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# Faculty of Science NEWSLETTER

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## WHAT IS FOOD TECHNOLOGY?

Many people are under the misconception that in food technology we either teach our students how to cook, or how to plan diets. This is very far from the truth, since food technology is about the science behind the manufacturing of food products on industrial

scale. It incorporates many disciplines such as food microbiology, food chemistry and food engineering. Food technologists fulfil important positions in food manufacturing companies such as quality control, production management and new product development.

THIS ISSUE **FOCUSES ON THE DEPARTMENT OF FOOD TECHNOLOGY.**





Denise Metcalfe: Head of Department



Dr Sue de Kock in the mycotoxin laboratory with 2 MTech students Witness Oaku and Lishia Khilosia

## RESEARCH

One of the research thrusts in the Department of Food Technology, in collaboration with Prof Dutton from the FEHRG, is mycotoxins. Agricultural commodities are prone to fungal infection, either through contamination and growth due to agricultural practices or by incorrect handling and storage of the commodity after harvesting. Some fungal species may produce toxic secondary metabolites called mycotoxins, which are present in the final feed or food product. *Fusarium* spp, *Aspergillus* spp and *Penicillium* spp are the major producers of mycotoxins such as fumonisin (FB), aflatoxin (AF), ochratoxin (OT), zearalenone (ZEA) and trichothecenes (TH). Mycotoxin contamination

in crops has been a matter of great concern due to the huge commercial losses incurred as well as the toxic effects they have on humans and animals upon ingestion of contaminated food/feed products. Mycotoxicoses has been linked to a wide range of health problems such as carcinogenesis, teratogenicity, immune suppression and growth retardation. Mycotoxins are invisible, odourless and very stable compounds, resisting degradation by most physical and chemical food technology practices. Food safety concerns, together with the estimation that a quarter of the world's crops are contaminated with mycotoxins, necessitates the need for monitoring and impact studies on feed and food products

produced in South Africa.

The incidence of fungal and mycotoxin contamination of South African commercial maize is one of the areas of our investigation. Maize is used extensively for animal feed and as human food. Contaminated maize and maize-based products (contaminated predominantly with FB) is of great concern as mycotoxicoses of humans and animals represents a major food safety risk.

Milk is another area of concern. Aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) is found in most feeds and foods and is highly carcinogenic. When ingested by ruminants it is converted to aflatoxin M<sub>1</sub> (AFM<sub>1</sub>) and is then secreted in the milk of lactating animals. Both AFB<sub>1</sub> and AFM<sub>1</sub> have

been linked to liver cancer in humans, especially children. It therefore poses a serious threat to young animals and children consuming contaminated milk. Retail milk, as well as feed and farm milk are routinely tested for presence of these toxins.

The third area of our study is the presence of mycotoxins in Macadamia nuts and their products. These nuts are not only eaten raw or after cooking, but also used to produce salad oils, can be coated with chocolate and is used on baked products. These uses can however be compromised by increased concentrations of mycotoxins and therefore the study of the presence of mycotoxins and the influence of processing on the mycotoxin levels present are of importance.



Witness Oaku explaining the canning operation in the food processing plant.





*Protein determination in the Food Biochemistry laboratory.*



*Witness Qaku in the food processing plant with a student.*

## Food Processing Plant

Food Technology has a big practical component and therefore students are being exposed to food manufacturing procedures throughout their study period. A wide range of products are produced in our food processing plant, including cheese, ice-cream, jam, viennas, baked products, canned goods and many more. During these sessions important aspects of food microbiology and food technology are practically illustrated and explored.

Some of the components of food products analysed in the Food Biochemistry laboratory include protein, starch, fat, fibre and moisture.



*Final year students in the food processing plant.*

## New product development day



*Some of the new food products being judged at the SAAFoST product development day.*

As part of their final assessment, each third year student has to develop a new food product which is not available on South African supermarket shelves. It is an integrated project which necessitates the student to draw from all theoretical subjects taught, as well as from the year's work integrated learning they have completed. The students are supported by their employers and industrial tutors during work integrated learning and on returning to the Department to complete

the last semester, through workshops offered to them on food product development, food ingredients, etc. During October of each year the food industry's professional body (SAAFoST) hosts a day where these products, together with products from TUT, are presented to the food industry, judges and potential employers. Our students develop novel, tasty and scientifically sound products which normally makes this day a proud showcase for UJ.



## The 3rd years of 2010 at the **SAAFoST** product development day



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