Burden and Trends in Campylobacter

Campylobacter is a common bacterial pathogen in the United States; it is estimated that there are 2.5 million infections every year resulting in 13,000 hospitalizations and 124 deaths. Persons with Campylobacter typically experience fever, abdominal cramps and diarrhea which may be bloody. Although most persons recover in about a week, persons with weakened immune systems may suffer complications such as a bloodstream infection or Guillain-Barre syndrome (a temporary paralysis that can last several weeks and usually requires intensive care). Anyone can get a Campylobacter infection, but children <5 years and young adults are known to be at a higher risk; males are more likely to become infected than females. Although there are many species of Campylobacter, the majority of human illness is caused by Campylobacter jejuni and most cases occur in the summer months. Campylobacter is spread through the consumption of contaminated food (typically poultry, water or contact with infected animals (particularly cats and puppies). Illness usually occurs 2-5 days after exposure. Outbreaks of Campylobacter are rare; however, many outbreaks are caused by the consumption of unpasteurized milk.

Campylobacter infections are not nationally notifiable, and prior to the establishment of FoodNet in 1996, there were no precise estimates of the burden of this important pathogen in the U.S. Using data from FoodNet, national goals were established for a 50% reduction in the 1996 incidence of infections by 2010 (goal of 12.3 cases per 100,000 persons). We are close to meeting this goal; compared to a baseline period of 1996-1998, the incidence of Campylobacter has declined by 30%. In 2006, the incidence was 12.7 per 100,000 persons, with the highest rate in California and lowest in Tennessee. Several efforts are underway in FoodNet to attempt to explain these regional differences in Campylobacter rates; including a survey of clinical laboratories regarding testing practices, and testing of poultry meat from retail stores. FoodNet has also conducted two case-control studies to help understand risk factors for sporadic disease (see summary of Sporadic Campylobacter Infections in Infants on pg. 2)

Continued active surveillance coupled with the work of partner agencies to understand the rates of contamination on meat and poultry products will help us to gain a better understanding of the overall burden of Campylobacter and enable the implementation of effective prevention and control measures. For more information on Campylobacter, visit: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/campylobacter_g.htm.

—Mary Patrick, CDC FoodNet

3Shiferaw et al. Use of Hospital Discharge Data to Assess the Incidence of Guillain-Barré Syndrome. Submitted to Neuroepidemiology, Fall 2007.
Infants have a higher risk of catching foodborne illness than older children or adults. However, findings from a recent study conducted by FoodNet describe several ways to reduce your infant's risk of contracting the most common bacterial foodborne illness in the United States.

Campylobacter infection has been linked to the consumption of unpasteurized (raw) milk and poultry, untreated water, contact with pets, especially those with diarrhea, and exposure to farms or farm animals. However, because of their limited diets and behavioral factors such as frequent hand-to-mouth contact, the sources of infection among infants may differ from those of older age groups.

FoodNet conducted a study of sporadic (non-outbreak) laboratory-confirmed Campylobacter cases occurring in children under the age of one year to investigate the potential sources of infection in infants residing in Connecticut, Minnesota, Oregon, and selected counties in California, Colorado, Georgia, New York and Tennessee. The study area covered a population of approximately 35.2 million persons (12.1% of the U.S. population), including approximately 450,000 infants. The study involved 123 infants infected with Campylobacter and 928 healthy infants. Parents or guardians were interviewed by telephone about various environmental and dietary exposures the infant may have had in the five days before illness or interview.

When compared to healthy infants of the same age, infants 0-6 months old with Campylobacter infection were less likely to have been breastfed, and more likely to have drunk well water or to have ridden in a shopping cart next to meat or poultry in the five days before illness or interview. For infants 7-11 months old, infants with Campylobacter infection were more likely to have visited or lived on a farm, to have contact with a pet with diarrhea in the home, and to have eaten fruits and vegetables prepared in the home. Campylobacter infection was associated with travel outside the U.S. in infants of all ages, though international travel was uncommon, suggesting that most infections in infants in the U.S. are acquired domestically.

—Bridget Anderson, New York FoodNet


FSIS Helps Consumers Be Food Safe

The United States Department of Agriculture’s Food Safety and Inspection Service (FSIS) helps to educate consumers on safe food handling practices to protect them from contracting a foodborne illness. Through its national consumer-oriented campaigns and programs, such as Be Food Safe and Is It Done Yet?, FSIS promotes the science-based and simple messages of Clean, Separate, Cook and Chill developed by the Partnership for Food Safety Education to help consumers prevent foodborne illness.

- **Clean**: Wash hands and surfaces often
- **Separate**: Don’t cross-contaminate
- **Cook**: Cook to proper temperature
- **Chill**: Refrigerate promptly

With the holiday season quickly approaching, knowing how to prepare your meat, poultry, and egg products safely is critical to helping you be food safe. Science tells us that Campylobacter and Salmonella, prevalent foodborne pathogens found in poultry, are easily destroyed by cooking all poultry to a safe minimum internal temperature of 165°F. FSIS recommends that a food thermometer be inserted in the thickest areas of the product without touching bone, to ensure the product is cooked to a safe minimum internal temperature. For whole turkey, check the internal temperature in the innermost part of the thigh and wing and in the thinnest part of the breast.

Additionally, FSIS encourages you to access its virtual food safety representative, Ask Karen, available 24/7, at [www.AskKaren.gov](http://www.AskKaren.gov), its Web site at [http://www.fsis.usda.gov/Fact_Sheets](http://www.fsis.usda.gov/Fact_Sheets), or call its Meat and Poultry Hotline at 1-888-MPHotline (1-888-674-6854) Monday through Friday from 10A to 4P, excluding all holidays, except Thanksgiving Day, when it is available 8AM to 2PM.

Accessing and applying this valuable safe food handling information will help you to prepare your meat, poultry, and egg products safely; thus, helping you be food safe all year round.

—Janice Adams King, USDA-FSIS

CAMPYLOBACTER: STRATEGIES FOR PREVENTION

- For young infants, breastfeeding is the best way to prevent illness and is encouraged for this and a variety of health reasons.
- Frequently wash your hands with soap and warm water or using an alcohol-based hand sanitizer, but especially before preparing food or bottles for infants.
- Pacifiers, teething rings and toys that fall to the floor should be cleaned with soap and water.
- Purified water should be used for drinking, brushing teeth, and mixing infant formula and foods.
- Fresh fruits and vegetables should be cooked or washed and peeled before eating.
- Use a disinfecting hand wipe to clean parts of shopping carts an infant may touch and place raw meat and chicken out of reach of infants.
- For more information regarding Campylobacter infection, please contact your local health department or visit the CDC website at [www.cdc.gov](http://www.cdc.gov).
Like a first down, enforcing regulations, identifying and implementing science-based strategies to keep our food safe, and educating the public about foodborne illness and safe food handling behaviors is an ongoing process in helping us score a touchdown – hence, achieving the goal of reducing pathogens in foods and preventing foodborne illness.

The United States Department of Agriculture’s Food Safety and Inspection Service (FSIS) ensures that meat, poultry, and egg products sold in interstate commerce are safe, wholesome, and correctly labeled and packaged. FSIS enforces food safety laws, regulations, policies, and programs year-round to reduce pathogens in meat, poultry, and egg products.

Never working in isolation, and always part of a team, FSIS partners with the food industry, state and other federal agencies, and academia to better understand existing and emerging foodborne pathogens, develop and implement food safety campaigns and educational initiatives, as well as programs, policies and procedures, such as the Hazard Analysis and Critical Control Point (HACCP) system and laboratory testing programs to help ensure the safety of its regulated products.

Recognizing that poultry can be contaminated with Campylobacter and that this pathogen presents public health challenges, FSIS sought advice from the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) on the applicability of various Campylobacter food testing methodologies. FSIS used the NACMCF recommendations (http://www.fsis.usda.gov/About_FSIS/NACMCF/index.asp) as the basis of the new FSIS broiler and turkey baseline studies underway in the fall of 2007. These baseline studies will help establish a microbiological performance standard for Campylobacter.

FSIS is working very hard to ensure that the industry is effectively addressing the occurrence of Salmonella on poultry products. Many of the interventions that are effective against Salmonella are also effective against Campylobacter. This effort has undoubtedly contributed to the reduction in human illnesses attributable to Campylobacter.

For more information about the work of FSIS, visit: http://www.fsis.usda.gov/

—Janice Adams-King, USDA-FSIS
The 14th International Workshop on Campylobacter, Helicobacter and Related Organisms (CHRO 2007) was held in Rotterdam, the Netherlands, on September 2-5.

There were a number of presentations on multilocus sequence typing (MLST). In the United Kingdom, W. F. Sopwith et al. reported that sequence types (ST) ST-21, ST-257 and ST-45 were the most common clonal complexes in humans. N. French reported that the most common human STs in New Zealand (ST-474 and ST-190) are both are internationally rare and found almost exclusively in humans and poultry. A case-control study in England by C.C. Tam et al. found that, compared to those who normally consume chicken, non-habitual chicken eaters had a greater risk of infection when consuming commercially-prepared chicken in the previous five days.

A quantitative risk model for C. jejuni and C. coli developed by R. J. Lake et al. indicates that poultry is an important vehicle for campylobacteriosis transmission in New Zealand.

B. Borck et al. reported that a risk management strategy in Denmark has had a significant impact on the occurrence of Campylobacter in Danish broiler meat. The strategy focused on reducing infection at the farm level, reducing the concentration of Campylobacter on the chicken meat, and educating the consumers.

FoodNet presented three posters at the conference (see recently presented abstracts below). Pat McDermott from FDA gave an oral presentation on the NARMS Retail Foods Study. Conference abstracts are available at http://www.chro2007.nl/.

—Elaine Scallan, CDC FoodNet

For additional information or to join the International Collaboration please email: ICOFDN@lisrserv.cdc.gov.

—Elaine Scallan, CDC FoodNet

### Recently Presented Abstracts on Campylobacter

- L. Demma, Campylobacter species in FoodNet and NARMS 1997-2004: is the incidence of Campylobacter coli infection increasing?
- L. Demma, Clinical laboratory practices for the isolation and identification of Campylobacter in FoodNet sites and correlation with geographic variation.

### Additional Campylobacter Resources

- [http://www.fightbac.org](http://www.fightbac.org)
- [http://www.cdc.gov/ncidod/dbmd/diseaseinfo/campylobacter_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/campylobacter_g.htm)