

# CHAPTER 14

On April 7, 2017, this chapter was revised to include corrected 2020 target values for the following objectives: FS-6.1, FS-6.2, FS-6.3, FS-6.4, FS-6.5, FS-6.6, FS-6.7, FS-6.8, FS-6.9, FS-6.10. Corrections are highlighted in yellow on pages 14–9 and 14–10.

## Food Safety (FS)

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### Lead Agencies

Food and Drug Administration  
Department of Agriculture

### Contents

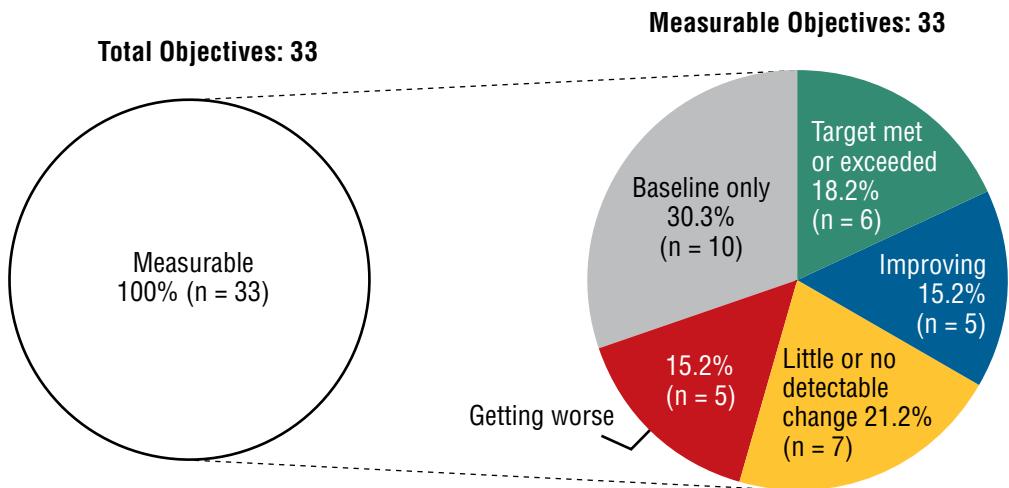
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## Goal: Improve food safety and reduce foodborne illnesses.

This chapter includes objectives that monitor specific infections and diseases commonly transmitted through food, and consumer and restaurant safe food preparation practices. The *Reader's Guide* provides a step-by-step explanation of the content of this chapter, including criteria for highlighting objectives in the Selected Findings.<sup>1</sup>

### Status of Objectives

**Figure 14–1. Midcourse Status of the Food Safety Topic Area Objectives**



All 33 objectives in the Food Safety Topic Area were measurable<sup>2</sup> (Figure 14–1, Table 14–1). The midcourse status of these objectives (Table 14–2) was as follows:

- 6 objectives had met or exceeded their 2020 targets,<sup>3</sup>
- 5 objectives were improving,<sup>4</sup>
- 7 objectives had demonstrated little or no detectable change,<sup>5</sup>
- 5 objectives were getting worse,<sup>6</sup> and
- 10 objectives had baseline data only.<sup>7</sup>

### Selected Findings

#### Infections Caused by Pathogens Commonly Transmitted Through Food

Of the seven objectives tracking infections caused by pathogens commonly transmitted through food, one objective improved, one objective worsened, and five objectives demonstrated little or no detectable change. Data were available by sex and age for all seven objectives, but the disparities were not tested for statistical significance.

- There was little or no detectable change in ***Campylobacter* species infections** (FS-1.1) from 2006–2008 to 2013 (12.7 and 13.7 cases per 100,000 population, respectively) (Table 14–2).
- There was no change in ***Escherichia coli* (E. coli) O157:H7 infections** (FS-1.2) from 2006–2008 to 2013 (1.2 cases per 100,000 population) (Table 14–2).
- There was no change in ***Listeria monocytogenes* infections** (FS-1.3) from 2006–2008 to 2013 (0.3 cases per 100,000 population) (Table 14–2).
- There was little or no detectable change in ***Salmonella* species infections** (FS-1.4) from 2006–2008 to 2013 (15.0 and 15.1 cases per 100,000 population, respectively) (Table 14–2).
- **Postdiarrheal hemolytic uremic syndrome in children under age 5 years** (FS-1.5) decreased from 2.0 cases to 1.4 cases per 100,000 population from 2006–2008 to 2012, moving toward the 2020 target (Table 14–2).
- ***Vibrio* species infections** (FS-1.6) increased from 0.3 cases per 100,000 population in 2006–2008 to 0.5 in 2013, moving away from the baseline and 2020 target (Table 14–2).

- There was no change in ***Yersinia* species infections** (FS-1.7) from 2006–2008 to 2013 (0.4 cases per 100,000 population) (Table 14–2).

## Outbreak-associated Infections

- Three objectives monitoring **infections due to Shiga toxin-producing *E. coli* O157, or *Campylobacter*, *Listeria*, or *Salmonella* species** exceeded their 2020 targets between 2006–2008 and 2013. The number of **infections associated with dairy products** (FS-2.2) decreased from 786 to 181; **infections associated with fruits and nuts** (FS-2.3) decreased from 311 to 43; and **infections associated with leafy vegetables** (FS-2.4) decreased from 205 to 168 (Table 14–2).
- Between 2006–2008 and 2013, the number of **infections due to Shiga toxin-producing *E. coli* O157, or *Campylobacter*, *Listeria*, or *Salmonella* species associated with poultry** (FS-2.5) increased from 258 to 823, moving away from the baseline and 2020 target (Table 14–2).

## Antimicrobial Resistance

- Three objectives to **prevent an increase in the proportion of non-typhoidal *Salmonella* and *Campylobacter jejuni* isolates from humans that are resistant to antimicrobial drugs** had met their 2020 targets at the 2006–2008 baseline and either met or exceeded their targets in 2013: the proportion of **isolates resistant to ceftriaxone** (FS-3.2) decreased from 3.0% to 2.5%; the proportion of **isolates resistant to gentamicin** (FS-3.3) was constant at 2.0%; and the proportion of **isolates resistant to three or more classes of antimicrobial agents** (FS-3.5) decreased from 10.6% to 9.8% (Table 14–2).
- The proportion of **non-typhoidal *Salmonella* isolates from humans with reduced susceptibility to ciprofloxacin** (FS-3.1) increased from 2006–2008 (2.6%) to 2013 (3.5%), as did the proportion of ***Campylobacter jejuni* isolates from humans resistant to erythromycin** (FS-3.6: 2.0% and 2.2%), moving away from their respective baselines and 2020 targets (Table 14–2).

## Allergic Reaction to Food

- The proportion of **severe allergic reactions to food among persons aged 18 and over with food allergies** (FS-4) decreased from 29.3% in 2006 to 21.8% in 2010, moving toward the 2020 target (Table 14–2).
  - » In 2010, there was a statistically significant disparity by age in the proportion of severe allergic reactions to food among persons aged 18 and over with food

allergies (FS-4). The disparities by sex and education were not statistically significant (Table 14–3).

## Safe Food-handling Behaviors

- Between 2006 and 2010, the proportion of **consumers aged 18 and over who washed their hands and surfaces often during food preparation** (FS-5.1) increased from 67.2% to 72.6%, moving toward the 2020 target (Table 14–2).
  - » In 2010, there were statistically significant disparities by sex, race and ethnicity, age, education, and income in the proportion of consumers aged 18 and over who washed their hands and surfaces often during food preparation (FS-5.1) (Table 14–3).
- Between 2006 and 2010, the proportion of **consumers aged 18 and over who separated (did not cross-contaminate) foods during preparation** (FS-5.2) increased from 88.6% to 90.8%, moving toward the 2020 target (Table 14–2).
  - » In 2010, there were statistically significant disparities by sex, race and ethnicity, age, and income in the proportion of consumers who separated (did not cross-contaminate) foods during preparation (FS-5.2). The disparity by education was not statistically significant (Table 14–3).
- Between 2006 and 2010, the proportion of **consumers aged 18 and over who cooked food to the proper temperature** (FS-5.3) increased from 36.9% to 38.9%, moving toward the 2020 target (Table 14–2).
  - » In 2010, there were statistically significant disparities by sex, race and ethnicity, education, and income in the proportion of consumers who cooked food to the proper temperature (FS-5.3). The disparity by age was not statistically significant (Table 14–3).
- The proportion of **consumers aged 18 and over who refrigerated foods promptly** (FS-5.4) decreased from 88.1% in 2006 to 83.7% in 2010, moving away from the baseline and 2020 target (Table 14–2).
  - » In 2010, there were statistically significant disparities by race and ethnicity, education, and income in the proportion of consumers aged 18 and over who refrigerated foods promptly (FS-5.4). The disparities by sex and age were not statistically significant (Table 14–3).

## More Information

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Readers interested in more detailed information about the objectives in this topic area are invited to visit the [HealthyPeople.gov](http://www.healthypeople.gov) website, where extensive substantive and technical information is available:

- For the background and importance of the topic area, see: <http://www.healthypeople.gov/2020/topics-objectives/topic/food-safety>
- For data details for each objective, including definitions, numerators, denominators, calculations, and data limitations, see: <http://www.healthypeople.gov/2020/topics-objectives/topic/food-safety/objectives>  
*Select an objective, then click on the “Data Details” icon.*
- For objective data by population group (e.g., sex, race and ethnicity, or family income), including rates, percentages, or counts for multiple years, see: <http://www.healthypeople.gov/2020/topics-objectives/topic/food-safety/objectives>  
*Select an objective, then click on the “Data2020” icon.*

Data for the measurable objectives in this chapter were from the following data sources:

- Food Safety Survey: <https://www.healthypeople.gov/2020/data-source/food-safety-survey>
- Foodborne Diseases Active Surveillance Network: <http://www.cdc.gov/foodnet/index.html>
- National Antimicrobial Resistance Monitoring System for Enteric Bacteria: <http://www.cdc.gov/narms/>
- National Outbreak Reporting System: <http://www.cdc.gov/nors/>
- Retail Food Risk Factor Study: <http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodborneIllnessRiskFactorReduction/>

## Footnotes

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<sup>1</sup>The Technical Notes provide more information on Healthy People 2020 statistical methods and issues.

<sup>2</sup>Measurable objectives had a national baseline value.

<sup>3</sup>Target met or exceeded—One of the following, as specified in the Midcourse Progress Table:

- » At baseline the target was not met or exceeded and the midcourse value was equal to or exceeded the target. (The percentage of targeted change achieved was equal to or greater than 100%.)

- » The baseline and midcourse values were equal to or exceeded the target. (The percentage of targeted change achieved was not assessed.)

<sup>4</sup>Improving—One of the following, as specified in the Midcourse Progress Table:

- » Movement was toward the target, standard errors were available, and the percentage of targeted change achieved was statistically significant.
- » Movement was toward the target, standard errors were not available, and the objective had achieved 10% or more of the targeted change.

<sup>5</sup>Little or no detectable change—One of the following, as specified in the Midcourse Progress Table:

- » Movement was toward the target, standard errors were available, and the percentage of targeted change achieved was not statistically significant.
- » Movement was toward the target, standard errors were not available, and the objective had achieved less than 10% of the targeted change.
- » Movement was away from the baseline and target, standard errors were available, and the percentage change relative to the baseline was not statistically significant.
- » Movement was away from the baseline and target, standard errors were not available, and the objective had moved less than 10% relative to the baseline.
- » There was no change between the baseline and the midcourse data point.

<sup>6</sup>Getting worse—One of the following, as specified in the Midcourse Progress Table:

- » Movement was away from the baseline and target, standard errors were available, and the percentage change relative to the baseline was statistically significant.
- » Movement was away from the baseline and target, standard errors were not available, and the objective had moved 10% or more relative to the baseline.

<sup>7</sup>Baseline only—The objective only had one data point, so progress toward target attainment could not be assessed.

## Suggested Citation

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National Center for Health Statistics. Chapter 14: Food Safety. Healthy People 2020 Midcourse Review. Hyattsville, MD. 2016.

## Table 14–1. Food Safety Topic Area Objectives

### LEGEND

 Data for this objective are available in this chapter's Midcourse Progress Table.



Disparities data for this objective are available, and this chapter includes a Midcourse Health Disparities Table.



A state or county level map for this objective is available at the end of the chapter.

 Not Applicable Midcourse data availability is not applicable for developmental and archived objectives. **Developmental** objectives did not have a national baseline value. **Archived** objectives are no longer being monitored due to lack of data source, changes in science, or replacement with other objectives.

Objective Number	Objective Statement	Data Sources	Midcourse Data Availability
FS-1.1	Reduce infections caused by <i>Campylobacter</i> species transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.2	Reduce infections caused by Shiga toxin-producing <i>Escherichia coli</i> (STEC) O157 transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.3	Reduce infections caused by <i>Listeria monocytogenes</i> transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.4	Reduce infections caused by <i>Salmonella</i> species transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.5	Reduce postdiarrheal hemolytic uremic syndrome (HUS) in children under age 5 years	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.6	Reduce infections caused by <i>Vibrio</i> species transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-1.7	Reduce infections caused by <i>Yersinia</i> species transmitted commonly through food	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID	 
FS-2.1	Reduce the number of outbreak-associated infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with beef	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE	 
FS-2.2	Reduce the number of outbreak-associated infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with dairy	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE	 
FS-2.3	Reduce the number of outbreak-associated infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with fruits and nuts	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE	 
FS-2.4	Reduce the number of outbreak-associated infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with leafy vegetables	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE	 

**Table 14–1. Food Safety Topic Area Objectives—Continued**

## LEGEND

	Data for this objective are available in this chapter's Midcourse Progress Table.		Disparities data for this objective are available, and this chapter includes a Midcourse Health Disparities Table.		A state or county level map for this objective is available at the end of the chapter.
Not Applicable	Midcourse data availability is not applicable for developmental and archived objectives. <b>Developmental</b> objectives did not have a national baseline value. <b>Archived</b> objectives are no longer being monitored due to lack of data source, changes in science, or replacement with other objectives.				

Objective Number	Objective Statement	Data Sources	Midcourse Data Availability
FS-2.5	Reduce the number of outbreak-associated infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with poultry	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE	
FS-3.1	Prevent an increase in the proportion of nontyphoidal <i>Salmonella</i> isolates from humans that show reduced susceptibility to ciprofloxacin (fluoroquinolone)	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-3.2	Prevent an increase in the proportion of nontyphoidal <i>Salmonella</i> isolates from humans that are resistant to ceftriaxone (third-generation cephalosporin)	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-3.3	Prevent an increase in the proportion of nontyphoidal <i>Salmonella</i> isolates from humans that are resistant to gentamicin	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-3.4	Prevent an increase in the proportion of nontyphoidal <i>Salmonella</i> isolates from humans that are resistant to ampicillin	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-3.5	Prevent an increase in the proportion of nontyphoidal <i>Salmonella</i> isolates from humans that are resistant to three or more classes of antimicrobial agents	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-3.6	Prevent an increase in the proportion of <i>Campylobacter jejuni</i> isolates from humans that are resistant to erythromycin	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID	
FS-4	Reduce severe allergic reactions to food among adults with a food allergy diagnosis	Food Safety Survey, FDA	
FS-5.1	Increase the proportion of consumers who follow the key food safety practice of “Clean: wash hands and surfaces often.”	Food Safety Survey, FDA	
FS-5.2	Increase the proportion of consumers who follow the key food safety practice of “Separate: don’t cross-contaminate.”	Food Safety Survey, FDA	
FS-5.3	Increase the proportion of consumers who follow the key food safety practice of “Cook: cook to proper temperatures.”	Food Safety Survey, FDA	

**Table 14–1. Food Safety Topic Area Objectives—Continued**

## LEGEND

 Data for this objective are available in this chapter's Midcourse Progress Table.



Disparities data for this objective are available, and this chapter includes a Midcourse Health Disparities Table.



A state or county level map for this objective is available at the end of the chapter.

 Not Applicable	Midcourse data availability is not applicable for developmental and archived objectives. <b>Developmental</b> objectives did not have a national baseline value. <b>Archived</b> objectives are no longer being monitored due to lack of data source, changes in science, or replacement with other objectives.
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Objective Number	Objective Statement	Data Sources	Midcourse Data Availability
FS-5.4	Increase the proportion of consumers who follow the key food safety practice of “Chill: refrigerate promptly.”	Food Safety Survey, FDA	 
FS-6.1	Increase the proportion of fast-food restaurants where employees practice proper handwashing	Retail Food Risk Factor Studies, CFSAN	
FS-6.2	Increase the proportion of fast-food restaurants where food employees do not contact ready-to-eat (RTE) foods with bare hands	Retail Food Risk Factor Studies, CFSAN	
FS-6.3	Increase the proportion of fast-food restaurants where food contact surfaces are properly cleaned and sanitized	Retail Food Risk Factor Studies, CFSAN	
FS-6.4	Increase the proportion of fast-food restaurants where foods requiring refrigeration are held at the proper temperature	Retail Food Risk Factor Studies, CFSAN	
FS-6.5	Increase the proportion of fast-food restaurants where foods displayed or stored hot are held at the proper temperature	Retail Food Risk Factor Studies, CFSAN	
FS-6.6	Increase the proportion of full-service restaurants where employees practice proper handwashing	Retail Food Risk Factor Studies, CFSAN	
FS-6.7	Increase the proportion of full-service restaurants where food employees do not contact RTE foods with bare hands	Retail Food Risk Factor Studies, CFSAN	
FS-6.8	Increase the proportion of full-service restaurants where food contact surfaces are properly cleaned and sanitized	Retail Food Risk Factor Studies, CFSAN	
FS-6.9	Increase the proportion of full-service restaurants where foods requiring refrigeration are held at the proper temperature	Retail Food Risk Factor Studies, CFSAN	
FS-6.10	Increase the proportion of full-service restaurants where foods displayed or stored hot are held at the proper temperature	Retail Food Risk Factor Studies, CFSAN	

**Table 14–2. Midcourse Progress for Measurable<sup>1</sup> Food Safety Topic Area Objectives**

## LEGEND

Target met or exceeded <sup>2,3</sup>	Improving <sup>4,5</sup>	Little or no detectable change <sup>6–10</sup>	Getting worse <sup>11,12</sup>	Baseline only <sup>13</sup>	Informational <sup>14</sup>
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Objective Description	Baseline Value (Year)	Midcourse Value (Year)	Target	Movement Toward Target <sup>15</sup>	Movement Away From Baseline <sup>16</sup>	Movement Statistically Significant <sup>17</sup>
<sup>9</sup> FS-1.1 <i>Campylobacter</i> species infections transmitted commonly through food (per 100,000 population)	12.7 (2006–2008)	13.7 (2013)	8.5			7.9%
<sup>10</sup> FS-1.2 <i>Escherichia coli</i> O157:H7 infections commonly transmitted through food (per 100,000 population)	1.2 (2006–2008)	1.2 (2013)	0.6			0.0%
<sup>10</sup> FS-1.3 <i>Listeria monocytogenes</i> infections commonly transmitted through food (per 100,000 population)	0.3 (2006–2008)	0.3 (2013)	0.2			0.0%
<sup>9</sup> FS-1.4 <i>Salmonella</i> species infections commonly transmitted through food (per 100,000 population)	15.0 (2006–2008)	15.1 (2013)	11.4			0.7%
<sup>5</sup> FS-1.5 Postdiarrheal hemolytic uremic syndrome in children under age 5 years (per 100,000 population)	2.0 (2006–2008)	1.4 (2012)	1.0	60.0%		
<sup>12</sup> FS-1.6 <i>Vibrio</i> species infections transmitted commonly through food (per 100,000 population)	0.3 (2006–2008)	0.5 (2013)	0.2			66.7%
<sup>10</sup> FS-1.7 <i>Yersinia</i> species infections transmitted through food (per 100,000 population)	0.4 (2006–2008)	0.4 (2013)	0.3			0.0%
<sup>9</sup> FS-2.1 Infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with beef (number)	200 (2006–2008)	210 (2013)	180			5.0%
<sup>2</sup> FS-2.2 Infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with dairy (number)	786 (2006–2008)	181 (2013)	707	765.8%		
<sup>2</sup> FS-2.3 Infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with fruits and nuts (number)	311 (2006–2008)	43 (2013)	280	864.5%		
<sup>2</sup> FS-2.4 Infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with leafy vegetables (number)	205 (2006–2008)	168 (2013)	185	185.0%		
<sup>12</sup> FS-2.5 Infections due to Shiga toxin-producing <i>E. coli</i> O157, or <i>Campylobacter</i> , <i>Listeria</i> , or <i>Salmonella</i> species associated with poultry (number)	258 (2006–2008)	823 (2013)	232			219.0%
<sup>12</sup> FS-3.1 Non-typhoidal <i>Salmonella</i> from humans with reduced susceptibility to ciprofloxacin (fluoroquinolone) (percent of isolates)	2.6% (2006–2008)	3.5% (2013)	2.6%			34.6%
<sup>3</sup> FS-3.2 Non-typhoidal <i>Salmonella</i> from humans resistant to ceftriaxone (third-generation cephalosporin) (percent of isolates)	3.0% (2006–2008)	2.5% (2013)	3.0%			

**Table 14–2. Midcourse Progress for Measurable<sup>1</sup> Food Safety Topic Area Objectives—Continued**

## LEGEND

	Target met or exceeded <sup>2,3</sup>		Improving <sup>4,5</sup>		Little or no detectable change <sup>6–10</sup>		Getting worse <sup>11,12</sup>		Baseline only <sup>13</sup>		Informational <sup>14</sup>
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Objective Description	Baseline Value (Year)	Midcourse Value (Year)	Target	Movement Toward Target <sup>15</sup>	Movement Away From Baseline <sup>16</sup>	Movement Statistically Significant <sup>17</sup>
<sup>3</sup> FS-3.3 Non-typhoidal <i>Salmonella</i> from humans resistant to gentamicin (percent of isolates)	2.0% (2006–2008)	2.0% (2013)	2.0%			
<sup>9</sup> FS-3.4 Non-typhoidal <i>Salmonella</i> from humans resistant to ampicillin (percent of isolates)	10.0% (2006–2008)	10.4% (2013)	10.0%		4.0%	
<sup>3</sup> FS-3.5 Non-typhoidal <i>Salmonella</i> from humans resistant to 3+ classes of antimicrobial agents (percent of isolates)	10.6% (2006–2008)	9.8% (2013)	10.6%			
<sup>12</sup> FS-3.6 <i>Campylobacter jejuni</i> from humans resistant to erythromycin (percent of isolates)	2.0% (2006–2008)	2.2% (2013)	2.0%		10.0%	
<sup>4</sup> FS-4 Severe allergic reaction to foods among adults with food allergies (percent, 18+ years)	29.3% (2006)	21.8% (2010)	21.0%	90.4%		Yes
<sup>4</sup> FS-5.1 Consumers who wash hands and surfaces often during food preparation (percent, 18+ years)	67.2% (2006)	72.6% (2010)	74.0%	79.4%		Yes
<sup>4</sup> FS-5.2 Consumers who separate (don't cross-contaminate) foods during food preparation (percent, 18+ years)	88.6% (2006)	90.8% (2010)	92.0%	64.7%		Yes
<sup>4</sup> FS-5.3 Consumers who cook food to proper temperatures (percent, 18+ years)	36.9% (2006)	38.9% (2010)	76.0%	5.1%		Yes
<sup>11</sup> FS-5.4 Consumers who refrigerate foods promptly (percent, 18+ years)	88.1% (2006)	83.7% (2010)	91.1%		5.0%	Yes
<sup>13</sup> FS-6.1 Fast-food restaurants where employees practice proper handwashing (percent)	61.2% (2008)			61.4%		
<sup>13</sup> FS-6.2 Fast-food restaurants where employees do not contact ready-to-eat foods with bare hands (percent)	73.7% (2008)			73.9%		
<sup>13</sup> FS-6.3 Fast-food restaurants where food contact surfaces are properly cleaned and sanitized (percent)	58.3% (2008)			58.5%		
<sup>13</sup> FS-6.4 Fast-food restaurants where foods are properly refrigerated (percent)	32.0% (2008)			32.2%		
<sup>13</sup> FS-6.5 Fast-food restaurants where hot foods are held at the proper temperature (percent)	71.3% (2008)			71.5%		
<sup>13</sup> FS-6.6 Full-service restaurants where employees practice proper handwashing (percent)	24.2% (2008)			24.4%		
<sup>13</sup> FS-6.7 Full-service restaurants where employees do not contact ready-to-eat foods with bare hands (percent)	53.7% (2008)			53.9%		

**Table 14–2. Midcourse Progress for Measurable<sup>1</sup> Food Safety Topic Area Objectives—Continued**

## LEGEND

	Target met or exceeded <sup>2,3</sup>		Improving <sup>4,5</sup>		Little or no detectable change <sup>6–10</sup>		Getting worse <sup>11,12</sup>		Baseline only <sup>13</sup>		Informational <sup>14</sup>
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Objective Description	Baseline Value (Year)	Midcourse Value (Year)	Target	Movement Toward Target <sup>15</sup>	Movement Away From Baseline <sup>16</sup>	Movement Statistically Significant <sup>17</sup>
<sup>13</sup> <b>FS-6.8</b> Full-service restaurants where food contact surfaces are properly cleaned and sanitized (percent)	36.5% (2008)		36.7%			
<sup>13</sup> <b>FS-6.9</b> Full-service restaurants where foods requiring refrigeration are held at the proper temperature (percent)	28.1% (2008)		28.3%			
<sup>13</sup> <b>FS-6.10</b> Full-service restaurants where hot foods are held at the proper temperature (percent)	60.2% (2008)		60.4%			

## Table 14–2. Midcourse Progress for Measurable<sup>1</sup> Food Safety Topic Area Objectives—Continued

### NOTES

See [HealthyPeople.gov](#) for all Healthy People 2020 data. The [Technical Notes](#) provide more information on the measures of progress.

### FOOTNOTES

<sup>1</sup>**Measurable** objectives had a national baseline value.

#### Target met or exceeded:

<sup>2</sup>At baseline the target was not met or exceeded and the midcourse value was equal to or exceeded the target. (The percentage of targeted change achieved was equal to or greater than 100%.)

<sup>3</sup>The baseline and midcourse values were equal to or exceeded the target. (The percentage of targeted change achieved was not assessed.)

#### Improving:

<sup>4</sup>Movement was toward the target, standard errors were available, and the percentage of targeted change achieved was statistically significant.

<sup>5</sup>Movement was toward the target, standard errors were not available, and the objective had achieved 10% or more of the targeted change.

#### Little or no detectable change:

<sup>6</sup>Movement was toward the target, standard errors were available, and the percentage of targeted change achieved was not statistically significant.

<sup>7</sup>Movement was toward the target, standard errors were not available, and the objective had achieved less than 10% of the targeted change.

<sup>8</sup>Movement was away from the baseline and target, standard errors were available, and the percentage change relative to the baseline was not statistically significant.

<sup>9</sup>Movement was away from the baseline and target, standard errors were not available, and the objective had moved less than 10% relative to the baseline.

<sup>10</sup>There was no change between the baseline and the midcourse data point.

#### Getting worse:

<sup>11</sup>Movement was away from the baseline and target, standard errors were available, and the percentage change relative to the baseline was statistically significant.

<sup>12</sup>Movement was away from the baseline and target, standard errors were not available, and the objective had moved 10% or more relative to the baseline.

<sup>13</sup>**Baseline only:** The objective only had one data point, so progress toward target attainment could not be assessed.

<sup>14</sup>**Informational:** A target was not set for this objective, so progress toward target attainment could not be assessed.

<sup>15</sup>For objectives that **moved toward** their targets, movement toward the target was measured as the percentage of targeted change achieved (unless the target was already met or exceeded at baseline):

$$\text{Percentage of targeted change achieved} = \frac{\text{Midcourse value} - \text{Baseline value}}{\text{HP2020 target} - \text{Baseline value}} \times 100$$

<sup>16</sup>For objectives that **moved away** from their baselines and targets, movement away from the baseline was measured as the magnitude of the percentage change from baseline:

$$\text{Magnitude of percentage change from baseline} = \frac{|\text{Midcourse value} - \text{Baseline value}|}{\text{Baseline value}} \times 100$$

<sup>17</sup>Statistical significance was tested when the objective had a target and at least two data points, standard errors of the data were available, and a normal distribution could be assumed. Statistical significance of the percentage of targeted change achieved or the magnitude of the percentage change from baseline was assessed at the 0.05 level using a normal one-sided test.

### DATA SOURCES

FS-1.1	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.2	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.3	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.4	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.5	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.6	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.7	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-2.1	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE
FS-2.2	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE
FS-2.3	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE
FS-2.4	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE
FS-2.5	National Outbreak Reporting System (NORS), CDC/NCEZID and CSTE
FS-3.1	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-3.2	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-3.3	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-3.4	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-3.5	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-3.6	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), CDC/NCEZID
FS-4	Food Safety Survey, FDA
FS-5.1	Food Safety Survey, FDA
FS-5.2	Food Safety Survey, FDA
FS-5.3	Food Safety Survey, FDA
FS-5.4	Food Safety Survey, FDA
FS-6.1	Retail Food Risk Factor Studies, CFSAN
FS-6.2	Retail Food Risk Factor Studies, CFSAN
FS-6.3	Retail Food Risk Factor Studies, CFSAN
FS-6.4	Retail Food Risk Factor Studies, CFSAN
FS-6.5	Retail Food Risk Factor Studies, CFSAN
FS-6.6	Retail Food Risk Factor Studies, CFSAN
FS-6.7	Retail Food Risk Factor Studies, CFSAN
FS-6.8	Retail Food Risk Factor Studies, CFSAN
FS-6.9	Retail Food Risk Factor Studies, CFSAN
FS-6.10	Retail Food Risk Factor Studies, CFSAN

**Table 14–3. Midcourse Health Disparities<sup>1</sup> for Population-based Food Safety Topic Area Objectives**

Most favorable (least adverse) and least favorable (most adverse) group rates and summary disparity ratios<sup>2,3</sup> for selected characteristics at the midcourse data point

## LEGEND

At the midcourse data point



Group with the most favorable (least adverse) rate



Group with the least favorable (most adverse) rate



Data are available, but this group did not have the highest or lowest rate.



Data are not available for this group because the data were statistically unreliable, not collected, or not analyzed.

Population-based Objectives	Characteristics and Groups										Summary Disparity Ratio <sup>3</sup> Poor Near-poor Middle Near-high High													
	Sex		Race and Ethnicity				Age		Education <sup>4</sup>															
	Male	Female	Summary Disparity Ratio <sup>2</sup>	American Indian or Alaska Native	Asian	Native Hawaiian or other Pacific Islander	Two or more races	Hispanic or Latino	Black, not Hispanic	White, not Hispanic	Summary Disparity Ratio <sup>3</sup>													
<b>FS-1.1</b> <i>Campylobacter</i> species infections transmitted commonly through food (per 100,000 population) (2013)	Red	Blue	1.276 <sup>†</sup>								Blue	Grey	Grey	Red	1.055 <sup>†</sup>									
<b>FS-1.2</b> <i>Escherichia coli</i> O157:H7 infections commonly transmitted through food (per 100,000 population) (2013)	Blue	Red	1.275 <sup>†</sup>								Red	Grey	Blue	Grey	2.671 <sup>†</sup>									
<b>FS-1.3</b> <i>Listeria monocytogenes</i> infections commonly transmitted through food (per 100,000 population) (2013)	Red	Blue	1.020 <sup>†</sup>								Grey	Blue	Grey	Red	10.011 <sup>†</sup>									
<b>FS-1.4</b> <i>Salmonella</i> species infections commonly transmitted through food (per 100,000 population) (2013)	Blue	Red	1.058 <sup>†</sup>								Red	Blue	Grey	Grey	1.600 <sup>†</sup>									
<b>FS-1.5</b> Postdiarrheal hemolytic uremic syndrome in children under age 5 years (per 100,000 population) (2012)	Red	Blue	1.002 <sup>†</sup>																					
<b>FS-1.6</b> <i>Vibrio</i> species infections transmitted commonly through food (per 100,000 population) (2013)	Red	Blue	2.112 <sup>†</sup>								Blue	Grey	Grey	Red	3.850 <sup>†</sup>									
<b>FS-1.7</b> <i>Yersinia</i> species infections transmitted through food (per 100,000 population) (2013)	Red	Blue	1.202 <sup>†</sup>								Red	Blue	Grey	Grey	2.399 <sup>†</sup>									
<b>FS-4</b> Severe allergic reaction to foods among adults with food allergies (percent, 18+ years) (2010)	Blue	Red	1.609								White	Red	Blue	Blue	1.943*	White	Red	Blue	Blue	White	1.366	Grey	Grey	

**Table 14–3. Midcourse Health Disparities<sup>1</sup> for Population-based Food Safety Topic Area Objectives—Continued**

Most favorable (least adverse) and least favorable (most adverse) group rates and summary disparity ratios<sup>2,3</sup> for selected characteristics at the midcourse data point

## LEGEND

At the midcourse data point



Group with the most favorable (least adverse) rate



Group with the least favorable (most adverse) rate



Data are available, but this group did not have the highest or lowest rate.



Data are not available for this group because the data were statistically unreliable, not collected, or not analyzed.

Population-based Objectives	Characteristics and Groups										Summary Disparity Ratio <sup>3</sup> High Near-high Middle Near-poor Poor												
	Sex		Race and Ethnicity				Age		Education <sup>4</sup>														
	Male	Female	Summary Disparity Ratio <sup>2</sup>	American Indian or Alaska Native	Asian	Native Hawaiian or other Pacific Islander	Two or more races	Hispanic or Latino	Black, not Hispanic	White, not Hispanic	Summary Disparity Ratio <sup>3</sup>	Aged less than 18 years	Aged 18–44 years	Aged 45–64 years	Aged 65 years and over	Summary Disparity Ratio <sup>3</sup>	Less than high school	High school graduate	At least some college	Associate's degree	4-year college	Advanced degree	Summary Disparity Ratio <sup>3</sup>
<b>FS-5.1</b> Consumers who wash hands and surfaces often during food preparation (percent, 18+ years) (2010)	Red	Blue	1.157*	White	White	White	Grey	White	Red	Blue	1.082*	White	Blue	White	Red	1.070*	Blue	White	White	White	Red	White	1.108*
<b>FS-5.2</b> Consumers who separate (don't cross-contaminate) foods during food preparation (percent, 18+ years) (2010)	Red	Blue	1.149*	White	White	White	Blue	White	White	Red	1.047*	White	Red	Blue	White	1.039*	Red	Blue	White	White	White	White	1.025*
<b>FS-5.3</b> Consumers who cook food to proper temperatures (percent, 18+ years) (2010)	Blue	Red	1.066*	White	White	White	Grey	White	Blue	Red	1.257*	White	Red	White	Blue	1.050	Red	White	White	White	White	Blue	1.150*
<b>FS-5.4</b> Consumers who refrigerate foods promptly (percent, 18+ years) (2010)	Blue	Red	1.006	White	White	White	Grey	White	Blue	Red	1.138*	White	Red	White	Blue	1.026	Red	White	White	White	White	Blue	1.064*

**Table 14–3. Midcourse Health Disparities<sup>1</sup> for Population-based Food Safety Topic Area Objectives—Continued****NOTES**

See [HealthyPeople.gov](#) for all Healthy People 2020 data. The [Technical Notes](#) provide more information on the measures of disparities.

**FOOTNOTES**

<sup>1</sup>**Health disparities** were assessed among population groups within specified demographic characteristics (sex, race and ethnicity, educational attainment, etc.). This assessment did not include objectives that were not population-based, such as those based on states, worksites, or those monitoring the number of events.

<sup>2</sup>When there were only two groups (e.g., male and female), the **summary disparity ratio** was the ratio of the higher to the lower rate.

<sup>3</sup>When there were three or more groups (e.g., white non-Hispanic, black non-Hispanic, Hispanic) and the most favorable rate ( $R_b$ ) was the highest rate, the **summary disparity ratio** was calculated as  $R_b/R_a$ , where  $R_a$  = the average of the rates for all other groups. When there were three or more groups and the most favorable rate was the lowest rate, the summary disparity ratio was calculated as  $R_a/R_b$ .

<sup>4</sup>Unless otherwise footnoted, data do not include persons under age 25 years.

<sup>5</sup>Unless otherwise footnoted, the poor, near-poor, middle, near-high, and high income groups are for persons whose family incomes were less than 100%, 100%–199%, 200%–399%, 400%–599%, and at or above 600% of the poverty threshold, respectively.

**FOOTNOTES—Continue**

<sup>†</sup>The summary disparity ratio was not tested for statistical significance because standard errors of the data were not available or normality on the natural logarithm scale could not be assumed.

<sup>\*</sup>The summary disparity ratio was significantly greater than 1.000. Statistical significance was assessed at the 0.05 level using a normal one-sided test on the natural logarithm scale.

**DATA SOURCES**

FS-1.1	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.2	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.3	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.4	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.5	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
FS-1.6	Foodborne Diseases Active Surveillance Network (FoodNet), CDC/NCEZID
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FS-4	Food Safety Survey, FDA
FS-5.1	Food Safety Survey, FDA
FS-5.2	Food Safety Survey, FDA
FS-5.3	Food Safety Survey, FDA
FS-5.4	Food Safety Survey, FDA