



# RESEARCH REPORT

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# Evaluation of the Tiger Brands Foundation's Pilot In-School Breakfast Feeding Programme

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The Tiger Brands Foundation was established for broad based community impact. It benefits non-fee paying schools as part of a Memorandum of Agreement with the Basic Department of Education, vulnerable groups in society as well as projects that promote sustainable livelihoods in the areas in which such non-fee paying schools exist. To achieve this vision, the Foundation plays a funding, thinking, co-ordination and delivery role in partnership with a number of stakeholders.

This study was a collaborative initiative between the Centre for Social Development in Africa, University of Johannesburg and the Tiger Brands Foundation.

The views expressed and information contained in this report are not necessarily those of or endorsed by the Tiger Brands Foundation or the Department of Basic Education. The contents of the report remain the responsibility of the authors.

Photos depict Alexandra Township and the breakfast feeding programme in action. Photos kindly provided by Kelvin Glen, Brenda Goldswaine, and Per Herbertsson

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## List of acronyms

<b>BMI</b>	Body mass index
<b>CSDA</b>	Centre for Social Development in Africa, University of Johannesburg
<b>DBE</b>	Department of Basic Education
<b>GHS</b>	General Household Survey
<b>NSNP</b>	National School Nutrition Programme
<b>TBF</b>	Tiger Brands Foundation
<b>VUT</b>	Vaal University of Technology
<b>WHO</b>	World Health Organization

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## Key messages

- Nutritional deprivation in childhood can have severe and long-lasting negative effects on the physical and intellectual development of children.
- Investing in school-based nutrition programmes is a key strategy to address child hunger and the associated negative outcomes.
- Addressing such potential negative outcomes during the early years of children's lives will reap positive social and economic returns for societies in the future.
- The Tiger Brands Foundation's investment in a school based breakfast feeding programme should thus be viewed as a key social investment in South Africa's future.
- The study demonstrates positive results in the reduction of numbers of overweight children and the number of children reported as being either stunted or wasted between the baseline and follow up measurements.
- While there is no clear difference in school performance or attendance, this is likely due to weaknesses in the data collected from schools.
- However, educators, principals and learners all perceive there to be a connection between the in-school breakfast feeding programme and improved school performance, particularly with regard to encouraging attendance, reducing late coming, and improving concentration in class.
- The Tiger Brands Foundation's breakfast feeding programme model is viewed positively by educators and principals who demonstrate a sense of ownership of and investment in the programme.
- An additional value of the programme is that Tiger Brands Foundation uses the breakfast feeding programme as an entry point to investing in school development.
- Such investments should also focus on improving the ability of schools to keep accurate records in order to assist with monitoring and evaluation of this and similar programmes.
- Some participants indicated that further variety in the foods, particularly the inclusion of milk products on certain days, would be highly appreciated.
- While there is potential to expand the programme to rural and peri-urban schools, this should not mean that low income schools in urban areas such as those piloted are excluded. They demonstrate an equal need for such investments.
- Ensuring long term financial security of the programme is a central consideration to the sustainability of the programme once Tiger Brands Foundation withdraws as is the intention.
- The Public-Private Partnership model employed has been very positive. By connecting with an existing government nutritional programme (the National School Nutrition Programme implemented by the DBE) already present in these schools the Tiger Brands Foundation's breakfast feeding programme is viewed positively by stakeholders and demonstrates good potential for scalability.
- There is no doubt that the Tiger Brands model is one that can and should be replicated elsewhere.



## Overview

In July 2011 the Tiger Brands Foundation initiated a pilot in-school breakfast feeding programme in six schools in Alexandra township in Johannesburg. In order to assess whether the programme was having the desired impact, and with a view to extend the programme to other schools, the TBF contracted the Centre for Social Development in Africa at the University of Johannesburg to conduct an independent evaluation of the pilot programme. This report is the outcome of that evaluation.

The purpose of the evaluation has been to determine whether the breakfast feeding programme has made an impact on the nutritional status of learners, their performance at school and their attendance – three outcomes of school feeding programmes identified by studies across the globe. It also reviews the secondary ‘spin-offs’ of the in-school breakfast feeding programme and the challenges associated with the programme by making recommendations based on the outcomes of and learning from the programme.

The TBF intends to implement the breakfast feeding programme in all nine provinces, and as such, the evaluation could play an important role in decisions around expanding, adapting or reproducing the TBF programme in other areas nationally. Finally, as an independent evaluation of the programme, this study helps to assess whether the TBF feeding programme is an effective way to contribute to reducing the negative impacts of poverty and deprivation on children.

This evaluation used a combination of methodologies to ascertain whether the pilot feeding programme has had an impact on learners and, to distinguish between cause and effect, included a three-phase approach that sought to establish a baseline of learners in relation to performance, attendance and nutritional status. The baseline phase was carried out in October 2011 and thereafter an interim (March 2012) and final phase (June to August 2012), to ascertain any impact of the feeding programme.

The methodology included:

- **Anthropometric measurements** (height and weight) of sampled children were used to determine the impact of the programme on their nutritional status. The approach referenced World Health Organization (WHO) standards for the analysis of data (WHO, 2007).
- **Quantitative analysis** of the average grades included attendance figures of sampled learners to determine the impact of the programme on school performance and attendance.
- **Qualitative research** to determine the secondary impact of the pilot feeding programme on stakeholders.

The impact of school feeding programmes on educational and health outcomes for children is difficult to measure because of external variables such as the quality of education received or food intake outside of school hours. This is particularly the case where an evaluation takes place within a 12 month period, making it hard to observe significant trends in data over such a short period of time. However, the evaluation compensated for these variables as much as possible by triangulating the results of all three methodologies.

The results of the programme have been positive overall. Triangulation of the anthropometric research and qualitative research suggests that children experience substantial benefits as a result of the programme.

Anthropometric measurements show positive improvements on the nutritional status of the learners across all schools for wasting, stunting and overweight learners. However, the high numbers of overweight learners remain a challenge across all six pilot schools. Continued obesity amongst learners can likely be attributed to the high starch and sugar content and low nutritional content of staple foods on which households survive.

Educational outcomes of the TBF in-school breakfast feeding programme indicate that there has been an improvement in the children’s concentration and participation in class. School stakeholders perceive the breakfast feeding programme to have made a positive impact on learner performance both inside and outside the classroom. The breakfast programme has an important incentivising effect on learner punctuality in the mornings and on school attendance, although overall absenteeism amongst learners was low prior to the introduction of the TBF programme.



The approach taken by TBF to the implementation of the pilot in-school feeding programme is developmental in nature, and the secondary 'spin-offs' of the in-school breakfast feeding programme reflect this. Both school and social benefits are evident based on the qualitative research. Stakeholders report that they have benefitted from the sharing of knowledge as a result of the programme including skills development, mentoring and nutritional information. School stakeholders have also benefitted from the investment by the TBF in school infrastructure such as kitchens. Social benefits include the institutionalisation of healthy eating habits amongst learners, the provision of excess food to vulnerable children and members of the community and the creation of entrepreneurial opportunities for some of those involved in the feeding programme.

In conclusion, the TBF breakfast feeding programme appears to have had a positive influence on the health and educational variables identified as part of the evaluation. Furthermore, it is apparent that the programme is highly valued by all school stakeholders as well as the National School Nutrition Programme.

Recommendations primarily focus on issues that would maintain and strengthen the quality control, sustainability and functionality of the breakfast programme. In relation to nutrition it is recommended that the TBF consider additional provision of milk products, deworming to boost the efficacy of the programme, and that TBF and schools consider if there is a way to control learner access to informal traders selling unhealthy food. In relation to school performance, it is recommended that the Department of Basic Education continue to promote quality education and improve school record keeping to strengthen institutional capacity, and that the TBF intensify the training and development of principals and educators.

Finally, the evidence presented in this evaluation supports the continuation and expansion of the TBF school breakfast feeding programme. The model that the TBF engages in is one of a public-private partnership and is to date the largest collaboration between the NSNP and the private sector. Given high rates of poverty experienced by many children in South Africa and the benefits of school feeding, the model warrants a broader replication within the private sector.

## 1. Introduction

Since the demise of apartheid and the introduction of a constitutional democracy in 1994, South Africa's political transformation has not been matched by social and economic transformation, with the majority of the country's residents continuing to live in poverty. Despite constitutional guarantees of children's rights to basic nutrition, two-thirds of South Africa's children continue to live below the poverty line (Hall & Wright, 2010), and by 2009, almost three million children (16%) were living in households that were nutritionally deprived (Statistics South Africa, 2009). Child hunger remains highest in the Free State (21%), the Eastern Cape (20%), the North West (20%) and KwaZulu-Natal (19%). Limpopo remains an exception, however, possibly due to the impact of rural subsistence agriculture on food security. Gauteng has the third largest number of children who are nutritionally deprived. The provincial distribution of child hunger is closely correlated with high rates of poverty and unemployment; African children are most severely affected (Jamieson, Bray, Viviers, Lake, Pendlebury & Smith, 2011). At national level, 33.3% of preschool children are vitamin A deficient, 21.4% are anaemic, and 5% suffer from iron deficiency anaemia (Faber & Wenhold, 2007).

In 2009, nearly a quarter of the children in the developing world were underweight, with the poorest children making the slowest progress in improved nutrition (UN, 2011). Child hunger thus remains a problem as nutritional deprivation in childhood can have severe and long-lasting negative effects on the physical and intellectual development of children (Agüero, Carter & Woolard, 2006). Improved nutrition contributes to several social development goals (Devereux & Sabates-Wheeler, 2011; Agüero et al., 2006). It is now widely acknowledged in the development field that public and private investments – through nutritional interventions, early childhood development and improved school performance – during the early years of children's lives will reap positive social and economic returns for societies in the future (Devereux & Sabates-Wheeler, 2011; Agüero et al., 2006; World Bank, 2006). Thus school nutrition programmes are considered to be important social investments in child wellbeing that are likely to yield positive long-term benefits in the nutritional status of children and in improved school enrolment, attendance, achievement and in terms of other observable variables such as test scores; attention span; memory; and cognitive, psychomotor and mental development (World Food Programme, 2009;



Bundy, Burbano, Grosh, Gelli, Jukes & Drake, 2009; World Health Organization, 2007; Bennett, 2003; Buhl, undated). For example, a study on the cognitive and behavioural effects of a school breakfast on junior primary school children in South Africa revealed evidence of an increase in active participation in class, improved concentration, improved short-term memory, increased positive peer interaction, and reduced disruptive behaviour, all of which was attributed to the improved nutritional intake due to the consumption of breakfast (Richter, Rose & Griesel, 1997). Similar conclusions emerged from research conducted in 32 countries in sub-Saharan Africa; improved school enrolment, attendance and decreases in school dropout rates were attributed to the introduction of school feeding programmes (Bundy et al., 2009). In addition, Bundy et al. (2009) found that enrolment ratios for female children, including progression through primary school, also improved. Fittingly then, investment in nutrition for children is recognised as a key development goal in the National Development Plan 2030.

The positive impacts of school nutrition programmes on child nutrition and child health status have also been well documented. School feeding programmes not only reduce short-term hunger and allow for better micronutrient intake, they have also been shown to prevent stunting (Gelli, 2010: 8), increase children's caloric and micronutrient intake (Adelman, Gilligan & Lehrer, 2008) that in turn increases weight gain and/or capacity for activity and improved learning (Briggs, 2008). Malnutrition in children and poor educational performance have intergenerational origins (Devereux & Sabates-Wheeler, 2011) and are caused by structural or systemic inequality in the society. School feeding programmes are therefore of particular significance in that they attempt to break the intergenerational cycle of child vulnerability due to poverty and income inequality.

## 1.1. South Africa's National School Nutrition Programme

The NSNP is a school nutrition programme that was introduced in 1994. It was one of the strategic initiatives identified by the Reconstruction and Development Programme and implemented as an initiative from the Presidential Office. School nutrition has been one of a range of interventions to address child hunger; other interventions include the Child Support Grant, which is now reaching 11.3 million children (SASSA, 2012), and the mandatory fortification of food such as maize meal, bread and salt with micronutrients (Vorster, 2010). The NSNP is one of the most significant programmes to date to focus on the link between nutrition and education. Initially targeted at primary schools only, the programme was extended to secondary schools from 2009 (Department of Basic Education, 2010). The objectives of the programme are to:

- Contribute to enhanced learning capacity through school feeding programmes,
- Promote and support food production and improve food security in school communities, and
- Strengthen nutrition education in schools and communities (Department of Basic Education, 2010).

The programme focuses on learners in no-fee and low ranked quintile (1-3) primary schools and some low ranked quintile (1-3) secondary schools.<sup>1</sup> In the 2009/10 financial year, the programme provided cooked meals to 7 125 273 learners in 20 345 schools for five days a week, and by June 2011 it was estimated to reach 9 million learners who are being served weekly in 21 000 schools at the cost of R4.9 billion (Personal Communication with an NSNP official, 7 June 2012). In South Africa in the school setting it is common to see children from poor families arriving in class without having eaten since the previous day (Richter et al., 1997). Even when food is available, it is frequently of a poor nutritional quality (Faber & Benadé, 1999). In South Africa, nutritional deficits play a significant role in poor school attendance and punctuality, as well as poor school performance (Napier, Oldewage-Theron & Kearney, 2009).

The NSNP faces increasing pressure from civil society organisations and communities to scale up its provision of nutritious meals to children; however, limited funds remain a problem (Personal Communication with an NSNP official, 7 June 2012). Expenditure on primary school children during 2009/10 amounted to R1.80 per child and R2.35 per secondary school child (Department of Basic Education, 2010). The allocation is yearly reviewed. The allocated amount is for a lunch time meal with one portion of protein, vegetables and starch per

<sup>1</sup> The schooling system in South Africa is arranged for ranking and funding purposes according to quintiles, with the lowest quintiles serving learners from the most needy and resource-poor homes.



learner, and includes cooking fuel and stipends for food handlers. School feeding programmes targets all learners in a school instead of only selecting the poorest ones. Thus there is no stigmatisation of certain selected children who are the recipients. Despite the national expansion of the programme and other cash transfers, child hunger still remains a significant problem due to high rates of unemployment and poverty (Hall & Wright, 2011).

The NSNP evaluates its performance in terms of indicators that relate to the *reach* and the *functioning* of the programme, for example, the number of learners provided with meals, the number of schools served, and so on (Department of Basic Education, 2010). While this is important during the feeding programme's early establishment stages, it does not provide any information on the impact of the NSNP on the nutritional status of children and on school performance (Personal Communication with an NSNP official, 7 June 2012). However, other South African research does outline the direct benefits of school feeding. The positive benefits identified by Richter et al. (1997) have already been mentioned above. In addition, a study by Van Strujvenberg et al. (in Bundy et al., 2009) has shown that the combination of an in-school snack fortified with micronutrients reduces absenteeism resulting from diarrhoea related diseases from 79 days to 52 days a year and increases attendance by 15%. In addition, there is emerging evidence of the benefits of school feeding programmes on enrolment, attendance and school progression of orphans and vulnerable children living in areas with a high prevalence of HIV/Aids (Bundy et al., 2009). This is particularly relevant to the South African context.

## 1.2. The Tiger Brands Foundation's In-School Breakfast Feeding Programme

In order to scale up the impact of school nutrition provision in the country, the TBF, a Section 21 company, initiated and implemented a school breakfast programme to fill the current gap in the government feeding programme, which can only provide one meal a day to learners. The TBF in-school breakfast programme therefore complements the NSNP. This type of public-private partnership conforms to the UN 'gold standards' of public-private partnerships in areas that are strategically aligned with national policy (World Food Programme, 2009). It responds to an important need, involves a pooling of resources and the use of existing infrastructure to meet programme goals more efficiently and effectively. Besides the provision of a nutritious breakfast, the TBF programme also supports the installation or upgrading of kitchen facilities, nutrition education, skills and community development as well as job creation. This is part of the TBF's long-term vision to 'improve the lives of vulnerable school children and their surrounding community by creating sustainable, scalable and replicable programmes focused on nutrition and education enhancement' ([www.thetigerbrandsfoundation.com](http://www.thetigerbrandsfoundation.com)). The programme is based on the following principles:

- Encouraging ownership of the feeding programme by the school and surrounding communities,
- Sharing experiences and knowledge to produce learning,
- Acting as a donor and an enabler. As the TBF is funded from company profits and dividends as a shareholder, it has a fairly secure funding base, and
- Working closely with government to complement the nutrition provided by the existing NSNP.

In July 2011, the TBF launched its pilot in-school breakfast feeding programme in six schools (five primaries and one combined school) in Alexandra township in Johannesburg. This community is one of the poorest areas in Johannesburg with 70% of households being moderately or severely food insecure, which is higher than other poor areas surveyed in the Johannesburg Poverty and Livelihoods Study (De Wet, Patel, Korth & Forrester, 2008). Some of the schools earmarked for the pilot study were familiar to the TBF, as Tiger Brands' corporate social investment division had implemented a life-skills programme here. The six schools that participated in the pilot in Alexandra township were:

- Ekukhanyisweni Primary School,
- Emfundisweni Primary School
- Ikage Primary School,
- Ithute Primary School
- Pholosho Combined School, and
- Skeen Primary School.



This report is the outcome of the evaluation of the pilot programme. It also has wider significance by contributing to the development of knowledge on the efficacy and value of in-school breakfast feeding programmes in primary schools in South Africa. The TBF intends to implement the breakfast feeding programme in all nine provinces; thus the evaluation could play an important role in decisions around expanding, adapting or reproducing the TBF programme in other areas nationally. Finally, as an independent evaluation of the programme, this study helps to assess whether the TBF feeding programme is an effective way to contribute to reducing the negative impacts of poverty and deprivation on children.

### 1.3. Research aims and objectives and structure of the report

The overall aim of the research was to evaluate whether or not the TBF breakfast feeding programme made an impact on children in the six pilot schools in Alexandra during the first year of its implementation.

The primary objectives of the pilot phase evaluation were therefore assessing whether the programme had an impact on:

- the **nutritional status** of the learners,
- **learner performance** and
- **school attendance**.

The secondary objectives of the pilot phase evaluation were to determine the extent to which the following occurred:

- **school development benefits** associated with the feeding programme in the form of:
  - o skills development for the volunteer food handlers,
  - o generation of knowledge of nutrition amongst volunteer food handlers and
  - o improved infrastructure in the form of kitchens or other new material resources that are for the benefit of schools.
- **social benefits** associated with the feeding programme in the form of:
  - o generation of knowledge of nutrition amongst children,
  - o the creation of a sense of occasion at meal times for learners and
  - o the institutionalisation of healthy eating habits amongst the learners (such as washing hands before and after meals).

Finally, the pilot phase evaluation sought to identify challenges related to the feeding programme and recommend areas for improvement or lessons for the replication of the feeding programme to other areas.

This introduction is followed by a brief discussion of the literature on feeding programmes (part 2) that informed the study, and the methods employed are discussed in part 3. The integrated findings of the qualitative and quantitative data are presented in the results in part 4 and the results pertaining to the broader functionality and sustainability are discussed in part 5. The summary of the findings, recommendations and conclusions are provided in part 6.

## 2. A review of the literature on school feeding programmes

Approximately 66 million primary school age children go to school hungry in the developing world, and 23 million of these children are located in Africa (World Food Programme, 2011). The consequences of undernourishment are numerous and include low school performance, low attendance, increased risk of exiting school early (Bennett, 2003) and negative health outcomes related to nutrient deficiencies. Investments in nutrition at the school level are therefore likely to have positive and multiplier effects in the life of a child.

Hunger manifests in a variety of ways, and each of these ways has different health consequences (Agüero et al., 2006). **Undernourishment** indicates that the intake of food does not have sufficient calories to meet the minimum physiological needs for an active life. Most undernourished people (925 million globally) live in developing countries. **Malnutrition** refers to the consequences of persistent



undernourishment. In these cases individuals do not have an adequate intake of protein, energy and micronutrients. Undernourishment is usually assessed using three measures – a person being underweight, wasted or stunted. **Underweight**, reflected by low-weight-for-age, is a measure for chronic and acute malnutrition, but as a measure cannot determine whether a child is acutely or chronically malnourished. Further, international standards for weight-for-age for children cannot be determined after the onset of puberty as growth in height (typical during puberty) will have an impact on normal weight-for-age data (Mei et al., 2002). **Wasting**, or low-weight-for-height-and-age, indicates acute malnutrition. It is evident when an individual has substantial weight loss that is a result of starvation or disease (World Food Programme, <http://www.wfp.org/hunger>). Wasting prevalence in populations can change rapidly with improved nutrition (Faber & Wenhold, 2007). **Stunting**, or low-weight-for-height, is a symptom of chronic malnutrition. In South Africa, chronic malnutrition (stunting) is considered to be a bigger problem than acute malnutrition (wasting) (Faber & Wenhold, 2007). These definitions and categories informed the data collection and analysis of this evaluation.

Hunger and malnutrition are key factors that not only affect children's immediate health and development over the long term but also hinder their ability to benefit from educational opportunities. It is well known that hunger impairs children's ability to concentrate in class and therefore perform complex tasks (Faber & Wenhold, 2007; Grantham-McGregor in Gelli, 2010; Buhl, undated). However, **micronutrient deprivation**, also known as 'hidden hunger' because the symptoms do not physically manifest themselves, makes children more vulnerable to infectious diseases, harms normal physical and mental development and can result in disability and even premature death (Jamieson et al., 2011; Gelli, 2010; Adelman et al., 2008). Micronutrient deprivation also effectively reduces children's cognitive abilities (Gelli, 2010). Children in these circumstances have significant attention deficits, distractibility and energy depletion (Richter et al., 1997) and are thus more likely to underperform, attend school irregularly, enrol late and/or drop out of school (Faber & Wenhold, 2007). The consequences of poor educational performance mean hunger also imposes a burden on the developing world by reducing people's productive capacity. As the World Food Programme website ([www.wfp.org/hunger](http://www.wfp.org/hunger)) points out, 'every child whose physical and mental development is stunted by hunger and malnutrition stands to lose five to ten percent of lifetime earnings.'

School feeding programmes have arisen worldwide as a dual response to poverty (and its associated effects of short- and long-term hunger) and the desire to assist children to benefit from education.<sup>2</sup> School feeding programmes therefore act both as a social safety net that assists impoverished children and a means to help children to access and stay in school and perform better. Their underlying principle is that they attract children to school by providing nutritious meals in exchange for school participation.

While South Africa is food secure at a national level, profound inequality within the country means that many South Africans remain food insecure (Buhl, undated). A brief picture of this context is painted through the points below:

- There is notable **inequity in access to nutrition between rural and urban populations**. A national study showed that 26.5% of South African children in rural areas were stunted compared to 16.7% in urban areas (Labadarios, Steyn, Maunder, Macintyre, Swart & Gericke, 2000).
- There is **inequity in access to nutrition between and within population groups**, and there is a clear link between poverty and stunted or underweight people in South Africa (Vorster, 2010).
- There is a **co-existence of under-nutrition and obesity** in households and, as a result, a prevalence of diseases related to both under-nutrition and obesity exists (Bradshaw, Schneider, Norman & Bourne, 2006). The seeming contradiction is attributed to low quality staple foods consumed by poor households and the longer-term consequences of foetal malnutrition. While approximately half the female population are either obese or overweight, children tend to be underweight (Faber & Wenhold, 2007). South African children consume primarily a maize-based diet that is inadequate in energy and nutrients (Faber & Wenhold, 2007).
- **Obesity is increasing amongst adults and children** in South Africa. While the latter reflects global trends, research also suggests that there is a **relationship between chronic early malnutrition and later obesity**, especially amongst black women (Vorster, 2010).
- **Hidden hunger is prevalent in South Africa**. Micronutrient deficiencies include a lack of calcium and iron (especially amongst black women and girls), zinc (most groups), riboflavin (most groups), vitamin B6 (most groups), folate (Indian and black women), vitamin C (Indian, coloured and black groups) and vitamin A (especially children) (Vorster, 2010).

<sup>2</sup> The largest provider of school feeding programmes is the United Nations World Food Programme.



To sum up, South Africa's government school nutrition programme is based on the assumption that there is a causal relationship between high rates of poverty and resulting nutritional deprivation leading to children's reduced capacity to learn. The NSNP operates as an in-kind transfer to the poorest primary schools across South Africa (Institute for Democracy in Africa, undated). By housing nutrition programmes such as the NSNP within the education sector – the DBE, for instance – the potential effectiveness and sustainability of school feeding programmes is enhanced (Gelli, 2010).

Debate exists about the model of delivery to use in school feeding, and in the main two modalities are identified. The first is the provision of on-site meals. These meals are the most popular with school feeding programmes on a global scale and are either delivered to school premises as a full meal or as a snack, such as a nutritional biscuit (Gelli, 2010). On-site school feeding programmes are implemented with a predominantly educational focus: supporting access to education and improving learning by reducing short-term hunger and/or micronutrient deficiencies. However, in-school meals can be labour intensive in terms of the human and physical resources required to prepare food on time. This is the model primarily used in South Africa. 'Take-home rations' is the second model that is used, and it is targeted at the most vulnerable children in schools and implemented on an individual basis. This mode of school feeding requires less infrastructure and time than in-school meals or snacks, and rations are often only given to children on a monthly basis (in the form of food products that can be used by that household).

The debate between the two modalities centres on cost effectiveness of take-home rations versus on-site meals (Gelli, 2010). According to Bundy et al. (2009), take-home rations have lower administrative costs than on-site meals but result in the same increases in school enrolments. However, on-site meals have a greater potential impact on educational outcomes; they increase enrolment and relieve short-term hunger, therefore leaving children free to focus on learning. The mode that school feeding takes needs to be closely aligned with the programme's objectives as well as the local geographical location and social context in which these are implemented (Gelli, 2010).

Based on the literature and local and international studies, the key impacts of school feeding programmes are briefly summarised below. These findings have been alluded to in the introduction.

**Physical health outcomes:** School feeding programmes impact positively on the physical health of school going children by improving their nutritional status, reducing short-term hunger and allowing for better nutrient intake (Gelli, 2010). In addition, research suggests that nutrition provided at school leads to intergenerational benefits. These are benefits that extend beyond addressing short-term hunger; helping children to stay (and perform) in school using school feeding programmes, for instance, helps prevent the stunting of *their* children (Bundy et al., 2009). Every additional year of education that a mother receives reduces the potential for stunting of her child by 4% to 5% per year (Bundy et al., 2009).

**Improved food energy (calorie) consumption:** Most studies suggest that school feeding is an effective way to increase school aged children's calorific intake. Increased calorie consumption benefits children who are undernourished through weight gain and/or increased capacity for activity. According to Adelman et al. (2008), school food programmes are particularly effective in areas where the daily average consumption of food by children is far below the recommended levels for their age, weight and height.

**Anthropometric impact:** While measurements for calorific consumption are based on the nutritional inputs a child receives, anthropometric measurements assess the *nutritional status* that has been achieved by a child. Anthropometric indicators measure nutritional status based on the body size of a child in comparison to a standard reference population and include weight-for-height, weight-for-age and height-for-age measurements. Anthropometric measurements can only record the overall impact of school feeding programmes on health and nutrition rather than the specific reasons for the improvements observed in children, for example, increased zinc intake (Adelman et al., 2008).

**Impact on micronutrient status of children:** Micronutrient deficiency commonly occurs in school aged children and, according to Bundy et al. (2009), half the children in Sub-Saharan Africa who are living in poor communities are deficient in iron. This is especially



apparent in areas where children do not consume a variety of food and experience a high incidence of infection (Adelman et al., 2008). Micronutrient fortification of foods is directly beneficial to school aged children because unlike other physical manifestations of malnourishment, the effects of micronutrient deficiencies are rapidly reversible at any age. Iron, zinc, vitamin A and iodine are important micronutrients that make children more resilient to infections and therefore improve growth (Adelman et al., 2008). They have also been linked to improved learning capacity (Briggs, 2008). Micronutrient fortification is also cost effective in relation to the impact it has on children.

**Deworming:** Deworming has a huge impact on growth when used in conjunction with school food programmes (Bundy et al., 2009; Adelman et al., 2008). Numerous studies have proven that the impact of school feeding programmes on the nutrition of children is more effective when combined with deworming (for example, see Gelli, 2010; Bundy et al., 2009; Briggs, 2008), and therefore an integrated relationship between health initiatives and school feeding programmes is essential.

**Other impacts of school feeding programmes:** First, school feeding programmes are able to contribute to gender equality in education by targeting the social vulnerability of girls, who are often faced with additional household care burdens that limit their access to education or impact negatively on performance. The design of feeding programmes therefore need to take into account gender equality. Secondly, programme design also needs to take into account the needs of children and households affected by HIV/AIDS and other vulnerabilities such as disability. Thirdly, where programmes source food locally in communities, there is scope for promoting local economic development (Bundy et al., 2009). In this way a stable demand can be created for food at the local level, with multiplier effects on the local economy and the local community.

### 3. Research design and methodology

Assessing the impact of any programme, including feeding programmes, in the context of a broader social environment is challenging because of the role that intervening or extraneous variables play on the outcomes being measured. For instance, body mass index (BMI) is affected by the natural growth and maturation of an individual, as well as by food sources other than the particular feeding programme being assessed. Similarly, a range of factors – including political action, transport failures, personal problems and illness – can affect school attendance. Finally, school performance is affected by learners' foundation skills and interest in the subject and teachers' subject knowledge and teaching methods.

In order to limit the effect of these intervening variables, a pre- and post-test research design was employed (De Vos, 2002). Our intention was to measure what the impact of the TBF's in-school breakfast feeding programme was on the nutritional status of the children and on school attendance and performance. Measurement was conducted in the initial implementation of the pilot programme, at a mid-point during the programme and at the end of the programme. The pre- and post-test design sought to ensure that the changes in the outcomes being measured could be attributed to the presence of the feeding programme. As such, the evaluation took place in three phases over a ten month period:

- collection of baseline data in October 2011,
- collection of interim data in March 2012, and
- collection of final data in June, July and August 2012.

The evaluation drew on both quantitative and qualitative research methodology to fulfil the objectives of the research. The CSDA partnered with a doctoral candidate housed in the Centre of Sustainable Livelihoods (Vaal University of Technology) in order to provide the nutritional expertise necessary for this study, including the collection of anthropometric data as an indicator of nutritional impact.



The evaluation methodology included:

### **1. Anthropometric measurements of sampled children to determine the impact of the pilot in-school breakfast feeding programme on the nutritional status of children**

Anthropometric measurement is the measurement of weight and height of the sampled children. All subjects were weighed in light clothes without shoes on a portable digital electronic calibrated scale to ensure that the measurements were accurate. Two measurements for weight were taken with no more than 0.5 kg variance; the average of the two measurements was used if both measurements were not the same. Height was measured with an upright stadiometer placed against a perpendicular wall at the pilot schools. Two measurements for height were also taken with no more than 0.5 cm variance, and then the average of the two measurements was used if the measurements were not the same.

The 2007 WHO references for growth standards of children aged five to 19 years were used for statistical analyses of the anthropometric indicators. Results were calculated according to the WHO growth standard in terms of the following parameters: height-for-age and weight-for-height-and-age (BMI).

Height and weight measurements were classified according to height-for-age to determine if the children were stunted ( $\leq -2$ SD from median), BMI to find out both whether the children were wasted ( $\leq -2$ SD from median) and to determine whether the children were overweight ( $\geq +1$ SD from median). For example, the WHO standards indicate that at the age of 6 ½ years (midway between the ages of 6 and 7 years), the median measurement for girls is 15.3 kg/m<sup>2</sup>. In order to be considered within the normal growth range, a 6 ½ year old girl's BMI should fall between 12.7 kg/m<sup>2</sup> ( $-2$  SD from the median) and 17.1 kg/m<sup>2</sup> ( $+1$ SD from the median). If she falls BELOW the minimum BMI of 12.7 kg/m<sup>2</sup>, then she is considered wasted, and if she falls ABOVE the maximum BMI of 17.1 kg/m<sup>2</sup>, then she is considered overweight.

### **2. Quantitative analysis of the average grades and attendance figures of sampled learners to determine the impact of the programme on the performance and attendance of learners**

Grade and attendance data for sampled learners were collected using end-of-term school records from the six pilot schools for the 2011 school year. While data from the first two terms of 2012 were collected, the schools provided incomplete records and therefore 2012 data could not be analysed.

### **3. Qualitative research to triangulate primary data and to determine the secondary impact of the pilot feeding programme on stakeholders**

Qualitative research was used to triangulate the outcomes of the quantitative and anthropometric data for the primary objectives of the research and to gather information related to the secondary objectives of the study. Quantitative findings are presented alongside qualitative data which confirm or clarify or deepen the interpretation of statistical findings. In-depth and group interviews were conducted and focus groups held with key stakeholders in the pilot feeding programme. This data sought to determine other potential outcomes related to the feeding programme, as well as any challenges that the schools face with regard to the feeding programme.

Focus groups were also held with Grade 6 learners at two of the pilot schools. These focus groups sought to determine the experience of primary 'users' of the programme, i.e. the learners; questions for example focused on whether the learners liked the food, how many meals they were receiving, their perception of the impacts, if any, of the programme, and whether the feeding programme had led to any changes at home with regard to food.

### 3.1. Research site: Alexandra township

Although Alexandra township is located in the wealthiest province in South Africa, Gauteng, it is an historically poor and under-developed area in which widespread inequalities and poverty continues to exist and children continue to experience socio-economic deprivation.

The township is characterised by high population density and growth rates, high levels of unemployment, a predominantly youthful population, low levels of education and low monthly household incomes (Mathee, Barnes & De Wet, 1999:2). The infrastructure in Alexandra is under immense strain due to the influx of people. As a result, environmental factors – such as the lack of access to sanitation, water and proper shelter – impact heavily on the wellbeing of residents. Originally designed for 70 000 people, Alexandra is now home to approximately 350 000 people all living within a small geographic area and mostly in informal dwellings, hostels or small freestanding government subsidised housing (Murray, 2009; UN, 2009).<sup>3</sup> There are an estimated 4 000 formal houses and 34 000 self-built shacks in the township (Murray, 2009).

Interviews with school stakeholders confirm the dire socio-economic circumstances that most children attending the six pilot schools face daily: most children come from single-headed households predominantly headed by grandmothers, foster parents or mothers; many parents are young; most caregivers are unemployed; schools have to supply the most basic necessities including uniforms and food; and children live mainly in informal housing, hostels and Reconstruction and Development Programme (RDP) housing. Many stakeholders report that it is common for children to attend school without having been fed.

### 3.2. Sampling

The evaluation used stratified random sampling for the quantitative components of the study. At the start of the evaluation, principals from the six pilot schools in Alexandra provided researchers with class lists of each grade in their school. These lists were used to randomly select learners that would participate in the sample for the research and as substitutes in proportion to grade sizes. The grade and student number breakdown for 2011 for the six schools is outlined in Table 1.

The sample was calculated in two steps. First, a sample was drawn that would allow a confidence level of 95%, and a margin of error of 5%. This sample reflects approximately between 25% and 30% of the total number of learners at the six participating schools. Given the difficulty of tracking learners over the period of a year because of environmental factors, step two in the sampling exercise was to devise a substitute list so that in cases where learners did not continue at a school or were absent on the day of measurement, the correct sample size could be maintained. This combined total (sample plus substitutes) is reflected in Table 1.

Participating schools	Grade range of school (Gr = Grade)	Total number of learners 2011	Sample size (including substitutions)	Actual numbers in final BMI measurement	Actual numbers in final performance measurement
Skeen Primary	Gr R – Gr 6	1 186	371	137	149
Ikage Primary	Gr R – Gr 6	1 174	376	199	264
Ekukhanyisweni Primary	Gr R – Gr 6	1 068	355	131	251
Ithute Primary	Gr R – Gr 6	1 203	379	175	163
Emfundisweni Primary	Gr R – Gr 6	1 040	371	161	363
Pholosho Secondary	Gr 6 – Gr 9	985	360	54	140
<b>Total numbers</b>		<b>6 656</b>	<b>2 212</b>	<b>857</b>	<b>1 330</b>
<b>Total % of population</b>		<b>100%</b>	<b>33%</b>	<b>13%</b>	<b>20%</b>

**Table 1: Population and sample per school**

<sup>3</sup> Unofficial figures place the number of people living in Alexandra at 700 000.



As reflected in Table 1, the actual number of learners measured in the analysis of school performance was 1 330, 20% of the overall school population. At the final anthropometric measurement stage, the number of learners who were measured was 857 across all schools (13% of the total population). In terms of the anthropometric results, as we wanted to investigate the *change* in measurement over *time*, our analysis reports *only* the children who were measured at *all three* stages; that is, we tracked only these 857 children across all stages. Data on children who were measured at only one stage (baseline stage with no follow up) or two stages (baseline stage and interim stage but no final stage measurements) are not helpful to indicate change over time and therefore are not reported on in this document.

### 3.3. Data collection

Data were collected in a phased approach over ten months as follows:

#### Phase 1: Baseline data collection

The baseline data were collected two-and-a-half months after the launch of the feeding programme in the six participating schools. The baseline anthropometric measurements of learners were conducted directly after a weeklong school holiday reflecting as closely as possible the BMI of learners without access to a feeding programme rather than children in the midst of receiving nutritional supplementation. These data have been used as a proxy for the baseline data.

The CSDA collected the baseline data in mid-October 2011 and January 2012, including the:

- anthropometric measurements of sampled children from 12 to 20 October. Each school was allocated a day for measuring the weight and height of children in the sample;
- sampled learners' average grades for the 2011 academic year (terms one to four), drawn from school records. These grades were collected in January 2012; and
- sampled learners' school attendance figures for the 2011 academic year (terms one to four), drawn from school records. These figures were also collected in January 2012.

Although the CSDA had arranged with the school principals for data to be collected in December 2011, we experienced numerous challenges in retrieving the data from some schools and had to make more trips than anticipated to collect this data. The final performance and attendance data were therefore collected by 20 January 2012.

Originally principals had stated that they could provide us with punctuality data for the sampled learners, which would have allowed us to see if punctuality had improved since the introduction of the feeding programme. However, this proved too difficult for them to find and collate, and therefore we were unable to undertake this analysis quantitatively.

The baseline data collection phase was accompanied by researchers familiarising themselves with contextual information about participating schools and liaising with the DBE's NSNP to understand the broader context of the pilot programme.

#### Phase 2: Interim data collection

The second phase of data collection took place in March 2012, six months after the collection of baseline data and eight months after the start of the implementation of the programme. The collection of the interim data was timed so that it took place prior to the April vacation period to ensure that it reflected children's nutritional status while benefitting from the breakfast pilot.

At this stage only anthropometric measurements of sampled children were collected. It was decided that 2012 term one and term two school data would be collected in one period at mid-year to reduce the administrative burden on the schools.

#### Phase 3: Final data collection

The final phase of data collection took place over a three month period, June to August 2012, and coincided with the end of the pilot phase of the project. This phase included the collection of anthropometric, quantitative and qualitative data.



- Anthropometric measurements were collected prior to the mid-year school holidays and took place at each of the schools between 13 and 22 June 2012.
- The average grades of learners and their school attendance figures for the first and second terms of 2012 (drawn from school records) were collected in July and August 2012 to allow schools the opportunity to collate this information for the research.
- In-depth and group interviews and focus groups were held over the period stretching from 7 to 20 June 2012.

In-depth interviews were held with all six school principals (or as in the case of one school, the principal's representative); two representatives from the DBE's NSNP; and the Director of the TBF. Group interviews were conducted with two food handlers as well as with two educators at two schools – Ekukhanyisweni Primary School and Ithute Primary School. In addition, one focus group with Grade 6 learners at each of these schools was conducted. A list of interviews and focus groups is contained in Appendix 1.

Unfortunately, finding and collating performance and attendance data for the sampled learners was a huge challenge for the schools, implying institutional weaknesses across all six schools. Follow up was done by the CSDA in the form of many and repeated telephone calls, emails, physical visits, and requests via the TBF, but this did not result in a full data-set being collected. Substantial 2012 performance and attendance records were missing. Therefore, comparisons between 2011 and 2012 data were not possible. Analysis was thus conducted on 2011 data only, comparing term one to term four.

### 3.4. Data analysis

**Anthropometric data:** Results were compared across the three phases of the research and across each of the schools. Data were analysed in 'IBM SPSS Statistics' (SPSS), using WHO growth standards for both boys and girls aged five to 19 years (WHO, 2007). The growth standards used included height-for-age and BMI-for-age. From the onset of puberty, BMI standards are a more accurate measure of excess weight than weight-for-age standards due to the rapid growth in height that young people experience during this period. As a result, we use BMI-for-age to assess the number of overweight children in the sample.

The WHO growth standards use standardised cut-off points to determine malnutrition. The extent of wasting is determined by the number of children whose BMI is more than two standard deviations below the median BMI for their age. The number of overweight learners is determined by the number of children whose BMI is more than one standard deviation from the median BMI for their age. Finally, the extent of stunting is determined by the number of children whose height-for-age is more than two standard deviations below the median height for the age of the child. The measurements also take sex into account. The cut-off points used in the study are as follows:

- <-3 SD: learners with severe wasting or stunting;
- <-2 SD: evidence of wasting or stunting;
- >+1SD: overweight learners; and
- >+2SD: severely overweight learners.

The Wilcoxon Signed Ranks Test was used as a test of significance of the results.

**School performance and attendance data:** Quantitative data were analysed using SPSS, which generated descriptive statistics in averages and frequencies.

It was anticipated that the data used to assess school performance would be based on the term results of learners as reflected in their school reports. However, in the case of junior learners (Grade R to Grade 3), term averages and records across all the schools were poorly and unevenly recorded. This meant that the primary source for assessing change in school performance was unreliable, and therefore an alternative data source had to be found.



By looking at the individual results for each subject for each learner, it was possible to create an average for each pupil for each term. These averages did not reflect a percentage per se but rather a category of performance. Term averages regarding senior learners were sufficiently recorded, and therefore these individual percentages were used, without averages having to be created.

It must be noted that despite school performance and attendance data being collected from all school for the final phase, these were not used due to the challenges with the data outlined above. Analysis of this data is thus limited to term one to term four of 2011.

**Qualitative data:** These data were analysed thematically in order to reach conclusions regarding the perceptions and opinions of key stakeholders affected by the intervention. Identified themes correlated closely with the primary and secondary objectives of the research, the functionality of the programme, its sustainability and the recommendations for the feeding programme and its replication.

Themes identified in the qualitative research in relation to the primary research objectives – the attendance, performance and nutritional status of learners – were triangulated with results from both the anthropometric data outcomes and school performance and attendance data results. In this way, the evaluation sought to use varied sources to confirm the outcomes of the research.

### 3.5. Ethical considerations

Given that the evaluation involved learners at a primary school level during term time, a number of ethical considerations were taken into account.

- Permission for the research was secured at a national, provincial and district level. Gauteng Province DBE provided a letter of approval for the evaluation to take place.
- Schools were guaranteed that the outcomes of the research would not in any way affect the continuation of the feeding programme at the school either during or after the research.
- At the participant level, adult respondents were fully briefed on the nature and purpose of the research and were given an opportunity to give informed consent to qualitative interviews. Responses have been treated as confidential. Some key informants can be identified in the report (for example, the principals of the various schools), but these informants were aware of this likelihood during their interviews and were comfortable with the absence of anonymity.
- Parental consent was received with the assistance of the schools for child participants. Parents of all sampled learners were informed in detail about the study in a letter sent home written in English but also translated into five additional languages, which are the most common home languages amongst learners in these schools. Only learners who returned *signed parental consent forms* for their participation in the survey were allowed to participate in the sample and the focus groups. Research was also conducted in a child-friendly manner and the identities of the participants are protected.

### 3.6. Capacity building as a secondary outcome of data collection

The TBF anthropometric measurements were taken by a team of undergraduate (third and final year BTech) and post-graduate (masters) students from the Faculty of Human Sciences at the Vaal University of Technology, led by a qualified nutritionist, herself a doctoral student, from the Centre of Sustainable Livelihoods at the university. The Centre is a research centre that primarily conducts community nutrition research projects.

The Centre recruited and trained the students on anthropometric data collection. The exposure these students received from the TBF evaluation study was beneficial to their learning and data collection experience. This was a very new environment for them in relation to the geographic and socio-economic area, the age of the learners and the professional nature of the work, as their training had exposed them only to the measurement of preschool children in the communities near the university, and in small numbers.

Students reported that this was a wonderful opportunity for learning. In particular, they believed it helped them function more efficiently, encouraged them to think on their feet when problems arose, and they were exposed to project planning and execution skills that will



assist them when conducting their own and other projects in future. They also commented that conducting this research in a context of urban poverty and in very busy schools humbled them and engendered patience and humour in their work.

### 3.7. Limitations and assumptions of the pilot phase evaluation

This study did not use an experimental design which could systematically control for other intervening factors. Such a design would have included a control group (non-breakfast feeding programme school) and would have allowed for greater confidence in attributing the results observed in children to the breakfast feeding programme as it would have been controlled against children not benefiting from such a programme. The main reason that an experimental design was not used was due to ethical reasons. Ethically it was felt that it would be unjust to expose low income schools to a potential breakfast feeding programme for control purposes without being able to commit to offering the benefits of such a programme. Nevertheless, this study still demonstrates possible effects of the feeding programmes and confidence in the study is improved due to the testing across six different schools as well as through the longitudinal design which allows for testing the influence of the feeding programme over time. As the same children are measured at three different points, the design does control for other possible factors to some extent. Such designs have been used in previous studies and can reflect to some extent the influence of the programme (see Van Stuijvenberg, Kruger, Badenhorst, Masvelt & Laubscher, 1997).

A second limitation pertains to the attrition rate of learners across the three points of measurement. While the ideal sample size would have been 2212 learners (accounting for substitutions) ultimately post-test data was only available for 857 learners, which limits the confidence with which the data can be used to infer the results for the wider learner population in these schools.

As the feeding programme was launched prior to the baseline data being collected, the intervention could have already impacted on learners in relation to their BMI. This limits the usefulness of baseline measurement. This effect was partially offset by taking baseline anthropometric measurements after the school holidays, when children would not have been exposed to the feeding programme for a period of time. In addition, these effects are likely to be minor and are not a concern in relation to school attendance and performance findings as these are based on past school records which include pre-programme learner results.

It should be noted, however, that while the breakfast programme is likely to have a direct impact on the children's BMI, the effect on school attendance and performance is less direct and thus more difficult to establish. Changes in school performance, for instance, are likely to be related to a number of factors that are linked more directly to achievement than nutritional intake. For example, factors such as teacher subject knowledge, availability of teachers and access to resources are likely to have a far greater impact than the nutritional intervention. The experimental research design would have enabled us to determine the relative contribution of the feeding programme to changes observed by comparing this to schools in which no Tiger Brands Foundation breakfast feeding programme was operating. While the CSDA has tried to consider the potential influence of as many variables as possible, this limitation means findings on school performance need to be read cautiously. The difficulty in isolating the effects of school feeding is a common problem in studies in the developing world (Richter et al., 1997).

In addition, since the baseline and final data collection points were fewer than 12 months apart, it is further acknowledged that significant jumps in indicators like school performance and BMI over this period are unlikely, and conclusive outcomes may only be seen in the longer term.

Finally, missing school performance and attendance data for the first two terms of 2012 meant that the impact of the programme could not be assessed for this period. Poor record keeping by the schools meant that compensations had to be made from the beginning of the data analysis, which in turn led to the data analysis being compromised. The outcomes of the analysis may have been affected by these challenges.



## 4. Results

### 4.1. Nutritional status results

The first primary objective of this evaluation was to assess whether the TBF's breakfast feeding programme impacted on the nutritional status of learners over the period October 2011 to June 2012.

As indicated in the methodology section, anthropometric measurements of sampled learners took place in three phases – a baseline phase, an interim phase and a final phase. Tracking the same 857 children across these phases indicates the *change over time* in their nutritional status.

Overall, as Table 2 and Table 3 indicate, there was improvement in the nutritional status across all schools for height-for-age and for BMI-for-age measurements over the evaluation period. This is a positive result. While these improvements cannot be attributed to the feeding programme solely, these results are suggestive of the positive influence of the TBF breakfast feeding programme and affirm the potential of the programme.

Table 2 presents the results for stunting (low height-for-age) in the sample. In the baseline measurements 11% of children were categorised as stunted, and severely stunted, 7.5% of learners. Together this makes up nearly a fifth of the overall sample (18.5%; n=158), which is a concerning level of malnutrition. This is in line with national estimates as well as those for the province (Labadarios, 2007). We see a 4.7% reduction in severe stunting levels and a slight increase in stunting levels. The slight increase in stunting is likely accounted for by the changes experienced for severely stunted children moving into the stunted category. An overall 4.3% positive change is seen in the number of children classified as within normal height for age limits at the final phase. The overall change is statistically significant.

Stunting (height-for-age)						
Cut-off	Classification	Baseline		Final		Total percentage point change over evaluation period
		n=857		n=857		
		n	%	n	%	
<-3SD	Severely stunted	64	7.5	24	2.8	-4.7%
<-2SD	Stunted	94	11	97	11.3	0.3%
Not stunted		699	81.6	736	85.9	4.3%

**Table 2: Changes in stunting over time across all schools**  
(green text indicates positive nutritional changes)

Body Mass Index is the relationship between weight and height, and BMI-for-age is a reference to the weight and height combination that is considered normal for the age of a child. A BMI measurement will indicate whether the individual falls above the BMI guideline (overweight), within the guideline (normal growth), or below the guideline (wasted) for their respective age. As Table 3 indicates, the category 'within BMI guidelines for age', that is, normal growth, increased by 10% between the baseline and the final stages, meaning there was a 10% health improvement indicated by BMI standards across the sample. The *decrease* in the number of both wasted and overweight children over the measurement period is statistically significant. This table is discussed in more detail below.



Overweight/wasting results (BMI-for-age)						
Cut-off	Classification	Baseline		Final		Total percentage point change over evaluation period
		n=857		n=857		
		n	%	n	%	
>+2SD	Severely overweight	92	10.7	55	6.4	-4.3%
>+1SD	Overweight	145	16.9	118	13.8	-3.1%
Within BMI guidelines for age		574	67	660	77	10%
<-2SD	Wasted	24	2.8	18	2.1	-0.7%
<-3SD	Severely wasted	22	2.6	6	0.7	-1.9%

**Table 3: BMI for age nutritional results over time across all schools**

(green text indicates positive nutritional changes)

Very worrying is the high numbers of overweight learners across all the schools. Baseline measurements indicated that 27.6% of all learners were either overweight (16.9%) or severely overweight (10.7%). This did reduce by the end of the measurement period to 13.8% and 6.4% respectively, showing a percentage point reduction of 3.1% for overweight learners and 4.3% for severely overweight learners. This combined percentage point change of 7.4% is the most dramatic health improvement seen in this study. This improved health (weight loss) is encouraging, although far too many children continue to be overweight or severely overweight (20.2%, or a fifth, of the total sample at final measurement).

It must be noted that there were two winter seasons during the evaluation period, and this could have influenced learners' dietary intake to include more food high in fats and starch. But it is unlikely that all these learners are only 'seasonably' overweight. In addition, informal observation in the areas around the schools suggests that many learners and household members depend on 'spaza' shops that sell mostly unhealthy fatty foods such as 'skambane' (a quarter loaf of bread with chips, 'atchar', a 'Russian' (sausage) or processed meat and cheese). The consumption of poor quality foods (that is, foods low in nutritional benefits) and very little variety in food consumed is often a cause of obesity amongst poor people (Faber & Wenhold, 2007).

Learners themselves suggested that the breakfasts provided to them make them feel fuller and curb their appetite for junk food. Two learners expressed this as follows:

*Some children go buy junk food because they are not full, but most of us don't eat that anymore because of the breakfast.*  
(Grade 6 Learner Focus Group, Ithute Primary School, 20 June 2012)

*[T]he breakfast they give us has vitamins and gives us more energy.*  
(Grade 6 Learner Focus Group, Ekukhanyisweni Primary School, 19 June 2012).

Educators and principals recognised that the nutritional value of the food the children received in the breakfast programme is higher than the food they received at home.

*They [learners] have seen what we are providing, which parents can't afford to provide [...] They can't get Jungle Oats or Morvite at home. These are highly nutritional porridges [...]*  
(Principal, Skeen Primary School, 12 June 2012)

The decrease in numbers of overweight learners could have been influenced by the provision of healthy breakfasts via the TBF breakfast feeding programme.



In contrast to the higher stunting levels, measurements for wasting (low weight for height and age), as indicated in Table 3, were lower. This is in line with findings in South Africa that demonstrate that stunting (indicating chronic malnutrition) is a greater problem than wasting (indicating acute malnutrition) (Faber & Wenhold, 2007). Table 3 shows that only 2.8% of the sample was wasted, and 2.6% were severely wasted at the baseline stage. Encouragingly, the health of these children improved over the pilot period so that at the final measurement stage, only 2.1% were wasted and 0.7% of the children were severely wasted.

The nutritional gains are also reflected in the nutritional knowledge that children seem to have gained in the course of the programme. In an exercise with Grade 6 learners they suggested that the food from school is more nutritious than food they receive at home, for example, breakfast and lunch time meals 'at home'<sup>4</sup> often consist of bread and tea. The images below drawn by Grade 6 learners demonstrate the difference in nutritional value between breakfast and lunch time foods provided on a school day ('Yesterday' in the image) and a weekend day, where learners only access food that their caregivers provide. The weekend nutrition consists mainly of starch with some vegetables or salad and in some instances meat presented at dinnertime.

	What did you have?	Where did you get this food?
Yesterday		
Breakfast	Jungle oats	at School
Lunch	rice fish	at School
Dinner	pepp meat	at home
Sunday		
Breakfast	Bread and tea	at home
Lunch	nothing	at church
Dinner	rice salads	at home

	What did you have?	Where did you get this food?
Yesterday		
Breakfast	Jungle oats	at School
Lunch	Brown Bread and Butter	at Home
Supper	Pap and meat	at Home
Sunday		
Breakfast	Bread and tea	at Home
Lunch	Bread and beans	at Home
Dinner	Rice and meat	at Home

**Figure 1: Graphics by Grade 6 learners, Ithute Primary School**

Improvements in underweight (wasted) children were noticed by research participants, both in relation to themselves as well as to others. There were also cases of particular children, perceived to be those learners who were especially underfed at home, that stood out clearly as having gained weight. Examples of comments to this effect from participants are below:

*They love the breakfast. Even their weight, even their facial appearances you see that change [...] that they have eaten something special now.*

(Educator, Ithute Primary School, 19 June 2012)

*I was so thin, my friends called me skeleton [...] when the TBF came, I am big now and I don't have pimples on my face. I am stronger and don't get sick too much.*

(Grade 6 Learner Focus Group, Ekukhanyisweni Primary School, 19 June 2012)

*A little boy who is six years old but looks like a four-year-old [...] is now gaining weight.*

(Principal, Emfundisweni Primary School, 14 June 2012)

<sup>4</sup> 'At home' meals in this context refer to food learners receive at their homes, their grandmothers' or neighbours' homes (Grade 6 Focus Groups, 2012).

While improved nutritional intake has important long-term health benefits, it also has dramatic impacts on short-term outcomes such as energy levels and concentration of learners in class. Most often mentioned was the improvement in energy levels amongst children. Principals and educators reported that children were more active on school grounds than prior to the introduction of the breakfast feeding programme. One principal suggested that increased energy levels were especially noticeable amongst Foundation Phase learners while physical growth was evident amongst older learners:

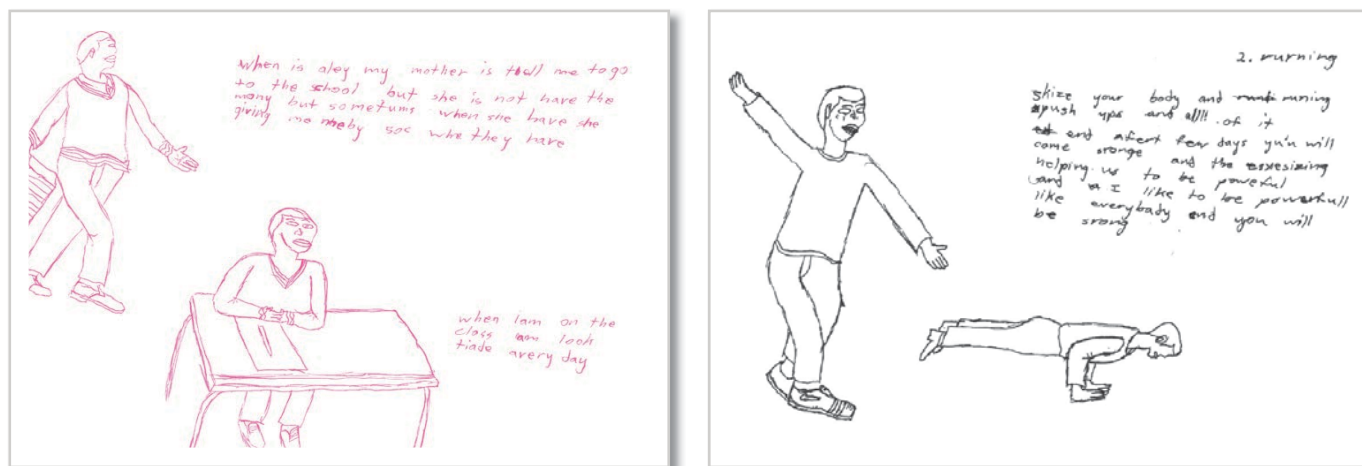
*Our children are not as weak as they used to be. In the upper grades, the physical development [...] is showing [...] they are looking fit. With the foundation phase, it is the energy [of children] that we are seeing.*  
(Principal, Ikage Primary School, 12 June 2012)

Learners reported their subjective experience of improved energy as follows:

*After a few days you will become stronger and the exercise helps us to be powerful [...] I like to be powerful.*  
(Grade 6 Learner Focus Group, Ekukhanyisweni Primary School, 20 June 2012)

*We have lots of energy [since the arrival of the TBF programme]. I play at school. I get home and I play, I sleep and then I play.*  
(Grade 6 Learner Focus Group, Ithute Primary School, 20 June 2012)

In the graphic below, one child tells the story of how he has changed from being tired to feeling strong enough to be active.

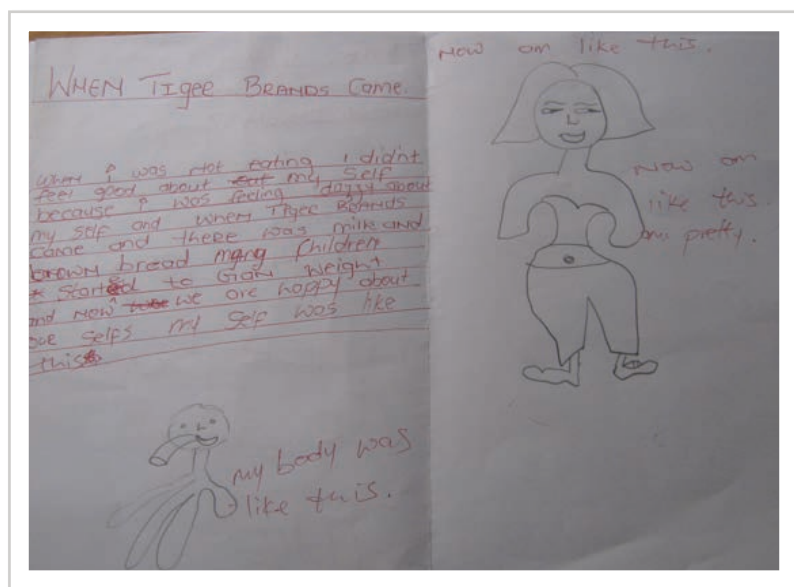


**Figure 2: Graphics by Grade 6 learner, Ekukhanyisweni Primary School**

A related issue was the improvements that were seen in the general overall health of the learners.

*Now that I eat at school, I feel strong, and I don't get sick anymore.*  
(Grade 6 Learner Focus Group, Ithute Primary School, 20 June 2012)

*Before the Tiger Brands Foundation breakfast started, I used to get sick with high temperatures. Now that I am eating at school, I am stronger. The breakfast has more vitamins and gives us more energy.*  
(Grade 6 Learner Focus Group, Ekukhanyisweni Primary School, 19 June 2012)



**Figure 3: Graphic by Grade 6 learner, Ithute Primary School**

*[Prior to the breakfast feeding programme] the sick room was full with the learners [...] but there is lot of difference now.*  
(Educator, Ithute Primary School, 19 June 2012)

### Conclusion: Health impacts

Although there were other variables that were not investigated during this study (such as socio-demographic factors, health factors, eating habits or dietary intake beyond the school feeding programme), positive improvement of the nutritional status of learners during the pilot phase of the TBF breakfast feeding programme might be attributable to the programme itself. The percentages of improvement for this study are within the broad trends when compared to other similar feeding programme evaluations conducted in South Africa (Napier et al., 2009).

One of the aspects that makes the TBF breakfast feeding programme unique is that it supplements the one meal a day that the DBE had been providing to these schools. As a result, learners access both breakfast and lunch at school.

## 4.2. Learner performance results

A key goal of the TBF breakfast feeding programme is to impact positively on learners' educational performance. Studies have established that by improving the nutritional status of malnourished children, their short-term (such as improved concentration in class) as well as their long-term educational performance is improved (Napier et al., 2009; Levitsky, 2005).

A quantitative evaluation of this outcome compared school performance, in the form of term marks or grades, during the first term of 2011 (prior to the introduction of the feeding programme) with that of the fourth term of the same year (when the children would have had the benefit of the breakfast programme for two terms). The breakfast feeding programme launched in July 2011, at the start of the third academic term. No 2012 data were used, as these were not available from the schools.

The analysis has been divided into junior learners (Grade R to Grade 3) and senior learners (Grade 4 to Grade 9) to accommodate the different grading systems. Note that no actual percentages are given for each subject at the junior level. Instead, numerical values

from 1 to 5 are ascribed to each subject, indicating the learner's level of competency. These values and their corresponding meaning are as follows:

- 1 = Not achieved
- 2 = Partial achievement
- 3 = Satisfactory achievement
- 4 = Excellent achievement
- 5 = Outstanding achievement

Because the variance of these values (1 to 5) is so small, a change that appears very small – for example, from a first term average of 2.00 to a fourth term average of 2.50 – in reality is a 25% change in performance over a year, indicating a major swing.

An analysis of **junior learners'** grades for the first four terms of 2011 indicates that all primary schools improved their junior term average. The change in Skeen and Emfundisweni Primary Schools was marginal (0.26% and 1.16% respectively), while there was a marked increase at Ikage (16.65%), Ekukhanyisweni (12.91%) and Ithute (18.07%)<sup>5</sup>. This information is displayed in Table 4, below.

Performance by school	Skeen	Ikage	Ekukhanyisweni	Ithute	Emfundisweni
Term 1 average	3,028	2,378	2,495	2,424	2,925
Term 2 average	3,109	2,614	2,612	2,672	2,964
Term 3 average	2,962	2,748	2,787	2,841	2,817
Term 4 average	3,036	2,774	2,817	2,862	2,959
<b>Total (year average)</b>	<b>3,034</b>	<b>2,629</b>	<b>2,678</b>	<b>2,700</b>	<b>2,916</b>
<b>% change</b>	<b>0,26</b>	<b>16,65</b>	<b>12,91</b>	<b>18,07</b>	<b>1,16</b>

**Table 4: Term average by school – Grade R to Grade 3**

When disaggregating the data by grade, it is clear that there was a positive change across all grades, and this change was particularly high at the Grade R level (25.79%) (see Table 5, below). For all grades, there was a correlation (albeit small) between an improvement in performance and each successive term. Of all the grades, the most marginal improvement (3.75%) was seen at a Grade 3 level. The data did not indicate any differences between junior female and male learners.

Performance by grade	Grade R	Grade 1	Grade 2	Grade 3
Term 1 Average	2,563	2,61	2,627	2,721
Term 2 average	2,945	2,759	2,805	2,743
Term 3 average	3,187	2,784	2,794	2,767
Term 4 average	3,224	2,85	2,863	2,823
<b>Total (year average)</b>	<b>2,980</b>	<b>2,751</b>	<b>2,772</b>	<b>2,764</b>
<b>% change</b>	<b>25,79</b>	<b>9,20</b>	<b>8,98</b>	<b>3,75</b>

**Table 5: Term average by grade – Grade R to Grade 3**

Although it is expected that learner performance should improve over the school year, it was the strong belief of the research participants that this positive change was due, at least in part, to the TBF feeding programme. One educator expressed this as follows:

<sup>5</sup> Pholosh Secondary School does not have any junior learners



*After they've eaten, they look bright [...] the lesson just flows, unlike where you get other children feeling sleepy.*  
(Educator, Ekukhanyisweni Primary School, 19 June 2012)

A principal links the feeding programme directly to improved performance, as expressed below:

*[Since TBF started the breakfast programme] their results are much better [...] those that we know [...] who had problems at home [...] have changed a lot.*  
(Principal, Ithute Primary School, 18 June 2012)

As many variables impact on school performance, these improvements for the junior learners might also have something to do with the inherent nature of the Foundation Phase of education. Until certain basic literacy and numeracy skills are grasped in the early years of learning, performance is likely to be poor, but will improve as these skills are mastered over time. Therefore it is important that the impact of nutritional programmes is assessed over a longer period of time than one year. Should substantial improvements be noted over a longer time period, one might be able to conclude that a breakfast feeding programme could have been an especially significant support to learners in Grade R, as prior to the first year of formal schooling, needy learners would most likely not have had access to nutritional programmes.

Performance by term average per school for **senior learners** indicates marginal *negative* changes in school performance over the course of 2011 (see Table 6, below), with the exception of Ithute Primary School (which improved by 8.87%) and Emfundisweni Primary School (which improved by 1.05%). In particular, Pholoshos Secondary School's performance decreased by 13.50%, a worrying statistic. It is hard to determine the reasons for this decline given the number of variables that affect school performance. No differences were found between senior male and female learner performance.

Performance by school	Skeen	Ikage	Ekukhanyisweni	Ithute	Emfundisweni	Pholoshos
Term 1 average	46,75	55,29	44,72	43,06	43,97	52,96
Term 2 average	41,63	54,65	43,32	46,35	44,92	40,97
Term 3 average	45,44	57,09	43,38	47	42,74	50,36
Term 4 average	43,81	54,57	43,64	46,88	44,43	45,81
<b>Total (year average)</b>	<b>44,408</b>	<b>55,400</b>	<b>43,765</b>	<b>45,823</b>	<b>44,015</b>	<b>47,525</b>
<b>% change</b>	<b>-6,29</b>	<b>-1,30</b>	<b>-2,42</b>	<b>8,87</b>	<b>1,05</b>	<b>-13,50</b>

**Table 6: Term average by school – Grade 4 to Grade 9**

Table 7 below provides an indication of term average by grade for the senior grades. Grade 5 learners were the only group to reflect an improvement in overall performance from the beginning of the year to the end (6.58% improvement). Grade 9 learners performed worse than other grades (the deterioration in their grades over 2011 was 18.51%, a startling percentage for a school year that is often considered to be the 'foundation' for achievement in the final year of school, grade 12).

Performance by grade	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
Term 1 result average	46,53	45,89	48,87	52,73	55,9	48,09
Term 2 result average	44,7	46,71	50,1	47,32	45,03	32,15
Term 3 result average	43,4	47,14	51,11	52,65	51,61	46,7
Term 4 result average	46,47	48,91	45,96	48,59	49,59	39,19
<b>Total (year average)</b>	<b>45,275</b>	<b>47,163</b>	<b>49,01</b>	<b>50,323</b>	<b>50,533</b>	<b>41,533</b>
<b>% change</b>	<b>-0,13</b>	<b>6,58</b>	<b>-5,95</b>	<b>-7,85</b>	<b>-11,29</b>	<b>-18,51</b>

**Table 7: Term average by grade – Grade 4 to 9**



It is important to bear in mind the range of variables – changes in the school curriculum is but one example – that can impact on the performance and attendance of learners. One principal indicated that a new curriculum was implemented in 2012, which demanded ‘a lot from teachers’, making it difficult to compare last year with this year.

*It's a new format and different approach for Grade R to Grade 6.*

(Principal, Skeen Primary School, 12 June 2012)

Contrary to the lack of positive change in term grades seen amongst senior learners, school educators, all school principals and learners reported that the TBF feeding programme has made a notable positive impact on learner performance. Specifically, they report it has improved learners’ ability to concentrate and participate in class. The following quotes are indicative of these beliefs:

*When learners are full, their disruption is minimal [...] Before there were learners that would sleep in class. No longer.*

(Principal, Pholoshu Secondary School, 13 June 2012)

*They come, they have their breakfast, they are listening attentively to the educators [...] in the past you would find the learners sleeping [...] You'd have to try to find something for that learner so that they can concentrate in the classroom.*

(Principal, Emfundisweni Primary School, 14 June 2012)

*You'll find that they do pay attention until 11:00am. Before [the feeding programme] you would find that they were waiting for the bell to ring so that they can go out and eat [lunch provided by the DBE] [...] it [the breakfast programme] sustains them until break-time comes.*

(Educator, Ithute Primary School, 19 June 2012)

*School started at 8am and [the DBE lunch] was only at 11:30am [...] now they are paying attention to the teachers and don't care about when [the lunch] is going to be.*

(Grade 6 Focus Groups, June 2012)

*They don't listen to the teacher because they don't eat at home – their parents don't have money to buy bread.*

(Grade 6 Focus Groups, June 2012)

In fact, Grade 6 learners attributed their improved energy levels and better performance at school directly to the TBF breakfast feeding programme. The insert overleaf is an example of an exercise Grade 6 learners were asked to complete during a focus group. Learners were asked to draw or write down how they felt before and after the programme began. In both instances, the learners linked their classmates’ improved concentration directly to the breakfast feeding programme.



Some children don't eat at home and they parent don't work so when they came at school they are hungry so they listen to the teacher. So they don't listen to the teacher because they don't eat at home they parent don't have the money to buy bread. We thank Tiger brand for giving us food in the morning and at the lunch we thank you Tiger brand for giving us food now we can listen to the teacher so now they parent can save money to buy supper food and they give us clothes to wear and like ~~out~~ to take it home to with our parent and we eat and sleep we thank you Tiger brand very much for giving our school food thank you Tiger brand.

Before the Tiger brands start other children we not ~~per~~ pay attention at the teacher because they can wait ~~this~~ long the school starts at 08:00 and the break is 11:30. So I was eating at home my heart was broken when I see other children on paying attention at the classroom and they always get lower marks ~~most~~ and I was the highest but beside that I'm eating at home. And Tiger brands feeding was a good choice and know I'm still the highest but know they are trying than before.

Now they are paying attention to the teachers they don't care anymore about the break time when it going to be I'm happy now.

**Figure 4: Graphics by Grade 6 learners, Ekukhanyisweni Primary School**

Improved class concentration and participation even when 2011 performance results indicate marginal or no improvement in learner grades is an interesting finding. Concentration and participation are short-term gains from improved nutrition (that is, learners are no longer distracted by hunger or have a lack of energy to participate in learning) and are critical to have in place if any longer-term gains are to be seen. In other words, school performance cannot improve without satisfactory levels of concentration and participation. This is expressed well by one learner:

*Other children don't eat at home, [therefore] they are not concentrating on school, so they get lower marks.*  
(Grade 6 Focus Groups, June 2012)

However, even when concentration and participation improve, gains may be limited by poor quality teaching, lack of learning support material and other factors that impact directly on school performance.

### **Conclusion: Educational performance**

While relatively marginal, there was an improvement in overall school performance amongst Grade R to Grade 3 learners as the year progressed. This was particularly true for learners in Grade R, suggesting that earlier interventions often lead to significant gains (Heckman, 2008). Across all schools and all junior grades, the fourth and final term results were higher than the year average, while the



first term results were generally lower. While not conclusive due to the many factors that affect performance, we can tentatively suggest that the TBF feeding programme positively influenced performance at the junior level.

Unlike their younger counterparts, there was little correlation between school performance and the school term amongst Grade 4 to Grade 9 learners. Whereas with the junior learners there was some indication that performance improved (albeit marginally) over time, the opposite seems to hold true for seniors. With the exception of Grade 5, grades generally decreased (also marginally) as the year progressed. As previously mentioned, many variables affect performance; this means no conclusions can be drawn about the impact of the feeding programme on performance of senior learners.

On the other hand, the qualitative data indicate that there was a unanimous perception that the feeding programme has had a positive effect on behaviour that is integral to school performance, specifically an improvement in attention span and in class participation.

### 4.3. School attendance results

Repeated absenteeism and late coming of both learners and educators in South African schools is not uncommon and has been blamed in part for poor school performance. Therefore an intervention that promotes punctuality and attendance is a welcome one. In this context, the third primary objective of the evaluation was to assess whether school attendance improved both in terms of late coming and absenteeism.

Quantitative data from school records were incomplete, with no late-coming data provided and very thin absenteeism data provided. Using the data available, analysis of absenteeism suggests that overall absenteeism rates were low across all six schools for both junior (Grade R to Grade 3) and senior learners (Grade 4 to Grade 9): fewer than one day per learner per term. There were no discernible patterns in terms of the average number of absenteeism days per term for either junior or senior learners although there was a slight increase in absenteeism in the third term for both. The absenteeism might be due to increased winter illnesses, as the third term coincides with the winter months.

Absenteeism data disaggregated by school show some differentiation between schools for junior learners (see Table 8). Absenteeism was highest for juniors at Ikage and Emfundisweni; these are also the schools that experienced a marked *increase* in absenteeism over the year: 74.44% increase from the first half to the second half of the year at Ikage and a 66.50% increase over the same period at Emfundisweni. Skeen Primary School showed the lowest degree of absenteeism, and the rate of absenteeism also *decreased* over the year by 14.01% for Skeen. Ithute Primary School saw an 17.54% decrease in absenteeism.

Absenteeism by school (frequencies)	Skeen	Ikage	Ithute	Emfundisweni
	Sum	Sum	Sum	Sum
Days absent (Terms 1 and 2 combined)	157	223	211	197
Days absent (Terms 3 and 4 combined)	135	389	174	328
<b>Total</b>	<b>292</b>	<b>612</b>	<b>385</b>	<b>525</b>
<b>% change (Term 1&amp;2 –Terms 3&amp;4)</b>	<b>-14,01</b>	<b>74,44</b>	<b>-17,54</b>	<b>66,50</b>

**Table 8: Absenteeism by school (frequencies) – Grade R to Grade 3<sup>6</sup>**

Data for senior learners are displayed in Table 9. Absenteeism increased in the third and fourth terms across all the schools, with the exception of Skeen and Emfundisweni Primary Schools. Pholoshu had an alarming 154.12% *increase* in absenteeism between the first

<sup>6</sup> Insufficient information regarding Ekukhanyisweni absenteeism data was available. Pholoshu has no junior learners.



and second half of the year. This may be either as a result of real absenteeism or due to sudden improvements in recording absenteeism in the latter half of the year.

<b>Absenteeism by school (frequencies)</b>	<b>Skeen</b>	<b>Ikage</b>	<b>Ithute</b>	<b>Emfundisweni</b>	<b>Pholosh</b>
Days absent (Terms 1 and 2 combined)	128	225	37	209	85
Days absent (Terms 3 and 4 combined)	69	270	51	145	216
<b>Total</b>	<b>197</b>	<b>495</b>	<b>88</b>	<b>354</b>	<b>301</b>
<b>% change (Term 1&amp;2 –Terms 3&amp;4)</b>	<b>-46,09</b>	<b>20,00</b>	<b>37,84</b>	<b>-30,62</b>	<b>154,12</b>

**Table 9: Absenteeism by school (frequencies) – Grade 4 to Grade 9<sup>7</sup>**

Differences in absenteeism between girls and boys in both junior and senior grades were slight.

In contrast to the inconclusive data from school records, educators and principals at all schools report that absenteeism has improved and attribute this to the TBF feeding programme, as suggested in the quote below:

*We have seen learners who used to be absent a lot changing their behaviour and coming to school.*  
(Educator, Ithute Primary School, 19 June 2012)

Pholosh Secondary School principal suggested that, '*Attendance is the most noticeable change*' as a result of the breakfast feeding programme and that, '*Learners come rushing to school*', while Ekukhanyisweni's principal suggests that the breakfast feeding programme has improved the attendance of older learners in particular. According to the Ekukhanyisweni educator (19 June 2012), there is also a better understanding of why learners were latecomers, as follows:

*We didn't understand why the learners were always late. The feeding programme changed many things [...] They won't tell you the truth that at home there is nothing, 'So I had to run around looking for food.'*  
(Educator, Ekukhanyisweni Primary School, 19 June 2012)

This is supported by a comment made by another principal, suggesting that the breakfast is perceived to be a critical reason to attend school. She expressed this thus:

*Even those learners who are sick come to eat breakfast, and afterwards you report to their parents that they are not well [and they go home].*  
(Principal, Emfundisweni Primary School, 14 June 2012)

Educators and principals were particularly vocal about improved punctuality, reporting that the provision of breakfast at school encourages learners to arrive at school on time because latecomers are refused breakfast. Examples of how this was expressed is as follows:

*Learners are enjoying it – they arrive early, especially on a Monday. They are hungry from the weekend with not enough food from home.*  
(Principal, Emfundisweni Primary School, 14 June 2012)

*Now they have started coming early because when they don't, the eating time is gone.*  
(Educator, Ekukhanyisweni Primary School, 19 June 2012)

<sup>7</sup> Data for term two for Ekukhanyisweni was too unreliable, so they were omitted from the analysis of absenteeism data.



Grade 6 learners suggested that the breakfast feeding programme has motivated them to both attend school and arrive at school on time. They reported this as follows:

*When you get to school late, you don't get the food.*  
(Grade 6 learner, Ekukhanyisweni Primary School, 19 June 2012)

*Now it is easier to come early because you know that you are going to eat at school.*  
(Grade 6 learner, Ithute Primary School, 20 June 2012)

Pholosho Secondary School principal even suggested that late coming at her school: *'[...] has been minimised compared to the school next door, where there are lots of late learners and no Tiger Brands Foundation programme [...] [At Pholosho, almost] no learners come after 8am.'*

An important issue, raised by a number of principals, needs further consideration: they said sometimes learners are late due to particularly difficult home circumstances, and further increasing their hardships by denying them breakfast is counter-intuitive to supporting those who are most vulnerable. A less punitive approach is needed in such circumstances.

### Conclusion: Absenteeism

While data from school records are inconclusive on absenteeism, educators, principals and learners report that absenteeism has decreased. They also believe that the provision of breakfast at school is an incentive to get to school on time, with a clear negative consequence if the learner is late.

## 4.4. Social and school development benefits

Physical and educational outcomes of any feeding programme are typically accompanied by secondary benefits or 'spin-offs' to the school and its surrounding communities. This section reviews the extent of social and school development benefits.

### School development benefits

Food handlers report that they have gained numerous skills and knowledge through this programme. Examples are, firstly, how to cook in large pots and measure the right amount of food required to cater for many people. As a result, they can use their skills at weddings or other private functions if they are requested to cook. Secondly, they have learnt that hygienic practice is essential to employ while cooking. Thirdly, they reported they have an improved knowledge of how to cook nutritiously and what the right kind of food is to eat. This has positive spin-off effects on their food preparation at home. Finally, they reported they now understand the importance of breakfast to learners. They suggested that they were previously unaware of the need for breakfast but that it has now been 'proven' through their observation of improved learner behaviour.

*TBF taught [us] to avoid fatty food and put less sugar in the porridge. [We] are very cautious of this as [we] cook.*  
(Food Handler Group Interview, Ekukhanyisweni Primary School, 19 June 2012)

Principals report that better nutritional knowledge has filtered up and down through the school community, improving the practices of principals themselves as well as improving parental knowledge of food preparation (in some schools the TBF held a food preparation training workshop for parents in 2011).

*It's not the intention of the programme to get children obese or diabetic – the programme is holistic. Some of us used to just pour sugar, and we now know that you have to eat [only a little bit].*  
(Principal, Ikage Primary School, 15 June 2012)



Teachers and principals suggested that the TBF in-school breakfast feeding programme had assisted in creating a sense of school community and resulted in the personal buy-in of teachers. They reported that they enjoyed accessing breakfast at the same time as pupils, even if this meant that they had to arrive earlier at school than would otherwise have been the case, indicated below:

*Staff give their time in the morning to be early for the programme, but they have made that commitment themselves on a voluntary basis.*

(Principal, Ikage Primary School, 12 June 2012)

Principals indicated that a small minority of teachers did not want to come early to participate in the breakfast feeding programme. This was addressed by involving parents in the classroom breakfast programme.

The breakfast programme has led to improved infrastructure at the schools. Five of the six schools received kitchen containers at either the beginning or halfway through the programme. This has impacted positively on schools beyond the provision of breakfast. The kitchen has ensured that preparing the DBE lunch has been made easier and more hygienic, and further the kitchen is viewed as an investment in the community as a whole.

*It's not for the school only; the kitchen is for the community. We have programmes running at the school – farewell functions for educators, learners, etc. It's where we cook for the whole school and staff, for Grade 7 learners and their parents, and at AGM functions we cook for the parents. It has become a societal benefit.*

(Principal, Skeen Primary School, 12 June 2012).

Principals also felt that the kitchen infrastructure gave their school a level of prestige in comparison to other schools. They felt that this contributed to their schools being seen as the schools of choice within the area – and this left them with a sense of pride.

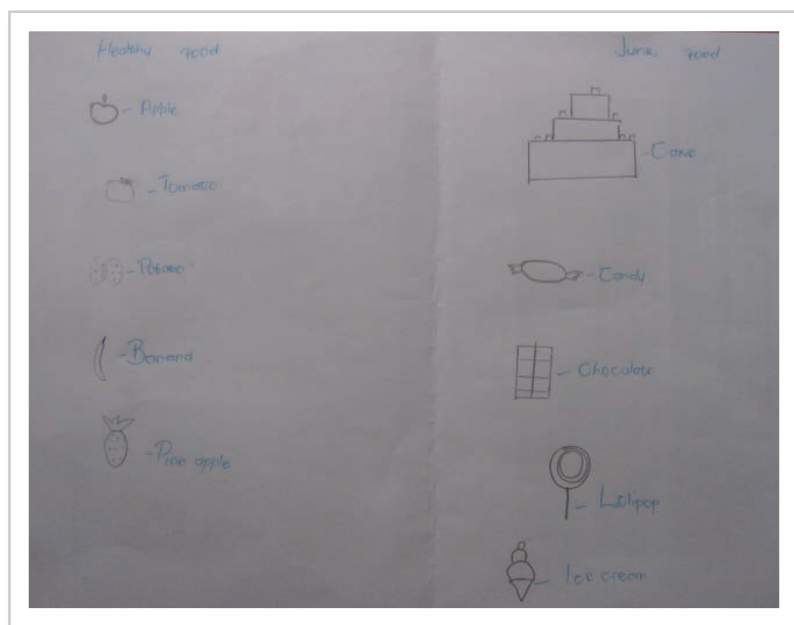
The mentorship and development of principals has been an important outcome of the TBF programme. They were exposed to a host of business management skills such as report writing, proposal writing, budget and performance management, and accountability training. These skills (necessary for running the feeding programme) can be relayed to other school activities. Principals have expressed their deep appreciation and enjoyment of this training and have further said that they feel extremely supported by the TBF, which holds individual meetings with principals every month to identify potential problems for that month and assist principals in dealing with challenges.

### **Social and community benefits**

The generation of knowledge of nutrition amongst children has been an important achievement. This knowledge comes from both their curriculum and a TBF booklet on “good foods” that they referred to. The following list and graphics were produced in the Grade 6 focus groups when learners were asked to identify healthy and unhealthy foods in one of the exercises.

- Cheese: Good food – it gives energy and is made with milk.
- Peanut butter sandwich: Brown bread is healthy and peanuts have fats so not so healthy.
- Chips: Bad food because it has fats and oils, which make us fat.
- Banana: Has vitamins and minerals. Fruit and vegetables are good.
- Sweets: Bad food because it has more sugar.
- Hamburger: It has meat fried in oil, which is bad food, but also lettuce and tomato, which are vegetables and have vitamins.

*Ekukhanyisweni Primary School Focus Group*



**Figure 5: Graphic by Grade 6 learner, Ithute Primary School**

The breakfast programme was implemented in a routine manner across the six schools, and children followed the same steps every day as part of the programme. These steps created a sense of occasion for learners, which the principals identified as positive. For example:

*When children eat, they are taught about etiquette. They need to wash their hands before they eat, they need to pray before they eat, they need to eat seated. We are also encouraging them to bring some small placemats, so it is like a child is eating at home.*  
(Principal, Ikage Primary School, 12 June 2012)

*We teach them the manners, like they mustn't talk while they are eating, and they must not leave the food unattended, so they must make sure that they eat and finish before they stand up.*  
(Educator, Ithute Primary School, 19 June 2012)

The breakfast feeding programme has institutionalised healthy eating habits – such as washing hands prior to eating – amongst learners. Learners report that they follow a similar routine for meals at home. However, at home it is harder to maintain these habits, as there are also chores associated with meals at home that do not feature at school; these chores include looking after siblings, preparing food for siblings and cleaning dishes and floors. As one learner said,

*Not all of us pray and wash our hands at home because others are at work, and others don't have parents, so they just eat.*  
(Grade 6 Learner Focus Group, Ithute Primary School, 20 June 2012)

Vulnerable members of the school community were supported as many schools had arranged for surplus food to be delivered to vulnerable learners and their parents. One school also periodically provided breakfast to community workers when they were in the vicinity.

*Sometimes when we have surplus, maybe five packets remaining, we just give it to those that are vulnerable so that they can eat at home.*  
(Principal, Ithute Primary School, 18 June 2012)



The programme has resulted in income generation opportunities for some in the community. Food handlers, mostly comprising unemployed parents, receive a stipend from the TBF in addition to the stipend they receive from DBE. School monitors, comprising post-matric youths between 18 and 22 years of age who cannot find employment, receive a small monthly stipend for working mornings at the schools.

The breakfast programme has created an entrepreneurial opportunity in that it has enabled a local small enterprise to expand its delivery business to include the collection and delivery of food to the pilot schools in Alexandra and the TBF feeding programme schools in other provinces. To date, three people have been permanently employed in an independent small enterprise as a result of the TBF programme.

## 5. Functionality and sustainability

### 5.1. Functionality

One of the key aspects of any evaluation is determining what lessons can be learnt from the implementation of a project, particularly a pilot project, and what aspects of the programme have worked well and where the programme has encountered challenges.

The TBF has adopted a learning approach to the implementation of the feeding programme and is willing to make adaptations where needed as the pilot progresses. According to the TBF Director, many of the challenges the TBF have experienced have been back-end (for example administration, procurement, etc.). The research suggests that the TBF reacted quickly to challenges that arose. Feedback on what worked well and where improvements can still be made are as follows:

1. Open communication and intentional relationship building between stakeholders has been fundamental to the TBF's evolving approach. As a result, government stakeholders suggest that the breakfast programme 'runs smoothly' and 'professionally' and would not change anything about the programme.

*DBE is delighted with the partnership [...] Their involvement and commitment is exemplary [...] There is good communication, how they roll out the programme is good, they have commitment to the programme, they are looking to be sustainable and not just a once off donation.*

(Personal Communication with NSNP official, 7 June 2012)

2. This is an example of a successful public-private partnership model. The TBF has worked closely with the NSNP to implement the feeding programme, and this is the first successful public-private partnership of this size with the department (Personal Communication with NSNP official, 7 June 2012).

*Learners benefit from both. NSNP can just give one meal – if a public-private partnership can add breakfast, that would benefit everyone.*

(NSNP official, 7 June 2012)

3. School stakeholders report that processes run smoothly and they would not change anything about the way in which the programme is run. Stakeholders also suggest that the breakfast is directed at the correct recipients.
4. The TBF should consider including a wider variety of food. Food handlers suggested including alternatives to the current menu, including milk, which children are reported to have enjoyed as part of the sandwich and milk programme. This would also be a highly nutritious addition.

*Milk is very important – and would be good to be included. If they could just add milk for the kids, they would definitely eat.*

(Food Handler Group Interview, 19 June 2012)



A NSNP official also suggests the inclusion of milk to the breakfast programme one or two days per week would be a welcome addition to the learners' current nutritional offering.

5. The different types of porridge vary in preparation time. This can cause logistical challenges. 'Brown' Mabele takes 30 to 40 minutes longer to prepare than instant porridge or oats. To ensure that the Mabele is thoroughly cooked in time for serving learners at 7:30am requires that food handlers arrive at school earlier than usual as the pots need to be put on to boil before 6:00am. Food handlers suggest that this is not always possible.

*As a result, Brown Mabele is not fully cooked when it is served. The pot also takes longer to warm up.*  
(Food Handler Group Interview, 19 June 2012).


6. Emfundisweni Primary School relies on electricity to cook breakfast because it already had this kitchen infrastructure prior to the introduction of the TBF breakfast feeding programme. However, there have been numerous power outages in Gauteng, and if these coincide with preparation times, the breakfast programme is delayed on that particular day. Ideally, gas hobs give schools more control over cooking times. All the other schools cook on gas hobs as it was this technology that was installed in the TBF financed kitchens.
7. Challenges exist in managing the food handler role. A number of issues emerge here. First, there are differences in remuneration policies between the TBF and the NSNP, causing tension (for example, the NSNP pays food handlers over the December-January holiday period, while the TBF does not). Secondly, the NSNP has a policy, to which the TBF has to adhere, that *new* food handlers are employed each year. This has negative effects on the programmes' functionality and quality, as a brand new team of food handlers has to be trained every January. It is felt that at least one 'senior' food handler in each school should stay on for longer and be recognised more formally, which will benefit the programme in relation to quality. Thirdly, the integration of the food handlers into the broader team has been difficult, and in some cases they feel undermined. It is important that building respect for food handlers as part of the team, by drawing them into food management teams and other stakeholder workshops, is prioritised.
8. Ensuring that withholding of breakfast from latecomers does not penalise the very vulnerable is a difficult process. Principals recognise that some of those that come late do so due to extremely difficult home circumstances and not through their own tardiness. Principals and educators need permission and training to treat the 'no late breakfast' policy with discretion in these exceptional cases.

## 5.2. Sustainability

The TBF has conceptualised the breakfast feeding programme as a three to five year intervention that is geared towards enabling schools to manage the implementation of the programme without TBF assistance (Personal Communication with Director, TBF, 15 June 2012).

The first three years are resource intensive for the TBF as the focus lies on helping schools to run the breakfast feeding programme smoothly and building capacity at schools from food handler to principal level. In year four, the programme's goal is for schools to be in a position to manage the programme with financial support from the DBE for food, stipends and cooking fuel. Currently, the DBE is moving away from its model that relies on tenders to provide schools with food to one where funds are transferred directly into school bank accounts (Personal Communication with Director, TBF, 15 June 2012). In year five, the TBF intends to act as a mentor and guide to schools and then to completely withdraw.

1. **Financial challenges:** Principals expressed confidence that their schools would be able to run the breakfast feeding programme without the TBF's help from a functionality point of view. However, they are anxious about the funding for the programme, which they are not convinced will be forthcoming from the DBE.



*We cannot run the programme on our own because parents are not supportive enough [financially]. If we found sponsors that would be okay, but parents don't contribute [...] We know how to run the programme. It's the money that is the problem*  
(Principal, Emfundisweni Primary School, 14 June 2012)

Principals expressed concern about their ability to provide learners with the same standard of food. They feel that children may withdraw from the programme if the quality of the food is perceived to decline.

2. **School monitors:** School monitors are now considered a key component of the programme because of their ability to identify challenges quickly and communicate these to the relevant people. A number of principals indicated that to run the programme smoothly, stipends would be required for monitors too.

*The educators and principals are in the classroom, so immediately where there is a problem, the monitor communicates with TBF. For example, where the pot was faulty, they communicated with TBF, and TBF brought technicians.*  
(Principal Ikage Primary School, 12 June 2012)

The efficacy of school monitors in an example like the latter relies on their link with the TBF and the TBF's resources to resolve such challenges. The continuation of this aspect of the school monitor role would need to be rethought if the TBF were no longer supporting the programme, especially given the acknowledgement by the NSNP that monitoring the feeding programmes is currently a challenge for them.

## 6. Conclusion and recommendations

The overall finding of this study is that the TBF has introduced a model of school nutrition into vulnerable schools in a way that respects the school staff, that intends to build capacity, and that is connected to rather than contrary to government programmes. The relationships and connections that have been built through the programme – such as those between the TBF and the school principals, and between the TBF and the DBE – should be seen as key success factors that are integral to similar future programmes and for scalability of the programme.

There were very positive and statistically significant nutritional changes over the period of the pilot programme, most dramatically in the reduction in numbers of overweight children and in stunting. Less substantial changes were seen in the reduction of the incidence of wasting (underweight-for-height and age), but there have been some improvements in this regard. While it is unclear whether these changes are directly attributable to the programme, and which other factors may have also influenced these changes, the TBF breakfast programme can be viewed to have contributed positively to the health and wellbeing of children participating in the programme.

Learner attendance and performance results are largely inconclusive, which is to be expected given the indirect relationship between nutrition and learner performance. Nevertheless, the educators and principals as well as the learners indicate a strong perception that the feeding programme does impact on children's ability to learn by improving concentration and participation in classroom activities. In addition, they also perceive the programme to have a strong influence on learner attendance and in reducing learner late coming. The lack of performance and attendance data is a key limitation of this study and points to the schools' lack of efficiency and capacity to handle additional administrative loads – something that should be taken into consideration should TBF embark on further monitoring and evaluation of the programme as it expands.

Linked with the TBF's philosophy of using the feeding programme to build local capacity, there are clear social benefits that are perceived by those involved in the programme. These include direct benefits to the school, such as strengthening the capacity of school principals and contributing to school infrastructure, as well as to the community, such as providing employment and business opportunities to



community members. A benefit that begins in the schools and extends beyond that is the increased knowledge of healthy foods that learners and food handlers expressed.

We can therefore conclude that:

- the TBF in-school breakfast feeding programme appears to have had a **positive influence on the key evaluation variables** (nutritional outcomes, learner performance and learner attendance at school);
- the programme is **highly valued** by all school stakeholders, including principals, educators, food handlers, learners and parents; and
- this evidence **supports the continuation and expansion** of the TBF breakfast feeding programme.

The TBF's school breakfast programme provides important evidence for social investment in the early years of life of disadvantaged children. Improved nutrition has multiple positive benefits for children in terms of improved health, cognitive abilities and promoting schooling. Early interventions of this kind serve to close the ability gaps between advantaged and disadvantaged children, are a valuable economic and social investment (Heckman, 2008) and could be an important mechanism for reducing the intergenerational transmission of poverty (Belli, Bustreo & Preker, 2005). Early interventions of this kind also reduce the cost to society of remedying disadvantage in later life. It is for these reasons that the CSDA recommends the expansion of the programme into other disadvantaged schools.

## Recommendations

The evaluation has the following recommendations for the replication and expansion of the TBF in-school pilot breakfast feeding programme.

### Strive towards sustainability

- School stakeholders recognise the need for the programme to be sustainable but will rely on further training and support from the TBF and concrete financial support from the DBE to implement the programme effectively in the future.
- The programme has the capacity to be sustainable if the DBE can assist schools with requisite funding for food and stipends, and if the TBF can conduct further fundraising training with principals. School officials must be willing to approach other sponsors to generate their own funding for the programme but seem to lack confidence in this area and may require further training on this.
- One of the challenges that schools experience with the DBE nutrition programme is the inconsistent quality of the food they receive. The sustainability of the TBF programme relies on the involvement of the DBE through the provision of funds. If the DBE does not implement a system where there is a direct transfer of funds to school, schools may experience food quality challenges similar to those currently being experienced by the DBE lunch programme. Poor quality food has limited appeal and therefore a potentially negative impact on the programme.
- School monitors have been established as an essential component of the breakfast feeding programme, providing an essential function that allows principals, educators and food handlers to focus on their respective areas of responsibility. Securing DBE or NSNP stipends for school monitors once the TBF withdraws from the programme will make it more sustainable.

### Improve monitoring and evaluation

- Beyond the pilot project, mechanisms need to be put in place for continued monitoring and evaluation of the feeding programme. The latter is necessary given the dynamic environment in which the programme operates.
- During the pilot phase, a number of issues arose around data collection, and these impacted on the efficacy of the data. The TBF could work with schools to develop systems for monitoring and evaluation of programmes through, for example, the creation of templates for schools to enter performance and attendance data on a monthly or term-by-term basis to facilitate data collection and further information on in-school breakfast feeding.
- The TBF could also work with the NSNP to develop stronger institutional components of the programme at national, provincial and district level. In this way, appropriate monitoring and evaluation can occur once the TBF has withdrawn from the programme and it is managed with NSNP funding. For example, the incorporation of school monitors into the programme has greatly facilitated functionality and quality control in the breakfast programme, and this strengthens the smooth running of the programme.



### **Enhance the functionality of the programme**

- The programme may need to consider introducing more food variety into breakfast for older learners – some stakeholders indicate that while younger children enjoy the porridges provided, older learners get bored with the repetition of the food provided.
- One principal suggested the provision of an 'official' eating space for children such as a dining room rather than the current classroom arrangements in order to further encourage or appreciate the ceremony associated with eating.
- Stakeholders suggest the provision of milk products with breakfast based on observations of learner enjoyment of milk and for its nutritional value. Additional sponsors could perhaps provide milk and milk products.

### **Recognise the role of food handlers**

- Although the TBF has focused on empowering food handlers, it needs to continue focusing on building the capacity and recognition of these individuals, so that they feel like equal partners in the process.
- Given the extent of poverty in South Africa, it is highly likely that there will be a continuous need for feeding programmes. The sustainability of the feeding programme relies on the services of caregiver volunteers, who act as food handlers at schools. It also requires knowledge of how the equipment operates, nutrition and hygiene. Given that feeding programmes will continue to be prevalent in South Africa on a long-term basis, government should consider the formalisation of food handler labour and remuneration.

### **Adapt the approach to accommodate late coming of vulnerable children**

- Particularly in light of the stakeholders' indication that latecomers are often some of the most vulnerable children with difficult circumstances at home, the TBF should consider establishing a different approach to vulnerable learners who arrive late. Not allowing them to eat may be counter-intuitive to the objectives of the feeding programme.
- Stakeholders suggest further engagement with caregivers of children over the cause of their late coming and/or a national government advocacy initiative promoting the importance of punctuality at school.

### **Work with the NSNP to foster departmental links**

- The TBF has fostered links between departments to facilitate holistic school development. One link that may be worthwhile exploring, based on the literature, is one between the NSNP and TBF feeding programmes and Department of Health deworming initiatives. Or, alternatively, exploring whether deworming could further improve educational and health outcomes in the South African context.

### **Rethink the TBF's programme refocus from urban to rural areas**

- The TBF has indicated that it is shifting focus by implementing feeding programmes only in peri-urban or rural schools and moving away from urban environments (Personal Communication with Director, TBF, 15 June 2012). While urban environments may be a more intensive commitment on the part of the TBF, withdrawing from township schools and focusing exclusively on rural schools may exclude those learners that are equally in need (although less obviously so). As has been discussed earlier, evidence suggests that in fact children in rural areas such as Limpopo may be more food secure than those living in very poor urban areas, possibly due to relatively greater access to arable land in rural areas. While the channelling of funds to contexts of greatest need should be supported, such decisions need to be based on assessments of political and situational circumstances.

### **Market the public-private partnership model**

- The public-private partnership approach used by TBF as a complementary and supportive feeding programme to the NSNP should be marketed as a successful model.
- The TBF could potentially act as a facilitator for other private sector players to become involved.



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## APPENDIX 1: List of in-depth interviews, group interviews and focus groups

### **In-depth interviews**

- Principal, Skeen Primary School, interviewed on 12 June 2012
- Principal, Ikage Primary School, interviewed on 12 June 2012
- Principal, Pholosho Combined School, interviewed on 13 June 2012
- Principal, Emfundisweni Primary School, interviewed on 14 June 2012
- Principal, Ekukhanyisweni Primary School, interviewed on 15 June 2012
- Acting principal, Ithute Primary School, interviewed on 18 June 2012
- Educator, Ekukhanyisweni Primary School, interviewed on 19 June 2012
- Director, Tiger Brands Foundation, interviewed on 15 June 2012
- Official, National School Nutrition Programme, DBE, interviewed on 7 June 2012

### **Group interviews**

- Food handlers, Ekukhanyisweni Primary School, interviewed on 19 June 2012
- Food handlers, Ithute Primary School, interviewed on 19 June 2012
- Educators, Ithute Primary School, interviewed on 19 June 2012

### **Focus groups**

- Grade 6 learners, Ekukhanyisweni Primary School, interviewed on 19 June 2012
- Grade 6 learners, Ithute Primary School, interviewed on 20 June 2012





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