

## Chapter 5 Discussion, conclusion and recommendations

### 5.1 Discussion

#### 5.1.1 Introduction

Widespread undernutrition suggests a failure of multiple sectors to provide for the basic human rights of food and nutrition security. In 2005, the Secretary General of the UN at that stage, Kofi Annan, noted that “Hunger is a complex crisis” and further remarked that to solve this crisis, the interrelated problems must be identified and addressed, and that was precisely the aim of this study.

The main objectives of this study were to evaluate the five different products used in school feeding programmes in the Vaal Region in terms of the following:

- The nutritional content of the product (by means of chemical analyses);
- The impact of the product on the nutritional status of primary school children (by analysing their dietary intakes, as well as the biochemical and anthropometric results);
- The compliance of the product (by analysing the sensory analyses and shelf life studies);
- The cost effectiveness of the product (by calculating the cost per product and comparing it to the cost margin of the DoE); and
- The impact of the product on school attendance (by analysing the school attendance records during the implementation of the respective school feeding programmes).
- Will be used to provide guidelines on the optimal school feeding strategy to NGOs and other organisations involved in school feeding programmes, as well as to the Gauteng Department of Education, based on the results of this study.

### 5.1.2 Limitations of this study

One of the limitations in the Eatonside community may lie in the power of the study. Consent was obtained for only 160 of the 519 (30.8%) children in the school to participate in the intervention trial.

The second limitation of this study was that the breakfast pattern questionnaire was completed only in the Eatonside community.

The third limitation of this study was that the QFFQ was completed in all the groups for pre-testing; however, for post-testing it was completed only in Orange Farm for the CSB and Sejo groups and not in the Eatonside community.

The fourth limitation of the study was that there was a lack of compliance testing conducted for the Sejo group by the researchers. Although JAM monitored the consumption of the product daily, no formal recording was done. The researchers relied on the suppliers for the nutritional content of both the CSB and Sejo. Chemical analysis could have been conducted for verification purposes, but due to the high costs involved in chemical analyses, this was not done.

A fifth limitation may be that there was no assessment of the effect of cooking on the nutritional value of CSB and Sejo, or on the influence of seasonality on the products.

In both the Eatonside and Orange Farm communities, a limitation might have been the seven month time period over which the school feeding programmes were implemented. The initial planning was that the intervention should be implemented for at least one year. However logistical problems prevented this,

as the intervention could not take place during any of the school holidays as mentioned in Chapter 1. The school principals also advised that no measurements could be made during examination times, thus follow-up measurements had to be scheduled for the end of October instead of early December before the schools closed.

An alternative could be to do the intervention over a two year period, however, this would exclude older children (13 years) from the study due to the fact that they would be leaving primary school for secondary school. Furthermore, fieldworkers might also not be available in the second year due completion of their studies. Funding might also be compromised as food provision, as part of a research project, proved to be costly. Thus, the practical implications of extending the intervention to a two year period made this not feasible.

The influence of peer group pressure on the consumption of the products was also not assessed in Eatonside or Orange Farm respondents.

In considering the extent to which the different studies incorporated in the thesis (with different outcome measures) could be combined to supply the information needed to make a valid conclusion, it has to be admitted that the design could have been improved by measuring exactly the same variables (biochemistry and school attendance) in all the studies. For future studies this is strongly recommended.

One of the most important limitations of this thesis might have been that no testing for HIV/AIDS was conducted. The HIV status of the schoolchildren was not determined, as this was not the focus of the thesis; however, a positive HIV status would definitely have an impact on the nutritional status of the children.

### 5.1.3 Main findings

- Socio-demographic data from the preliminary survey indicated that household food insecurity contributed to the poor dietary intake of both of the communities, as a large percentage of the communities was unemployed, including 94.2 percent in Eatonside and 93.3 percent in Orange Farm. Extensive research proved that poverty is the main underlying cause of undernutrition and its determinants (Black 2003:2, Rivera *et al.* 2003:4010S, Müller & Krawinkel 2005:280). This proved to be the case in these two communities as well, where a large percentage of the households earned less than a thousand rand per month. This contributed to the household food insecurity that resulted in an undernourished sample.
- The dietary intake patterns indicated poor nutritional status in terms of the anthropometric indices of the children in both the communities, as a mainly carbohydrate-based diet was followed, with inadequate fruit and vegetable intake, similar to what was found in the NFCS (1999) as reported by Labadarios *et al.* (2005:333). The dietary intake patterns confirmed low iron intake. The post-intervention results indicated that the food consumption patterns did not change dramatically during the intervention.
- Pre-intervention results for nutrient intake in both communities indicated that the mean daily energy intake of all the children was below the DRIs for children aged from seven to ten years, as discussed in 4.3.1.1. All the interventions improved the mean energy intake of the children.
- The mean weight, height and BMI increased with all the interventions.
- The biochemical results indicated that normal values were present for the majority of the parameters before and after the interventions; however, the anthropometric indices indicated acute and chronic food shortage and

therefore, hunger. This could lead to nutrient deficiencies if not addressed.

- The cost of all five products proved to be within the provincial budget for school feeding. CSB and Sejo proved to be the cheapest products (being subsidised), but least cost-effective in terms of micronutrient intakes. After the intervention, the intakes of micronutrients such as calcium, iron, magnesium, zinc, thiamine, riboflavin, niacin as well as vitamins C, D and E decreased, although not significantly. Vetkoek, however more expensive, fulfilled the criteria set by the DoE in terms of nutrient requirements and improved all the micronutrient intakes of which many statistically significantly. The cost-effectiveness in terms of school attendance could not be determined for CSB and Sejo. In the case of vetkoek (R1.51 child/day), PSNP (R1.50) and fruit (R1.00), school attendance improved as shown in Table 4.17. Absenteeism decreased by 8.2 percent and 14.9 percent for vetkoek and PSNP respectively, which indicates cost-effectiveness in terms of school attendance.
- School attendance was not formally recorded in all the groups. However, a decrease in absenteeism was noted in those groups where it was recorded.

School feeding programmes have proved to be good strategies for addressing undernutrition amongst primary school children if they are monitored regularly (Kristjansson *et al.* 2007). The Copenhagen Consensus indicated that nutrition interventions rank very high amongst other interventions in terms of cost benefit (WB 2006:141). Therefore, school feeding programmes can be successfully used to attempt to reduce undernutrition in primary school children. School feeding programmes are strategies adopted worldwide to alleviate hunger and thus increase concentration and learning capacity (Kristjansson *et al.* 2007).

However, obesity has become a global health problem and a study conducted in SA in 2006 indicated that the prevalence of obesity amongst primary school children (aged 6-13 years) was 3.2 percent for boys and 4.9 percent for girls, whereas overweight prevalence was 14 and 17.9 percent for boys and girls respectively (Armstrong, Lambert, Sharwood & Lambert 2006:1). This indicates that South African children show trends of obesity and overweight, evident from this study as seen in section 4.4. Therefore, intervention strategies such as school feeding should take this into account when targeting children to be fed and when choosing products.

## **5.2 Conclusion**

Investing in nutrition is critical in order to attain the MDG of achieving universal primary school education. Extensive research has proved that undernutrition affects the chances that a child will go to school, and stay in school and perform well. Therefore, direct action, such as establishing school feeding programmes, should be taken to improve nutrition in schoolchildren,

The following conclusions can be drawn from this study:

- The products evaluated in this study proved to be within the range of the provincial school feeding budget, and compliance for the products was good, which indicates that these products can be successfully implemented in a school feeding programme in the particular communities where hunger is a problem.
- Although few statistically significant differences were observed between the groups with regard to indices of nutritional status, positive changes were observed in each of the groups, indicating that any one of these products may have a positive effect on hungry, malnourished children. This was the first time that commercial products used in school feeding

programmes in the Vaal Region were compared to the existing PSNP, as well as to a developed food product (vetkoek) and fruit. This study showed no significant differences between commercial and home-prepared food items when used in school feeding programmes in hungry communities.

- Both the Eatonside and Orange Farm communities were involved in this study by actively taking part in the preparation and distribution of the products to the children. Their involvement in the day-to-day operations of the school feeding programmes made them aware that there are different ways of contributing to the well-being of the children in these communities.

### **5.3 Recommendations**

Undernutrition erodes human capacity through irreversible and intergenerational effects on cognitive and physical development (WB 2006:38). Various strategies may be implemented to address the persistent undernutrition problem, and all these have their own advantages and disadvantages. In South Africa, up to 2007, nearly six million learners in 18 039 schools benefited from school feeding. Costs of school feeding programmes are usually high, and depend on various mechanisms for successful implementation. Consequently, many problems emerge, such as irregular supply, food spoilage, disruption of teaching for the preparation of meals, and logistical problems.

The recommendation, therefore, is that fruit is an ideal product to be used in school feeding programmes. There are numerous benefits involved in that fruit is cost effective, easily available, easy to store, a variety can easily be given and it was popular amongst children in this study. Since there is no need for preparation before consumption, other than rinsing in cold water, no initial costs

for kitchen equipment are incurred. Furthermore, the probability of food contamination is lower for the serving of fruit than for cooked food. It has also been found in a recent study conducted in Canada amongst 4 589 primary schoolchildren that children who eat a diet rich in fruit and vegetables perform better academically than their peers (Asbridge & Veugelers 2008:209).

During the baseline survey, the researchers involved in Eatonside in 2004 donated fruit trees, which were planted on the school premises. Different classes were responsible for taking care of these fruit trees and currently the fruit trees are a valuable source of fresh fruit during harvesting season, when different classes are allowed to pick and eat the fruit. This proved to be an easy and cost effective way to introduce extra food to the children, and the benefits were similar to those initiated by the NSNP as mentioned below. However, fruit is not energy-dense, and in order to increase the energy intake, it is suggested that fruit is alternated with vetkoek containing spinach and milk powder, like the recipe used in Eatonside.

Providing fruit will also encourage healthy eating habits amongst the children, an outcome visualised by Grantham-McGregor (2007), and fruit forms part of the South African Food Based Dietary Guidelines (FBDG), which promote the following: “Eat plenty of fruit and vegetables every day” (Love & Sayed 2001:2). By including fruit, one of the objectives of NEPAD’s School Feeding Programme, which was designed to stimulate local production through the purchase of locally produced food for schools, can be achieved. Local small-scale farmers will be given the opportunity, coupled with initial assistance, to provide schools with the necessary food products, which could result in economic growth.

Since the nutrition programme was transferred to the Department of Education, the feeding scheme has been further developed to include a food garden project



for schools (NSNP 2008), and seven thousand food gardens have been established in schools to date (Polity 2007). The food gardens were implemented with the support of the Department of Agriculture, local authorities and NGOs, and are now used not only to produce meals for learners, but also to teach them about food production and management (NSNP 2008). The recommendation therefore is that, in addition to vegetables, fruit trees should be planted in all schoolyards, with the multiple purpose of providing fresh fruit and shade in the summer and serving as an educational aid.

The tendency in school feeding programmes globally is towards universal coverage, providing meals for all schoolchildren. This is the recommended approach for South African school feeding programmes: to introduce them in all needy primary schools. The researcher observed during the intervention study that children who did not form part of any of the groups receiving school feeding in Eatonside tried to persuade friends to share their food. Since the beginning of 2008, all the children in the school have been receiving school feeding.

The causes of undernutrition are complex, and differ among countries, communities and households. Causes of undernutrition differ over time as well, and the consequences are far-reaching. Nutrition problems are influenced by human behaviour, and cultural, socioeconomic and political factors play a major role in undernutrition worldwide. Attempts should be made to alleviate nutrition problems and sustainable solutions must be customised to fit into a particular environment. Many countries are following different intervention strategies to implement large numbers of small-scale projects in nutrition, which are often inadequately evaluated. They leave communities poorly served and governments not knowing which strategies are most effective (WB 2006:101). Therefore, evaluation of school feeding programmes, as suggested by Wentzel-

Viljoen (2003), is essential. Furthermore sustainability of these programmes is of the utmost importance.

### 5.3.1 Sustainability

It is recommended that when school feeding programmes are designed for nutrition interventions, well-designed programmes, which address specific needs for specific age groups, should be planned. Responsible supervision of these programmes is important.

Both the Sejo and CSB provided by JAM proved to be sustainable due to the fact that JAM is a Christian relief and development organisation with 22 years experience in sustainable development. The results indicated that Vetkoek is not a sustainable product, when the funding stopped and no ingredients were delivered the community workers stopped preparing the vetkoek, however, they are still preparing it at home. Fruit could be sustainable when it forms part of the PSNP, funded by the government, or provided from fruit trees in the school garden.

### 5.3.2 Strategies to improve sustainability

#### 5.3.2.1 Management capacity

Because management and the generation of practical knowledge regarding livelihoods and lifestyles have proved to be important, attention should be given to this aspect. The capacity to integrate nutrition within sector initiatives should be developed. Nutrition indicators should be developed and used to measure progress in non-nutrition activities, such as the planting and managing of home gardens and fruit trees.

### 5.3.2.2 Commitment

Nutrition programmes can be successfully implemented and sustained only if key politicians, officials and local communities are committed to them. Investment decisions should not be taken only on the basis of what is politically rational. For example, investments in children are often politically popular, and addressing undernutrition through child development programmes can make political sense as well as simultaneously reaping benefits from the synergy between improving health, nutrition and early stimulation.

### 5.3.2.3 Capacity

Limited technical capacity can be a major constraint when nutrition programmes are designed. When management capacity is limited, the ability to expand such programmes is negatively influenced. It is suggested that nutrition interventions building on existing capacity should be implemented. JAM serves as an excellent example, with 22 years' experience in sustainable development. Where breakfasts or mid-morning snacks require preparation, schools should be provided with rapid cooking methods or be encouraged to use foods requiring little preparation time.

### 5.3.2.4 Affordability

Nutrition intervention programmes can have a huge impact and be highly cost effective at the same time. It is essential for governments and development partners to get together and decide to test projects that have the possibility of succeeding. From the results of this study it can be seen that all the products evaluated proved to be cost effective, as shown in Chapter 4. The World Bank

(2006) has suggested that direct interventions are usually the most cost effective way to improve nutrition.

#### 5.3.2.5 Targeting

Targeting based on greatest need is often the fastest way to reduce undernutrition from high to medium levels. From an epidemiological and economic perspective, it is rational to target higher-intensity, higher-quality programmes in socioeconomically disadvantaged communities.

Therefore, priorities for any school feeding programme should be determined for the next five years at least, based on the above-mentioned criteria.

The following framework for the evaluation of nutrition and nutrition-related programmes, developed by Wentzel-Viljoen (2003), are supported by the author of the thesis. The following steps are recommended:

- Identify and engage the stakeholders;
- Focus on the question of evaluation;
- Develop the evaluation framework, indicators and measuring instruments;
- Collect high quality data and information;
- Justify the conclusion; and
- Use and implement the evaluation.

#### 5.4 Recommendations for further research

Results from the Cochrane review on school feeding programmes indicate that with regard to educational and cognitive outcomes, children who were fed at school gained more than controls did in mathematics achievement and on certain short-term cognitive tasks (Kristjansson *et al* 2007). Therefore, it is

recommended that further research be conducted on the impact of school feeding on the cognitive performance of learners in the Vaal Region.

The WFP has linked school meals to the fight against HIV/AIDS and believes that school meals are an effective way to attract children to school and reduce HIV/AIDS infections among schoolchildren. The WFP's executive director noted: "A basic meal in school is the gateway to a better, brighter and, crucially, an HIV/AIDS-free future". The high prevalence of HIV/AIDS in South Africa makes it necessary to include the measuring of the presence of HIV/AIDS in schoolchildren, and it is therefore suggested that future school-based nutrition research pay attention to this matter.

Studies are needed to test long-term compliance and its impact on nutritional status, specifically in micronutrient-deficient children.

School feeding programmes are not just another form of charity; they need to be planned and implemented with great care. The improved health and education of the children across South Africa will lead to a stronger, healthier, more educated economy, because feeding children at school benefits the community and society at large.

There is no better single investment in future development than education. But schools, textbooks and teachers are not enough if the classrooms are empty and children too hungry to fill them.