## Table of Contents

Acknowledgments	vii
Dedication from the Author	viii
Foreword	ix
Preface	x
Safety Procedures	xiii
Teacher Background	1
The Importance of Product Testing	2
The Ingredients: Their Properties and Roles in Ice Cream Formulation	3
The Production Process: From Blending to Freezing	10
Quality Assurance: The Role of the Laboratory Technician	14
References	15
Section 1: "I Scream, You Scream, We All Scream for Ice Cream"	17
Ice Cream—A Chip Off the Old Block (Student Background 1A)	18
Ice Cream Comes of Age (Student Background 1B)	22
Ice Cream Dates in History (Overhead 1)	24
Section 2: The Ingredients—Their Properties and Roles in Ice Crea	
The Language of Ice Cream Production (Student Background 2A)	26
What Goes In Will Come Out: The Importance of Raw Materials (Student Background 2B)	28
How Acidic Is Your Milk? (Student Activity 2A)	
Instructor Notes for Student Activity 2A	
How Much of Your Milk Is Solid? (Student Activity 2B)	36
Instructor Notes for Student Activity 2B	39
Do We Really Want 31 Flavors? (Student Background 2C)	40
Vanilla (Overhead 2)	
How Pure Is Your Vanilla? (Student Activity 2C)	44
Instructor Notes for Student Activity 2C	49
Section 3: The Production Process—From Blending to Freezing	51
A Step-by-Step Overview of Ice Cream Production (Student Background 3)	52
Plant Tour (Overhead 3A)	56
Continuous Freezer (Overhead 3B)	57
The Effect of Sweeteners on Freezing Point (Student Activity 3)	58
•	62

Section 4: Quality Assurance—The Role of the Laboratory Techni in Product Testing	
U.S. FDA Standards for Ice Cream Manufacturing (Student Background 4A)	66
The Importance of Air in Ice Cream (Student Background 4B)4B	68
How "Light" Is Your Ice Cream? (Student Activity 4A)	70
nstructor Notes for Activity 4A	73
Quality Equals Safety (Student Background 4C)	75
How Many Microbes Are Present? (Student Activity 4B)	76
nstructor Notes for Activity 4B	81
Section 5: Ice Cream Take-Out	83
Melting Behavior of Ice Cream (Student Research Investigation 5A)	84
nstructor Notes for Student Research Investigation 5A	85
Amount and Distribution of Mix-Ins (Student Research Investigation 5B)	86
nstructor Notes for Student Investigation 5B	87
Texture of Ice Cream (Student Research Investigation 5C)	88
nstructor Notes for Student Research Investigation 5C	89
Structure of Ice Cream (Overhead 5)	90