

## REFERENCES

1. **Adegbola, R., S. Alabi, F. Akinkuade, A. Cocker, and T. Odungbemi.** 1990. Correlation between human and animal bio-serogroups of *Campylobacter* isolates in Nigeria. *Journal of Tropical Medicine and Hygiene* **93**:280-283.
2. **Allos, B.** 2001. *Campylobacter jejuni* infection: Update on emerging issues and trends. *Clinical Infectious Disease* **32**:1201-1206.
3. **Ausubel, F., R. Brent, R. Kingston, D. Moore, J. Seidman, A. Smith, and K. Struhl.** 1997. *Current protocols in molecular biology*, vol. 1-3. John Wiley & son, New York.
4. **Bang, D., A. Wedderkopp, K. Pedersen, and M. Madson.** 2002. Rapid PCR using nested primers of the 16s rRNA and the hippuricase (*hipO*) genes to detect *Campylobacter jejuni* and *Campylobacter coli* in environmental samples. *Molecular and Cellular Probes* **16**:359-369.
5. **Baron, E., L. Peterson, and S. Finegold.** 1994. *Diagnostic microbiology*, 9 ed. Mosby, New York.
6. **Barton, M.** 1998. Does the use of antibiotics in animals affect human health? *Australian Veterinary journal* **76**(3):177-180.
7. **Becham III, H., C. Lebron, and P. Echeverria.** 1997. Short report: impact of traveller's diarrhea on United States troops deployed to Thailand. *American Journal of Tropical Medicine and Hygiene* **57**(6):699-701.
8. **Blaser, M., D. Taylor, and P. Echeverria.** 1986. Immune response to *Campylobacter jejuni* in a rural community in Thailand. *The Journal of Infectious Diseases* **153**(2):249-254.
9. **Chattopadhyay, U., M. Rashid, S. Sur, and D. Pal.** 2001. The occurrence of campylobacteriosis in domestic animals and their handlers in and around Calcutta. *Journal of Medical microbiology* **50**:933-934.
10. **Chuma, T., T. Ikeda, T. Maeda, H. Niwa, and K. Okamoto.** 2001. Antimicrobial susceptibility of *Campylobacter* strains isolated from broilers in the southern part of Japan from 1995 to 1999. *Journal of Veterinary Medical Science* **63**(9):1027-1029.
11. **Cloak, O., and P. Reatamico.** 2002. A multiplex polymerase chain reaction for the differentiation of *Campylobacter jejuni* and *Campylobacter coli* from a swine processing facility and characterization of isolates by pulsed-field gel electrophoresis and antibiotic resistance profiles. *Journal of Food Protection* **62**(2):266-273.
12. **Cocker, A., R. Isokpehi, B. Thomas, K. Amisu, and C. Obi.** 2002. Human campylobacteriosis in developing countries. *Emerging Infectious Disease* **8**(3):237-243.
13. **Denis, M., J. Refregier-Petton, M.-J. Lainsey, G. Ermel, and G. Salvat.** 2001. *Campylobacter* contamination in French chicken production from farm to consumers. Use of a PCR assay for detection and identification of *Campylobacter jejuni* and *Campylobacter coli*. *Journal of applied microbiology* **91**:255-267.

14. Denis, M., C. Soumet, K. Rivoal, G. Ermel, D. Blivet, G. Salvat, and P. Colin. 1999. Development of a m-PCR assay for simultaneous identification of *Campylobacter jejuni* and *C.coli*. *Letters in Applied Microbiology* 29:406-410.
15. Echeverria, P., N. Blacklow, L. Sanford, and G. Cukor. 1981. Traveler's diarrhea among American peace corps volunteers in rural Thailand. *The Journal of Infectious Disease* 143(6):767-771.
16. Echeverria, P., L. Jackson, C. Hoge, M. Arness, G. Dunnivant, and R. Larsen. 1993. Diarrhea in U.S. troops deployed to Thailand. *Journal of Clinical Microbiology* 31(12).
17. Echeverria, P., D. Taylor, U. Leksomboon, M. Bhaibulaya, N. Blacklow, K. Tamura, and R. Sakasaki. 1989. Case-control study of endemic diarrhea disease in Thai children. *The Journal of Infectious Disease* 159(3):543-548.
18. Fermer, C., and E. Engvall. 1999. Specific PCR identification and differentiation of the thermophilic *Campylobacter jejuni*, *C.coli*, *C.lari*, and *C.upsaliensis*. *Journal of Clinical Microbiology* 37(10):3370-3373.
19. Friedman, C., J. Neimann, H. Wegener, and R. Tauxe. 2000. Epidemiology of *Campylobacter jejuni* infections in the United States and other industrialized nations, p. 121-138. In I. Nachamkin and M. Blaser (ed.), *Campylobacter*, 2 ed. ASM press, Washington DC.
20. Garcia, M., M. Eaglesome, and C. Rigby. 1983. *Campylobacter* important in veterinary medicine. *Veterinary Bulletin* 53:793-818.
21. Gaudreau, C., and H. Gilbert. 1998. Antimicrobial resistance of clinical strains of *Campylobacter jejuni* subsp. *jejuni* isolated from 1985 to 1997 in Quebec, Canada. *Antimicrobial agents chemotherapy* 42:2106-2108.
22. Giessen, A., J. Tilburg, and W. Ritmeester. 1998. Reduction of *Campylobacter* infections in broiler flocks by application of hygiene measures. *Epidemiology Infection* 121:57-66.
23. Hanninen, M., S. Pajarre, M. Klossner, and H. Rautelin. 1998. Typing of human *Campylobacter jejuni* isolates in Finland by Pulsed-Field Gel Electrophoresis. *Journal of Clinical Microbiology* 36(6):1787-1789.
24. Helms, M., P. Vastrup, P. Gerner-Smidt, and K. Molbak. 2003. Short and long term mortality associated with foodborne bacterial gastrointestinal infections: registry based study.
25. Korolik, V., D. Friendship, T. Peduru-Hewa, D. Alfredson, D. Fry, and P. Coloe. 2001. Specific identification, grouping and differentiation of *Campylobacter jejuni* among thermophilic *campylobacters* using multiplex PCR. *Epidemiology and Infection* 127:1-5.
26. Leksomboon, U., P. Echeverria, C. Suvongse, and C. Duangmani. 1981. Viruses and bacteria in pediatric diarrhea in Thailand: A study of multiple antibiotic-resistant enteric pathogens. *American Journal of Tropical Medicine and Hygiene* 30(6):1281-1290.
27. Lin, J., L. Michel, and Q. Zhang. 2002. CmeABC functions as a multidrug efflux system in *Campylobacter jejuni*. *Antimicrobial agents and chemotherapy* 46(7):2124-2131.
28. Manatsathit, S., S. Tansupasawadikul, D. Wanachivanacin, S. Setawarin, Suwanagool.P., S. Prakasvejakit, S. Leelakusolwong, B. Eampokalap, and U. Kachintorn. 1996. Causes of chronic diarrhea in patients with AIDS in Thailand: A

- prospective clinical and microbiological study. *Journal of Gastroenterology* 31:533-537.
29. **Michino, H., and K. Otsuki.** 2000. Risk factors in causing outbreaks of food-borne illness originating in school lunch facilities in Japan. *Journal of Veterinary Medical Science* 562(5):557-560.
  30. **Misawa, N., K. Kawashima, H. Kawamoto, and F. Kondo.** 2002. Development of a combined filtration-enrichment culture followed by a one step duplex PCR technique for the rapid detection of *Campylobacter jejuni* and *C.coli* in human faecal samples. *Journal of Medical microbiology* 51:86-89.
  31. **Newell, D., J. Shreeve, M. Toszeghy, G. Domingue, Bull.S., T. Humphrey, and G. Mead.** 2001. Changes in the carriage of *Campylobacter* strains by poultry carcasses during processing in abattoirs. *Applied and environmental microbiology* 67:2636-2640.
  32. **On, S.** 1996. Identification methods for *Campylobacters*, *Helocobacters*, and related organisms. *Clinical Microbiology Reviews* 9(3):405-422.
  33. **Padungtod, P., R. Hanson, D. Wilson, B. Julia, J. Linz, and J. Kaneene.** 2002. Identification of *Campylobacter jejuni* isolates from cloacal and carcass swabs of chicken in Thailand by 5' nuclease fluorogenic polymerase chain reaction assay. *Journal of Food Protection* 65(11):1712-1716.
  34. **Poocharoen, L., and C. Bruin.** 1986. *Campylobacter jejuni* in hospitalized children with diarrhea in Chiang Mai, Thailand. *Southeast asian j trop med public health* 17(1):53-58.
  35. **Quinn, P., M. Carter, B. Markey, and M. Hanninen.** 1999. *Clinical Veterinary Microbiology*. Mosby, New York.
  36. **Rasrinaul, L., O. Suthienkul, P. Echeveria, D. Taylor, J. Seriwatana, A. Bangtrakulnonth, and U. Leksomboon.** 1988. Foods as a source of enteropathogens causing childhood diarrhea in Thailand. *Journal of Tropical Medicine and Hygiene* 39(1):97-102.
  37. **Rautelin, H., J. Jusufovic, and M. Hanninen.** 1999. Identification of hippurate-negative thermophilic *Campylobacters*. *Diagnostic microbiology and infectious disease* 35:9-12.
  38. **Refregier-Petton, J., N. Rose, M. Denis, and G. Salvat.** 2001. Risk factors for *Campylobacter spp.* contamination in French broiler-chicken flocks at the end of the rearing period. *Preventive Veterinary Medicine* 50:89-100.
  39. **Rivoal, K., M. Denis, G. Salvat, P. Collin, and g. Ermel.** 1999. Molecular characterization of the diversity of *Campylobacter spp.* isolates collected from poultry slaughterhouse: analysis of cross contamination. *Letters in Applied microbiology* 29:370-374.
  40. **Ruiz, J., P. Goni, F. Marco, F. Gallardo, B. Mirelis, and T. Jimenez.** 1998. Increased resistance to quinolones in *Campylobacter jejuni*: a genetic analysis of *gyrA* gene mutations in quinolone-resistant clinical isolates. *Microbiology and Immunology* 42:223-226.
  41. **Saenz, Y., M. Zarazaga, M. Lantero, M. Gastanares, F. Baquero, and C. Torres.** 2000. Antibiotic resistance in *Campylobacter* strains isolated from animals, foods and humans in Spain in 1997-1998. *Antimicrobial agents and chemotherapy* 44(2):267-271.

42. **Smith, K., J. Besser, C. Hedberg, F. Leano, J. Bender, and J. Wicklund.** 1999. Quinolone-resistance *Campylobacter jejuni* infections in Minnesota, 1992-1998. *New England Journal of Medicine* **340**:1525-1532.
43. **Sopwith, W., M. Ashton, J. Frost, K. Tocque, S. O'Brien, M. Regan, and Q. Syed.** 2003. Enhanced surveillance of *Campylobacter* infection in the North West of England 1997-1999. *Journal of Infection* **46**:35-45.
44. **Steinhauserova, I., J. Ceskova, K. Fojtkova, and I. Obrovskaa.** 2001. Identification of thermophilic *Campylobacter spp.* by phenotypic and molecular methods. *Journal of applied microbiology* **90**:470-475.
45. **Taylor, D., M. Blaser, P. Echeverria, C. Pitarangsi, L. Bodhidatta, and W. Wang.** 1987. Erythromycin-resistant *Campylobacter* infections in Thailand. *Antimicrobial agents and chemotherapy* **31**(3):438-442.
46. **Taylor, D., and P. Echeverria.** 1986. Etiology and epidemiology of traveler's diarrhea in Asia. *Reviews of infectious disease* **8**(2):s136-s141.
47. **Taylor, D., P. Echeverria, D. Pal, O. Sethabutr, S. Saiborisuth, S. Sricharmorn, B. Rowe, and J. Cross.** 1986. The role of *Shigella spp.*, *Enteroinvasive Escherichia coli*, and other enteropathogens as causes of childhood dysentery in Thailand. *The Journal of Infectious Disease* **153**(6):1132-1138.
48. **Taylor, D., P. Echeverria, C. Pitarangsi, J. Seriwatana, O. Sethabutr, L. Bodhidatta, C. Brown, J. Herrmann, and N. Blacklow.** 1988. Application of DNA hybridization technique in the assessment of diarrheal disease among refugees in Thailand. *American Journal of Epidemiology* **127**(1):179-187.
49. **Taylor, D., J. Kiehlbauch, W. Tee, C. Pitarangsi, and P. Echeverria.** 1991. Isolation of 2 group aerotolerant *Campylobacter* species from Thailand with diarrhea. *The Journal of Infectious Disease* **163**:1062-1067.
50. **Taylor, D., D. Perlman, P. Echeverria, U. Leksomboon, and M. Blaser.** 1993. *Campylobacter* immunity and quantitative excretion rates in Thai children. *The Journal of Infectious Disease* **168**:754-758.
51. **Vandamme, P.** 2000. Taxonomy of the family Campylobacteraceae, p. 3-26. In I. Nachamkin and M. Blaser (ed.), *Campylobacter*, 2 ed. ASM press, Washington, D.C.
52. **Wang, G., C. Clark, M. Taylor, C. Pucknell, C. Barton, L. Price, D. Woodward, and F. Rodgers.** 2002. Colony multiplex PCR assay for identification and differentiation of *Campylobacter jejuni*, *C. coli*, *C. lari*, *C. upsaliensis*, and *C. fetus subsp. fetus*. *Journal of Clinical Microbiology* **40**(12):4744-4747.
53. **White, D., S. Zhao, S. Simjee, D. Wagner, and P. McDermott.** 2002. Antimicrobial resistance of foodborne pathogens. *Microbes and Infection* **4**:405-412.
54. **Wilson, D., S. Abner, T. Newman, L. Mansfield, and J. Linz.** 2000. Identification of Ciprofloxacin-resistant *Campylobacter jejuni* by use of fluorogenic PCR assay. *Journal of Clinical Microbiology* **38**(11):3971-3978.
55. **Wilson, I.** 2002. *Salmonella* and *Campylobacter* contamination of raw retail chickens from different producers: a six year survey. *Epidemiology and Infection* **129**:635-645.



## APPENDIX

Profile of antibiotic resistance of *Campylobacter* spp. by sample

Isolate	spp	source	AMP	CEF	FLO	NA	TET	CLI	ERY	CEP	STR	COT
354	cc	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
378	cc	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
402	cc	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
723	cc	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
374	cc	farm	N	R	N	N	N	ND	ND	ND	ND	ND
441	cc	farm	N	R	N	R	N	ND	ND	ND	ND	ND
464	cc	farm	N	R	N	R	N	ND	ND	ND	ND	ND
472	cc	farm	N	R	N	R	N	ND	ND	ND	ND	ND
458	cc	farm	N	R	N	R	N	ND	ND	ND	ND	ND
353	cc	farm	N	R	N	R	N	ND	ND	ND	ND	ND
405	cc	farm	N	R	N	R	R	ND	ND	ND	ND	ND
471	cc	farm	N	R	N	R	ND	ND	ND	ND	ND	ND
482	cc	farm	N	R	N	R	ND	ND	ND	ND	ND	ND
459	cc	farm	N	N	N	N	ND	ND	ND	ND	ND	ND
462	cc	farm	N	N	N	R	N	ND	ND	ND	ND	ND
397	cc	farm	N	N	N	R	N	ND	ND	ND	ND	ND
469	cc	farm	N	N	N	R	N	ND	ND	ND	ND	ND
398	cc	farm	N	N	N	R	R	ND	ND	ND	ND	ND
751	cc	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
757	cc	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
770	cc	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
647	cc	farm	ND	ND	ND	R	R	R	R	ND	ND	ND
706	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
620	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
638	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
733	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
652	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
772	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
695	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
769	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
613	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
642	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
635	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
651	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
621	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
606	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
639	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
766	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
723	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
756	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
752	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
768	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
623	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND

Isolate	spp	source	AMP	CEF	FLO	NA	TET	CLI	ERY	CEP	STR	COT
721	cc	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
708	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
579	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
608	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
759	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
762	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
765	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
736	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
694	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
657	cc	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
645	cc	farm	ND	ND	ND	R	R	R	R	ND	ND	ND
648	cc	farm	ND	ND	ND	R	R	R	R	ND	ND	ND
405	cc	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
535	cc	farm	N	R	ND	N	N	N	N	R	N	R
536	cc	farm	N	R	ND	N	N	N	N	R	N	R
408	cc	farm	N	R	ND	R	N	N	N	R	N	N
439	cc	farm	N	R	ND	R	N	N	N	R	N	R
399	cc	farm	N	R	ND	R	N	N	N	R	N	R
395	cc	farm	N	R	ND	R	N	N	N	R	N	R
394	cc	farm	N	R	ND	R	N	N	N	R	N	R
502	cc	farm	N	R	ND	R	N	N	N	R	N	R
496	cc	farm	N	R	ND	R	N	N	N	R	N	R
389	cc	farm	N	R	ND	R	N	N	N	R	N	R
371	cc	farm	N	R	ND	R	N	N	N	R	N	R
500	cc	farm	N	R	ND	R	N	N	N	R	N	R
995	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
994	cc	market	ND	ND	ND	R	N	N	N	ND	ND	ND
943	cc	market	ND	ND	ND	R	N	N	N	ND	ND	ND
979	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
993	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
949	cc	market	ND	ND	ND	R	N	N	N	ND	ND	ND
992	cc	market	ND	ND	ND	N	N	N	N	ND	ND	ND
983	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
934	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
942	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
977	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
991	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
1002	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
955	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
981	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
1001	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
1003	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
973	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
945	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
998	cc	market	ND	ND	ND	R	R	N	N	ND	ND	ND
1000	cc	market	ND	ND	ND	R	R	R	R	ND	ND	ND
614	cc	slaughter	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
645	cc	slaughter	N	R	N	N	N	ND	ND	ND	ND	ND

Isolate	spp	source	AMP	CEF	FLO	NA	TET	CLI	ERY	CEP	STR	COT
629	cc	slaughter	N	R	N	R	N	ND	ND	ND	ND	ND
845	cc	slaughter	ND	ND	ND	N	N	N	N	ND	ND	ND
787	cc	slaughter	ND	ND	ND	N	R	N	N	ND	ND	ND
929	cc	slaughter	ND	ND	ND	N	N	N	N	ND	ND	ND
813	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
891	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
820	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
895	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
932	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
924	cc	slaughter	ND	ND	ND	N	N	N	N	ND	ND	ND
797	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
803	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
819	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
833	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
836	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
840	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
856	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
880	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
890	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
894	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
905	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
913	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
921	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
912	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
925	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
889	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
799	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
791	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
829	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
801	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
884	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
898	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
906	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
850	cc	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
927	cc	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
724	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
492	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
501	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
400	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
418	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
444	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
445	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
442	cj	farm	N	R	N	N	N	ND	ND	ND	ND	ND
375	cj	farm	N	R	N	N	R	ND	ND	ND	ND	ND
380	cj	farm	N	R	N	N	R	ND	ND	ND	ND	ND
365	cj	farm	N	R	N	R	N	ND	ND	ND	ND	ND
399	cj	farm	N	R	N	R	N	ND	ND	ND	ND	ND
477	cj	farm	N	R	N	R	R	ND	ND	ND	ND	ND

Isolate	spp	source	AMP	CEF	FLO	NA	TET	CLI	ERY	CEP	STR	COT
488	cj	farm	N	R	N	R	R	ND	ND	ND	ND	ND
499	cj	farm	N	R	N	R	R	ND	ND	ND	ND	ND
411	cj	farm	ND	N	N	N	ND	ND	ND	ND	ND	ND
417	cj	farm	N	N	N	N	N	ND	ND	ND	ND	ND
588	cj	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
578	cj	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
704	cj	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
707	cj	farm	ND	ND	ND	N	R	N	N	ND	ND	ND
577	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
636	cj	farm	ND	ND	ND	N	N	N	N	ND	ND	ND
593	cj	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
586	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
710	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
730	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
693	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
594	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
592	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
604	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
719	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
646	cj	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
602	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
633	cj	farm	ND	ND	ND	R	N	N	N	ND	ND	ND
622	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
724	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
728	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
738	cj	farm	ND	ND	ND	R	R	N	N	ND	ND	ND
612	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
422	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
482	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
484	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
505	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
542	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
549	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
553	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
562	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
565	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
609	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
620	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
623	cj	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
605	cj	farm	R	R	ND	R	N	N	R	R	R	R
548	cj	farm	R	R	ND	R	N	R	R	R	N	R
540	cj	farm	N	R	ND	N	N	N	N	R	N	R
568	cj	farm	N	R	ND	N	N	N	N	R	N	N
544	cj	farm	N	R	ND	R	N	N	N	R	R	N
572	cj	farm	N	R	ND	R	N	N	N	R	N	R
489	cj	farm	N	R	ND	R	N	N	N	R	N	R
547	cj	farm	N	R	ND	R	N	N	N	R	N	R
567	cj	farm	N	R	ND	R	N	N	N	R	N	R





Isolate	spp	source	AMP	CEF	FLO	NA	TET	CLI	ERY	CEP	STR	COT
604	other	farm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
554	other	farm	N	R	ND	R	N	N	N	R	N	R
976	other	market	ND	ND	ND	N	R	N	N	ND	ND	ND
526	other	slaughter	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
550	other	slaughter	N	R	N	R	N	ND	ND	ND	ND	ND
519	other	slaughter	N	R	N	R	N	ND	ND	ND	ND	ND
559	other	slaughter	N	N	0	R	N	ND	ND	ND	ND	ND
788	other	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
789	other	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
816	other	slaughter	ND	ND	ND	R	N	N	N	ND	ND	ND
874	other	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND
904	other	slaughter	ND	ND	ND	R	R	N	N	ND	ND	ND

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