

Making today matter by improving food security in Africa

The newly established Micronutrient Nutrition Research Programme at the University of Pretoria is conducting research into non-invasive assays, interactions between zinc and the gut microbiome, bone health in children, and nutritious traditional foods for infants and young children.

One in five South African children is stunted. One in ten is underweight. And according to a recent survey, child deaths are on the rise. These terrifying numbers point to a massive and underreported problem with nutrition in South Africa, says Professor John Taylor, Theme Leader for Nutritional Science at the University of Pretoria's (UP's) Institute for Food, Nutrition and Wellbeing (IFNuW). Researchers believe that micronutrients may be the key to addressing this national socioeconomic and health crisis.

Micronutrient Nutrition Research Programme

IFNuW has recently launched the Micronutrient Nutrition Research Programme, which aims to address micronutrient

deficiencies through research to determine the major underlying causes of child malnutrition, and by developing practical solutions. The Programme is working closely with communities to make sure that the research they are doing is actually addressing Africa and South Africa's nutritional needs.

“Our research places a strong emphasis on market pull - in the last year we've been canvassing farmers and entrepreneurs about what foods they want to produce, testing prototype products in the community, and asking people how much they would pay, to see whether our products really are small business opportunities,” says Taylor.

This innovation-orientated research is spearheaded by young, mostly female researchers who are finding ways to address iron, zinc and vitamin deficiencies in South African children. In particular, they are trying to improve how the body absorbs micronutrients (known as bioavailability), and ways to add locally-produced fruits and vegetables to processed foods. Every new product or formulation is tested by potential consumers.

Addressing problems with SA diet

Taylor says that the Programme came into being in response to a very obvious lack of micronutrients in the average South African diet. “While South Africans are often getting sufficient proteins and carbohydrates, they're missing out on crucial micronutrients,” says the professor. “A South African survey at the end of the 20th century revealed that both urban and rural children were deficient in a whole range of micronutrients.”

Since that survey was completed, the South African government has made fortification of bread and maize meal a law, although there it seems that this is having little effect. “There's been no reduction in stunting in SA in the last 30 years, in spite of the fortifications.” Stunting occurs when children don't get the



Honours student Nomthandazo Hlophe and Prof John Taylor making sorghum-bambara biscuits.

Researchers at UP's IFNuW have developed protein- and nutrient-rich biscuits by blending sorghum flour with African legumes like cowpeas and bambara groundnuts. The biscuits are simple to make and hence are ideal for community business enterprises. They can be used as complementary foods in formal school nutrition schemes or as a snack. Image credit: University of Pretoria.

right nutrition during pregnancy and early childhood, and is linked to lost IQ, decreased productivity and poor health in adulthood. “It's not something that kids can recover from – it's a life time penalty, a permanent handicap on the individual and on our economy,” Taylor warns.

All about implementation

The Programme will address this dangerous deficiency while stimulating economic growth by transferring results rapidly to society. “We run training courses where entrepreneurs in the rural food processing sector are being taught to make the products, as well as about other aspects like food safety and food hygiene.”

Between research, technology transfer and providing South Africa with reliable and unbiased knowledge about food and nutrition, the Micronutrient Nutrition Research Programme looks set to improve the health and wellbeing of South African citizens for years to come.

The dangers of deficiency

Deficiencies affect human health in seen and unseen ways. These are a few of the major culprits in SA, whose impact can be felt by millions across the country.

Protein: a lack of high-quality and bioavailable protein means weak immune systems, muscle wasting and reproductive problems.

Vitamin A: not getting enough vitamin A means poor vision, weakened immune system and even death in infants.

Iron and zinc: often referred to as the Hidden Hunger, a lack of dietary iron and zinc leads to diarrhoea, physical and mental stunting and severely reduced work capacity.

This is why SA fortifies its bread and maize meal with pro-vitamin A, iron and zinc.



Image adapted from Hendriks (2015) The food security continuum: a novel tool for understanding food insecurity as a range of experiences.

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A balanced, nutritionally adequate day's meal, according to the national Food-based Dietary Guidelines.

Many South Africans suffer the consequences of monotonous staple-based diets, such as persistent micronutrient deficiencies, amongst other things. It is important that people consume diverse foods to obtain all the nutrients they need on a daily basis. Image credit: Hettie Schonfeldt.