

FOOD FOR THOUGHT

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ACRYLAMIDE - NEW FINDINGS IN FOODSTUFFS

Acrylamide is a well-known compound that is chemically manufactured in large amounts and used in the synthesis of polyacrylamide. This polymer is frequently used as a flocculation agent in water treatment and as an insulating material. Acrylamide may therefore occur naturally in water and air and is considered carcinogenic.

Acrylamide was not considered to be a great health risk in food prior to April 2002, however when the Swedish National Food Administration (NFA) presented the results of its studies on barbecued, deep-fried and oven-baked foodstuffs they found that the formation of acrylamide occurred at high temperatures and in products containing carbohydrates. These results had repercussions all over the world. The official reaction from different countries is that this study does not expose a new food scandal. The general feeling is that the study has provided data on a phenomenon that has probably existed for thousands of years. However it is regarded as an important discovery, so much so that further studies are planned in order to obtain a sound scientific basis for the effect observed.

These studies include the testing and evaluation of cooked foods, the determination of the amount of acrylamine in relation to process parameter and more importantly, the health risk of eating food containing acrylamide. There is also demand for a comparison of the results obtained using different analytical techniques. The current state of scientific knowledge is insufficient for action and no countries have as yet changed their dietary recommendations.

It has been suggested that comparable products contain acrylamide at different levels and also there does seem to be a correlation with the food production condition. It has been observed that vigorous heat stress, combined with any number of factors, increases the content of acrylamide.

Therefore it is suggested that it may be possible to reduce the formation of acrylamide by alteration in processing technologies. Many manufactures are considering these changes with regard to the principle that the content of any hazardous compound should always be minimized in foods.

It is worth noting that there is no current limit for the concentration of acrylamide in foodstuffs. The World Health Organization (WHO) has recommended a limit of 0.5 mg/l for drinking water. The EU Drinking Water Directive of 1998 specifies a limit of 0.1 mg/l. The laboratories of Eurofins in Denmark have confirmed the Swedish findings for acrylamide, ranging from below the limit of detection up to 4,000 mg/kg. The foodstuffs examined included potato chips, hard pastries, biscuits, crisp bread and breakfast cereals. This comparison illustrates the extent of the problem, although the consumption of water is much greater than the foodstuffs in question. Furthermore, the findings of unprocessed and boiled foods were well below the limit of detection.

Unlike the majority of food related scares, which in general are related to industrially manufactured products, acrylamide formation occurs domestically by frying, grilling or baking.

EDITORIAL COMMENT

Harmful bugs may lurk within leaves

Healthy salad greens could be contaminated with bacteria that cause food poisoning, despite thorough rinsing. New research shows that harmful bugs can enter a lettuce plant through its roots and end up in the edible leaves. Although uncommon, food poisoning caused by eating plants can occur. Vegetables that are fertilized with animal manure, which can contain pathogens, pose the biggest threat. Raw salad vegetables are now washed after harvesting to reduce the risk of contamination.

Food Microbiologist Karl Matthews and colleagues at Rutgers University in New Jersey investigated whether bacteria were getting inside the lettuce, rather than just sitting on the leaves. The team grew lettuce in manure inoculated with *E. coli* O157:H7.

After sterilizing the plant's surface with bleach, the researchers still found bacteria within the internal tissues that are for water transport. Lettuce leaves could be infected by simply irrigating plants with bacteria-inoculated water, despite the fact that foliage did not come into direct contact with the water. Small gaps in growing roots are a known port of entry for plant pathogens, and may allow *E. coli* to get in.

"If it is found in saleable plants, it presents us with a new vehicle for *E. coli* O157:H7," says Tom Cheasty, who directs *E. coli* O157:H7 surveillance at the UK Public Health Laboratory Services in London. But he adds that, for the

moment, there is no compelling reason to treat salad with suspicion.

Maanda Mandavha

Reference: Hilborn, E D. et al. A multistate outbreak of E. coli O157:H7 infections associated with consumption of mesclun lettuce.

HYGIENE ON THE HOME FRONT

World Summit delegates might have left town, but the topic of conversation still remains focused on health and hygiene in the developing world. Local and international experts attending the annual Domestos Hygiene Symposium in Sandton on the 17th of September 2002, all agreed that a simple task of hand washing can save thousand of lives.

Attended by over 300 delegates comprising members of the health care profession, media, and members of the public, the symposium was an eye opener regarding food preparation and the kitchen as a primary source of contamination if proper hygiene is not practiced.

A panel of experts included international specialists Dr John Barker and Dr Ros Stanwell-Smith, as well as local authorities Professor Adriano Duse and Aubrey Parsons.

Dr John Barker focused on the spread and persistence of some common viral infections in domestic homes and community facilities, as well as the role of improved standard of education, personal hygiene and targeted environmental hygiene in control and prevention. Dr Stanwell-Smith looked at the changing perspective of hygiene over the years and the issue of whether homes can actually be too clean.

Professor Duse discussed the indiscriminate use of disinfectants in the home environment, as well as a study of chicken carcasses in which more than 50% of those tested were found to be contaminated with one or more pathogens.

Hilary Biller of The Star's Angela Day Column focused on the importance of fresh ingredients in cooking, the hygienic handling of food, what goes on chopping boards and the effect that popular television chef presenters are having on kitchen hygiene.

One of the most relevant presentations was that of Gerry Sharpe, matron of the Johannesburg General Teaching Hospital who discussed the simple intervention of hand washing in saving lives. Aubrey parsons questioned the safety of food in the home environment and Mrs Makhoane from the Department of Health offered a global view on defining responsibility in Food Hygiene Regulations. Top chefs, Julian Caldow and Heinz Brunner offered insight into food safety and hygiene in commercial kitchens.

Ethne Whitley, Public Affairs Manager for Lever Ponds says Domestos has been an international leader in home hygiene for over 70 years and by sponsoring the annual symposium, it keeps communities up to date with the latest international and local information. "Domestos actively promotes good hygiene practices in the home and community via its Hygiene advisory Services and its involvement in the International Scientific Forum on Home Hygiene (IFH)," she says.

The IFH is an organization of world-renowned scientist and healthcare professionals involved in developing and promoting home hygiene through scientific research, founded on the belief that home hygiene can make a difference to people's health and quality of life.

The Star, September 20 2002

BIOTECHNOLOGY AND BIO-DIVERSITY FOR SUSTAINABLE DEVELOPMENT

The World Summit on Sustainable Development (WSSD) took place from August to the 4th of September 2002 in Johannesburg. Its objective was to bring world leaders, concerned citizen groups, media and scientists to assess global change; reviewing progress made in achieving the resolution since the Earth Summit, held a decade ago in Rio de Janeiro, Brazil.

As part of the activities associated with the World Summit on Sustainable Development (WSSD), AfricaBio, and its partners presented a one-day workshop at the Ubuntu Village (Water Berry Room) on the "Role of Biotechnology and Biodiversity in Sustainable Development" within the context of the Forum on Science, Technology and Innovation for Sustainable Development.

Attended by over 250 delegates comprising members from Government Departments (mostly from Health, Agriculture, and the Department of Science and Technology), NGOs such as CSIR, and Monsanto S.A. to name a few, the workshop was an eye opener regarding biotechnology with particular emphasis on capacity building for narrowing the knowledge and technology gaps between developed and developing countries. The workshop also promoted greater cooperation between scientists and policy makers, improved north-south cooperation and technology transfer, as well as highlighted the success of science and technology projects that have enhanced sustainable development.

A panel of experts included international and local specialists, and South African Minister of Science and Technology, Dr Ben Ngubane. Dr Florence Wambungu of "A Harvest", Mr Kinua Mbijjewe of Monsanto, Nathalie Moll of Eurobio, Professor Klaus Amman from Botanical Garden, University of Bern, and Mr Andrew Natsios a USAID Administrator, were among those that made presentations at the workshop.

The honourable Minister, Dr Ngubane offered a keynote address by giving thumbs up to the technology and emphasized that it will bring about change and a better life for all. The Government underscored the future of biotechnology as a tool for sustainable development in South Africa. "We have to devote the necessary resources to scientific and technological research and development, including biotechnology," the Minister says. President Mbeki said the very same utterance without any equivocation at the ANC 90th anniversary celebration earlier this year.

Mr Natsios gave an overview of Biotechnology, an American perspective. Mr Mbijjewe offered a presentation on the role of the Biotechnology Industry in Sustainable Development. Nathalie Moll offered insight into the European perspective of Biotechnology; its challenges and opportunities. Professor Amman continued with pointing out the benefits of the technology by comparing organic foods with GM-foods.

Dr Florence Wambungu, Executive Director of "A Harvest," says her organization is an international non-profit foundation with the mission of using biotech tools for sustainable agricultural development. It has a global vision with an African focus to fight hunger, malnutrition and poverty. "Africa urban population spends 60% income on food, European spends 25% of total income on food and US spends 12.5% of total income on food," she says. Biotechnology will increase productivity and reduce rural and/or urban poverty.

These were the recommendations made for the technology to work in Africa:

- Building capacity and infrastructure by increasing government investment into biotechnology.
- Political empowerment
- Policy development
- Public awareness and access strategy

Maanda Mandavha

SOUTH AFRICAN FOOD CONTROL SYSTEM - A FRAGMENTED STATE OF AFFAIRS

More consumer protection and less duplication of services will be just two of the major benefits the newly established New Zealand Food Safety Authority (NZFSA) will bring. NZFSA, which came into being on July 1 2002, combines the functions of the Ministry of Agriculture and Forestry and the food responsibilities of the Ministry of Health providing a more integrated approach to food safety.

Today, the South African Food Control System is still fragmented between a number of authorities and components at national, provincial and local level as well as between several other organizations. The same product is

therefore often controlled by several different authorities in terms of a number of different sets of legislation. This can best (or worst!) be illustrated by looking at the country's control over meat and meat products.

The Meat Safety Act, 2000, regulates the slaughter of animals and the hygiene and safety of meat until it leaves the abattoir. This veterinary control ends when the vehicle exits the abattoir gate. Therefore hygiene control (including vehicles and food premises) is exercised by local authorities in terms of the Health Act, 1977. (The processing of meat destined for exports - is also regulated by the later Act). SABS controls the canning of meat in terms of the Standard Act, 1993 but if a can contains less than 10% meat, this is done by the Department of Agriculture in terms of the Agricultural Product Standard Act, 1990.

At least 13 Acts have provisions that relate to food. The most important of these are:

Department of Health

- The foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972)
- The Health Act, 1977 (Act 63 of 1977)
- The International Health Regulations Act, 1974 (Act 28 of 1974)

Department of Agriculture

- The Agricultural Product Standards Act, 1990 (Act 119 of 1990)
- The Liquor Products Act, 1989 (Act 60 of 1989)
- The Meat Safety Act, 2000 (Act 40 of 2000)
- The Animal Diseases Act, 1984 (Act 35 of 1984)

South African Bureau of Standards (SABS)

- The Standards act, 1993 (Act 29 of 1993)

This fragmented structural and legislative control over food safety and quality has led to inefficiency, duplication, overlapping, lack of co-ordination and, in some instances, even lack of control.

Maanda Mandavha

NEWS IN BRIEF

Bad Salt, no babies

We are in a Kenyan village where miscarriage is common. Everyone is concerned. Husbands beat their wives, thinking they are bewitched, and blame them for the failed pregnancies. Then the Public Health Officer appears, and considers the situation. He learns that women in the village, on instructions from their husbands, are scraping the leavings from the local salt factory in an effort to cut down on expenses, and thus are not getting iodized

salt. He tells them that this practice is the cause of their abortions. The husbands then realized they were wrong in telling their wives to collect the bad salt, and they promise from now on to use iodised salt. **IDD NEWSLETTER, FEB 2002.**

Snack attack

A US Woman is suing a snack food company for \$50-million (R560-million) saying incorrect information on the label of its corn and rice puffs had ruined her diet. Meredith Berkman, 37, claims she suffered "emotional distress" because the snacks contained three times more fat than its label advertised. Sapa-AP report that Pirate's Booty was recalled in January after the Good Housekeeping Institute found it contained 147 calories and 8.5 grams of fat, while its label said that it contained only 120 calories and 2.5 grams of fat. **REUTERS.**

Chefs have a finger in the pie

Feeling a bit queasy after that sumptuous buffet? It may be the chef's fingernails. US researchers have found that long fingernails on chefs, bakers and other who work with food could be a health hazard because they harbour 90% of the bacteria that accumulates on hands. A study at the University of Georgia found even vigorous washing does not remove all the bacteria under long or artificial nails, the New Scientist magazine said. Next time you go to a restaurant it might be worth inspecting the chef's fingernails. **REUTERS.**

Workers deboned feet with teeth

A Chinese factory was shut down after its workers were caught using their teeth to debone chicken feet before packing the meat for sale to food outlets. Health officials of the southwestern Chinese city of Chengdu railed the food processing plant, and caught two women gnawing at chicken claws. Beside them was a basketful of chewed-off bones. The workers pried open the skin with their fingers and used their teeth to take out the bones. **REUTERS.**

FOOD FORTIFICATION – POTENTIALLY PROMISING STRATEGY

Continuing intensive research increasingly and more consistently underscores the important role of micronutrient status in health and disease. On the disease prevention front for instance, improved micronutrient is being increasingly recognized as a successful intervention strategy with the potential to decrease the annual hospitalization costs relating to birth defect, low birth weight, premature birth and coronary heart disease. In relation to immunity, infectious diseases comprise the biggest cause of mortality amongst children and young adults in the world.

There can be little doubt that micronutrients, and particularly vitamins A, D, E, C, B6, B12, folate as well as zinc and iron play an important role in the immunodysfunction of malnutrition. The balance of available evidence would significantly afford an important role of iron on immune function, especially in the presence of iron deficiency anemia, by impairing cell mediated immunity,

an effect thought to be due to an impaired activity in iron-dependent enzymes such as myeloperoxidase and ribonucleotide reductase. According to recent estimates, iron deficiency anemia affects more than 1 billion people worldwide.

Recent evidence indicates that poor zinc status is widespread, especially among populations with cereal based staple diets not only because of inadequate intake but also and equally important because of the known low bioavailability of zinc from such staple food. Accepted as the role of zinc amongst others is to ensure an adequate gain of weight and height. The relationship between immune function and nutrition in children and the elderly is a subject of intense investigation and interest not only because children and the elderly are generally accepted to be the population at risk of malnutrition, but also because of the premise that nutrient deficiencies, may accelerate the growth process in the elderly and inhibit the process of growth in children.

It is quite evident that, there exists a great need for the implementation of successful strategies such as food fortification for the purpose of preventing, reducing or controlling a deficiency of one or more nutrients in the people's population. Strategies like food fortification, have potentially very significant advantage in terms of disease prevention, health care cost and, indirectly, quality of life.

Medical Update, No 37, Vitamin Information Centre.

THE STORY OF AN ENVIRONMENTAL HEALTH PRACTITIONER IN NEW ZEALAND

Jenny Bishop is cautious about what she eats. You probably would be after seeing some of the things she's seen.

The 27-year old former Health Protection Officer (an Environmental Health Practitioner in the South African context) and now Advisory Risk Management, Processed Foods and Retail Sale Group, is one of about 12 people who have moved from the Ministry of Health to the New Zealand Food Safety Authority and Jenny thinks it's a good move.

"It will be nice to have food as the priority, that's the nice thing about coming here. We (MAF Food and the Ministry of Health) will be able to combine our strengths in different areas and work together better."

Armed with a Bachelor of Applied Science majoring in environmental health at Wellington Polytech (now Massey University), Jenny's career in food safety began at Auckland Health Care where she was a Health Protection Officer.

"We dealt with all sorts of strange things - a razor blade in a spice package, a fly in a roll of gladwrap, nuts and bolt in lollies, cigarette butts in sugar. Anything you can think about can be in food." Then of course there were the

food poisoning investigations. "For those we did case control studies, that involves interviewing people, doing a food history and talking them into providing a faecal specimen."

You can imagine how much ribbing Jenny was subjected to over that part of her job. "I would be really careful about making sure I provide a brown paper bag as well as the bottles so I didn't have to see anything," she says. She was also involved in emergency call outs which could see her inspecting ships for rats one day and overseeing the disinterment of a body the next.

Jenny began working for the Ministry of Health about three years ago, her role has been to advise health protection officers, co-ordinate issues and develop policy. She managed, or has been involved in, about 20 food recalls. She is also part of the team that oversees the food safety programme exemption process. "We are in a transition process at the moment. We want every one to go onto this new system.

The supermarkets are really keen. They have all their food safety programmes and they are putting pressure on the suppliers to have food safety programmes as well. They are really pushing it."

And the things Jenny can't eat? Now that would be telling and we don't want to ruin your lunch.

NZFSA Food Focus, Issue 1, August 2002

PUBLIC HEALTH IMPLICATIONS OF ABUSED COOKING OIL: WHAT IS THE EVIDENCE?

There is general agreement that undesirable or harmful materials are formed during the overuse of fats. Although most of the research has been performed on animals, some important studies were reported linking the consumption/inhalation of thermally oxidized fats: 1) to an increase in oxidized compounds in human plasma and 2) to lung cancer. It is important to realize that the level of fat abuse in South Africa is in many cases much higher than that found in fats used in the above studies.

Various surveys since 1995 by research groups have shown that large quantities of unstable already used cooking fats (fat waste also known as "fish oils") are distributed to our poor communities for further use in food preparation. This leads to further rapid oxidation of these foodstuffs to levels unheard of in other countries. These super oxidized soups (SOS) are then consumed together with the prepared food while the corresponding volatiles are inhaled during processing. Consequently our poor communities are continuously exposed to large quantities of potent oxidizing agents, which may be linked to various diseases as well as oxidative stress.

Since 1995 the University of Free State as well as industry are actively engaged across S.A. to terminate this problem. Although several successes have already been achieved (Kock et al., 1999), much more input from government and the private sector is needed to effectively combat this problem. The consumption of these oils should be stopped immediately through (1) increased policing and (2) increased awareness campaigns.

Urgent epidemiological studies should now be conducted investigating possible links between SOS consumption/inhalation, disease, oxidative stress and the progression of HIV/AIDS in patients who have a history of consuming/inhaling SOS over extended periods of time.

An extensive database and expertise have been developed since 1995 on this issue and should be used as a starting point for such a study.

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Quality Quote

Eat no onion nor garlic, for we are to utter sweet breath.

William Shakespeare

" To find more information on the Directorate Food Control, visit the Department of Health website at <http://www.doh.gov.za>. The Directorate: Food Control is under the Cluster: Pharmaceutical Policy and Planning. For comments, remarks or any other inputs, email mandam@health.gov.za

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