

---

# Contents

	<b>Page</b>
Foreword . . . . .	iii
Acknowledgments . . . . .	ix
<b>SECTION I. Invited Papers</b>	
<b>Chapter 1. Cigarette Testing and the Federal Trade Commission: A Historical Overview . . . . .</b>	<b>1</b>
Question-and-Answer Session . . . . .	8
References . . . . .	8
<b>Chapter 2. Review of the Federal Trade Commission Method for Determining Cigarette Tar and Nicotine Yield . . . . .</b>	<b>9</b>
Question-and-Answer Session . . . . .	12
References . . . . .	14
<b>Chapter 3. Changes in Cigarette Design and Composition Over Time and How They Influence the Yields of Smoke Constituents . . . . .</b>	<b>15</b>
Introduction . . . . .	15
Background . . . . .	15
Changes in Cigarette Design and Composition . . . . .	18
Summary . . . . .	31
Question-and-Answer Session . . . . .	33
References . . . . .	35
Acknowledgments . . . . .	37
<b>Chapter 4. Attitudes, Knowledge, and Beliefs About Low-Yield Cigarettes Among Adolescents and Adults . . . . .</b>	<b>39</b>
Introduction . . . . .	39
Monitoring National Data . . . . .	42
Survey Findings . . . . .	43
Health Beliefs and Switching . . . . .	47
Quitting Smoking . . . . .	49
Discussion . . . . .	51

Question-and-Answer Session . . . . .	53
References . . . . .	56
<b>Chapter 5. Cigarette Smoke Components and Disease: Cigarette Smoke Is More Than a Triad of Tar, Nicotine, and Carbon Monoxide . . . . .</b>	<b>59</b>
Introduction . . . . .	59
Mainstream Vs. Sidestream Cigarette Smoke . . . . .	59
Major Health Effects of Cigarette Smoke . . . . .	60
Cancer . . . . .	61
Noncancerous Lung Diseases . . . . .	62
Atherosclerotic Cardiovascular Diseases . . . . .	63
Cigarette Smoking and Human Reproduction . . . . .	65
Absolute Risk Vs. Relative Risk . . . . .	66
Tar, Nicotine, Carbon Monoxide, and Other Smoke Constituents . . . . .	66
Smoke Constituents, Cigarette-Related Disease, and Modified Labeling of Cigarettes . . . . .	67
Question-and-Answer Session . . . . .	70
References . . . . .	72
Acknowledgment . . . . .	75
<b>Chapter 6. The Changing Cigarette and Disease Risk: Current Status of the Evidence . . . . .</b>	<b>77</b>
Introduction . . . . .	77
Epidemiologic Evidence on the Changing Cigarette and Disease Risks . . . . .	79
Conclusions . . . . .	86
Question-and-Answer Session . . . . .	87
References . . . . .	91
<b>Chapter 7. Biomarkers of Cigarette Smoking . . . . .</b>	<b>93</b>
Introduction . . . . .	93
Use of Various Biomarkers . . . . .	93
Nicotine Absorption From Cigarettes . . . . .	93

Nicotine Content of Tobacco Vs. FTC Yield.....	95
Quantitating Nicotine Intake in Smokers.....	95
Cotinine Levels and Nicotine Intake .....	98
Ultralow-Yield Cigarettes .....	101
Nicotine Intake and Machine-Determined Yield .....	102
Carbon Monoxide and FTC Yield .....	104
Tar-to-Nicotine Ratio .....	104
Conclusions.....	106
Question-and-Answer Session.....	108
References .....	110
Acknowledgments.....	111
<b>Chapter 8. Pharmacology and Markers: Nicotine Pharmacology and Addictive Effects .....</b>	<b>113</b>
Introduction .....	113
Cigarette Smoking as Drug Dependence .....	113
Nicotine Delivery Systems .....	115
Nicotine's Effects.....	116
Smoking and Nicotine Dose .....	119
A Proposal for More Meaningful Cigarette Labeling .....	122
Question-and-Answer Session.....	122
References .....	124
<b>Chapter 9. Consumer/Smoker Perceptions of Federal Trade Commission Tar Ratings .....</b>	<b>127</b>
Introduction .....	127
Tar Level of Cigarettes.....	127
Knowledge of Advertised Tar Numbers .....	128
Smokers' Interpretations of Tar Numbers.....	130
Smokers' Use of Advertised Tar Numbers.....	132
Conclusions.....	132
Question-and-Answer Session.....	132
Reference .....	134

<b>Chapter 10. Sensitivity of the Federal Trade Commission Test Method to Analytical Parameters</b> .....	135
Introduction .....	135
Standard Machine Smoking .....	135
Influence of Smoking Parameters .....	137
Influence of Human Smoking Practices .....	141
Conclusions .....	149
Question-and-Answer Session .....	149
References .....	149
Acknowledgments .....	150
<b>Chapter 11. Human Smoking Patterns</b> .....	151
Introduction .....	151
How Do Humans Smoke? .....	151
Which Human Smoking Behaviors Determine Smoke Exposure? .....	152
Are Human Smoking Patterns Dynamic or Static? .....	153
Does the FTC Method Accurately Reflect Human Smoking Patterns? .....	154
Summary .....	156
Question-and-Answer Session .....	157
References .....	159
<b>Chapter 12. Compensation for Nicotine by Smokers of Lower Yield Cigarettes</b> .....	161
Background .....	161
Cigarette Brand Switching in Experimental Research .....	161
Research .....	162
One Repeated-Measures Study of Self-Selected Brand Switching .....	165
Smokers Can Get High Yields From the Lowest of the Low-Yield Cigarettes: More on the Issue of Vent Blocking .....	165
Graphic Information on Tar and Nicotine Yields: The Color-Matching Technique .....	166

Summary .....	168
Question-and-Answer Session .....	168
References .....	171
<b>Chapter 13. Cigarette Design Technologies Reduce Smoke Yield and Expand Consumer Choices: The Role and Utility of the FTC Test Method .....</b>	<b>173</b>
Background .....	173
Cigarette Design and Changes in the Cigarette Market .....	174
Utility of the FTC Test Method .....	176
Question-and-Answer Session .....	180
References .....	191
<b>SECTION II. Transcript of Second-Day Discussion .....</b>	<b>193</b>
<b>SECTION III. Recommendations and Findings .....</b>	<b>239</b>
<b>SECTION IV. Overview of 1980 to 1994 Research Related to the Standard Federal Trade Commission Test Method for Cigarettes .....</b>	<b>249</b>
Introduction .....	249
Parameters of the FTC Test Method and Current Smoking Patterns .....	250
Impact of Changing Parameters of the FTC Test Method on Absolute Yields of a Cigarette Brand and Relative Yields of Different Brands .....	252
Tar and Nicotine Yield by the FTC Test Method and Amounts Delivered to Smoker .....	253
Relative Yields of Different Brands by the FTC Test Method and Amount of Nicotine Absorbed by Smokers .....	257
Yield by the FTC Test Method and Absorption of Nicotine in Switchers .....	259
Yields by the FTC Test Method and Other Constituents Using FTC Puff Profile .....	270
Proposals To Change the FTC Test Method .....	273
References .....	273