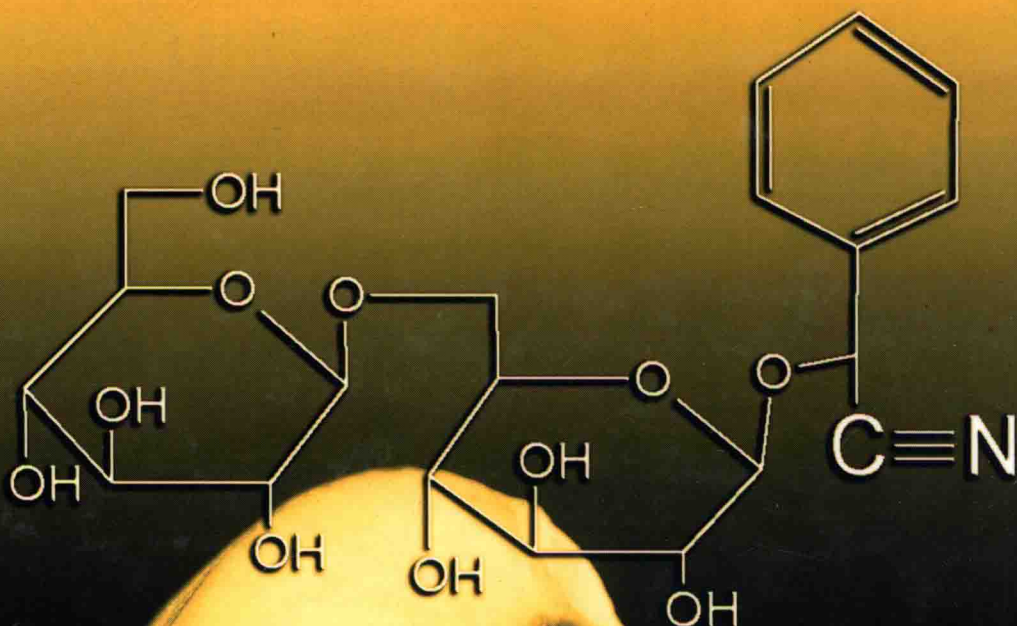


PRINCIPLES OF FOOD TOXICOLOGY



Tõnu Püssa



CRC Press
Taylor & Francis Group

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Boca Raton London New York

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CRC Press
Taylor & Francis Group
6000 Broken Sound Parkway NW, Suite 300
Boca Raton, FL 33487-2742

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Printed in the United States of America on acid-free paper
10 9 8 7 6 5 4 3 2 1

International Standard Book Number-13: 978-0-8493-8090-7 (Hardcover)

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Library of Congress Cataloging-in-Publication Data

Pussa, Tonu.

Principles of food toxicology / by Tonu Pussa.
p. ; cm.

Includes bibliographical references and index.

ISBN-13: 978-0-8493-8090-7 (alk. paper)

ISBN-10: 0-8493-8090-1 (alk. paper)

1. Food--Toxicology. I. Title.

[DNLM: 1. Food--toxicity. 2. Food Contamination. WA 701 P987p 2008]

RA1258.P87 2008

615.9'54--dc22

2007013979

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<http://www.crcpress.com>

PRINCIPLES OF FOOD TOXICOLOGY

Dedication

To my wife, Tiia

Preface

Food, as an extremely complex and complicated system, consists of practically an endless number of high- and low-molecular substances, mostly of natural origin. A majority of these compounds are indispensable for the normal functioning of the human organism, either as a source of energy or building material or normal source of pleasure, and their function is to turn eating into a pleasure and to improve digestion. Some of the food components also make food healthier and safer, as well as prolong its storage life.

On the other hand, food also contains substances that are capable of evoking smaller or bigger health disorders, that is, food can sometimes be toxic. Poisonous compounds may not only originate from the raw material of food but may also get into food during its processing, transportation, or storage. Toxic substances may also be the compounds, often synthetic, that are intentionally added to food. Although nowadays these substances called food additives are subjected to exhaustive toxicological examination, one can never be absolutely sure that a long-known food constituent can be regarded as safe in a new environment, where it can turn toxic by itself or synergistically enhance the toxicity of another so far nontoxic food component. Food is never ready; various physical and (bio)chemical processes are continuously going on, which may result in the formation of new and not always harmless substances. The so-called health-promoting functional additives may also elicit toxicological problems.

This textbook is an attempt to put into one pot the principles of general and food toxicology and to spice them up with the most important and vivid examples of food-related poisons and poisonings from all over the world. Owing to the rapid development of food toxicology, it is not usually possible to present the ultimate truth about toxic effects and their mechanisms. And this is good, because it makes the reader think with us. Special attention is paid to the (bio)chemical mechanisms of the toxic effects as much as they are known. Knowledge of the mechanisms helps toxicologists perform risk assessment scientifically.

The first part of the book is dedicated to introduction of the principles of toxicology at the molecular, cellular, as well as organism level, related as closely as possible to food. At times, examples from the second part are drawn to illustrate the principles. The second part is a systematic

characterization of the most important foodborne toxicants, closely interconnected with the first part of the book.

This textbook is a thoroughly revised and updated translation of the respective book written in Estonian, which is being used in the author's course of food toxicology at the Estonian University of Life Sciences. It may be of interest for students of food science and technology, for professional food scientists, manufacturers, and regulatory agency personnel.

Acknowledgments

The author would like to express his gratitude to his colleagues who were helping him at the time of writing the Estonian version as well as in translation. Special thanks to associate professor Ain Raal for his reading of the Estonian manuscript and his valuable advice concerning the medicinal side of toxicology and the textbook, to master student Piret Raudsepp for preparation of the figures, and my daughter, Triina, for the linguistic proofreading of the translation.

Author

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section one

*Basics of toxicology connected
to food*