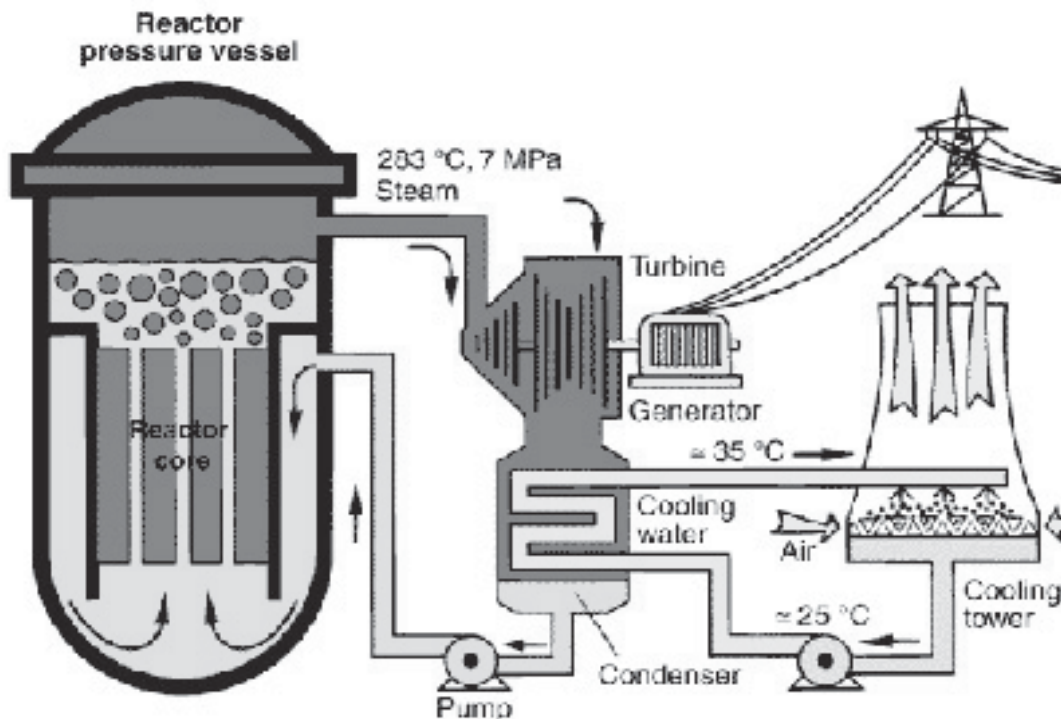


Environmental Contamination of Food

- The routes include the atmosphere, soil and surface or ground water.
 - Contamination due to industrial or agricultural manufacture
- The manufacture of organic chemicals produces gases, sludges, and liquid effluents’.
- Metals can be released into the environment in several ways. The mining and refining processes produce dust and gases which enter the atmosphere. Metallic salts formed during recovery and refining processes can escape as waste products into surface and ground water.
- The usual waste disposal methods (sewage systems, incineration, landfill) are unable to prevent organic residues , Metals from entering the environment in spite of several laws
 - Contamination due to radioactivity
- The release of radioisotopes by unsafe storage of nuclear wastes and nuclear accidents ,present a serious environmental threat.
- Nuclear weapons tests distribute their fission products globally
- These contaminants can last for many years due to long half-lives and are subject to biological magnification.

Nuclear Power Reactor



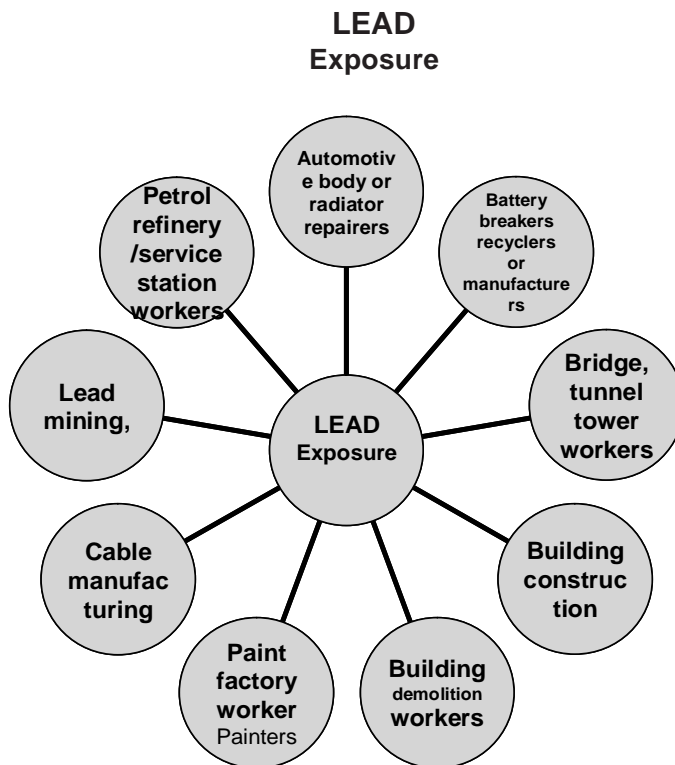
LEAD POISONING

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth.

It has no special taste or smell .

Lead is a metal which is cheap and useful. Hence it is found in ZXmany products and in many places in the environment.

Sources of Lead Exposure:-



Significant exposures result from inadequately controlled industrial emissions from such operations as lead smelters and battery recycling plants, which contaminate environments and people in the surrounding areas.

Petrol

Continuing use of lead in petrol exposes the entire community to lead through car emissions in the air. Lead also can enter the body when leaded petrol comes into contact with the skin.

Water

Lead in drinking water — The major source is the corrosion of leaded plumbing materials in the water supply and household plumbing.

Contamination can arise from lead connectors, lead and PVC piping, lead-soldered joints in copper and brass faucets and other fittings containing lead.

Water from lead-soldered water tanks or run-off systems from roofing with lead-based paint also pose a risk,.

Contaminants in Food and Beverages

The highest level of environmental contamination is found to be associated with uncontrolled recycling operations and the most highly exposed adults are those who work with lead

Lead and your health

zOnce lead is absorbed into the bloodstream, some of it is filtered out and excreted, but the rest gets distributed to the liver, brain, kidneys and bones.

No level of lead in blood is safe or normal.

The disturbing fact is that exposure to **extremely small amounts** can have long-term and measurable effects in children while at the same time **causing no distinctive symptoms.**

Symptoms at a Glance

Below 2.17 $\mu\text{m/L}$ (45 $\mu\text{g/dl}$) in children and 2.90 $\mu\text{m/L}$ (60 $\mu\text{g/dl}$) in adults, lead exposure is usually asymptomatic.

Moderate

children (> 45 $\mu\text{g/dl}$)
(2.17-2.65 $\mu\text{m/L}$)
adults >60 $\mu\text{g/dl}$

muscle pains
prickly, itchy feeling
mild fatigue
Aggressiveness
Irritability
lethargy
abdominal discomfort

Severe

children 55-70 $\mu\text{g/dl}$
(2.64-3.4 $\mu\text{m/L}$)

joint pain
general fatigue
poor concentration
tremor
headache
abdominal pain
constipation
weight loss

Medical emergency

children >70 $\mu\text{g/dL}$ +
(3.4+ $\mu\text{m/L}$)
adults > 80 $\mu\text{g/dL}$ +

partial paralysis
paralysis
brain edema
stupor or coma
fits and vomiting
gum lead line
colic
death

Testing for lead

It is often difficult to see that symptoms of ill health are due to lead.

If you think there is a risk to you or your family, have a blood test - it is the best way to check for lead poisoning. The test shows how much lead is in the blood.

What one can do

The best solution to reducing lead hazards is to avoid being exposed in the first place.

Eating well

Lead is absorbed more easily if your diet lacks essential minerals such as iron, calcium and zinc. To reduce the amount of lead the body absorbs if it is inhaled or swallowed, make sure your family - especially young children and pregnant women - has a diet low in fat and rich in:

- calcium (milk, cheese, yogurt, nuts - especially almonds)
- iron (eggs, lean red meat and poultry, liver, fish, cereal, beans, peas, lentils, dark green leafy vegetables)

- zinc (wheat bran, yeast products, red meat and liver, oysters and crab).

Too much fat also aids lead absorption (but there is no evidence that a low fat diet minimizes absorption). Frequent nutritious meals are important for children. Food in the stomach decreases the absorption of lead from non-food sources.

Reducing the use of leaded petrol

Reducing the use of leaded petrol and reducing amounts of lead in the petrol will result in a decline in lead in the air we breathe.

Reference site:-

Want more information about LEAD and LEAD POISONING ?

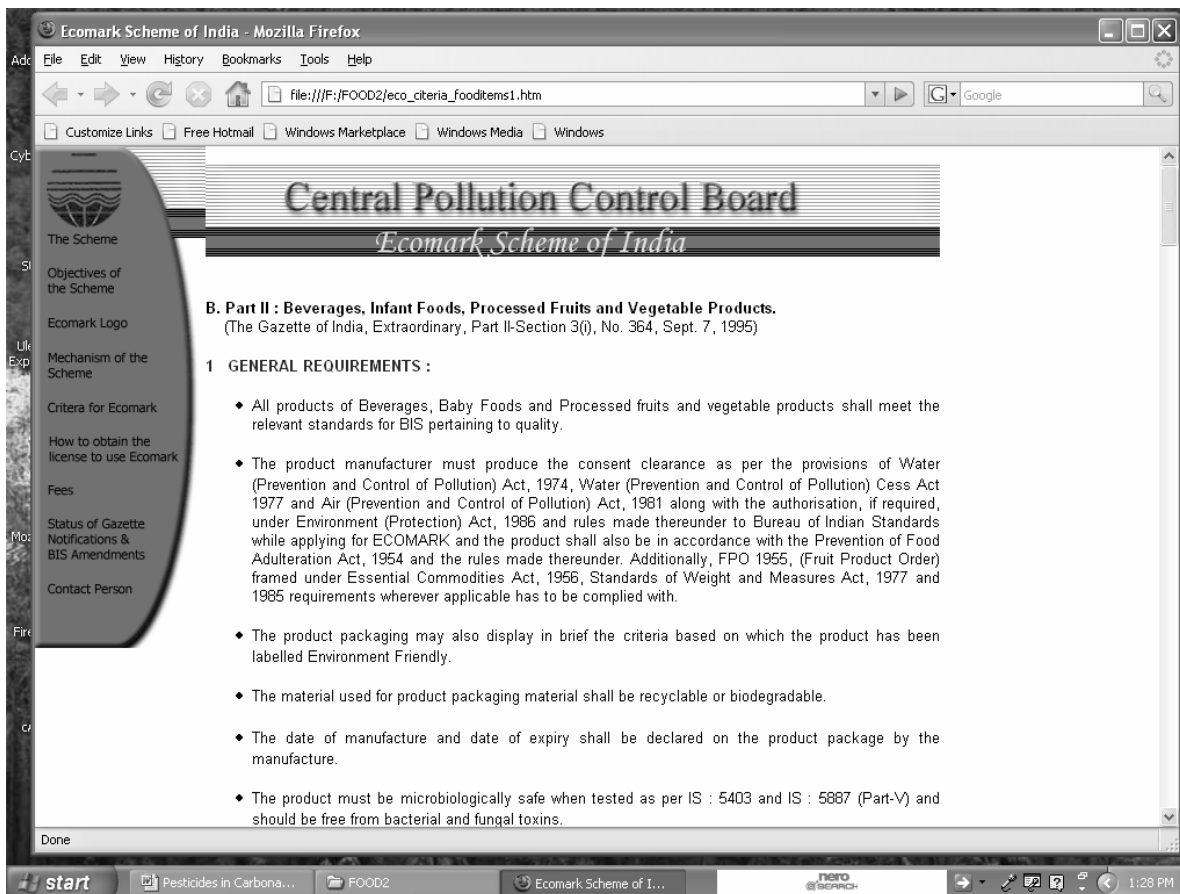
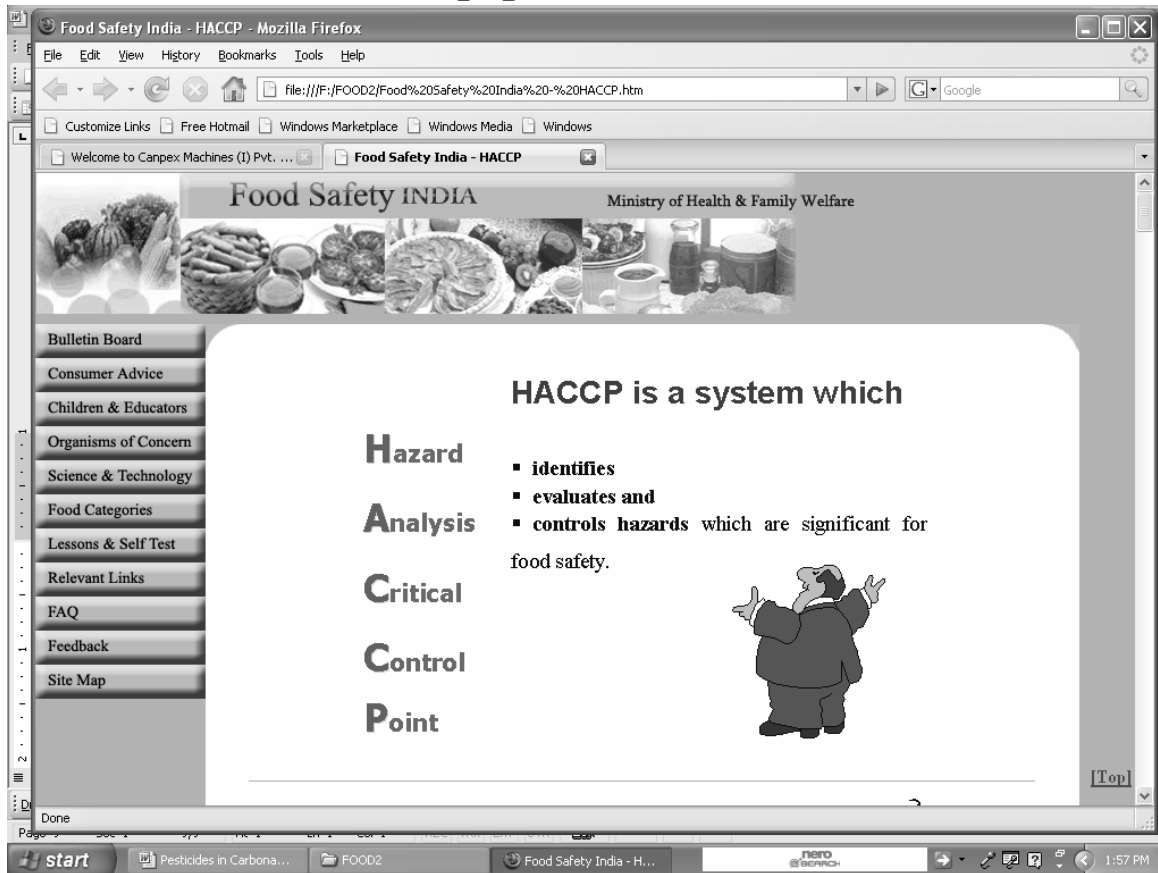
Visit - leadpoison.net

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"I THINK I'VE FOUND THE ANSWER."

Important Websites



Using Nanotechnology to Detect Contaminants in Food and Water

Source: AZoNano.com

Author: n/a 7/23/2007

Researchers from the Technical University of Denmark have developed two new portable sensor devices that can detect a variety of contaminants, ranging from molecules to whole bacteria, in food and water. One device consists of two microscale cantilevers that are coated with antibodies specific to the contaminant of interest. When liquid is passed through the cantilevers, the microbe or contaminant molecule under investigation binds to the surface of the cantilevers, causing them to bend and changing their electrical resistance, which can then be measured as a means of detection. Researcher Anja Bosen explained that that the device could be expanded to simultaneously detect many different types of contaminants by adding several cantilevers that are each coated with different detector molecules. The same cantilever technology is also applied to “lid devices” that produce a visible color indication of contaminant detection. The article says that such lid devices take the form of a portable one centimeter plastic box. Boisen said: “We use processes where the cantilevers are fabricated by etching a thin silicon wafer three-dimensionally. The procedure is suitable for mass production and it might be possible to make sensors so cheaply that they can be disposable. . . The lid device could be included in food packaging since it requires no external energy and is cheap to make. When a food is infected, the control unit in the plastic wrapping becomes coloured.”

Thus a simple colour indicator can show the quality of the food.”

Research at NASA (USA)

Welcome to Canpex Machines (I) Pvt. Ltd. - Mozilla Firefox

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file:///F:/FOOD2/faq%20Reverse%20osmosis.htm

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Refined Technology for Pure drinking water

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>> FAQ

Q. What is Reverse Osmosis System?

Reverse Osmosis system is the result of years of meticulous research of NASA (USA) and is proving very useful in many parts of India, where water quality is below the prescribed standard. The process of RO ensures that every drop of water is just the way nature intended it to be.. Pure, Safe and Sparkling Fresh. The unique Reverse Osmosis Technology (RO) and multistage purification process reduces hardness and revives the original taste of water. While making water chemically and micro biologically potable as well as reducing Total Dissolved Solids (TDS), heavy metal contaminants. In fact, this water even ensures that there is no scaling in cooking vessels. Trust RO and you'll never ever have to compromise on the water you drink.

X-ray systems detect range of contaminants

Source: AZoNano.com

Author: n/a 8/16/2007

- A new range of x-ray systems can inspect package products for a wide variety of contaminants, its manufacturer claims.

S + S Separation and Sorting Technology said its Raycon x-ray series can detect a wide variety of foreign particles including metal contaminants, glass, ceramics, stones, rubber, bones and polyvinyl chloride (PVC).

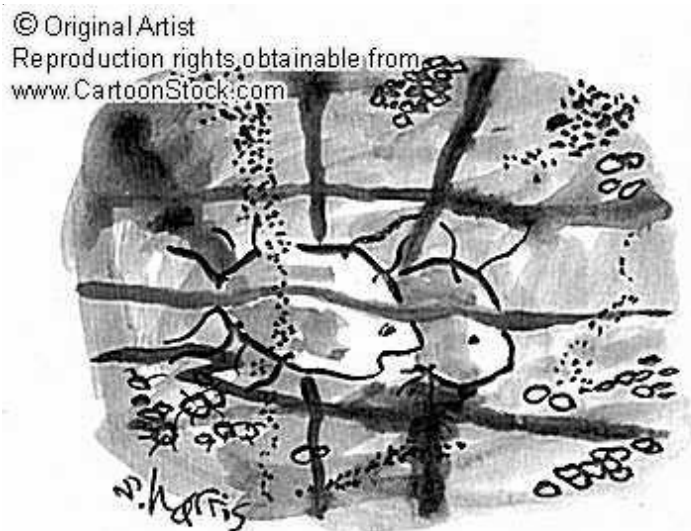
Manufacturers are upgrading their inspection systems to improve food safety and to reduce the risk of contaminants in food that can lead to costly recalls and damage consumer confidence in brands.

Moreover, tougher hygiene regulations based on hazard analysis and critical control point (HACCP) are forcing food processors to identify the parts production lines where risks of contamination are high and implement control measures to mitigate those risks.

The system is used for the final inspection of packaged products. Aluminium-coated packing materials or metallised films are no problem at all. The system also permits the simultaneous inspection of different products and packaging even in parallel production lines.

Out of line or misplaced products are inspected by the x-ray, but do not cause error messages. Up to 600 units per minute be checked by the system that can be connected to a pc.

The stainless steel construction ensures systems can withstand the harsh chemical and high-temperature washdowns.



"YOU MEAN THIS SEWAGE HAS
ALREADY BEEN TREATED?"

BOOK INFORMATION

A large number of Books are available in the market.

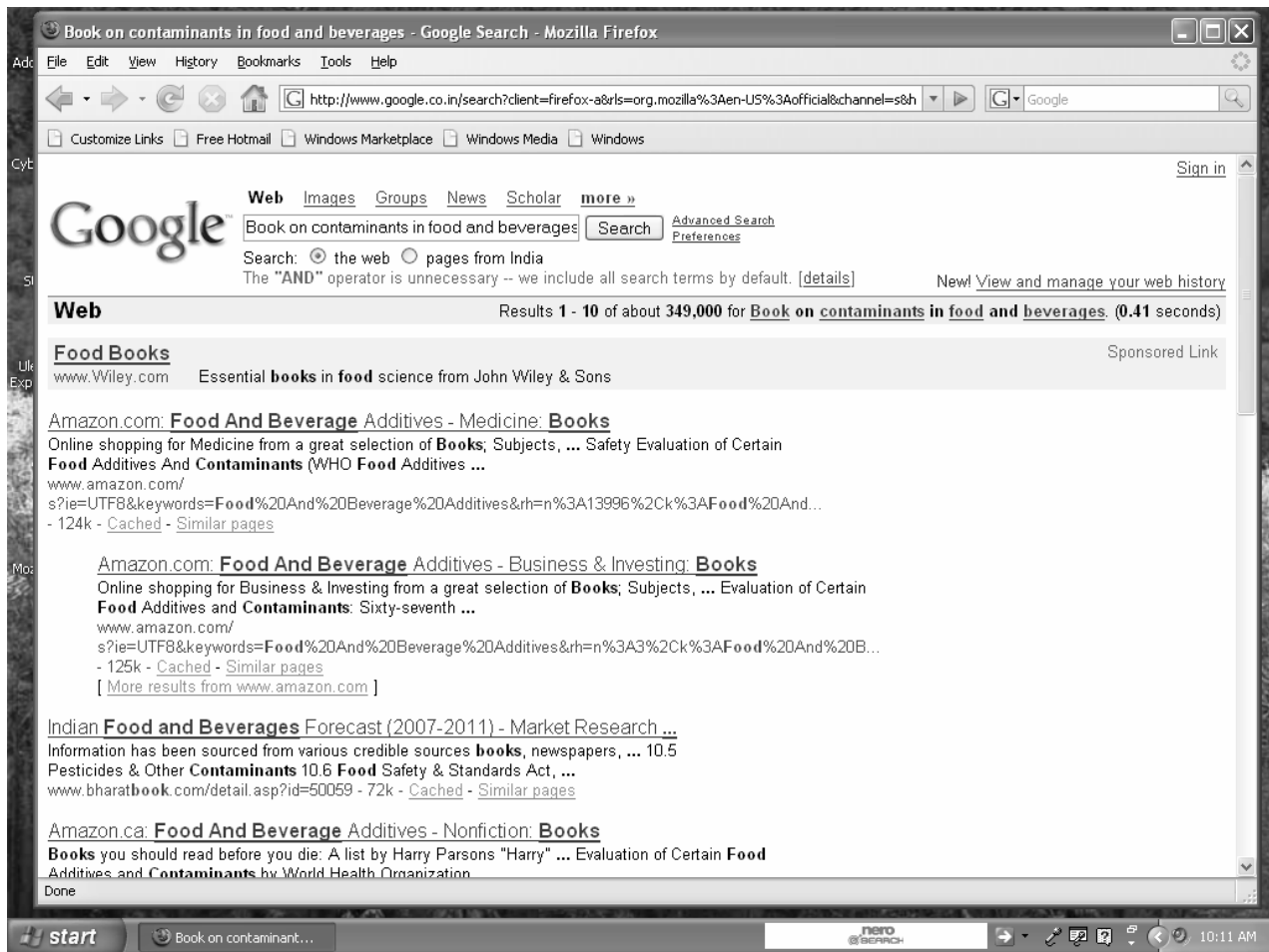
Now a days one can order a book through Internet

On the Google Search Engine on 15 September 2007

Results :- Duration :- 0.41 seconds

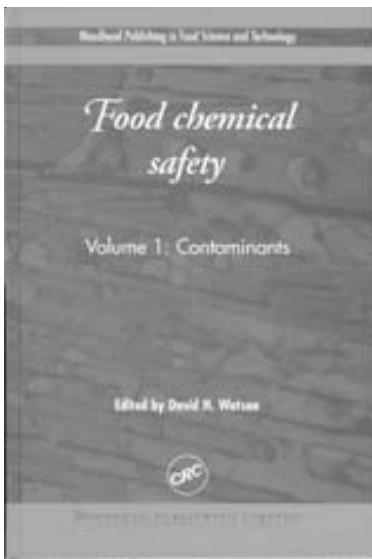
Subject :- Contaminants in Food and Beverages

Books / Reports:- 349,000



It is really amazing

Book 1



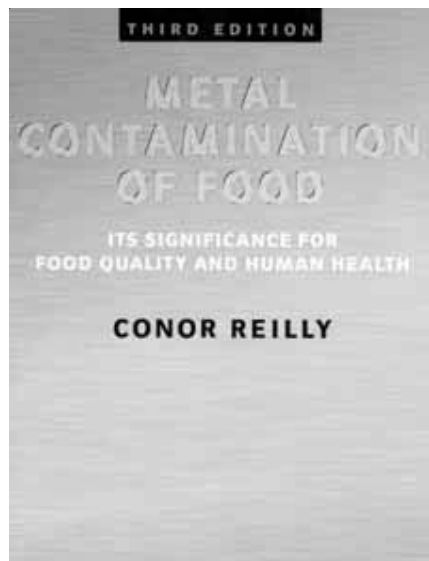
Food chemical safety: Contaminants (Volume 1)

336 pages ISBN 1855734621 £145.00

Edited by D Watson, Food Standards Agency, UK

This volume provides comprehensive information about contaminants in the food industry. The book opens with an explanation of risk analysis and analytical methods used for detecting contaminants in food products. This is followed by full details of relevant EU and USA regulations. The second part of the book provides information about specific contaminants.

Book 2



Author has many years experience teaching and researching in the area

Metal Contamination of Food is an essential reference book for food industry personnel, including those working in food processing, formation and ingredients, packaging, quality control and food safety.

Contents

I The Metals We Consume:

Introduction

The metals in food

Metal analysis of food How metals get into food

Metals in food and the law

II The Individual Metals:

The persistent contaminants: lead, mercury, cadmium

The packaging metals: aluminium and tin

Transition metals: chromium, manganese, iron, cobalt, nickel, copper, molybdenum

The other transition metals and zinc

The metalloids: arsenic, antimony, selenium, tellurium and boron

The new metal contaminants Barium, beryllium, thallium and the other metals - summing up

Index

Book 3

Food contaminants: Sources and surveillance

Edited by C Creaser, University of East England and R Purchase, British Industrial Biological Research Association, UK

ISBN 1 85573 784 1

[ISBN-13: 978 1 85573 784 6]

January 1991

204 pages 234 x 156mm hardback

£125.00 / US\$240.00 / €180.00

This book contains contributions based on the proceedings of two symposia on food contamination held in London in April 1989 and May 1990, both of which were organized jointly by the Environment, Food Chemistry and Toxicology Groups of the Royal Society of Chemistry.

The aim of these meetings was to assess the extraneous chemical contamination of food from two sources: firstly, food-chain contaminants - the presence of plant toxicants or fungal metabolites in food, or the contamination of food from environmental sources (airborne, aquatic and terrestrial); and secondly, food-production contaminants - contaminants of man-made origin brought about by a desire to facilitate food production and distribution.

The contributors concentrate on the contamination of food by chemicals arising from environmental and food-production sources.

Chapter 1 is concerned with food-chain contaminants present in food as natural components of the diet. This is followed by discussion of the chlorinated dioxins and furans, and polycyclic aromatic hydrocarbons. Following an introduction to the control and surveillance of food-production contaminants, four areas of activity are described: migration from food contact materials with particular reference to plastics, the analysis and regulatory control of veterinary products, the analysis of pesticides in drinking water and finally the problem of food taints.

Book 4

Preventing Foreign Material Contamination of Foods

By **Doug Peariso**

DOUGLAS PEARISO is the former senior quality assurance manager of the Foods Business Unit of Gerber Products Company, Freemont, MI

Written for quality assurance, HACCP, and related professionals charged with maintaining the integrity of their food product, *Preventing Foreign Material Contamination of Foods* offers conceptual, pragmatic, and *implementable* strategies to detect and eliminate physical contamination during food processing.

Table of Contents

1. The Importance of Preventing Foreign Material Contamination of Food Products
2. Proactive Management Strategies for Dealing with Foreign Materials

3. Physical Separation Techniques for Controlling FM Contaminants
4. Applications of Magnetic Separation to Prevent Foreign Material Contamination of Finished Food Products
5. Principles and Strategies for Using Metal Detectors to Isolate Metallic Foreign Materials from Food Products
6. Machine Vision and Its Application to Prevent FM Contamination of Foods
7. X-ray Examination of Foods for Foreign Materials
8. Proper Initial Validation, Ongoing Verification, and Change Control for Separation and Detection Equipment
9. Proper Use of Acceptance Sampling and Statistical Process Control to Augment FM Control Programs

Book 5

Indian Food and Beverages Forecast

(2007-2011)

Publication Date	June 2007
Publisher	RNCOS
Product Type	Report
Pages	85
ISBN Number	not applicable
Product Code	RCS00198

Price

£595.00

approximately: \$1,200 /€ 878

Summary

The “Indian Food and Beverages Forecast (2007-2011)” report gives an in-depth analysis of the present and future prospects of the Indian food and beverages industry.

It looks into the industry in detail with foci on organized food retailing, consumer food purchasing behaviour, food processing industry and packed/convenience food industry.

This report helps clients to analyze the factors and examine the opportunities critical to the success of food and beverages industry in India.

List of some Books on Food

Food Toxicology, Food Irradiation and Food Contamination

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Culinary and Hospitality Industry Publications Services

TITLE/AUTHOR	PRICE
Acrylamide and other Hazardous Compounds in Heat-Treated Foods (Skog)	238.95
Aflatoxin and Food Safety (Abbas)	189.95
Aldo-Keto Reductases and Toxicant Metabolism (Penning/Petrash)	159
Basics of Toxicology: Preserving the Legacy (Kent)	89
Carcinogenic and Anticarcinogenic Food Components (Baer-Dubowska)	138.95
Casarett & Doull's Toxicology: The Basic Science of Poisons, 6th edition (Klaasen)	119.95
Chemical Food Safety: A Scientist's Perspective (Riviere)	74.95
Clostridium Botulinum: Ecology and Control in Foods (Hauschild)	208.95
Dioxins and Health 2nd edition (Schecter and Gasiewicz)	179
Electronic Irradiation of Foods (Miller)	128
Environmental Contaminants in Food (Moffat)	178.95
Food and Nutritional Toxicology (Omaye)	118.95
Food Antioxidants: Technological, Toxicological, and Health Perspectives (Madhavi/Deshpande/Salunkhe)	228.95
Foodborne Carcinogens: Heterocyclic Amines (Nagao)	314
Food Chemical Safety, Volume 1: Contaminants (Watson)	268.95
Food Chemical Safety, Volume 2: Additives (Watson)	268.95
Food Irradiation: Principles and Applications (Molins)	159
Food Irradiation Research and Technology (Sommers)	184.95
Food Technology: Irradiation Video	115
Food Toxicology (Helferich and Winter)	148.95
Free Radicals and Oxidation Phenomena in Biological Systems (Roberfroid)	168.95
Handbook of Food Toxicology (Deshpande)	248.95
Handbook of Toxicology 2nd edition (Derelanko)	198.95
Indirect food Additives and Polymers: Migration and Toxicology (Sheftel)	178.95
Introduction to Biochemical Toxicology (Hodgson and Smart)	134
Irradiation for Food Safety and Quality (Loaharanu)	148.95
Irradiation of Food and Packaging (Komolprasert and Morehouse)	159
ISO 9000 Quality System: Applications in Food and Technology (Newslow)	78.95
Metal Contamination of Food: Its Significance for Food Quality and Human Health, 3rd edition (Reilly)	189.95

<i>Contaminants in Food and Beverages</i>	
Natural Toxicants in Feeds, Forages, and Poisonous Plants (Cheeke)	57
Nutritional Toxicology 2nd edition (Kotsonis and Mackey)	148.95
Nutrition and Chemical Toxicity (Ioannides)	254
Persistent, Bioaccumulative, and Toxic Chemicals I: Fate and Exposure (Lipnick et al)	184
Pesticide Chemistry and Bioscience: The Food-Environment Challenge (Brooks/Roberts)	144
Pesticide Residues in Foods: Methods, Techniques and Regulations (Fong et al)	124
Pesticide Residues in Food and Drinking Water: Human Exposure and Risks (Hamilton and Crossley)	216
Pesticides, Veterinary and Other Residues in Food (Watson)	308.95
Plant Food Allergens (Mills and Shewry)	188.95
Poisonous Plants and Related Toxins (Acamovic et al)	139
Progress in Food Contaminant Analysis (Gilbert)	229
Radionuclide Concentrations in Food and the Environment (Pöschl)	168.95
Reviews in Food and Nutrition Toxicity Volume 1 (Preedy and Watson)	138.95
Reviews in Food and Nutrition Toxicity Volume 2 (Preedy and Watson)	138.95
Seafood and Freshwater Toxins: Pharmacology, Physiology, and Detection (Botana)	238.05
Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens	
• 2 Volume Set 4th edition (Pohanish)	494
Textbook of Modern Toxicology, 3rd edition (Hodgson)	98.95
Toxins in Food (Dobrowski)	178.95
Ullmann's Industrial Toxicology 2-Volume Set	499

Prices subject to change - Prices are in U.S. Dollars

The concern today is not contamination of **Carbonated Drinks** with pesticides,

There is no reason to neglect the traces of pesticides however small the amount may be found in our food or beverages. Over the years these chemicals accumulate in our bodies and harm our health and the wellbeing of our future generations. They are called **cumulative poisons** i.e. they poison slowly and insidiously. They also poison synergistically where the combined effect exceeds the sum total of individual effect. Pesticides like DDT, Lindane, Malathion, Chlorpyrifos etc. are known to cause cancers, damage nervous system, reproductive system, cause birth defects, disrupt immune system and reduce bone density, to name a few.

In 1986, ICMR (Indian Council of Medical Research) found that 51% of the food items it tested were contaminated with pesticide residues and 20% of these had pesticides above the maximum residue limit (MRL). For e.g.: Cereals: CERC reported that most of the wheat flour brands in India are contaminated with pesticides like Lindane (which should be absent), DDT, aldrin (banned in 1996) and dieldrin (restricted to use).

Food safety on the whole

We need to talk about food safety on the whole, and take into account the numerous other chemical contaminants including those due to heavy metals such as lead, mercury, cadmium, fluorine, nitrate, nitrites, phosphate etc. The release of radioisotopes by unsafe storage of nuclear wastes and nuclear accidents ,present a serious environmental threat. These contaminants can last for many years due to long half-lives and are subject to biological magnification.

The positive side of such controversies is that they help to create awareness and interest in issues as important as these which have been neglected over the years .

This is the main purpose of this seminar..

B.N. Bandodkar Collage of Science

Seminar Information on the Net

Date :- 24 September 2007



V.P.M's

B.N. Bandodkar College of Science, Thane

Department of Chemistry

Seminar on Contaminants in Food and Beverages

1st Preparatory Workshop :- January 16, 2007 (Time 10.00a.m. to 01.00 pm)

Venue:- Thorale Bajirao Peshwe Sabhagruha ,Thane college Campus.

Inaugural Lecture

Scope and Importance of the subject

Mr. S.G. Medhekar

(H.O.D. and Co-convener)

Presentation by College Lecturer

Food additives

Mr.D.R. Ambavadekar

Presentation by College Students

Toxic effects of Food additives

Miss Kamakshi Nayak
T.Y.B.Sc (Zoology)

Contaminants in Meat, Milk and Eggs

Miss Purva Acharekar
T.Y.B.Sc (Zoology)

Contaminants in Water

Miss Tejashree Dange
T.Y.B.Sc (Chemistry)

Contaminants in Beverages

Miss Sonal Salvi
S.Y.B.Sc.

Harmful Bacteria in Food

Miss Amurata A. Shaligram
T.Y.B.Sc. (Chemistry)

Hazardous effects of

Lead and Benzene present in Food

Miss Swati S. Kadlag
T.Y.B.Sc. (Chemistry)