

# ACRYLAMIDE IN FOOD

## What is it? How can we reduce it?

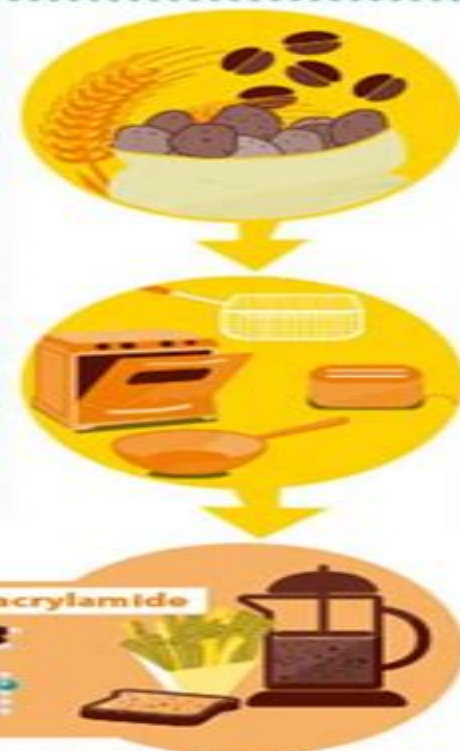
### HOW ACRYLAMIDE FORMS IN FOOD

Acrylamide is a chemical compound that typically forms in **starchy foods** when they are baked, fried or roasted at high-temperatures (120-150°C).

The main chemical reaction is known as the **Maillard reaction**

When the sugar and amino acid naturally present in starchy food are heated, they combine to form substances giving new flavours and aromas. This also causes the browning of the food and produces acrylamide.

#### Maillard reaction (or browning)



### ACRYLAMIDE IN FOOD IS MOSTLY FOUND IN



# Health Implications Of Acrylamide In Food

**Ching Kuang Chow**



## **Health Implications Of Acrylamide In Food:**

**Health Implications of Acrylamide in Food** Food and Agriculture Organization of the United Nations, 2002-12-28 The FAO WHO Consultation on Health Implications of Acrylamide in Food has undertaken a preliminary evaluation of new and existing data and research on acrylamide The Consultation provided a range of recommendations for further information and new studies to better understand the risk to human health posed by acrylamide in food The Consultation also provided some advice to minimize whatever risk exists including avoiding excessive cooking of food choosing healthy eating investigating possibilities for reducing levels of acrylamide in food and establishing an international network on acrylamide in food The Consultation reviewed the methods of analysis available to test for acrylamide in foodstuffs and food ingredients and for acrylamide and its metabolites as haemoglobin adducts in blood Of the limited range and number of foods analysed to date acrylamide levels are highest in potato and cereal based products subjected to heat processing such as frying grilling or baking However only a limited range of food types have been tested to date and these belong to the Western diet The range of foods investigated needs to be extended to include staple foods from different regions and diets Considered collectively data on the absorption metabolism distribution and excretion of acrylamide suggest that toxicological findings in animals should be assumed to be relevant for extrapolation to humans The Consultation would encourage transparent and open risk assessment and risk management processes and recognises the importance of involving interested parties consumer industry retail etc in this process *Health Implications of Acrylamide in Food*, Printbegr nsninger Der kan printes kapitelvis

Acrylamide and Other Hazardous Compounds in Heat-Treated Foods K Skog, J Alexander, 2006-10-30 Although the aim of cooking foods is to make them more appetizing and microbiologically safe it is now known that cooking and food processing at high temperatures generate various kinds of toxic substances such as heterocyclic amines and acrylamide via the Maillard reaction Summarising the latest research in this field this important collection discusses both the formation of health hazardous compounds during heat treatment of foods and practical methods to minimise their formation Part one analyses the formation of hazardous compounds in heat treated foods such as meat potatoes cereal and coffee Part two discusses the health risks posed by heat induced toxicants It includes chapters on bio monitoring exposure assessment and risk assessment as well as chapters on the risks of specific compounds The final part of the book is concerned with the key area of minimising the formation of harmful compounds in food products This can be achieved by controlling processing conditions and modifying ingredients among other methods With its distinguished editors and international team of contributors with unrivalled academic and industry experience Acrylamide and other hazardous compounds in heat treated foods is invaluable for all those concerned with this crucial safety issue throughout the food industry Analyses the formation of health hazardous compounds during heat treatment of foods Discusses practical methods to minimise formation Distinguished editors and international team of contributors **Safety Evaluation of Certain Contaminants in Food** Joint FAO/WHO Expert

Committee on Food Additives. Meeting, 2006-01-01      Risk management strategies: monitoring and surveillance Frans J.M. Smulders, John D. Collins, 2023-08-28 For the veterinarian monitoring and surveillance represent the best means of ensuring sustainable animal production at a time when consumer demands reflect awareness that many of the hazards associated with food animal production can be minimised or avoided through proper management at the primary production level Preventive medicine and quality and safety assurance programmes are primarily based on knowledge of the existing strengths and weaknesses of the clients enterprise and their ability to enact effective intervention measures Accordingly the food animal veterinarian relies upon effective monitoring of current performance and herd health status both for the purpose of maximising efficiency of production and providing an assurance that the primary food product meets required health standards in terms of freedom from those agents of concern that have their origin on the farm These agents include foodborne parasites pathogenic bacteria some of which display a resistance to antimicrobial agents contaminants of environmental origin as well as chemical and pharmaceutical residues The more successful these hazards are addressed at the farm the better the quality and safety of the final product and their marketing possibilities will be Communication between the primary producer and the food processing industry that facilitates real time exchange of information on these issues is essential for the practice of preventive medicine at the herd and flock level Integrated food chain quality and safety control programmes when linked to such monitoring and surveillance principles in regard to both human and animal health represent the means of achieving sustainable food animal production on a global scale in line with the conclusions of WTO and EU Volume 3 of the Food Safety Assurance and Veterinary Public Health series addresses this collaborative approach Leading international experts from academia industry and governmental institutions have been identified to deal with the various aspects of this collaborative approach in monitoring and surveillance      **Food Toxicology and Safety** Sofia Agriopoulou, Maria Tarapoulouzi, 2025-08-22 Food toxicology deals with the existence of dangerous toxic components that food may contain and various food processing contaminants are formed during the production process as a direct result of traditional and emerging food processing techniques This book brings together food toxicology and food safety linking them to several types of food processing It addresses the gaps in how contaminants are formed at different stages of food processing highlighting ongoing efforts related to food safety In addition it studies how processing technologies affect food products explaining the advantages disadvantages and process operations of these techniques      **Health Implications of Acrylamide in Food** , 2002      **Processing Effects on Safety and Quality of Foods** Enrique Ortega-Rivas, 2009-10-08 Covers a Host of Groundbreaking Techniques Thermal processing is known to effectively control microbial populations in food but the procedure also has a downside it can break down the biochemical composition of foods resulting in a marked loss of sensory and nutritional quality Processing Effects on Safety and Quality of Foods delineates three dec      **A Guide to Food Safety Sourcebook, First Edition** James Chambers, 2022-07-01 Provides consumer health information about food safety

antimicrobial use common foodborne pathogens and illnesses basic food safety in the kitchen safety by events and seasons allergies and intolerance Includes index glossary of related terms and other resources

**Fatty Acids in Foods and their Health Implications, Third Edition** Ching Kuang Chow, 2007-11-19 Since the publication of the bestselling second edition mounting research into fatty acids reveals new and more defined links between the consumption of dietary fats and their biological health effects Whether consuming omega 3 to prevent heart disease or avoiding trans fats to preserve heart health it is more and more clear that not only the quantity but the type of fatty acid plays an important role in the etiology of the most common degenerative diseases Keeping abreast of the mechanisms by which fatty acids exert their biological effects is crucial to unraveling the pathogenesis of a number of debilitating chronic disorders and can contribute to the development of effective preventive measures Thoroughly revised to reflect the most recent research findings Fatty Acids in Foods and their Health Implications Third Edition retains the highly detailed authoritative quality of the previous editions to present the current knowledge of fatty acids in food and food products and reveal diverse health implications This edition includes eight entirely new chapters covering fatty acids in fermented foods the effects of heating and frying on oils the significance of dietary linolenate in biological systems and inflammation biological effects of conjugated linoleic acid and alpha linolenic acid and the role of fatty acids in food intake and energy homeostasis as well as cognition behavior brain development and mood disease Several chapters underwent complete rewrites in light of new research on fatty acids in meat meat products and milk fat fatty acid metabolism eicosanoids fatty acids and aging and fatty acids and visual dysfunction The most complete resource available on fatty acids and their biological effects Fatty Acids in Foods and their Health Implications Third Edition provides state of the science information from all corners of nutritional and biomedical research

**Foundations of EU Food Law and Policy** Assoc Prof Alberto Alemanno, Dr Simone Gabbi, 2014-02-28 This volume presents the viewpoints of academics food lawyers industry and consumer representatives as well as those of EU policymakers on the first ten years of activity of one of the most prominent European agencies Its broader purpose however is to discuss the future role played by EFSA within the rapidly evolving area of EU food law and policy By revisiting and discussing the milestones in the history of EFSA the collection provides forward looking views of food leaders and practitioners on the future scientific and regulatory challenges facing the European Union In particular by presenting a critical assessment of the agency's activities within its different areas of work the book offers readers a set of innovative tools for evaluating policy recommendations and better equips experts and the public to address pressing regulatory issues in this emotive area of law and policy Despite its celebratory mood the book's focus is more about the future than the past of EU food law and policy Each chapter discusses how EFSA's role has evolved and identifies what it should have done differently while presenting an overall assessment of how the agency has discharged its mandate

*Essentials of Human Nutrition 6e* Jim Mann, A. Stewart Truswell, Leanne Hodson, 2023 Essentials of Human Nutrition provides a complete and student friendly introduction to the field for those

embarking on courses in nutrition or related subjects for the first time Written by an international team of experts every chapter is carefully edited to give consistently clear and coherent explanations of all of the essential principles of nutrition

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**Advances in Molecular Toxicology** James C. Fishbein, 2012-08 Advances in Molecular Toxicology features the latest advances in all of the subspecialties of the broad area of molecular toxicology Toxicology is the study of poisons and this series details the study of the molecular basis by which a vast array of agents encountered in the human environment and produced by the human body itself manifest themselves as toxins Not strictly limited to documenting these examples the series is also concerned with the complex web of chemical and biological events that give rise to toxin induced symptoms and disease The new technologies that are being harnessed to analyze and understand these events will also be reviewed by leading workers in the field Advances in Molecular Toxicology will report progress in all aspects of these rapidly evolving molecular aspects of toxicology with a view toward detailed elucidation of both progress on the molecular level and on advances in technological approaches employed Cutting edge reviews by leading workers in the discipline In depth dissection of molecular aspects of interest to a broad range of scientists physicians and any student in the allied disciplines Leading edge applications of technological innovations in chemistry biochemistry and molecular medicine

**Food and the Risk Society** Charlotte Fabiansson, Stefan Fabiansson, 2016-05-26 This book offers a comprehensive understanding of the current scientific knowledge concerning risks associated with food preparation processing and consumption with particular attention to the gap between scientific research and public perception Examining the effects of food on the body from both micro and macro levels it covers a range of broad themes and current concerns including obesity and the obesity epidemic the benefits or otherwise of dietary supplements caffeine consumption GM food alcohol organic food the consumption of fruit and vegetables and pathogens and contaminants Thematically arranged according to the application of broad theoretical approaches in sociological theory the socio cultural perspective the risk society perspective and the governmentality perspective each chapter focuses on a particular area of interest or concern in relation to food covering the existing literature in detail and offering illustrative empirical examples whilst identifying gaps in knowledge and areas for further research An accessible and rigorous examination of food and health and

the discrepancy between scientific opinion and consumer perception of safe food the real risks versus the perceived risks this book will appeal to scholars and students of sociology geography food nutrition and environmental ecosystems as well as health professionals

Total Diet Studies Gerald G. Moy, Richard W. Vannoort, 2013-11-08 Unless a food is grossly contaminated consumers are unable to detect through sight or smell the presence of low levels of toxic chemicals in their foods Furthermore the toxic effects of exposure to low levels of chemicals are often manifested slowly sometimes for decades as in the case of cancer or organ failure As a result safeguarding food from such hazards requires the constant monitoring of the food supply using sophisticated laboratory analysis While the food industry bears the primary responsibility for assuring the safety of its products the overall protection of people's diets from chemical hazards must be considered one of the most important public health functions of any government Unfortunately many countries do not have sufficient capability and capacity to monitor the exposure of their populations to many potentially toxic chemicals that could be present in food and drinking water Without such monitoring public health authorities in many countries are not able to identify and respond to problems posed by toxic chemicals which may harm their population and undermine consumer confidence in the safety of the food supply From a trade perspective those countries that cannot demonstrate that the food they produce is free of potentially hazardous chemicals will be greatly disadvantaged or even subject to sanctions in the international marketplace The goal of a total diet study TDS is to provide basic information on the levels and trends of exposure to chemicals in foods as consumed by the population In other words foods are processed and prepared as typical for a country before they are analyzed in order to better represent actual dietary intakes Total diet studies have been used to assess the safe use of agricultural chemicals e.g pesticides antibiotics food additives e.g preservatives sweetening agents environmental contaminants e.g lead mercury arsenic cadmium PCBs dioxins processing contaminants e.g acrylamide polycyclic aromatic hydrocarbons chloropropanols and natural contaminants e.g aflatoxin patulin other mycotoxins by determining whether dietary exposure to these chemicals are within acceptable limits Total diet studies can also be applied to certain nutrients where the goal is to assure intakes are not only below safe upper limits but also above levels deemed necessary to maintain good health International and national organizations such as the World Health Organization the European Food Safety Agency and the US Food and Drug Administration recognize the TDS approach as one of the most cost effective means of protecting consumers from chemicals in food for providing essential information for managing food safety including food standards and for setting priorities for further investment and study Total Diet Studies introduces the TDS concept to a wider audience and presents the various steps in the planning and implementation of a TDS It illustrates how TDSs are being used to protect public health from chemicals in the food supply in many developed and developing countries The book also examines some of the applications of TDSs to specific chemicals including contaminants and nutrients

In-Pack Processed Foods P Richardson, 2008-06-13 Recent developments have enabled the production of in pack processed foods with improved

sensory quality as well as new types of heat preserved products packaged in innovative containers This book reviews these advances in packaging formats and processing technologies and their application to produce higher quality safer foods Opening chapters cover innovative can designs and non traditional packaging formats such as retort pouches The second part of the book reviews the developments in processing and process control technology required by newer types of packaging Part three addresses the safety of in pack processed foods including concerns over pathogens and hazardous compounds in processed foods The book concludes with chapters on novel methods to optimise the quality of particular types of in pack processed foods such as fruit and vegetables meat poultry and fish products In pack processed foods improving quality is a valuable reference for professionals involved in the manufacture of this important group of food products and those researching in this area Reviews advances in packaging formats and processing technologies Covers innovative can designs and non traditional packaging formats Examines the safety of in pack processed foods including concerns over pathogens

**Process-Induced Food Toxicants** Richard H. Stadler, David R. Lineback, 2008-12-09 Process Induced Food Toxicants combines the analytical health and risk management issues relating to all of the currently known processing induced toxins that may be present in common foods It considers the different processing methods used in the manufacture of foods including thermal treatment drying fermentation preservation fat processing and high hydrostatic pressure processing and the potential contaminants for each method The book discusses the analysis formation mitigation health risks and risk management of each hazardous compound Also discussed are new technologies and the impact of processing on nutrients and allergens

**Innovative Food Science and Emerging Technologies** Sabu Thomas, Rajendran Rajakumari, Anne George, Nandakumar Kalarikkal, 2018-09-03 This volume covers many new trends and developments in food science including preparation characterization morphology properties and recyclability The volume considers food quality shelf life and manufacturing in conjunction with human nutrition diet and health as well as the ever growing demand for the supply and production of healthier foods Distinguished scientists specializing in various disciplines discuss basic studies applications recent advances difficulties and breakthroughs in the field The volume includes informative discussions and new research on food formulations manufacturing techniques biodegradably flexible packaging packaged foods beverages fruits and vegetable processing fisheries milk and milk products frozen food and thermo processing grain processing meat and poultry processing rheological characteristics of foods heat exchangers in the food industry food and health including natural cures and food supplements spice and spice processing and more

Olives and Olive Oil as Functional Foods Apostolos Kiritsakis, Fereidoon Shahidi, 2017-06-15 The only single source reference on the science of olives and olive oil nutrition and health benefits Olives and Olive Oil as Functional Foods is the first comprehensive reference on the science of olives and olive oil While the main focus of the book is on the fruit s renowned health sustaining properties it also provides an in depth coverage of a wide range of topics of vital concern to producers and researchers including post harvest handling packaging

analysis sensory evaluation authentication waste product utilization global markets and much more People have been cultivating olives for more than six millennia and olives and olive oil have been celebrated in songs and legends for their life sustaining properties since antiquity However it is only within the last several decades that the unique health benefits of their consumption have become the focus of concerted scientific studies It is now known that olives and olive oil contain an abundance of phenolic antioxidants as well as the anti cancer compounds such as squalene and terpenoids This centerpiece of the Mediterranean diet has been linked to a greatly reduced risk of heart disease and lowered cancer risk Bringing together contributions from some of the world s foremost experts on the subject this book Addresses the importance of olives and olive oil for the agricultural economy and the relevance of its bioactive components to human health Explores the role that olive oil plays in reducing oxidative stress in cells a well known risk factor in human health Provides important information about new findings on olive oil and lipids which reviews the latest research Explores topics of interest to producers processors and researchers including the fruit s chemical composition processing considerations quality control safety traceability and more Edited by two scientists world renowned for their pioneering work on olive oil and human health this book is an indispensable source of timely information and practical insights for agricultural and food scientists nutritionists dieticians physicians and all those with a professional interest in food nutrition and health

*Hazardous Waste Management* Rajesh Banu Jeyakumar,Kavitha Sankarapandian,Yukesh Kannah Ravi,2022-06-28 This book presents a comprehensive overview of hazardous waste and hazardous waste management It describes the various types and constituents of hazardous waste discusses hazardous waste management techniques and technologies and highlights techno economic considerations and key issues in remediation It is a useful resource for waste management and treatment professionals chemical engineers technicians medical professionals and environmental regulators as well as students studying hazardous waste management environmental engineering and environmental science

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