

# REFERENCES

- (1) L. Slutsker, V. Dietz, L.F. McCaig, J.S. Bresee, C. Shapiro Mead, Paul. P.M., Griffin and R.V. Tauxe. Food-Related Illness and Death in the United States. U.S. Department of Health and Human Services.
- (2) U.S. Department of Health and Human Services. 2000 Morbidity and Mortality Weekly Report Surveillance for Waterborne-Disease Outbreaks-United States, 1997-1998. Atlanta, Georgia.:Centers for Disease Control and Prevention.
- (3) U.S. Department of Health and Human Services. 1998. HACCP Regulatory Applications in Retail Food Establishments 3rd edition, Appendix C Foodborne Pathogenic Microorganism and Natural Toxins. Rockville, Maryland.: U.S. Public Health Service, Food and Drug Administration.
- (4) Chin, James. 2000. Control of Communicable Diseases manual 17th edition. Washington D.C.: American Public Health Association.
- (5) Maier, R.M., I.L. Pepper and C.P. Gerba. 2000. Environmental Microbiology, Academic Press.
- (6) U.S. Environmental Protection Agency. 1998. Giardia: Human Health Criteria Document. Office of Water 4304. EPA-823-R-002.
- (7) U.S. Environmental Protection Agency. 2001. Cryptosporidium: Human Health Criteria Document. Office of Science and Technology, Office of Water. EPA-822-K-94-001.
- (8) Harwood, R.F. and M.T. James. 1969. Herms's Medical Entomology 6th edition. London. Collier-Macmillan Limited.
- (9) Fenner, F.J. and D.O. White. 1976. Second Edition Medical Virology. New York. Academic Press.
- (10) Arizona Department of Health Services. 1998. Hantavirus Pulmonary Syndrome. Phoenix. Arizona. Vector-Borne and Zoonotic Disease Section.
- (11) Gerba, C.P. and M.E. Gaither. 1997. Occurrence of Giardia, Cryptosporidium and Viruses in the Colorado River and its Tributaries, Grand Canyon National Park. Tucson, Arizona. University of Arizona, Coconino County Department of Health Services.
- (12) Reynolds, T.D. and P.A. Richards. 1996. Unit Operations and Processes in Environmental Engineering. San Francisco, California. PWS Publishing Company.
- (13) U.S. Environmental Protection Agency. 1999. Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual. Office of Water 4607. EPA 815-R-99-015.
- (14) U.S. Department of Health and Human Services. @001.FoodCode2001. Washington D.C.: U.S. Public Health Service, Food and Drug Administration.
- (15) Arizona Department of Environmental Quality. 1978. Guidelines for the Construction of Water Systems, Engineering Bulletin No. 10.
- (16) U.S. Environmental Protection Agency. 1999. EPA Region 9: Solid Waste Laws and Regulations. <http://www.epa.gov/region9/waste/solid/laws.htm>.

# APPENDICES

**APPENDIX A.** Bacteria multiply by a process called binary fission. Binary fission is asexual reproduction where one bacteria cell splits into two complete organisms. Pathogenic (capable of causing disease) bacteria grow and multiply very rapidly under the ideal conditions. For example, one pathogenic bacterial cell can multiply into 66 million cells within 24 hours in potentially hazardous food. Many of the bacterial food borne diseases discussed below only require 10 to 20 cells to cause disease in a single person.

**APPENDIX B.** During 1997 to 1998 the Centers for Diseases Control and Prevention reported 49 waterborne outbreaks involving 4,166 individuals in the United States<sup>(2)</sup>. This number does not include the numerous unreported cases. Approximately 12% of the waterborne outbreaks were associated with surface water, and *Cryptosporidium* caused the majority of these illnesses. In fact, the largest waterborne outbreak ever documented in the United States occurred in Milwaukee, Wisconsin during April 1993 where 403,000 people became ill with Cryptosporidiosis<sup>(2)</sup>. About 4,400 sick people were hospitalized and there were 108 deaths<sup>(2)</sup>. The reason this massive outbreak occurred is that the surface water source for Milwaukee, which is Lake Michigan, was not properly filtered to remove the *Cryptosporidium* oocysts.

APPENDIX C	
Microorganism	Size
Viruses	0.01 to 0.1 micrometers
Bacteria	0.1 to 10 micrometers
Parasite - <i>Giardia lamblia</i>	7 to 15 micrometers
Parasite – <i>Cryptosporidium parvum</i>	4 to 6 micrometers

APPENDIX D		
Microorganism	Percentage Removal/Inactivation	Log Removal/Inactivation
Enteric Viruses	99.99%	4-log
Pathogenic Bacteria	99.9999%	6-log
<i>Giardia</i> cysts	99.9%	3-log
<i>Cryptosporidium</i> oocysts	99%	2-log

APPENDIX E		
Free Available Chlorine (mg/l or ppm)	Time (minutes)	CT Value Viral Inactivation 4-log 99.99%
0.2	30	6
0.3	20	6
0.4	15	6
0.5	12	6
0.6	10	6
1.0	6	6
2.0	3	6
3.0	2	6
4.0	1.5	6