealed that the drum maker was exposed while working with a contaminated goat hide from Guinea and that his workplace and home were contaminated with anthrax. His child was most likely exposed from cross-contamination of the home. The findings underscore the potential hazard of working with untreated animal hides from areas with epizootic anthrax and the potential for secondary cases from environmental contamination.

On July 22, while sanding a newly assembled goat-hide drum in his backyard shed, the drum maker felt a sting on his right forearm. He then proceeded to an upstairs bathroom in his house to wash his arm. Two days later, a painless 2 cm papular lesion with surrounding edema developed at the site. The man sought medical attention and was prescribed cephalexin and then clindamycin for a presumptive infected spider bite. On August 28, after the skin lesion progressed to an eschar with lymphangitic spread, the man consulted an infectious disease practitioner, who sent a biopsy specimen of the lesion to the Connecticut State Laboratory. Culture was negative, but *Bacillus anthracis* was detected by polymerase chain reaction (PCR). The patient received ciprofloxacin for suspect cutaneous anthrax.

On August 31, the Connecticut Department of Public Health was notified of a second suspect case of cutaneous anthrax in the drum maker's child aged 8 years, who developed a painless, 1 cm ulcer of 3 days' duration over the scapula that did not improve under treatment with amoxicillin-clavulanate. Culture of the lesion was negative, but biopsy specimens tested positive for *B. anthracis* by PCR at the Connecticut State Laboratory and by PCR and immunohistochemistry assay at CDC. The patient was treated with penicillin.

Also on August 31, an epidemiologic investigation was initiated to identify the primary source of exposure and the extent of dissemination of *B. anthracis* spores. The investigation included interviews with the index patient and his family and environmental testing. The family had moved into their

house in December 2006. The index patient made traditional West African drums (known as djembe drums) by soaking animal hides in water, stretching them over the drum body, then scraping and sanding them. At the end of June, a contact in New York City told the index patient that he had some new goat hides from Guinea. Shortly thereafter, the index patient purchased 10 of them, making the transaction on a street corner in New York City. Whether these goat hides were imported legally is unknown. The index patient used three of these hides to make drums during the time he developed anthrax.

All animal hides and drums in progress were stored in a backyard shed. Drum making usually occurred at the shed entrance. The affected child never participated in any drum making and had no known exposure to animal hides. He played indoors on carpeted floors and was prohibited from entering the shed.

Since childhood, the drum maker had been taught by his father, who also made djembe drums, to routinely use latex gloves and wear tight-fitting goggles when drum making. He also was taught to use designated work clothes with long sleeves, which were laundered periodically. In addition, the drum maker wore disposable facemasks to avoid the strong odor associated with animal hides. He always removed his work clothes and shoes before entering the house. One exception to these practices occurred on July 22, when the drum maker wore short sleeves and went indoors to an upstairs bathroom without removing his work attire. Although he kept all drum making equipment in the shed, the drum maker sometimes brought other items from the shed into the house.

On September 5 and 6, targeted environmental sampling was conducted collaboratively by the Federal Bureau of Investigation (FBI), the Environmental Protection Agency, and the Connecticut Department of Environmental Protection. The FBI chose to participate because anthrax is a select bioterrorism agent.* On the basis of initial positive results for *B. anthracis* in several areas of the house, extensive testing was performed a week later to guide decontamination efforts.† Specimens included swabs of all hides and drum heads (Figure) after transport to the state laboratory, seven of which underwent additional wipes and punch biopsies; 16 wipe samples of the shed, including table surfaces and coat hooks 5 feet above the ground; and a swab sample of the car used for transporting the recently purchased hides. House testing included vacuum samples from carpeted areas and composite wipe samples from selected hard surfaces in all regularly used areas.

FIGURE. *Bacillus anthracis*-contaminated drum head made from goat hide from Guinea — Connecticut, 2007



Photo/Connecticut State Department of Public Health Laboratory

The following were culture positive for *B. anthracis*: six (24%) of 25 drum heads, including the recently sanded drum; 15 (42%) of 35 hides, some of which were exposed to ambient dust in the shed; all 16 shed samples, many indicating heavy growth; the car trunk; and 18 (26%) of 72 house specimens, including vacuum samples from the upstairs hallway and both affected patients' bedrooms and swab and wipe samples from the laundry room and upstairs bathroom. DNA from all environmental isolates of *B. anthracis* and the cutaneous biopsy specimens were sent to CDC for genotyping using multiple-locus variable-number tandem repeat analysis (MLVA) (1). All isolates were MLVA genotype 1, as was the *B. anthracis* DNA detected in the child's biopsy specimen.

Federal, state, and local officials completed a comprehensive remediation process that included fumigation of the house with chlorine dioxide. The house and shed were cleared for occupancy on December 22, 2007, after all post-remediation samples had tested negative for anthrax. Because of exposure to aerosolized spores in the shed from drum making, the drum maker was continued on ciprofloxacin for a total of 60 days from the date of last presumed exposure based on recommendations established by CDC for postexposure prophylaxis against inhalation anthrax (2). No other contacts were identified with potential inhalation exposure. With the exception of lymphangitic scarring of the drum maker's arm, the illnesses in both patients resolved without sequelae.

* Information on selected agents and toxins available from the CDC Select Agent Program at <http://www.cdc.gov/od/sap/docs/salist.pdf>.

† Photos and additional information available at <http://www.epa.gov/region1/er/sites/danbury>.

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Editorial Note: This report highlights the individual and environmental risks for anthrax from using contaminated goat hides brought from West Africa for drum making. It also describes the first case in the United States of naturally acquired cutaneous anthrax in a personal contact caused by cross-contamination from drum making.

Since 2006, three unrelated cases of anthrax, including the first case described in this report, have been reported from direct occupational association with djembe drums made from untreated animal hides from West Africa. The first two cases were inhalation anthrax. One occurred in a New York City drum maker exposed while making a djembe drum from contaminated hides, and the other occurred in a man in Scotland who died of anthrax septicemia after playing or handling djembe drums newly made from contaminated hides (3,4). The Connecticut cases and the New York City case were caused by *B. anthracis* of MLVA genotype 1, a different genotype than the Ames strain used in the 2001 mail-related anthrax attacks (1). Although MLVA genotypes from West Africa have not been systematically studied, the widespread nature of genotype 1 (1) and its presence in the West African hides implicated in the New York City and Connecticut cases suggest that genotype 1 might be commonly found in West Africa.

The drum making process of stretching, scraping, and sanding animal hides could have released and potentially aerosolized any *B. anthracis* spores present on untreated hides, exposing the drum maker and contaminating the surrounding environment. However, despite direct exposure, the drum maker described in this report did not develop inhalation anthrax. He developed cutaneous anthrax only after wearing short sleeves and experiencing a penetrating injury or insect bite, which could have served to inoculate spores into the skin.

The Connecticut drum maker routinely wore personal protective equipment (PPE). His wearing a facemask might have reduced the amount of inhalation exposure. However, even if he had worked with all recommended precautions (3), such as working in a well-ventilated area using PPE that included a N95 respirator, his risk for cutaneous and inhalation exposure would have been lessened but not necessarily eliminated, and environmental contamination would still have occurred and required remediation.

In this investigation, environmental sampling indicated tracking of spores into the house by the drum maker, either through his work clothes or objects brought from the shed, leading to exposure and subsequent development of cutaneous anthrax in his child. Few cases of anthrax have been reported in children in the United States because most exposures are acquired occupationally. However, household members can be exposed through cross-contamination of living areas. In 1978, dust samples from vacuum cleaners in the houses of textile mill workers tested positive for *B. anthracis*, suggesting that workers carried spores into their homes (5). A case series of cutaneous anthrax in a Pennsylvania mill town indicated that 4% of all cases during a 22-year period occurred in household members of mill workers, including their children (6).

Decontamination of affected areas to minimize the risk for secondary cases of anthrax can be time-consuming and expensive. The cost of environmental cleanups on Capitol Hill in the District of Columbia and in postal facilities affected by the 2001 anthrax attacks ranged from \$464,000 to \$200 million (7).

To eliminate individual and environmental risks for anthrax in drum making, public health agencies have long advised that animal hides of unknown origin or from areas of epizootic anthrax should not be used. However, imported animal hides from West Africa, particularly goat hides, remain in demand because they are prized by drum makers for their acoustical quality. Because anthrax outbreaks in livestock frequently occur in West Africa, hides brought into the United States might contain *B. anthracis* spores. The Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture has the authority to regulate importation of all animal hides, mainly to prevent the introduction of foreign animal diseases of agricultural importance into the United States. However, APHIS does not mandate screening of imported hides for *B. anthracis* (8), and potentially contaminated hides might continue to be imported. In addition, importation can bypass legal channels (3). Currently, the World Health Organization recommends the use of sporicidal treatments to disinfect all contaminated animal hides, including ethylene oxide fumigation, gamma irradiation, preservation in a 5% formaldehyde solution, or chemical treatment with hydrochloric acid or salt in appropriate concentrations and durations (9,10).

Although safer practice in djembe drum making is needed to protect drum makers and others who might be exposed inadvertently, the best preventive measure is to use animal hides known to be free of anthrax spores. The use of PPE is not considered a safe alternative to the use of anthrax-free

hides. Until a process exists for certifying that imported hides from West Africa are free of anthrax, drum makers should follow current disinfection guidelines to reduce the risk for disease (9,10).

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References

1. Keim P, Price LB, Klevytska AM, et al. Multiple-locus variable-number tandem repeat analysis reveals genetic relationships within *Bacillus anthracis*. *J Bacteriol* 1999;182:298–336.
2. CDC. Update: investigation of bioterrorism-related anthrax and interim guidelines for exposure management and antimicrobial therapy, October 2001. *MMWR* 2001;50:909–19.
3. CDC. Inhalation anthrax associated with dried animal hides—Pennsylvania and New York City, 2006. *MMWR* 2006;55:280–2.
4. NHS Borders. Report on the management of an anthrax incident in the Scottish borders, July 2006 to May 2007. Available at http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/13_12_07_anthrax.pdf.
5. Bales ME, Dannenberg AL, Brachman PS, et al. Epidemiologic response to anthrax outbreaks: field investigations, 1950–2001. *Emerg Infect Dis* 2002;8:1163–74.
6. Gold H. Anthrax: a report of one hundred seventeen cases. *Arch Intern Med* 1955;96:387–96.
7. Canter DA, Gunning D, Rodgers P, et al. Remediation of *Bacillus anthracis* contamination in the U.S. Department of Justice mail facility. *Biosecur Bioterror* 2005;3:119–27.
8. US Department of Agriculture. Animal product manual. 2nd edition. Washington, DC: US Department of Agriculture; 2008. Available at http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/apm.pdf.
9. Russell AD, Yarnych VS, Koulikovskii A (eds). Guidelines on disinfection in animal husbandry for prevention and control of zoonotic diseases. Geneva, Switzerland: World Health Organization; 1984. Available at http://whqlibdoc.who.int/hq/pre-wholis/who_vph_84.4.pdf.
10. Turnbull PCB. Guidelines for the surveillance and control of anthrax in humans and animals. Geneva, Switzerland: World Health Organization; 1986. Available at http://www.who.int/csr/resources/publications/anthrax/WHO EMC_ZDI_98_6.

prevalence rate of 2%, one of the highest AIDS prevalence rates in the United States (2). Accurate death ascertainment is an important part of HIV/AIDS surveillance. Manual methods can substantially underestimate deaths by missing death certificates that do not mention HIV infection or deaths of residents that occur in other states. CDC and the Council of State and Territorial Epidemiologists (CSTE) recommend performing electronic record linkages to ascertain deaths annually as part of routine HIV/AIDS surveillance activities (3). In 2007, to identify all deaths that occurred during 2000–2005 among persons with AIDS who resided or received their diagnosis in DC, the HIV/AIDS Administration of the DC Department of Health, with assistance from CDC, performed an electronic record linkage. This report summarizes the results of that linkage, which determined that 54% of deaths among persons with AIDS had not been reported previously to the DC HIV/AIDS Reporting System (HARS). The results indicated that electronic record linkage for death ascertainment is necessary to more accurately estimate the prevalence of persons living with HIV/AIDS.

HARS is a confidential, name-based reporting system developed by CDC to manage HIV/AIDS surveillance data. HARS contains vital status information but does not contain information on cause of death. Until November 2006, DC records in HARS were limited to AIDS patients because non-AIDS patients with HIV infection were not reported by name in DC. To perform the electronic record linkage, Link Plus, a free program developed at CDC (4), was used to link AIDS patients in the HARS data file to records in two other computer data files: 1) the DC Vital Records Division's electronic death certificate file (eDCF) and 2) the Social Security Administration's Death Master File (SSDMF). The eDCF includes all deaths that occur in DC, regardless of state of residence, and some deaths of DC residents that occur in Maryland or Virginia. The SSDMF contains information on all deaths reported to the Social Security Administration, regardless of state of residence or where the death occurred. The eDCF has information on causes of death, but the SSDMF does not.

Analysis was limited to deaths that occurred during 2000–2005. The variables used for record linkage were name, date of birth, Social Security number, and sex. Three linkages were performed (Figure). Linkage 1 and linkage 2 matched the HARS file to eDCF and SSDMF records, respectively, to identify deaths among persons listed in HARS with reported AIDS. HARS cases that were successfully linked to eDCF or SSDMF records were categorized by whether the death had been previously reported to HARS.

Electronic Record Linkage to Identify Deaths Among Persons with AIDS — District of Columbia, 2000–2005

An estimated 1 million persons in the United States are living with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS); approximately 500,000 persons with AIDS have died since 1981 (1,2). In 2005, the District of Columbia (DC) had an estimated adult AIDS



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Breastfeeding-Related Maternity Practices at Hospitals and Birth Centers — United States, 2007

Breastfeeding provides optimal nutrition for infants and is associated with decreased risk for infant and maternal morbidity and mortality (1); however, only four states (Alaska, Montana, Oregon, and Washington) have met all five (2) *Healthy People 2010* targets for breastfeeding (3).^{*} Maternity practices in hospitals and birth centers throughout the intrapartum period, such as ensuring mother-newborn skin-to-skin contact, keeping mother and newborn together, and not giving supplemental feedings to breastfed newborns unless medically indicated, can influence breastfeeding behaviors during a period critical to successful establishment of lactation (4–9). In 2007, to characterize maternity practices related to breastfeeding, CDC conducted the first national Maternity Practices in Infant Nutrition and Care (mPINC) Survey. This report summarizes results of that survey, which indicated that 1) a substantial proportion of facilities used maternity practices that are not evidence-based and are known to interfere with breastfeeding and 2) states in the southern United States generally had lower mPINC scores, including certain states previously determined to have the lowest 6-month breastfeeding rates.[†] These results highlight the need for U.S. hospitals and birth centers to implement changes in maternity practices that support breastfeeding.

In 2007, in collaboration with Battelle Centers for Public Health Research and Evaluation, CDC conducted the mPINC survey to characterize intrapartum practices in hospitals and

birth centers in all states, the District of Columbia, and three U.S. territories. The survey was mailed to 3,143 hospitals and 138 birth centers with registered maternity beds, with the request that the survey be completed by the person most knowledgeable of the facility's infant feeding and maternity practices.

Questions regarding maternity practices were grouped into seven categories that served as subscales in the analyses: 1) labor and delivery, 2) breastfeeding assistance, 3) mother-newborn contact, 4) newborn feeding practices, 5) breastfeeding support after discharge, 6) nurse/birth attendant breastfeeding training and education, and 7) structural and organizational factors related to breastfeeding.[§] The subscales were derived

[§] *Labor and delivery* = mother-newborn skin-to-skin contact and early breastfeeding initiation. *Breastfeeding assistance* = assessment, recording, and instruction provided on infant feeding; not giving pacifiers to breastfed newborns. *Mother-newborn contact* = avoidance of separation during postpartum facility stay. *Newborn feeding practices* = what and how breastfed infants are fed during facility stay. *Breastfeeding support after discharge* = types of support provided after mothers and babies are discharged. *Nurse/birth attendant breastfeeding training and education* = quantity of training and education that nurses and birth attendants receive. *Structural and organizational factors related to breastfeeding* = 1) facility breastfeeding policies and how they are communicated to staff, 2) support for breastfeeding employees, 3) facility not receiving free infant formula, 4) prenatal breastfeeding education, and 5) coordination of lactation care.

^{*} Breastfeeding objectives are increases in the proportions of mothers who breastfeed their babies to meet the following targets: 75% in the early postpartum period (16-19a), 50% at 6 months (16-19b), 25% at 1 year (16-19c), 40% who exclusively breastfeed for 3 months (16-19d), and 17% who exclusively breastfeed for 6 months (16-19e). Objectives 16-19d and 16-19e were revised since the midcourse review. Additional information is available at ftp://ftp.cdc.gov/pub/health_statistics/nchs/datasets/data2010/focusarea16/o1619d.pdf and ftp://ftp.cdc.gov/pub/health_statistics/nchs/datasets/data2010/focusarea16/o1619e.pdf.

[†] Available at http://www.cdc.gov/breastfeeding/data/nis_data/data_2004.htm.

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