

# SECOND EDITION

Produced by the National Food Service Management Institute under a Cooperative Agreement with United States Department of Agriculture, Food and Nutrition Service

# **Acknowledgments**

This project has been funded with Federal funds from the U.S. Department of Agriculture, Food and Nutrition Service under a cooperative agreement with The University of Mississippi, the National Food Service Management Institute. The contents of this publication do not necessarily reflect the views or policies of the U.S. Department of Agriculture, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

The U. S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14<sup>th</sup> and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

The University of Mississippi complies with all applicable laws regarding affirmative action and equal opportunity in all its activities and programs and does not discriminate against anyone protected by law because of age, color, disability, national origin, race, religion, sex, or status as a veteran or disabled veteran.

Suggested Reference Citation: National Food Service Management Institute. (2002). Serving it safe (2nd ed). University, MS: National Food Service Management Institute.

Serving It Safe, 2nd Edition, Serving It Safe Instructor Guide, and Serving It Safe poster are available on the NFSMI Web site at: http://www.nfsmi.org/Information/sisindex.html

© 2002 National Food Service Management Institute, The University of Mississippi, Reprinted with corrections April 2004. Publication Number NFSMI ET 38-02

Serving It Safe



# **Table of Contents**

Introduction	ix
Chapter 1 - Food Safety Is Top Priority	1
Why is food safety a top priority?	2
What is a foodborne illness and foodborne outbreak? Foodborne Illness Foodborne Outbreak	2 2
What must be done to keep food safe? Know about Biological Hazards Know about Chemical Hazards Know about Physical Hazards	3 3 5
Summary	6
Chapter 2 - Prevent Foodborne Illness—Understanding Microorganisms	7
What happens in the body after a contaminated food has been eaten?	8
How do harmful microorganisms contaminate foods?	8
What are the three main causes of a foodborne illness?	9
Poor Personal Hygiene	9
Abuse of the Time-Temperature Relationship	
Cross-contamination	10
How can foodborne illness caused by microorganisms be	
prevented?	
Practice Good Personal Hygiene	
Control Time and Temperature of Foods	
Prevent Cross-Contamination	15
What are the responsibilities of the foodservice manager and	
employees?	
Responsibilities of the Foodservice Manager	
Responsibilities of Foodservice Employees	20
How should the foodservice manager respond if symptoms of foodborne illness are reported to the foodservice?	20
General Guidelines for the Foodservice Manager When Foodborne Illness is Suspected	20

Summary	23
Prevent Foodborne Illness Questionnaire	24
Chapter 3 - Basic Facts about Microorganisms	27
What are the most common causes of foodborne illnesses?	29
What are the major foodborne illnesses caused by bacteria and	
how can they be prevented?	
Botulism	
Campylobacteriosis or campylobacter	30
E. coli infection	
Listeriosis	
Perfringens foodborne illness	
Salmonellosis Shigellosis (bacillary dysentery)	
Singenosis (bachary dysentery)	
What are the major foodborne illnesses caused by viruses and how	
can they be prevented?	35
Gastroenteritis from Norwalk and Norwalk-like viruses/	26
calicivirus Hepatitis A	
*	30
What are the major foodborne illnesses caused by fungi and how	25
can they be prevented?	
Molds	
Yeasts	38
What are the major foodborne illnesses caused by parasites	
and how can they be prevented?	
Cyclosporiasis	
Giardiasis	
Trichinosis	
How do microorganisms grow?	40
Stages of Growth	
Control Conditions to Prevent the Growth of Foodborne Microorganisms	
Summary	
•	
Check Your Knowledge—Growth of Harmful Microorganisms	4/
Chapter 4 A Clean and Sanitary Ecodosymics	40
Chapter 4 - A Clean and Sanitary Foodservice	
How on food after he man stad through noncered hypera	

How can food safety be promoted through personal hygiene	
and work attire?	51
Know Why Personal Hygiene and Work Attire Are	
Important	51
Use Guidelines for Good Personal Hygiene	
Dress for Food Safety Success	
•	

Use Common Sense As a Guide When Working with Food	52
How can a food-safe facility be operated?	. 55
Know the Characteristics of a Food-safe Facility Maintain Clean Floors, Walls, and Ceilings	
Maintain Clean Floors, Wans, and Cennigs	. 54
Stations	54
Maintain Good Ventilation	
Maintain Clean Employee Restrooms	
Maintain Clean and Neat Trash Collection Areas	
Maintain an Effective Pest Control Program	
How should smallware be cleaned and sanitized?	
Select from Two Methods of Sanitizing	
Sanitize Smallware in a Three-Compartment Sink	
Sanitize Smallware in a Mechanical Dishwasher	60
How should large equipment be cleaned and sanitized?	
Use the Chemical Method to Sanitize Equipment Follow the Steps to Sanitize In-Place Equipment	
Who is responsible for food safety?	. 62
Manager's Responsibilities	
Employees' Responsibilities	
Summary	. 63
Chapter 5 - A Process for Preventing Foodborne Illness	. 65
How can foodborne illness be prevented in the eight steps of the	
How can foodborne illness be prevented in the eight steps of the foodservice process?	. 67
How can foodborne illness be prevented in the eight steps of the foodservice process? Step 1: Purchasing	. 67
How can foodborne illness be prevented in the eight steps of the foodservice process? Step 1: Purchasing Know How Purchasing Affects Food Safety	. 67 . 67 . 67
How can foodborne illness be prevented in the eight steps of the foodservice process? Step 1: Purchasing	. 67 . 67 . 67
How can foodborne illness be prevented in the eight steps of the foodservice process? Step 1: Purchasing <i>Know How Purchasing Affects Food Safety</i> <i>Follow Food Safety Guidelines for Purchasing</i> Step 2: Receiving	. 67 . 67 . 67 . 67 . 68
How can foodborne illness be prevented in the eight steps of the foodservice process? Step 1: Purchasing Know How Purchasing Affects Food Safety Follow Food Safety Guidelines for Purchasing Step 2: Receiving Know How Receiving Affects Food Safety	. 67 . 67 . 67 . 67 . 68 . 68
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing	. 67 . 67 . 67 . 67 . 68 . 68 . 68
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing	. 67 . 67 . 67 . 67 . 68 . 68 . 68 . 70
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving	. 67 . 67 . 67 . 68 . 68 . 68 . 68 . 70 . 70
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing	. 67 . 67 . 67 . 68 . 68 . 68 . 68 . 70 . 70 . 71
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing	. 67 . 67 . 67 . 68 . 68 . 68 . 70 . 70 . 71 . 72
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Milk and Yogurt During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving	. 67 . 67 . 67 . 67 . 68 . 68 . 68 . 70 . 70 . 70 . 71 . 72 . 72
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Milk and Yogurt During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving         Evaluate Canned and Dry Foods During Receiving	. 67 . 67 . 67 . 67 . 68 . 68 . 68 . 68 . 70 . 70 . 71 . 72 . 72 . 73
How can foodborne illness be prevented in the eight steps of the foodservice process?Step 1: PurchasingKnow How Purchasing Affects Food SafetyFollow Food Safety Guidelines for PurchasingStep 2: ReceivingKnow How Receiving Affects Food SafetyFollow Food Safety Guidelines for PurchasingEveluate Meet and Poultry During ReceivingEvaluate Meat and Poultry During ReceivingEvaluate Eggs and Dairy Products During ReceivingEvaluate Milk and Yogurt During ReceivingEvaluate Butter and Ice Cream During ReceivingEvaluate Fresh and Frozen Foods During ReceivingEvaluate Canned and Dry Foods During ReceivingEvaluate Specially Packaged Foods During Receiving	. 67 . 67 . 67 . 68 . 68 . 68 . 70 . 70 . 71 . 72 . 72 . 73 . 73
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Milk and Yogurt During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving         Evaluate Specially Packaged Foods During Receiving         Step 3: Storing	<ul> <li>. 67</li> <li>. 67</li> <li>. 67</li> <li>. 68</li> <li>. 68</li> <li>. 70</li> <li>. 70</li> <li>. 71</li> <li>. 72</li> <li>. 72</li> <li>. 73</li> <li>. 73</li> <li>. 73</li> </ul>
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Eveluate Mext and Poultry During Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving         Evaluate Canned and Dry Foods During Receiving         Evaluate Specially Packaged Foods During Receiving         Step 3: Storing         Know How Storing Affects Food Safety	<ul> <li>. 67</li> <li>. 67</li> <li>. 67</li> <li>. 68</li> <li>. 68</li> <li>. 70</li> <li>. 71</li> <li>. 72</li> <li>. 72</li> <li>. 73</li> <li>. 73</li> <li>. 74</li> </ul>
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving         Evaluate Specially Packaged Foods During Receiving         Step 3: Storing         Know How Storing Affects Food Safety         Follow Food Safety Guidelines for Storing	<ul> <li>. 67</li> <li>. 67</li> <li>. 67</li> <li>. 68</li> <li>. 68</li> <li>. 70</li> <li>. 70</li> <li>. 71</li> <li>. 72</li> <li>. 72</li> <li>. 73</li> <li>. 73</li> <li>. 73</li> <li>. 74</li> <li>. 74</li> </ul>
How can foodborne illness be prevented in the eight steps of the foodservice process?         Step 1: Purchasing         Know How Purchasing Affects Food Safety         Follow Food Safety Guidelines for Purchasing         Step 2: Receiving         Know How Receiving Affects Food Safety         Follow Food Safety Guidelines for Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Meat and Poultry During Receiving         Evaluate Eggs and Dairy Products During Receiving         Evaluate Butter and Ice Cream During Receiving         Evaluate Fresh and Frozen Foods During Receiving         Evaluate Canned and Dry Foods During Receiving         Evaluate Specially Packaged Foods During Receiving         Step 3: Storing         Know How Storing Affects Food Safety	<ul> <li>. 67</li> <li>. 67</li> <li>. 67</li> <li>. 68</li> <li>. 68</li> <li>. 70</li> <li>. 70</li> <li>. 71</li> <li>. 72</li> <li>. 72</li> <li>. 73</li> <li>. 73</li> <li>. 73</li> <li>. 74</li> <li>. 74</li> </ul>

Serving It Safe

Use Refrigerated Storage Safely	75
Use Deep Chilling Safely	
Use Frozen Storage Safely	
Step 4: Preparing	76
Know How Preparing Affects Food Safety	76
Follow Food Safety Guidelines for Pre-Preparation	77
Follow Food Safety Guidelines for Panned Foods to Be	
Cooked Later	78
Follow Food Safety Guidelines for Cold Foods That Will Not Be Cooked	78
Step 5: Cooking	
Know How Cooking Affects Food Safety	
Follow Food Safety Guidelines for Cooking Foods	
Minimum Safe Internal Temperatures	
v A	
Step 6: Holding and serving	81
Know How Holding and Serving Affect Food Safety	
Follow Food Safety Guidelines for Holding and Serving	81
Follow Food Safety Guidelines for Employees on the	
Service Line	
Follow Food Safety Guidelines for Sanitary Self-service	82
Follow Food Safety Guidelines for Transporting and	
Receiving Food for Off-site Feeding	82
Step 7: Cooling	83
Know How Cooling Affects Food Safety	83
Follow Steps for Safe Cooling	
Step 8: Reheating	84
Know How Reheating Affects Food Safety	
Follow Guidelines for Reheating Food	
Summary	
•	
Food Safety Checklist	86
Chapter 6 Introduction to Harand Analysis and Critical	
Chapter 6 - Introduction to Hazard Analysis and Critical	
Control Point (HACCP)	91
What is HACCP?	92
How can the HACCP principles be used to prevent foodborne	
illness?	93
HACCP Principle 1: Identify Hazards	93
HACCP Principle 2: Identify Critical Control Points	95
HACCP Principle 3: Establish Critical Limits	
HACCP Principle 4: Establish Monitoring Procedures	
	20

HACCP Principle 4: Establish Monitoring Procedures96HACCP Principle 5: Establish Corrective Action96HACCP Principle 6: Establish Verification Procedures97HACCP Principle 7: Establish Record Keeping Procedures97

100
101
103
105
109
110
116
118
119

# Introduction

I

### Getting the Most from Serving It Safe

In work environments, individual employees can make a big difference – in positive as well as negative ways. This is especially true in foodservice where an employee can introduce a food safety hazard at any point in the food production process. Foodservice personnel are the single most critical element in keeping the foodservice operation safe and sanitary.

## All foodservice personnel have a lot at stake as they prepare and serve food each day.

- Serving food that is improperly stored, prepared, cooked, or held may cause customers to become seriously, even fatally, ill.
- Unsafe foodservice practices also place employees in danger.
- The good reputation of a Child Nutrition Program must be built on serving safe food.

#### Some ways to ensure food safety are to

- EMPOWER employees with the knowledge and skills they need to prepare and serve foods safely.
- HELP them realize the key role they each play every day in protecting students' health and well-being.
- HOLD THEM RESPONSIBLE for preparing and serving food safely.

#### The technical material presented in Serving It Safe is based primarily on

- Serving It Safe: A Manager's Tool Kit.
- 2001 Food Code
- ServSafe Coursebook
- ServSafe Essentials

# The 2001 Food Code is a reference document for regulatory agencies responsible

for overseeing food safety in retail food establishments such as

restaurants and grocery stores and institutions such as nursing homes and child care centers. The *Food Code* is updated periodically; state, local, and tribal jurisdictions may use the *Code* as a model for their sanitation codes.



The reader may notice that in some cases this edition of *Serving It Safe* recommends a more conservative approach to food safety practices than the *Food Code*. In such instances, the recommendation will be noted as "best practice." The *Food Code* suggests minimum standards. A foodservice operation may select a more conservative approach to ensure a margin of safety. Recommended temperatures listed in this edition of *Serving It Safe* reflect the *2001 Food Code* and may be different than local or state requirement.

State and local public health department codes may have requirements different than those presented in this document. *Serving It Safe* should be adapted to include State and local public health department code requirements and school district policies and procedures.

### Serving It Safe

The six chapters of *Serving It Safe* provide foodservice personnel at all levels with an up-todate source of information for managing a safe and sanitary foodservice operation. The Table of Contents for *Serving It Safe* can be used to locate information about food safety.

CHAPTER 1: **Food Safety Is Top Priority** describes the responsibilities of foodservice personnel to prepare and serve safe food to customers including students, school faculty and staff, and visitors. The chapter describes why food safety is important and gives general guidance on how foodservice personnel can assure the preparation and service of safe foods.

#### CHAPTER 2: Prevent Foodborne Illness—Understanding Microorganisms

introduces the causes and prevention of foodborne illness. The chapter also describes how to respond when symptoms of foodborne illness are reported.

CHAPTER 3: **Basic Facts about Microorganisms** includes a description of the most common foodborne illnesses caused by bacteria, viruses, molds and yeasts, and parasites. Bacteria and viruses are the microorganisms of greatest concern in foodservice, and the chapter describes how the growth of these microorganisms can be prevented or controlled.

**CHAPTER 4: A Clean and Sanitary Foodservice** provides the foodservice director and manager with guidance on promoting food safety through good personal hygiene and common sense when working near food or with food. The chapter also includes information on maintaining a clean and sanitary environment for the preparation and service of food.

CHAPTER 5: **A Process for Preventing Foodborne Illness** explains the eight steps in the food production process and how to prevent foodborne illness at each step.

CHAPTER 6: Introduction to Hazard Analysis and Critical Control Point (HACCP) presents an overview of the HACCP system. The seven principles of HACCP are explained and examples are provided.