

6. FOOD SAFETY

Number	Objective
1	Foodborne infections
2	<i>Salmonella</i> and <i>Escherichia coli</i>
3	<i>Listeria monocytogenes</i> and <i>Vibrio vulnificus</i>
4	Antimicrobial-resistant bacterial pathogens
5	Food-induced anaphylaxis
6	Food handling by consumers
7	Food handling in retail establishments
8	Pesticide residue tolerances
9	Limits for mycotoxins

Food Safety

Goal

Reduce the number of foodborne illnesses.

Terminology

(A listing of all acronyms used in this publication appears on page 27 of the Introduction.)

Foodborne illness and **foodborne disease** are broad terms that encompass infection and intoxication caused by microbial or chemical contaminants in foods. Some foodborne illnesses, such as salmonellosis and staphylococcal food poisoning, are caused by a one-time intake of a sufficient number of microorganisms or amount of toxin to cause illness. Other foodborne illnesses are the result of the intake of compounds, such as aflatoxin, over long periods of time.

In addition, some acute foodborne illnesses may be associated with complications or **chronic sequelae**. **Hemolytic uremic syndrome** is a serious complication sometimes associated with illness caused by *Escherichia coli* O157:H7.^{1,2} Chronic joint diseases, such as reactive arthritis and Reiter's syndrome, can follow campylobacteriosis, *E. coli* enteritis, salmonellosis, shigellosis, and yersiniosis. Guillain-Barré syndrome, a polyneuritis that can result in temporary paralysis, can follow campylobacteriosis.

The **Food Code** is a book of recommendations of the U.S. Public Health Service, Food and Drug Administration (FDA), that was first published in 1993 and is revised every 2 years. It consists of model requirements for safeguarding public health and ensuring food is unadulterated and honestly presented when offered to the consumer. The **Food Code** is offered for adoption by local, State, and Federal Government jurisdictions for administration by the units which have been delegated compliance responsibilities for food service, retail food stores, or food vending operations.

The **food industry** includes producers (farmers, fishermen, ranchers), processors, storage, warehousing and transport, and retail.

The **retail food industry** (as covered by the *Food Code*) includes vending operations, grocery stores, other retail food outlets, and food service in restaurants and institutions.

A **foodborne disease outbreak** is the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food.³

The **infective dose** is the number of pathogenic microorganisms that will cause disease. This number may vary depending on the status of the individual's immune system.

A **pathogen** is a microorganism that causes illness.

An **emerging pathogen** is an illness-causing microorganism previously unknown to be a human pathogen, a foodborne pathogen not expected to occur in particular foods, or a pathogen that is dramatically increasing in prevalence.

1 **Overview**

2
3 Infectious foodborne diseases are increasing globally and threatening public health, contributing
4 significantly to the escalating cost of health care. In the United States an annual average of 15,475
5 foodborne illness cases and 14 foodborne illness-related deaths were reported to the Centers for Disease
6 Control and Prevention (CDC) for the years 1988-92.⁴ However, estimates indicate that between 6.5 and
7 33 million illnesses and 9,000 deaths each year are associated with microorganisms in food.⁵
8 Hospitalizations connected with these illnesses are estimated to cost over \$3 billion a year. It is further
9 estimated that the costs for lost productivity range between \$20 billion and \$40 billion per year.⁶ Since
10 foodborne chemical contaminants often cause chronic rather than acute problems, specific estimates of
11 their impact on health and the economy are not as readily available.

12
13 Several underlying forces may make foodborne illness more of a problem in the years to come. These
14 forces include⁷:

- 15
16 1. An increase in people at risk: The number of elderly and immunocompromised people who are at
17 greater risk of foodborne disease is increasing.
- 18
19 2. Declining safe preparation practices: Consumer research suggests that prior to the *E. coli* O157:H7
20 outbreak in 1993 the number of people following safe food preparation practices in their homes was
21 declining.
- 22
23 3. Increasingly diverse industry: The food service industry is characterized by a large, highly diverse
24 population of employees, with high rates of employee turnover, language and literacy barriers, and
25 nonuniform systems among States for training and certifying workers.
- 26
27 4. Global food supply: An increasing amount of the food eaten in most countries originates in other
28 countries. Methods of growing and handling food and the prevalence of enteric infections in food
29 handlers may increase the likelihood of food contamination in some of these countries.
- 30
31 5. Emerging pathogens: Because microorganisms continue to adapt and evolve, sometimes increasing
32 in their degree of virulence, outbreaks of illnesses have been caused by microorganisms previously
33 unknown to be human pathogens or by pathogens not expected to occur in particular foods. Known
34 pathogens can also be expected to alter their virulence attributes or to become resistant to antibiotics.

35
36 Pesticide residues in food also remain an area of great interest. Before pesticides may be sold, the
37 Environmental Protection Agency (EPA) determines how harmful a pesticide is to people, the extent to
38 which people are likely to be exposed, and the pesticide's use pattern. EPA sets limits on how much of a
39 pesticide may be used on food during growing and processing and how much can remain on the food
40 available for consumption. FDA and the Department of Agriculture (USDA) periodically check samples
41 of fresh produce and other foods for pesticide residues above the limits set by EPA. Federal, State, and
42 local agencies take action on foods found to have pesticide residues above the EPA limits. In 1996 new
43 legislation was passed that requires EPA to reassess all existing food tolerances. The Agency is to use
44 more rigorous criteria that focus more on sensitivities that children may have. The current regulatory
45 system appears to adequately address reasonable concerns about the potential risk from exposure to
46 pesticide residues in food.

47
48 Foodborne disease is a result of environmental and behavioral risk factors. Temperature abuse of food
49 will not result in illness if there are no pathogens or toxins present on or in the food. However, food
50 containing pathogens may not cause illness if the food is handled appropriately, i.e., stored to keep

1 pathogens from multiplying, cooked to destroy pathogens, and prevented from contaminating other foods.
2 When both systems break down, foodborne illness is likely. Generally, when food contains insignificant
3 levels of pathogens, toxins, or chemical contaminants and is handled appropriately, foodborne illness is
4 unlikely. However, very low levels of some pathogens, such as *Shigella* spp., *E. coli* O157:H7,
5 *Cyclospora cayetanensis*, and *Cryptosporidium parvum*, are sufficient to cause disease. Moreover, the
6 risk of infection by viruses and most protozoa is not reduced by cold storage of food because viruses and
7 parasites do not multiply in food. The effect of freezing food is diverse: Some pathogens are killed
8 whereas others preserved.
9

10 **Disparities in Health**

11
12 The very young, the elderly, and those who are not immunocompetent for a variety of reasons are the
13 populations who suffer most seriously from foodborne illness. In these populations, the infective dose is
14 usually smaller. Morbidity and mortality also may be higher than for other populations. In the special
15 cases of listeriosis and toxoplasmosis, pregnant women and their fetuses or newborns are at higher risk.
16

17 **Progress Toward Year 2000 Objectives**

18
19 As part of Healthy People 2000, four objectives, measured by 10 indicators, were identified for
20 determining whether efforts by the public and private sectors are reducing foodborne illness successfully.
21 These objectives and indicators included two objectives for tracking specific foodborne diseases, one
22 objective addressing consumer knowledge and use of safe handling practices, and one objective for
23 tracking State adoption and institutional food service use of FDA's *Food Code* for retail food
24 establishments.
25

- 26 • As of 1997, the incidence of disease caused by four key pathogens, *Salmonella* spp., *C. jejuni*, *E. coli*
27 O157:H7, and *Listeria monocytogenes*, has decreased to levels below the year 2000 targets.
28
- 29 • Reduction in the number of cases of disease caused by *L. monocytogenes* is especially encouraging;
30 however, this success may be difficult to replicate for other pathogens because of an increase in the
31 numbers of people at risk, declining safe preparation practices, an increasingly diverse food and food
32 service industry, the global food supply, and emerging pathogens.
33
- 34 • The number of outbreaks of *Salmonella* serotype Enteritidis also has decreased from 77 per year in
35 1989 to 44 per year in 1997, moving toward the goal of 25 per year.
36
- 37 • Data are not sufficient to fully assess changes in consumer food handling practices.
38
- 39 • Significant progress is being made toward the adoption of the new *Food Code*. Agencies in eight
40 States have adopted the *Food Code* and a majority of other States are reviewing the standards.
41
- 42 • Data are not sufficient to fully assess changes in use of the *Food Code* by institutions.
43

44 **Draft 2010 Objectives**

45
46 These objectives were developed from the Healthy People 2000 objectives based on the emphasis given
47 in the Food Safety Initiative,⁸ including the addition of increased surveillance and tracking of foodborne
48 illness cases and outbreaks caused by foodborne bacteria, parasites, and viruses and the modification of
49 the consumer handling practices objective to a basis on key practices and messages. In addition, the

proposed retail food handling objectives are more science based. Science-based objectives on pesticides were transferred from the Environmental Health Focus Area.

Foodborne Illness Surveillance

1. (Former 12.1) Reduce, by 50 percent for bacteria and 10 percent for parasites, the proportion of infections caused by key foodborne pathogens:

Microorganism	1997 Cases per 100,000	2010 Target Cases per 100,000
<i>Salmonella</i> species	13.8	6.9
<i>Campylobacter jejuni</i>	23.0*	11.5
<i>Escherichia coli</i> O157:H7	2.0*	1.0
<i>Toxoplasma gondii</i> (in children)	7,200.0**	6,480.0

*Based on preliminary 1997 active surveillance at FoodNet sites.

**Based on preliminary serological data from the National Health and Nutrition Examination Survey (NHANES) III.

Note: For *Toxoplasmosis gondii*, information is based on a seropositivity rate of 7.2 percent for children 6 to 10 years of age, or 7,200/100,000 children. Assuming that 50 percent of these, i.e., 3,600, were due to food consumption, a 20 percent improvement in the 3,600 cases associated with food consumption, i.e., 720, which represents an overall improvement of 10 percent, is targeted.

Target Setting Method: 50 percent improvement foodborne bacteria and 10 percent for foodborne parasites.

Potential Data Sources: National passive surveillance data from CDC, NCID: Salmonella Surveillance System and Campylobacter Surveillance System; supported by additional active surveillance data from Foodborne Disease Active Surveillance Network (FoodNet)(CDC, State agencies, FDA, and USDA) for bacterial pathogens. Data for *T. gondii* from National Health and Nutrition Examination Survey (NHANES) III, CDC, NCHS.

1a. (Developmental) Reduce foodborne infections caused by the parasitic pathogens *Cryptosporidium parvum* and *Cyclospora cayetanensis*, by hepatitis A virus and Norwalk virus, and incidence of postdiarrheal hemolytic uremic syndrome.

Campylobacteriosis and salmonellosis are the most frequently reported foodborne illnesses in the United States. The pathogens causing these illnesses, along with the less often reported but more severe *E. coli* O157:H7 and *L. monocytogenes*, were the focus under Healthy People 2000. Active surveillance for these bacterial species, based on laboratory data, also is being conducted at FoodNet sites.

Although not generally reported by clinicians, serosurveys suggest that toxoplasmosis may be one of the most common infections associated with food. As occurs with other parasitic diseases, examination for toxoplasmosis often is not available or is done infrequently. Many issues about the mode of transmission remain unknown, including the relative importance of the role of food in transmission. Studies are needed to determine the risk of infection attributable to foodborne exposure if food-related interventions are to be developed. A recent study of pregnant women found four particular food consumption and preparation practices significantly associated with congenital toxoplasmosis.⁹

1 *C. parvum* and *C. cayetanensis* have been or are being added to FoodNet in 1997 and 1998. Preliminary
2 data are available for *C. parvum*, *C. cayetanensis*, hepatitis A virus, and hemolytic uremic syndrome, but
3 what is needed is important information such as the proportion of infections that are foodborne and routes
4 of transmission for some of these pathogens. Examination for *C. parvum* and *C. cayetanensis* is not
5 universal in clinical labs; thus, data for these organisms may be less reliable than for the other organisms.
6 Epidemiologic information regarding hepatitis A and Norwalk cases often is incomplete; therefore,
7 special studies that provide data regarding the number of foodborne cases are needed to develop disease
8 reduction targets.

9
10 **2. (Former 12.2) Reduce the yearly outbreaks of infections due to *Salmonella* serotype Enteritidis
11 by 43 percent and *Escherichia coli* O157:H7 by 50 percent:**
12

	1997	2010 Target
	Number of Outbreaks	Number of Outbreaks
<i>Salmonella</i> serotype Enteritidis	44	25
<i>Escherichia coli</i> O157:H7	22	11

13
14 **Target Setting Method:** Retain the year 2000 target for outbreaks of *Salmonella* serotype
15 Enteritidis. For *E. coli* O157:H7, a 50 percent improvement (same target improvement as used in
16 12.1 for cases of *E. coli* O157:H7).
17

18 **Data Sources:** CDC Foodborne Disease Outbreak Surveillance System, CDC, NCID. Data for
19 hepatitis A to come from a Food Safety Initiative FoodNet project, CDC (NCID), FDA, USDA.
20

21 **2a. (Developmental) Reduce the number of foodborne outbreaks of hepatitis A.**
22

23 Reduction in outbreaks, as opposed to cases of sporadic disease, caused by significant foodborne
24 pathogens, is used by the food industry as a measure of success in application of improvements in food
25 production, processing, or food handling practices. Inclusion of this objective, although similar to
26 objective 1, gives very different information. A subobjective is to reduce the median size of an outbreak,
27 that is, the number of cases per outbreak. A reduction in size signals the ability to limit an outbreak that
28 has occurred. Although the number of cases per 100,000 may decrease, there may be not so great a
29 reduction in the number of outbreaks or initiating events. Smaller outbreaks may be a direct result of
30 better food handling and better epidemiological followup once cases are identified.
31

32 **3. (Developmental) Reduce the number of deaths from *Listeria monocytogenes* to __ annually and
33 *Vibrio vulnificus* to __ annually.**
34

35 **Potential Data Sources:** Gulf Coast *Vibrio* Surveillance System, CDC, NCID; FoodNet, CDC,
36 FDA, USDA.
37

38 Although foodborne illnesses from *L. monocytogenes* and from *Vibrio vulnificus* are rare, the illnesses are
39 serious and associated mortality rates are high among those at risk. *L. monocytogenes* causes listeriosis, a
40 serious disease manifested by septicemia and meningitis, which may result in death. The highest
41 incidence is among those with altered or deficient immune response, such as the very young, the elderly,
42 those taking immunosuppressive drugs, people with cancer or AIDS, and pregnant women. Listeriosis in
43 pregnant women may lead to abortion, stillbirth, or septicemia and meningitis in the neonate. The case
44 fatality rate is about 20 percent.
45

46 *Vibrio vulnificus* foodborne infections can cause primary septicemia (and may be accompanied by
47 gastroenteritis), which may be fatal within 2 to 3 days of onset of symptoms. Symptoms also may include

1 the formation of necrotic lesions that can result in limb amputation. Those at highest risk for septicemic
2 infection with *V. vulnificus* have pre-existing conditions, including liver disease (hepatitis, cirrhosis),
3 hemochromatosis, thalassemia, diabetes, or suppressed immune systems from any cause (AIDS, long-
4 term systemic glucocorticoid treatment, cancer). The case fatality rate for patients with these underlying
5 illnesses is about 50 percent. The medically at-risk population in the United States is estimated to be 9
6 million.

7
8 Reduction in numbers of deaths from these two illnesses may be possible through increased educational
9 efforts targeted at those in the at-risk populations.

10
11 **4. (Developmental) Reduce foodborne infections caused by antimicrobial-resistant bacterial**
12 **pathogens of the species *Salmonella*, *Campylobacter*, and *Escherichia coli* in humans and the**
13 **prevalence of resistant pathogens collected from animals.**

14
15 **Potential Data Sources:** The National Antimicrobial Susceptibility Monitoring Program active
16 surveillance system, supported by additional surveillance and research activities associated with
17 FoodNet sites and ongoing activities of FDA, CDC, and USDA.

18
19 The problem of foodborne disease is increasing, in part, because foodborne infections are becoming more
20 serious. One of the ways foodborne pathogens become more significant is by acquiring resistance to
21 antimicrobial agents. The trend toward increased resistance and multiple-resistant pathogens, originating
22 in animals with the potential for transmission to humans through the food supply, heightens public health
23 concerns about decreasing treatment options and impact on health care costs. For this reason increased
24 isolate testing is planned for rapid identification of emerging resistance and to monitor for the changes in
25 patterns and trends of existing problems in both human and animal populations. In 1997, 4,400 isolates
26 of *Salmonella* species, 250 isolates of *E. coli* and 500 isolates of *Campylobacter* spp. were tested for
27 antimicrobial resistance.

28
29 Augmented surveillance, planned as a result of the President's Food Safety Initiative and improvements
30 under consideration to the FoodNet Program, will allow the public health community, the veterinary and
31 producer groups, and the regulatory agencies to be proactive in addressing resistant zoonotic enteric
32 pathogens. As with all surveillance enhancements, increases are anticipated in the number of resistant
33 pathogens detected initially. Over time, as control and educational programs are enacted, decreases will
34 be targeted. Increased scope and representativeness of testing will give a better picture of the nature and
35 extent that antimicrobial-resistant foodborne pathogens are transmitted from animals to humans.

36
37 **5. (Developmental) Reduce deaths from food-induced anaphylaxis.**

38
39 Food allergy is an important clinical problem in that 6 to 8 percent of infants less than age 2 and 1 to 2
40 percent of U.S. adults are food allergic. Egg, milk, peanuts, soy, wheat, tree nuts, fish, and crustaceans
41 (shellfish) are the foods most likely to induce food allergy. The risk for food allergy is higher in infants
42 and young children than in adults. There are an estimated 2,500 individuals per year in the United States
43 who experience food-induced anaphylaxis. Because allergenic foods are present in a variety of foods, and
44 because even trace amounts of these allergenic foods can induce anaphylaxis, education and clear
45 ingredient information are critical to the management of food allergy.

1 **Safe Food Handling by Consumers**

2
3 **6. (Former 12.3) Increase the proportion of consumers who practice each of the four critical food**
4 **handling behaviors:**

5

	1998	2010 Target
1) Clean: wash hands after touching raw meat or poultry	77%	87%
2) Separate: wash cutting board or use a different board after cutting raw meat or poultry	81%	91%
3) Cook hamburgers thoroughly	80%	90%
4) Chill: refrigerate promptly	89%	94%

6
7 **Target Setting Method:** 10 percentage point increase for three behaviors based on 1998 baseline; 5
8 percentage point increase for behaviors already practiced by most people (89%).

9
10 **Data Source:** Food Safety Survey (FSS), FDA, planned to be used every 2 to 3 years.

11
12 A majority of meals (71 percent) and snacks (78 percent) are prepared at home.¹⁰ For these meals, the
13 food-preparing consumer represents the last opportunity to protect against foodborne illness. Recent
14 surveys show that improvement is needed in food handling at home.^{11,12} The consumer food safety
15 practices objective is based on key food safety messages/practices for consumers: (1) clean: wash hands
16 and surfaces often; (2) separate: don't cross-contaminate; (3) cook to proper temperatures; and (4) chill:
17 refrigerate promptly. Messages based on key food safety practices were developed cooperatively by the
18 Partnership for Food Safety Education, including FDA; USDA; CDC; the Food Marketing Institute; the
19 American Meat Institute; the National Restaurant Association; and other industry, State, and consumer
20 organizations. This partnership was formed as a direct result of the education portion of the President's
21 Food Safety Initiative.

22
23 **Safe Food Handling at Retail Establishments**

24
25 **7. (Developmental) Reduce the occurrences of the following factors in retail food establishments:**
26 **improper holding temperatures, inadequate cooking, poor personal hygiene, contaminated**
27 **equipment, and foods from unsafe sources.**

28
29 **Potential Data Sources:** Baseline data from FDA Retail Food Specialists through their field
30 inspections conducted initially in FY 98. National data will be obtained during FDA/State inspection
31 activities and FDA Specialists' audits of programs to include incorporation of *Food Code*
32 interventions. FDA/Center for Food Safety and Applied Nutrition and Office of Regional Activities.

33
34 Improper holding temperatures, inadequate cooking, poor personal hygiene, contaminated equipment, and
35 foods from unsafe sources have been associated with foodborne outbreaks in retail food establishments.
36 This objective focuses regulatory efforts on changing behaviors and practices that are directly related to
37 foodborne illness and to major *Food Code* interventions in foodborne disease transmission. It recognizes
38 the importance in directing regulatory resources to achieve the greatest degree of consumer protection and
39 the need for a measurable indicator that the risk of foodborne illness in the retail segment has been
40 reduced. Reduction in occurrences will follow training in and use of the *Food Code* by retail food
41 handlers.

1 *Ensuring Safe Food During Production*
2

3 **8. (Developmental) Complete __ percent of the reassessment of pesticide residue tolerances**
4 **mandated by the Food Quality Protection Act.**
5

6 **Potential Data Source:** Office of Pesticide Programs, Environmental Protection Agency.
7

8 In 1995, less than 1 percent of all domestic and imported food samples tested had pesticide residues
9 exceeding the current tolerance levels, and only 1.5 percent of foods sampled contained pesticides for
10 which no tolerances exist.¹³ The Food Quality Protection Act of 1996 requires that all existing food
11 tolerances for pesticides be reassessed by the year 2006. The safety standard that must be met is a
12 “reasonable certainty of no harm.” The Act specifies that when setting tolerances, EPA must consider
13 dietary exposures from all food uses of pesticides; dietary exposure from drinking water; nonoccupational
14 exposure, such as the use of the pesticides for lawn care; and any special sensitivities for children. In
15 addition, EPA must consider exposure from pesticides with common mechanisms of toxicity. As a result,
16 exposure from one use of a pesticide will affect whether or not the exposure from another use can be
17 permitted. About 10,000 tolerances need to be reassessed.
18

19 **9. (Developmental) Develop and promote risk reduction measures (e.g., consumption advisories,**
20 **good manufacturing practice changes, advisory residue level limits, regulatory standards) for**
21 **dietary mycotoxins: aflatoxin, fumonisin, deoxynivalenol (vomitoxin), and patulin.**
22

23 **Potential Data Sources:** Food and Drug Administration (FDA) and U.S. Department of Agriculture
24 data.
25

26 Mycotoxins are toxins formed by fungi (molds) in food and in animal feed and include, among others,
27 aflatoxins, fumonisins, deoxynivalenol, and patulin. Aflatoxins have been shown to cause liver cancer in
28 some animal species. Aflatoxins have been found to occur naturally in corn, peanuts, figs, cottonseed,
29 and various tree nuts and in milk of cattle consuming contaminated feed. Fumonisin and the mold that
30 produces these toxins in corn and corn products have been linked to fatalities in horses and swine, to
31 human esophageal cancer (South Africa and China) and to liver cancer in rats. Deoxynivalenol,
32 commonly referred to as vomitoxin, has been associated with two acute gastrointestinal illness outbreaks
33 in China (1984/1985) and India (1987). This toxin is produced by a mold in grains, including wheat,
34 corn, rye, and barley. Patulin is a compound that occurs in fungal contaminated rotting apples. It has
35 some cellular toxicity and has produced local irritation and acute intoxication in humans and laboratory
36 animals.
37

38 Mycotoxins cannot be entirely avoided or eliminated from human foods or animal feeds because the
39 molds occur naturally in grains and other food commodities. FDA is using a science-based risk
40 assessment procedure to help identify appropriate risk reduction measures for these mycotoxins in food.
41 Surveillance by FDA and USDA will be used to determine baselines for these dietary mycotoxins.
42

1 **Related Objectives from Other Focus Areas**

2 **Environmental Health**

- 3 10 Poisonings from contaminated fish
4 13 Pesticide poisonings
5 33 Total pesticide exposure

6
7 **References**

- 8
9 1. Council for Agricultural Science and Technology (CAST). 1994. *Foodborne Pathogens: Risks and*
10 *Consequences*. Task Force Report No. 122. p. 18.
11 2. Lindsay, J.A. Chronic sequelae of foodborne disease. *Emerging Infectious Diseases* 3:443-452, 1997.
12 3. Centers for Disease Control and Prevention (CDC). Surveillance Summaries, October 25, 1996. *Morbidity and*
13 *Mortality Weekly Report* 45 (SS-5).
14 4. CDC, op cit.
15 5. CAST, op cit.
16 6. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), Environmental Protection
17 Agency (EPA), Centers for Disease Control and Prevention (CDC). *Food Safety from Farm to Table: A*
18 *National Food Safety Initiative*. Report to the President, May 1997.
19 7. Food and Drug Administration. 1995. Healthy People 2000 Progress Review, SeFDA USDA, EPA, CDC, op.
20 cit.
21 8. Kapperud, G.; Jennum, P.A.; Stray-Pederson, B.; Melby, K.K.; Eskild, A., Eng. J.; Risk factors for *Toxoplasma*
22 *gondii* infection in pregnancy. *American Journal of Epidemiology* 144(4):405-412, 1996.
23 9. Guthrie, J.F. and Lin, B.H. *Trends in Consumption of Food Away From Home 1977-1985 and Implications for*
24 *Achieving Dietary Guidelines for Fat Intake*. Presented at the Annual Meeting of the American Dietetic
25 Association, 1997.
26 10. National Center for Health Statistics. *Healthy People 2000 Review, 1997*. Hyattsville, MD: Public Health
27 Service, 1997, p. 117.
28 11. Daniels, R.W. Home food safety. *Food Technology*. 52(2):54-56, 1998.
29 12. Food and Drug Administration. 1996. Pesticide Program Residue Monitoring, 1995. National
30 Technical Information Service PB96-503156.