

**Midcourse
Review**



Food Safety **10**

Co-Lead Agencies:

Food and Drug Administration
Food Safety and Inspection Service, U.S. Department of Agriculture

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Goal: Reduce foodborne illnesses.

Introduction*

Preventing food-related infections is an increasingly important public health problem. Yet, many people rarely think about food safety until a foodborne illness affects them or their family.

The Food Safety focus area seeks to decrease the rate of diseases caused by microorganisms transmitted mainly by food, such as *Salmonella* and *Campylobacter*. Specific objectives support tracking new and total cases of the most common food pathogen diseases and making food safety education a primary area of emphasis. A significant amount of research is being conducted to reduce foodborne disease and allergic reactions.

Progress was made in reaching Food Safety objectives regarding foodborne illness. Overall, total cases of predominantly foodborne infections¹ decreased for *Campylobacter* species, *Escherichia coli* (*E. coli*) O157:H7, and *Listeria monocytogenes* (*L. monocytogenes*). Consumer food safety practices also improved.

But work remains to be done, particularly in the area of bacterial antimicrobial resistance, which is increasing the overall illness, death, and economic costs associated with treating bacterial infections caused by resistant organisms worldwide. After several decades of successful antimicrobial use, multiresistant bacterial pathogens are emerging that are less responsive to therapy. For example, non-Typhi *Salmonella* strains from humans are demonstrating emerging resistance to the newest antibiotics, such as fluoroquinolones and third-generation cephalosporins. However, for older, less-prescribed antibiotics, such as gentamicin and ampicillin, resistance has decreased. To preserve their efficacy and thereby protect lives, antibiotics must be used prudently.

The focus area also examines health disparities among segments of the population. Once inequities are identified, work can begin on their correction. Limited data were available for populations by race, ethnicity, gender, and education. Overall, the non-Hispanic white population, females, and high school graduates had reduced rates for foodborne illness and safer food preparation practices. According to the preliminary data available, disparities among select racial and ethnic populations exist. With continued tracking of these differences, educational initiatives can better target the populations in need.

Modifications to Objectives and Subobjectives

The following discussion highlights the modifications, including changes, additions, and deletions, to this focus area's objectives and subobjectives as a result of the midcourse review.

* Unless otherwise noted, data referenced in this focus area come from Healthy People 2010 and can be located at <http://wonder.cdc.gov/data2010>. See the section on DATA2010 in the Technical Appendix for more information.

As stated in *Healthy People 2010*: “Most developmental objectives have a potential data source with a reasonable expectation of data points by the year 2004 to facilitate setting 2010 targets in the mid-decade review. Developmental objectives with no baseline at the midcourse will be dropped.” Accordingly, at the midcourse review, some developmental objectives and subobjectives were deleted due to lack of a data source. However, the U.S. Department of Health and Human Services and the agencies that serve as the leads for the Healthy People 2010 initiative will consider ways to ensure that these public health issues retain prominence, despite their current lack of data.

The objective measuring organophosphate pesticide exposure (10-7) was deleted. It was dropped because recent research has demonstrated that the absolute amounts of these substances in foods are negligible. Levels of pesticide residues in foods are monitored annually through the Total Diet Study (TDS)² conducted by the Food and Drug Administration (FDA). According to a 2002 analysis of the TDS results for organophosphates for the period 1997–99, very few detectable levels of organophosphate residues were found in foods.³ With such low levels and so few findings each year, no trend could be identified for the presence of organophosphate residues in TDS samples or for further calculation of exposure from foods.

Several subobjectives were deleted at the midcourse. Surveillance of *Cyclospora cayetanensis* (10-1e) was deleted because of its very low rate (0.1 cases per 100,000 population in 2002) and variable occurrence. Surveillance of congenital *Toxoplasma gondii* (10-1g) infections was deleted due to lack of a database and the unavailability of data. The subobjectives regarding antimicrobial drug resistance of non-Typhi *Salmonella* from animals at slaughter (10-3e through p) were deleted due to the unavailability of data.

For subobjectives 10-3e through p, the slaughter data available to the National Antimicrobial Resistance Monitoring System (NARMS) program are from a regulatory program of the U.S. Department of Agriculture’s (USDA’s) Food Safety and Inspection Service (FSIS) that is not designed to estimate total numbers nationwide.⁴ Three potential sources of data for these subobjectives are FSIS’s statistically designed microbiologic baseline studies in meat and poultry products; expanded and randomized antimicrobial drug resistance data on *Salmonella* isolates from retail meats collected by 10 sites⁵ in the Foodborne Disease Active Surveillance Network (FoodNet); and a more comprehensive assessment of the flow of antimicrobial drug-resistant organisms throughout the farm-to-slaughter continuum, using an initiative proposed by USDA and industry—Collaboration in Animal Health and Food Safety Epidemiology.

Two objectives and one subobjective became measurable. The wording of that subobjective, reducing the number of new cases of postdiarrheal hemolytic uremic syndrome (HUS) (10-1f), was revised to reflect surveillance of children under 5 years of age. Nationally representative data from FoodNet were available to make this subobjective measurable. The 2000 baseline is 1.8 cases per 100,000 children under age 5 years. The target is a 50 percent reduction to 0.9 cases per 100,000 children under age 5 years.

The objective for reducing deaths and illness from severe food allergies (10-4) became measurable and was divided into subobjectives for deaths in the total population (10-4a) and for severe allergic reactions in adults aged 18 years and older (10-4b). Progress toward the second subobjective was measured by the proportion of doctor-diagnosed food allergic respondents in the Food Safety Survey (FSS) whose most recent allergic reaction since 2000 was severe. In the FSS, severe allergic reactions are defined as those that require the use of an epinephrine pen, treatment in a hospital or a doctor’s office, or an overnight stay

in a hospital. The objective is limited to adults because the FSS sample includes only adults. The 2001 baseline is 26 percent, and the target is 21 percent, a reduction of 19 percent.

The objective covering safe food preparation practices in retail establishments (10-6) became measurable. Nine measurable subobjectives were added (10-6a through i). Two additional data points are anticipated to be available for each subobjective before the end of the decade.

Progress Toward Healthy People 2010 Targets

The following discussion highlights objectives that met or exceeded their 2010 targets; moved toward the targets, demonstrated no change, or moved away from the targets; and those that lacked data to assess progress. Progress is illustrated in the Progress Quotient bar chart (see Figure 10-1), which displays the percent of targeted change achieved for objectives and subobjectives with sufficient data to assess progress.

Data were available to measure progress for foodborne infections (10-1a through d, and f), outbreaks of foodborne infections (10-2a and b), antimicrobial resistance of *Salmonella* species (10-3a through d), and consumer food safety practices (10-5). One objective moved toward its target. The remaining three objectives demonstrated mixed progress toward or away from their targets based on individual subobjectives. Two subobjectives within these three objectives met their targets, and another four subobjectives made progress toward their targets. Five subobjectives moved away from their targets, and two objectives could not be assessed.

Objectives that met or exceeded their targets. Two subobjectives met their targets at baseline and continued to improve. Between 1997 and 2002, the percentage of human isolates of non-Typhi *Salmonella* species exhibiting resistance to gentamicin (10-3c) declined from 3 percent to 1 percent. The percentage of human isolates of non-Typhi *Salmonella* species displaying resistance to ampicillin (10-3d) declined from 18 percent to 13 percent. Decreased resistance to these antimicrobial drugs may be due, in part, to the development of prudent and judicious antimicrobial drug use programs by the American Veterinary Medical Association and FDA. These programs assist veterinarians and producers in making sound decisions about the use of such products in food animals.⁶

Objectives that moved toward their targets. Reductions in infections caused by *Campylobacter* species (10-1a), *E. coli* O157:H7 (10-1b), and *L. monocytogenes* (10-1c) showed progress toward their respective targets of 50 percent reductions from the baseline levels. Between 1997 and 2002, *Campylobacter* species infections (10-1a) declined from 24.6 cases per 100,000 population to 13.3 cases per 100,000 population, achieving 92 percent of the targeted change. During the same period, *L. monocytogenes* infections (10-1c) declined from 0.47 cases per 100,000 population to 0.26 cases per 100,000 population, achieving 91 percent of the targeted change. *E. coli* O157:H7 infections (10-1b) decreased from 2.1 cases per 100,000 population in 1997 to 1.7 per 100,000 population in 2002, achieving 36 percent of the targeted change. Outbreaks of infection from *Salmonella* serotype *S. enteritidis* (10-2b) declined from 44 outbreaks per year in 1997 to 29 outbreaks in 2002, achieving 68 percent of the targeted change. General food safety practices among consumers aged 18 years and older (10-5) improved from 73 percent in 1998 to 75 percent in 2001, attaining 33 percent of the targeted change.

Objectives that moved away from their targets. Five subobjectives moved away from their targets: foodborne infections caused by *Salmonella* species (10-1d), postdiarrheal HUS among persons

under 5 years of age (10-1f), outbreaks of foodborne infections from *E. coli* O157:H7 (10-2a), and percentage of human isolates of non-Typhi *Salmonella* exhibiting resistance to fluoroquinolones or third-generation cephalosporins (10-3a and b).

Three years of HUS data showed little change, with 1.80, 1.44, and 1.91 new cases per 100,000 population each year in 2000, 2001, and 2002, respectively.

The decrease in the number of cases and increase in the number of outbreaks of *E. coli* O157:H7 may signal either a real increase in number of outbreaks, perhaps associated with wider distribution of meats and produce, or the improved ability to group cases into outbreaks. Pulsed field gel electrophoresis (PFGE) methods allow differentiation of *E. coli* O157:H7 strains. The PulseNet linking of laboratories permits identification of widespread outbreaks that previously might have been considered sporadic cases.

The targets of 0.0 percent of non-Typhi *Salmonella* species exhibiting resistance to fluoroquinolones (10-3a) and third-generation cephalosporins (10-3b) were met at baseline. However, between the 1997 baseline and 2002, these percentages increased from 0.0 to 0.1 percent for fluoroquinolones and 0.2 percent for third-generation cephalosporins. These changes may be a result of the increasing use of these new antibiotics. Additional years of NARMS data will improve knowledge of the trends.³

Non-Typhi *Salmonella* is the third most commonly reported cause of foodborne illness in the United States.¹ A comprehensive farm-to-table approach to food safety is necessary for control.⁷

Objectives that could not be assessed. Data were unavailable to assess progress for 11 subobjectives. As previously noted, 1 objective and 14 subobjectives were deleted. Data sources have been identified for two formerly developmental objectives and subobjectives: deaths and illness from severe food allergies (10-4a and b) and safe food preparation practices in retail food establishments (10-6a through i).

Progress Toward Elimination of Health Disparities

The following discussion highlights progress toward the elimination of health disparities. The disparities are illustrated in the Disparities Table (see Figure 10-2), which displays information about disparities among select populations for which data were available for assessment. Limited data were available at the midcourse review regarding disparities.

One objective and six subobjectives had partial data available. For cases of foodborne infections (10-1a through d, and f), data were available to compare rates of males and females only. Females had better rates than males had for foodborne infections caused by *Campylobacter* species (10-1a) and *L. monocytogenes* (10-1c). The gender disparity in foodborne infections due to postdiarrheal HUS among children under 5 years of age (10-1f) declined between 1997 and 2002. For subobjectives 10-1a and c, males had a 10 percent to 49 percent higher rate of infection than females. Males experienced fewer foodborne illnesses from *E. coli* O157:H7 (10-1b) than females. Although males had the better rate than females for HUS (10-1f) since 2000, the disparity between males and females decreased by 10 to 49 percentage points.

Baseline disparity data for severe allergic reactions to food (10-4b) by gender showed that males had a better rate than females. High school graduates had a better rate for avoiding severe food allergy reactions than persons with at least some college.

The objective for food safety practices in consumers aged 18 years and older (10-5) (that is, clean—wash hands, utensils, and surfaces often; separate—don’t cross-contaminate; cook—cook to proper temperatures; and chill—refrigerate promptly) had data for gender and education level and comparison data for race and ethnicity. The white non-Hispanic population had the best rate of racial and ethnic groups; women had a better rate than men. The differences among education levels were less than 10 percent. The Asian population experienced the largest disparity—50 percent to 99 percent from the best group rate. Recognition of this disparity reveals the need for culturally competent and linguistically appropriate outreach to Asian audiences. Males and the Hispanic population each had a 10 percent to 49 percent disparity from the best group for objective 10-5. Data were not available for the American Indian or Alaska Native and Native Hawaiian or other Pacific Islander groups. To correct these inequalities, FSIS created and distributed culturally competent food safety message cards to underserved African American, Asian American, American Indian, and Hispanic populations.

Opportunities and Challenges

Surveillance, outbreak investigation, research, risk assessment, regulation, guidance, enforcement, coordination, and education are the broad strategies that Federal and State agencies, academia, the food industry, and trade organizations are using to focus efforts to decrease the number of foodborne illnesses, including decreasing the number and size of foodborne illness outbreaks. Surveillance systems, both passive and active, alert States, the Centers for Disease Control and Prevention (CDC), FDA, and FSIS to cases and increases of foodborne illness. Disease surveillance and epidemiologic investigations provide information for analyzing outbreaks and identifying tracebacks to food products, or to facilities, so that the remaining products can be removed from the market and other corrections or interventions can be made.

When outbreaks are tied to specific products, research can focus on the source of contamination and effective intervention. With the use of PFGE, phage-typing, and other methods of analysis, strains can be differentiated, for example, among *E. coli* O157:H7, *L. monocytogenes*, and *Salmonella* species. Public health officials are able to identify outbreaks that might otherwise have been considered sporadic cases and possibly limit their impact. FDA, FSIS, and others have developed microbiologic risk assessments on particular organisms to target prevention efforts on the riskiest products and procedures or steps in the farm-to-fork continuum.

Multiple education initiatives have been implemented to reduce the number of outbreaks and individual cases of foodborne infections in general and specific populations. FDA and FSIS each develop and distribute consumer materials on food safety such as the importance of cooking foods to safe temperatures; how to ensure safe temperatures in refrigerators and freezers; details on foodborne illness associated with raw and undercooked meat, poultry, eggs, and seafood; and special issues associated with highly susceptible populations, including older adults, immunocompromised individuals, pregnant women, and young children.

Another important program to educate the public about food safety is the “Fight BAC!”[®] campaign, a national initiative that unites FDA, FSIS, and the Partnership for Food Safety Education (PFSE).⁸ This program, which is the basis of the consumer food practices objective (10-5), reduces foodborne illness by stressing the four key food safety measures—clean, separate, chill, and cook—mentioned earlier. Also, for the annual National Food Safety Education Month[®] every September, planning guides of consumer education materials are issued to health educators.⁹ To further ensure that food safety messages

reach consumers, FSIS introduced the Food Safety Mobile in 2003 to deliver food safety education messages to consumers, educators, and other interested partners at the local level.¹⁰

Cooking foods to safe temperatures is the “Fight BAC!”[®] message that needs the most improvement among all consumer groups. “Thermy™” is a national food safety education campaign launched in 2000 by FSIS in cooperation with PFSE, the Food Temperature Indicator Association, and a number of grocery chains and thermometer companies across the country.¹¹ The campaign promotes the use of food thermometers when cooking meat, poultry, and egg products. In 2005, FSIS launched another national campaign, called “Is it done yet? You can’t tell by looking. Use a food thermometer to be sure.” to target families with young children and high-risk populations.¹²

In 2004, the National Coalition for Food Safe Schools released *The Food-Safe Schools Action Guide*. This guide reflects the state-of-the-science in school-based foodborne illness prevention.¹³

Since 2001, education programs about the risks of listeriosis and the importance of a refrigerator thermometer have been delivered through the media, grocery stores, health profession organizations, and authors of books on pregnancy. These programs have targeted at-risk groups, including older adults and pregnant women. For pregnant women, FDA has developed a food safety education program, Food Safety for Moms-to-Be, available in Spanish and English.¹⁴ FSIS produced a plain language flyer, *Protect Your Baby and Yourself from Listeriosis*, in Spanish and English, featuring information about foods suitable for pregnant women to eat to avoid contracting listeriosis.¹⁵ Information about *L. monocytogenes* was distributed by a segment aired nationwide through a television program aimed at young Hispanic mothers and pregnant women.

Efforts to reduce enteric infections caused by *Salmonella* species (10-1d and 10-3b) are under way. For example, in addition to its continuing consumer and food service personnel campaigns on the safe handling of shell eggs, FDA has proposed rules to assist in preventing *S. enteritidis* during egg production.^{16, 17, 18}

The *Food Code* is the foundation document of FDA’s National Retail Food Program. The code represents the agency’s policies and best science-based advice for a uniform system of provisions that address the safety and protection of food offered in the retail industry and in food service establishments. Having a regulatory foundation such as the *Food Code* in place is a key component of the FDA National Retail Food Program—the development of the Voluntary National Retail Food Regulatory Program Standards—aimed at decreasing foodborne illness.¹⁹ These standards provide nationally recognized criteria as a framework for public health administrators to assess their retail food protection program. They identify essential food safety program performance measurements; establish program priorities and intervention strategies; assess the design, structure, and delivery of program services; and allocate resources to programs providing the most significant public health benefits. As of 2005, 185 State, Tribal, and local food regulatory jurisdictions had enrolled in the program standards.

For improvement in food safety in retail establishments (10-6), regulators and the retail industry must focus on the following three risk factors for foodborne illness: food-holding times and temperatures, poor personal hygiene, and contaminated equipment. Progress toward safe food preparation depends on food service workers’ understanding and practicing effective safe food preparation techniques. Training and technical assistance must be made available to program operators. Furthermore, education and training materials must be provided in wordless or multilanguage formats to accommodate a diverse workforce.

For certain individuals, the presence of allergens in food can be life threatening. Currently no cure for food allergy is available. The only successful method of managing a food allergy is to avoid foods containing the allergen. Formulated foods present a separate challenge because the individual relies on accurate ingredient labeling.²⁰ For progress to occur in reducing the number of severe food allergic reactions and deaths, food manufacturers must comply with the Food Allergen Labeling and Consumer Protection Act (FALCPA). Enacted in 2004, FALCPA amends the Federal Food, Drug, and Cosmetic Act to require that food packages be labeled in consumer-friendly terms and provide information on any major food allergen used as an ingredient in the food. FALCPA also calls for inspections of facilities to ensure that they comply with practices that reduce cross-contact of a food with residues of major food allergens. Continuing outreach efforts, such as FDA's Guidance for Industry on FALCPA,²¹ are necessary to educate food manufacturers on the specific requirements of the law to ensure appropriate implementation. FALCPA's implementation is expected to help reduce severe allergic reactions to food by helping consumers avoid foods to which they are sensitive.

In addition, progress in reducing the number of severe food allergic reactions and deaths depends on the adoption of the *Food Code*, which addresses food allergen concerns at the retail level. Through the Conference for Food Protection (CFP), States have endorsed revision of the *Food Code* to provide additional information on food allergens and symptoms of allergic reactions to food. Updates to the *Food Code* also require that managers of food establishments be knowledgeable about the major food allergens and the symptoms of allergic reactions to them. For the past several years, FDA, together with the CFP Allergen Committee, has provided the *Food Code* with new allergen information.²² Forty-eight of the 56 (86 percent) States and U.S. Territories have adopted codes patterned after the *Food Code*.²³ These 48 jurisdictions represent 79 percent of the U.S. population. Furthermore, 35 of 334 Tribes with food service establishments have adopted a version of the code.

Emerging Issues

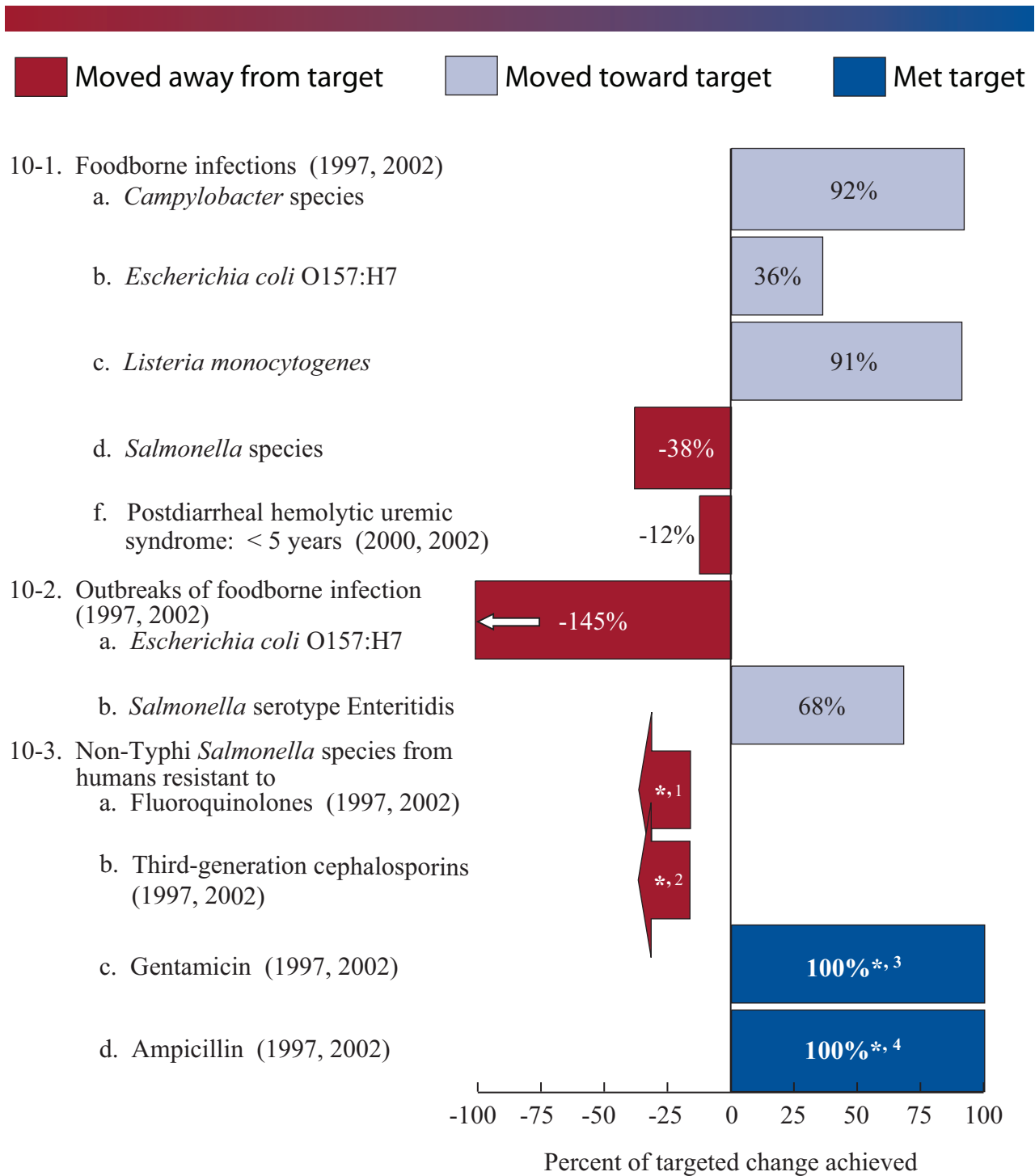
Fresh produce from a global supply chain is being consumed by the American public to a greater extent than ever before. However, foodborne illness associated with both domestic and imported fresh fruits and vegetables has increasingly been detected over the past several years. A need still remains for developing cost-effective prevention, intervention, and detection strategies to reduce the number of new cases of foodborne illness associated with these commodities.

The identification of antimicrobial-resistant *Salmonella* species, in particular multidrug-resistant variants, has also raised concerns that the treatment of salmonellosis may be compromised, because antimicrobial-resistant strains may cause a prolonged or more severe illness than antimicrobial-susceptible strains.^{24, 25} Of particular concern is the isolation of ceftriaxone-²⁶ and ciprofloxacin-resistant²⁷ *Salmonella* because of the importance of ceftriaxone and ciprofloxacin in treating *Salmonella* infections in children and adults, respectively.^{28, 29}

Also of recent concern are illnesses, such as listeriosis, *Salmonella typhimurium*, and *Mycobacterium bovis* tuberculosis,³⁰ associated with privately imported foods, especially products made from unpasteurized cow's milk. Additional educational and regulatory efforts are needed to decrease the number of illnesses that are related to these products.

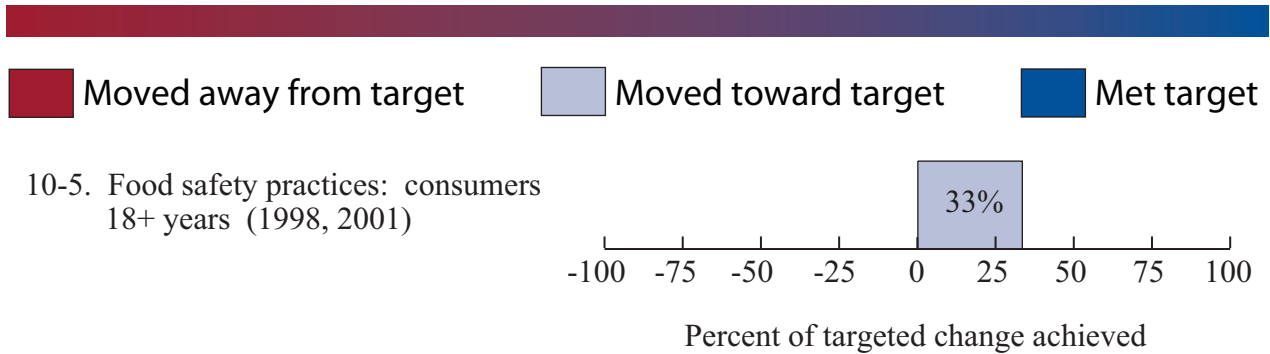
More focus area objectives for foodborne illness and food safety practices have moved toward their targets than have moved away. However, continuing efforts are needed to achieve all of the targets. Research is necessary to understand the sources and routes of pathogen contamination in produce and to control pathogens in animals. Science-based guidance on safe food practices is vital at all levels—from farm to consumer—to prevent contamination during production, processing, distribution, and food preparation. In addition, disparities in consumer food safety practices signal the importance of focused education programs directed toward racial and ethnic groups.

Figure 10-1. Progress Quotient Chart for Focus Area 10: Food Safety



See notes at end of chart. (continued)

Figure 10-1. (continued)



Notes: Tracking data for objectives 10-4a and b and 10-6a through i are unavailable. Objectives 10-1e and g, 10-3e through p, and 10-7 were deleted at the midcourse.

Years in parentheses represent the baseline data year and the most recent data year used to compute the percent of the Healthy People 2010 target achieved.

$$\text{Percent of targeted change achieved} = \left(\frac{\text{Most recent value} - \text{baseline value}}{\text{Year 2010 target} - \text{baseline value}} \right) \times 100$$

* Percent of target achieved cannot be calculated.

¹ The most recent value is 0.1%; the baseline and target values are 0.0%.

² The most recent value is 0.2%; the baseline and target values are 0.0%.

³ The most recent value is 1%; the baseline and target values are 3%.

⁴ The most recent value is 13%; the baseline and target values are 18%.

Figure 10-2. Disparities Table for Focus Area 10: Food Safety

Disparities from the best group rate for each characteristic at the most recent data point and changes in disparity from the baseline to the most recent data point.

Population-based objectives	Characteristics																			
	Race and ethnicity							Gender		Education			Income			Disability				
	American Indian or Alaska Native	Asian	Native Hawaiian or other Pacific Islander	Two or more races	Hispanic or Latino	Black non-Hispanic	White non-Hispanic	Summary index	Female	Male	Less than high school	High school graduate	At least some college	Summary index	Poor	Near poor	Middle/high income	Summary index	Persons with disabilities	Persons without disabilities
10-1a. Foodborne infections: <i>Campylobacter</i> species (1997, 2002) [†]								B												
10-1b. Foodborne infections: <i>Escherichia coli</i> O157:H7 (1997, 2002) [†]									B											
10-1c. Foodborne infections: <i>Listeria monocytogenes</i> (1997, 2002) [†]								B												
10-1d. Foodborne infections: <i>Salmonella</i> species (1997, 2002) [†]								B												
10-1f. Foodborne infections: postdiarrheal hemolytic uremic syndrome, < 5 years (2000, 2002) [†]								↓	B											
10-4b. Severe allergic reactions to food: 18+ years with food allergy diagnosis (2001) *						I			B		B									
10-5. Food safety practices: consumers 18+ years (1998, 2001) [†]						B		B			B									

Notes: Data for objectives 10-2a and b, 10-3a through d, 10-4a, and 10-6a through i are unavailable or not applicable. Objectives 10-1e and g, 10-3e through p, and 10-7 were deleted at the midcourse.

Years in parentheses represent the baseline data year and the most recent data year (if available).

Disparity from the best group rate is defined as the percent difference between the best group rate and each of the other group rates for a characteristic (for example, race and ethnicity). The summary index is the average of these percent differences for a characteristic. Change in disparity is estimated by subtracting the disparity at baseline from the disparity at the most recent data point. Change in the summary index is estimated by subtracting the summary index at baseline from the summary index at the most recent data point. See Technical Appendix for more information.

The best group rate at the most recent data point.	The group with the best rate for specified characteristic.	Most favorable group rate for specified characteristic, but reliability criterion not met.	Best group rate reliability criterion not met.	
Percent difference from the best group rate				
Disparity from the best group rate at the most recent data point.	Less than 10 percent or not statistically significant	10-49 percent	50-99 percent	100 percent or more
Increase in disparity (percentage points)				
↑ 10-49				
↑↑ 50-99				
↑↑↑ 100 or more				
Decrease in disparity (percentage points)				
↓ 10-49				
↓↓ 50-99				
↓↓↓ 100 or more				
Availability of data.	Data not available.	Characteristic not selected for this objective.		

* The variability of best group rates was assessed, and disparities of ≥ 10% are statistically significant at the 0.05 level. Changes in disparity over time, noted with arrows, are statistically significant at the 0.05 level. See Technical Appendix.

[†] Measures of variability were not available. Thus, the variability of best group rates was not assessed, and the statistical significance of disparities and changes in disparity over time could not be tested. See Technical Appendix.

¹ Data include persons of Hispanic origin.

Objectives and Subobjectives for Focus Area 10: Food Safety

Goal: Reduce foodborne illnesses.

As a result of the Healthy People 2010 Midcourse Review, changes were made to the Healthy People 2010 objectives and subobjectives. These changes are specific to the following situations:

- Changes in the wording of an objective to more accurately describe what is being measured.
- Changes to reflect a different data source or new science.
- Changes resulting from the establishment of a baseline and a target (that is, when a formerly developmental objective or subobjective became measurable).
- Deletion of an objective or subobjective that lacked a data source.
- Correction of errors and omissions in *Healthy People 2010*.

Revised baselines and targets for measurable objectives and subobjectives do not fall into any of the above categories and, thus, are not considered a midcourse review change.¹

When changes were made to an objective, three sections are displayed:

1. In the Original Objective section, the objective as published in *Healthy People 2010* in 2000 is shown.
2. In the Objective With Revisions section, strikethrough indicates text deleted, and underlining is used to show new text.
3. In the Revised Objective section, the objective appears as revised as a result of the midcourse review.

Details of the objectives and subobjectives in this focus area, including any changes made at the midcourse, appear on the following pages.

¹ See Technical Appendix for more information on baseline and target revisions.

ORIGINAL OBJECTIVE

10-1. Reduce infections caused by key foodborne pathogens.

Target and baseline:

Objective	Reduction in Infections Caused by Microorganisms	1997 Baseline	2010 Target
		<i>Cases per 100,000</i>	
10-1a.	<i>Campylobacter</i> species	24.6	12.3
10-1b.	<i>Escherichia coli</i> O157:H7	2.1	1.0
10-1c.	<i>Listeria monocytogenes</i>	0.47 ¹	0.24 ²
10-1d.	<i>Salmonella</i> species	13.6 ³	6.8
10-1e.	<i>Cyclospora cayetanensis</i>	Developmental	
10-1f.	Postdiarrheal hemolytic uremic syndrome	Developmental	
10-1g.	Congenital <i>Toxoplasma gondii</i>	Developmental	

Target setting method: 50 percent improvement.

Data source: Foodborne Disease Active Surveillance Network (FoodNet), CDC, NCID; FDA, CFSAN; FSIS, OPHS; and State agencies.

Potential data source: Toxoplasmosis data—National Notifiable Diseases Surveillance System (NNDSS), CDC, NCID.

¹ Baseline revised from 0.5 after November 2000 publication.

² Target revised from 0.25 because of baseline revision after November 2000 publication.

³ Baseline revised from 13.7 after November 2000 publication.

OBJECTIVE WITH REVISIONS (Including subobjectives deleted)

10-1. Reduce infections caused by key foodborne pathogens.

Target and baseline:

Objective*	Reduction in Infections Caused by Microorganisms	1997 Baseline (unless noted)	2010 Target
		<i>Cases per 100,000</i>	
10-1a.	<i>Campylobacter</i> species	24.6	12.3
10-1b.	<i>Escherichia coli</i> O157:H7	2.1	1.0
10-1c.	<i>Listeria monocytogenes</i>	0.47 ¹	0.24 ²
10-1d.	<i>Salmonella</i> species	13.6 ³	6.8
10-1e.	<i>(Subobjective deleted due to lack of data source)</i> [†] <i>Cyclospora cayetanensis</i>	Developmental	

**OBJECTIVE WITH REVISIONS (continued)
(Including subobjectives deleted)**

10-1f.	Postdiarrheal hemolytic uremic syndrome (HUS) in children less than 5 years of age	1.80 (2000)	0.90
10-1g.	(Subobjective deleted due to change in science Congenital <i>Toxoplasma gondii</i>)	Developmental	

* For data control purposes, subobjectives are not renumbered.

Target setting method: 50 percent improvement.

Data source: Foodborne Disease Active Surveillance Network (FoodNet), CDC, NCID; FDA, CFSAN; FSIS, OPHS; and State agencies.

¹ Baseline revised from 0.5 after November 2000 publication.

² Target revised from 0.25 because of baseline revision after November 2000 publication.

³ Baseline revised from 13.7 after November 2000 publication.

REVISED OBJECTIVE

10-1. Reduce infections caused by key foodborne pathogens.

Target and baseline:

Objective*	Reduction in Infections Caused by Microorganisms	1997 Baseline (unless noted)	2010 Target
		<i>Cases per 100,000</i>	
10-1a.	<i>Campylobacter</i> species	24.6	12.3
10-1b.	<i>Escherichia coli</i> O157:H7	2.1	1.0
10-1c.	<i>Listeria monocytogenes</i>	0.47 ¹	0.24 ²
10-1d.	<i>Salmonella</i> species	13.6 ³	6.8
10-1f.	Postdiarrheal hemolytic uremic syndrome (HUS) in children less than 5 years of age	1.80 (2000)	0.90

* For data control purposes, subobjectives are not renumbered.

Target setting method: 50 percent improvement.

Data source: Foodborne Disease Active Surveillance Network (FoodNet), CDC, NCID; FDA, CFSAN; FSIS, OPHS; and State agencies.

¹ Baseline revised from 0.5 after November 2000 publication.

² Target revised from 0.25 because of baseline revision after November 2000 publication.

³ Baseline revised from 13.7 after November 2000 publication.

NO CHANGE IN OBJECTIVE

10-2. Reduce outbreaks of infections caused by key foodborne bacteria.

Target and baseline:

Objective	Reduction in Infections Caused by Foodborne Bacteria	1997 Baseline	2010 Target
		<i>Number of Outbreaks per Year</i>	
10-2a.	<i>Escherichia coli</i> O157:H7	22	11
10-2b.	<i>Salmonella</i> serotype Enteritidis	44	22

Target setting method: 50 percent improvement.

Data source: Foodborne Disease Outbreak Surveillance System, CDC, NCID.

ORIGINAL OBJECTIVE

10-3. Prevent an increase in the proportion of isolates of *Salmonella* species from humans and from animals at slaughter that are resistant to antimicrobial drugs.

Target and baseline:

Objective	Prevention of Increase in Proportion of <i>Salmonella</i> species from humans and from animals at slaughter that are resistant to antimicrobial drugs	1997 Baseline	2010 Target
		<i>Percent of Isolates</i>	
	<i>Salmonella</i> from humans that are resistant to:		
10-3a.	Fluoroquinolones	0	0
10-3b.	Third-generation cephalosporins	0	0
10-3c.	Gentamicin	3	3
10-3d.	Ampicillin	18	18
	<i>Salmonella</i> from cattle at slaughter that are resistant to:		
10-3e.	Fluoroquinolones	Developmental	
10-3f.	Third-generation cephalosporins	Developmental	
10-3g.	Gentamicin	Developmental	
10-3h.	Ampicillin	Developmental	
	<i>Salmonella</i> from broilers at slaughter that are resistant to:		
10-3i.	Fluoroquinolones	Developmental	

ORIGINAL OBJECTIVE (continued)

10-3j.	Third-generation cephalosporins	Developmental
10-3k.	Gentamicin	Developmental
10-3l.	Ampicillin	Developmental
	Salmonella from swine at slaughter that are resistant to:	
10-3m.	Fluoroquinolones	Developmental
10-3n.	Third-generation cephalosporins	Developmental
10-3o.	Gentamicin	Developmental
10-3p.	Ampicillin	Developmental

Target setting method: No increase.

Data sources: National Antimicrobial Resistance Monitoring System: Enteric Bacteria—*Salmonella* (NARMS: Enteric Bacteria), CDC, NCID; FDA, CVM; USDA, FSIS, APHIS, and ARS; Foodborne Disease Active Surveillance Network (FoodNet), CDC, FDA, and USDA, FSIS.

OBJECTIVE WITH REVISIONS (Including subobjectives deleted)

10-3. Prevent an increase in the proportion of isolates of non-Typhi *Salmonella* species from humans and from animals at slaughter that are resistant to antimicrobial drugs.

Target and baseline:

Objective*	Prevention of Increase in Proportion of Isolates of non-Typhi <i>Salmonella</i> Species From Humans That Are Resistant to Antimicrobial Drugs	1997 Baseline	2010 Target
		<i>Percent of Isolates</i>	
	Salmonella from humans that are resistant to:		
10-3a.	Fluoroquinolones	0.0	0.0
10-3b.	Third-generation cephalosporins	0.0	0.0
10-3c.	Gentamicin	3	3
10-3d.	Ampicillin	18	18
	Salmonella from cattle at slaughter that are resistant to:		
10-3e.	<i>(Subobjective deleted due to lack of data source)*</i> Fluoroquinolones	Developmental	

OBJECTIVE WITH REVISIONS (continued)
(Including subobjectives deleted)

10-3f.	<i>(Subobjective deleted due to lack of data source)*</i> Third-generation cephalosporins	Developmental
10-3g.	<i>(Subobjective deleted due to lack of data source)*</i> Gentamicin	Developmental
10-3h.	<i>(Subobjective deleted due to lack of data source)*</i> Ampicillin	Developmental
	Salmonella from broilers at slaughter that are resistant to:	
10-3i.	<i>(Subobjective deleted due to lack of data source)*</i> Fluoroquinolones	Developmental
10-3j.	<i>(Subobjective deleted due to lack of data source)*</i> Third-generation cephalosporins	Developmental
10-3k.	<i>(Subobjective deleted due to lack of data source)*</i> Gentamicin	Developmental
10-3l.	<i>(Subobjective deleted due to lack of data source)*</i> Ampicillin	Developmental
	Salmonella from swine at slaughter that are resistant to:	
10-3m.	<i>(Subobjective deleted due to lack of data source)*</i> Fluoroquinolones	Developmental
10-3n.	<i>(Subobjective deleted due to lack of data source)*</i> Third-generation cephalosporins	Developmental
10-3o.	<i>(Subobjective deleted due to lack of data source)*</i> Gentamicin	Developmental
10-3p.	<i>(Subobjective deleted due to lack of data source)*</i> Ampicillin	Developmental

* For data control purposes, subobjectives are not renumbered.

Target setting method: No increase.

**OBJECTIVE WITH REVISIONS (continued)
(Including subobjectives deleted)**

Data source: National Antimicrobial Resistance Monitoring System: Enteric Bacteria—*Salmonella* (NARMS: Enteric Bacteria), CDC, NCID; FDA, CVM; USDA, FSIS, APHIS, and ARS; Foodborne Disease Active Surveillance Network (FoodNet), CDC, FDA, and USDA, FSIS.

REVISED OBJECTIVE

10-3. Prevent an increase in the proportion of isolates of non-Typhi *Salmonella* species from humans that are resistant to antimicrobial drugs.

Target and baseline:

Objective*	Prevention of Increase in Proportion of Isolates of non-Typhi <i>Salmonella</i> Species From Humans That Are Resistant to Antimicrobial Drugs	1997 Baseline	2010 Target
		<i>Percent of Isolates</i>	
	<i>Salmonella</i> from humans that are resistant to:		
10-3a.	Fluoroquinolones	0.0	0.0
10-3b.	Third-generation cephalosporins	0.0	0.0
10-3c.	Gentamicin	3	3
10-3d.	Ampicillin	18	18

* For data control purposes, subobjectives are not renumbered.

Target setting method: No increase.

Data sources: National Antimicrobial Resistance Monitoring System: Enteric Bacteria—*Salmonella* (NARMS: Enteric Bacteria), CDC, NCID; FDA, CVM; USDA, FSIS, APHIS, and ARS; Foodborne Disease Active Surveillance Network (FoodNet), CDC, FDA, and USDA, FSIS.

ORIGINAL OBJECTIVE

10-4. (Developmental) Reduce deaths from anaphylaxis caused by food allergies.

Potential data source: National Vital Statistics System (NVSS), CDC, NCHS.

OBJECTIVE WITH REVISIONS

10-4. (Developmental) Reduce deaths and illness from severe food allergies from anaphylaxis caused by food allergies.

OBJECTIVE WITH REVISIONS *(continued)*

Target and baseline:

Objective	Reduction in Deaths From Anaphylaxis Caused by Food Allergies and in Severe Allergic Reactions to Food Among Adults	2001 Baseline	2010 Target
		<i>Percent</i>	
10-4a.	Deaths	Developmental	
10-4b.	Severe allergic reactions among adults aged 18 years and older	26	21

Target setting method: 19 percent improvement for 10-4b.

Potential Data sources: National Vital Statistics System—Mortality (NVSS—M), CDC, NCHS; Food Safety Survey (FSS), FDA and USDA, FSIS.

REVISED OBJECTIVE

10-4. Reduce deaths and illness from severe food allergies.

Target and baseline:

Objective	Reduction in Deaths From Anaphylaxis Caused by Food Allergies and in Severe Allergic Reactions to Food Among Adults	2001 Baseline	2010 Target
		<i>Percent</i>	
10-4a.	Deaths	Developmental	
10-4b.	Severe allergic reactions among adults aged 18 years and older	26	21

Target setting method: 19 percent improvement for 10-4b.

Data sources: National Vital Statistics System—Mortality (NVSS—M), CDC, NCHS; Food Safety Survey (FSS), FDA and USDA, FSIS.

NO CHANGE IN OBJECTIVE (Data updated and footnoted)

10-5. Increase the proportion of consumers who follow key food safety practices.

Target: 79 percent.

Baseline: 73¹ percent of consumers aged 18 years and older followed key food safety practices in 1998, based on total population of adults who engaged in the practice.

Target setting method: Better than the best.

**NO CHANGE IN OBJECTIVE (continued)
(Data updated and footnoted)**

Data source: Food Safety Survey (FSS), FDA and USDA, FSIS.

¹ Baseline revised from 72 after November 2000 publication.

ORIGINAL OBJECTIVE

10-6. (Developmental) Improve food employee behaviors and food preparation practices that directly relate to foodborne illnesses in retail food establishments.

Potential data source: Retail Food Database of Foodborne Illness Risk Factors, FDA, CFSAN.

OBJECTIVE WITH REVISIONS

10-6. (Developmental) Improve food employee behaviors and food preparation practices that directly relate to foodborne illnesses in retail food establishments.

Target and baseline:

Objective	Increase in Safe Retail Food Preparation Practices	1998 Baseline	2010 Target
		<i>Percent</i>	
10-6a.	Hospital	80	85
10-6b.	Nursing home	82	87
10-6c.	Elementary school	80	85
10-6d.	Fast food restaurant	74	81
10-6e.	Full-service restaurant	60	70
10-6f.	Deli department	73	80
10-6g.	Meat/poultry department	81	86
10-6h.	Produce department	76	82
10-6i.	Seafood department	83	87

Target setting method: 25 percent improvement of observable out-of-compliance risk factors.

Potential data source: Retail Food Database of Foodborne Illness Risk Factors, FDA, CFSAN.

REVISED OBJECTIVE

10-6. Improve food employee behaviors and food preparation practices that directly relate to foodborne illnesses in retail food establishments.

REVISED OBJECTIVE *(continued)*

Target and baseline:

Objective	Increase in Safe Retail Food Preparation Practices	1998 Baseline	2010 Target
		<i>Percent</i>	
10-6a.	Hospital	80	85
10-6b.	Nursing home	82	87
10-6c.	Elementary school	80	85
10-6d.	Fast food restaurant	74	81
10-6e.	Full-service restaurant	60	70
10-6f.	Deli department	73	80
10-6g.	Meat/poultry department	81	86
10-6h.	Produce department	76	82
10-6i.	Seafood department	83	87

Target setting method: 25 percent improvement of observable out-of-compliance risk factors.

Data source: Retail Food Database of Foodborne Illness Risk Factors, FDA, CFSAN.

OBJECTIVE DELETED

10-7. *(Objective deleted due to negligible presence of organophosphate pesticide residues found in foods)* (Developmental) Reduce human exposure to organophosphate pesticides from food.

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Related Objectives From Other Focus Areas

8. Environmental Health

- 8-5. Safe drinking water
- 8-6. Waterborne disease outbreaks
- 8-8. Surface water health risks
- 8-10. Fish contamination
- 8-24. Exposure to pesticides
- 8-25. Exposure to heavy metals and selected environmental chemicals
- 8-29. Global burden of disease
- 8-30. Water quality in the U.S.-Mexico border region

14. Immunization and Infectious Diseases

- 14-21. Vancomycin use in intensive care units

20. Occupational Safety and Health

- 20-8. Occupational skin diseases or disorders

23. Public Health Infrastructure

- 23-2. Public access to information and surveillance data

