

Health & nutrition

Water use and nutrient content of crop and animal food products

The WRC completed a scoping study into the complexity of malnutrition and micronutrient deficiencies in South Africa.

Acute need to bust hunger in South Africa

In South Africa, poor rural households are particularly vulnerable to hunger and malnutrition (including overnutrition and under-nutrition). The current economic climate and rising food prices are making it difficult for people to achieve a balanced diet. Healthy food seems to be unaffordable for many South Africans and, even more alarming, it appears that, in general, nutrient rich foods tend to have sharper price rises relative to less nutritious foods.

To cope with these conditions vulnerable communities employ various mechanisms, including decreasing their consumption of non-staple foods, such as meats, dairy, fruit and vegetables. This, in turn, increases their risk for micronutrient malnutrition where the body lacks the required vitamins and minerals it requires to function healthily.

One way of improving household food and nutrition security, particularly among the rural poor, is to promote home production of nutrient-rich foods. While many poor residents living in rural areas have access to land and water resource for productive use indications are that food produced at household level currently makes an insignificant contribution to the diet of rural households. In addition, while information is available on what people should be eating on nutrient level, little is known about what people are actually eating.

Internationally it is accepted that better understanding of the links between agriculture, nutrition and health is a high priority. Before researching water use and nutritional productivity of crops, it is essential to know what food is consumed by poor people; what the nutrient content is of these food products; and which of

these foods can be produced by household members, either in homestead gardens or communal croplands.

WRC scoping study

These arguments motivated the initiation of a WRC-funded scoping study to investigate what we know about current food intake of rural communities in South Africa and to determine what the knowledge gaps are. The project also investigated the nutritional water productivity of several food crops.

The study was undertaken by a multidisciplinary team from the departments of human nutrition and plant production & soil science at the University of Pretoria, the Nutritional Intervention Research Unit at the Medical Research Council and the Human Sciences Research Group. Since malnutrition is the result of many factors, the study took a multidisciplinary approach, including human nutrition, social anthropology and agronomy perspectives.

Dearth of information

While several food- and nutrition-related studies have been undertaken in South Africa, particularly at a community and provincial level, the project team found that the available information cannot be taken as being representative of the food intake of rural poor South Africans! National studies are rare and did not generally distinguish between rural and urban poor, with food data in smaller studies often not comparable.

The project team found that the reasons for food intake were not considered in many studies. None of the national food surveys reviewed considered seasonal difference in food availability and accessibility and how



this may impact on food choices. In addition, despite the importance of basic services factors such as access to basic water, sanitation and healthcare were not generally considered in any detail in the studies reviewed.

From the findings it does appear that poor, rural households – like many other poor households in South Africa – lack dietary variety. This is the greatest challenge to improving food security and nutrition in South Africa. Diets have generally been found to be monotonous and cereal based, with a low intake of fruit, vegetables and food of animal origin.

Although not conclusive, it seems that **most poor people are buying and not growing the food that they are eating.**

At the same time it is of major concern that available natural resources (water, soil, plants, etc.) are under-utilised. This despite the fact that at least 40% of the population (i.e. 20 million people of which approximately 70% live in rural villages) are hungry and under-nourished.

As a result of the high percentages of food purchasing in poor, rural areas, food intake is mainly related to cost and availability. Food prices were found to be higher in rural than in urban areas while wages were lower in rural areas. As a result the regularity of which food products are purchased largely depends on income quantity and frequency. For example, studies of inland villages in the Eastern Cape found children only consumed meat once a month at the time of the monthly pension pay-out.

In addition, variety is generally less in rural areas, even within supermarket chains, and many rural consumers are heavily reliant on general dealers, spaza shops and what they can purchase from local informal markets, hawkers and producers. Access to electricity and refrigerators is also a factor when it comes to storing food.

At the national level, South Africans' main food-related purchases are maize, wheat, bread, and salt. Key micronutrients generally lacking in the diet of rural poor people are Vitamin A, iron and zinc. The study confirmed that the onset of HIV/AIDS in southern Africa is exacerbating food insecurity and malnutrition. This is because HIV/AIDS mostly affects the economically active and able-bodied members of the population, reducing household resilience and ability to recover from shocks and stressors.

Only in some studies was it found that food sources are sourced from the wild. In Limpopo, intakes from green leafy vegetables appear to be higher than the other provinces. In addition, while many households owned livestock, it was not a major source of food for household consumption.

Consumption of non-home prepared foods seems to be on the rise in line with international trends. Away-from-home

consumptions include school tuck shops, formal or informal street vendors and fast food establishments as well as food eaten at community gatherings, for example at funerals. Feeding schemes may also be a source of food. Overall, these outside foods seem to be less nutritious (i.e. high in sugar and/or fat) thereby contributing to levels of overnutrition.

Nutritional water productivity

In water-limiting environments, such as most parts of rural South Africa, it is of utmost importance to focus the promotion of home production of foods not only on those crops and livestock that have the potential to address nutritional deficiencies, but also on food products that are simultaneously water productive. Combining human nutrition needs with water productivity has resulted in a new concept amongst researchers, namely 'nutritional water productivity'. This also received attention in the WRC scoping study.

The nutrients – macronutrients (for example protein) and micronutrients (for example vitamin A) – within the edible output or harvest of crops or animal-source foods are of interest to nutritionists in the food-based prevention of malnutrition. *Nutritional water productivity* combines knowledge of the composition of food products in terms of nutrients (for example the protein or vitamin A content of a food) with knowledge of the water productivity of that food product.

The result is an index for a given food product which includes nutrient-based output per unit water use, for example micrograms of β -carotene in 100 g raw spinach per cubic metre of water used to produce the food. This knowledge can be used to promote the production of those food products that may contribute to closing the nutrient gaps in vulnerable communities while, simultaneously, leaving a sustainable water footprint.

Water and nutritional health of people are intricately linked: On the one hand enough clean water is an essential part of a healthy environment and water has been called a "neglected nutrient" in human nutrition. On the other hand, *nutritional water productivity* shows that collaboration between agriculture and human nutrition poses yet another prerequisite and challenge for improving food security and nutrition amongst the rural poor in South Africa.

Further reading:

To order the report, *Water use and nutrient content of crop and animal food products for improved household food security: A scoping study (Report No. TT 537/1/12)* contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za, or Visit: www.wrc.org.za to download a free copy.