

Chapter 2 Literature synthesis: School feeding programmes and products

2.1 Introduction

For millions of children today, hunger is one of the most pervasive and damaging phenomena; it has far-reaching effects on the development of both individuals and nations. Hunger negatively affects the brain development of children and impedes their chances of educational success later on. Hunger, poverty and poor education are interdependent. When children are hungry, chances that they will attend school are limited, and without education, their chances of breaking the poverty trap are significantly reduced (DoH 2005:27, WFP 2006). Research has indicated that both acute and chronic hunger affect children's access to school, their attention span, behaviour in class and educational outcomes. Studies have shown that children suffering from short-term hunger, as a result of skipping breakfast, for example, have difficulty concentrating in class and performing complex tasks (DoH 2005:27, WFP 2006).

Schoolchildren are particularly vulnerable to short-term hunger, especially where diets of poor quality are consumed. Factors such as the long distances children walk to school, having to complete chores before going to school and poor quality and quantity of meals consumed at home, contribute to hunger in schoolchildren. Children who come to school hungry have diminished attentiveness, a greater likelihood of becoming distracted and a lack of interest in learning, resulting in failure, low achievement and repetition (DoH 2005:32).

Although a child may be at school, he may not pay attention to a learning task if he is hungry. Even if there is a balance between the quality of teaching and the child's ability to learn, the actual time spent on the task is probably

the most critical component of learning. Relieving a child's hunger may improve his ability to concentrate and thereby facilitate learning. Children's memory may also improve so that they are more likely to learn (Grantham-McGregor 2005:S146).

Evidence indicates that hunger leads to psychosocial dysfunction in children, particularly increasing their levels of aggression and anxiety, indicating that hungry children are at greater risk of non-productive behaviour in class. Stunting, an indicator of chronic malnutrition, is widespread amongst school-age children, with negative effects on their education (WFP 2006:4).

Education, health and nutrition cannot be considered in isolation. A holistic approach to children's well-being should be followed (WFP 2006:4). Hunger is a barrier to learning and school feeding programmes throughout the world have successfully attracted children to school by offering them food or a nourishing snack. The primary objective of a school feeding programme is to provide meals or snacks to alleviate short-term hunger, thus enabling children to learn. School feeding programmes have proven effective in encouraging enrolment, increasing attention span and improving school attendance (Grantham-McGregor *et al.* 1998:785, UNICEF 2005).

2.2 History of school feeding

As early as 1790, a combined programme of teaching and feeding hungry children was begun in Munich, Germany, and in France in 1867, a school lunch programme for needy children was established in about 464 areas . In Norway, the Oslo Breakfast, introduced in 1897, consisted of half a pint of milk, wholemeal bread, cheese, half an orange and half an apple, and from September to March, one dose of cod-liver oil was included (FAO 2005:15). In the USA, the Children's Aid Society of New York began serving lunches to children at a vocational school as far back as 1853, and in Philadelphia the Starr Center Association began serving penny lunches in one school in 1894

(Gunderson 2007). The Netherlands became the first country to adopt national legislation specifically to provide school lunches in 1900. In Switzerland, lunches were provided by private societies to about eight percent of the primary school children. This was done to encourage school attendance by children who lived far from school and who were unable to go home for lunch (FAO 2005:15, Gunderson 2007). Dr Huber found that teachers supported the school feeding because of better attendance, improved attention and better scholastic work by the children. His findings and recommendations resulted in a national order being issued in 1903, making it obligatory for municipalities to provide food for children in need. In 1906, state funds were authorised for this purpose (Gunderson 2007). In 1905, the Education Provision of Meals Act was passed in England, the aim being to secure suitable meals for schoolchildren. This was the culmination of the efforts of 365 private charitable organisations (Gunderson 2007). An experimental programme, taking the form of a mid-morning lunch for elementary schools, was implemented in January 1910 in Boston and Chicago. By 1921, Chicago had the most intensive school lunch system in America, serving 31 000 children daily. By 1921, Los Angeles had also introduced a school feeding scheme, serving a snack at 10 a.m. or lunch at noon to underfed children. Lunches were sold at cost, but were given free to the children who were unable to pay (Gunderson 2007). By 1914, up to 50 Italian cities were conducting some form of school feeding programme. National school feeding schemes were introduced in the 1930s in the United Kingdom (UK) and the United States (US) with the explicit aim of improving the growth of children. In the UK, a programme that subsidised milk for schoolchildren was initiated in 1934, and milk was provided free from 1944 onwards (Gunderson 2007).

School feeding was introduced to South Africa in the early 1940s, providing free milk to white and coloured schools. In the late 1960s and early 1970s, this benefit was withdrawn from all, except for those children considered

particularly needy. This is an early example of the targeting approach in school feeding (Tomlinson 2007:4).

School feeding programmes are powerful tools for alleviating day-to-day hunger pains. It is suggested that giving children a daily breakfast at school may improve their scholastic achievement (Grantham-McGregor *et al.* 1998:785). Results of international studies indicate that breakfast makes such a significant contribution to a child's nutrient intake for the day, that a child who misses breakfast is unlikely to make up the deficit of nutrients during the rest of the day (Kruger *et al.* 2002:15). A study done in SA by Labadarios (1997:91) indicated that approximately one out of five rural and urban black primary school children, as well as urban coloured primary school children, do not eat breakfast before going to school and feel hungry as a result. Breakfast usually provides children with approximately one-third of their daily energy and other nutritional requirements. If the children have an inadequate breakfast at home, they may suffer from periods of hunger. The alleviation of short-term hunger may affect cognitive functions, such as memory and efficiency of information processing. Children's classroom behaviour, their attention and participation may also improve, and fidgeting may be reduced (Richter, Rose and Griessel. 1997:93, Grantham-McGregor *et al.* 1998:785, Roche 2000:3). Efforts targeted primarily at relieving short-term hunger should focus on providing breakfast or a small snack shortly after children arrive at school (Jamison & Leslie 1990:206). Richter *et al.* (1997:93) reported that developing countries experienced many problems in trying to isolate the effects of school feeding from other socioeconomic, cultural and educational factors. Food distribution programmes, including school feeding, are not always implemented sufficiently to show beneficial effects. Problems with regard to supply, administration, storage and delivery, *inter alia*, may occur. However, school feeding programmes can have numerous benefits. Children from poor families or marginal communities are frequently absent from school and this reduces the likelihood of their benefiting from educational activities.

2.3 School feeding programmes

School feeding is recognised as a way to improve children's nutrition and education and as a vehicle to fight disease. School feeding programmes throughout the world have successfully attracted children to school and have retained them by offering them food or a nourishing snack. Such programmes have indicated an increase in children's nutritional status, raised school enrolment, improved attendance, increased attention span and are solving community health problems. School feeding provides vital nutrients, and for many children the food they eat at school is the most nutritious they will get all day (IFPRI 2004a). School feeding could be seen as one of the key strategies in contributing to household food security, and should form part of a complete package to improve the health and general well-being of a child (DoH 2005:32).

School feeding programmes are effective in stimulating demand for schooling, particularly in settings where school attendance is low and where children come from rural, relatively low socioeconomic backgrounds. These programmes appear to contribute to improved attendance and enrolment when there is a good collaboration between the feeding programme design and the environment in which the programme operates (Levinger 2005:S171).

2.3.1 Aims of a school feeding programme (SFP)

Bennett (2003:14) distinguishes between five different types of SFPs, according to their objectives:

- School feeding as an emergency intervention;
- School feeding as a developmental intervention to aid recovery;
- School feeding as a nutritional intervention;
- School feeding to improve child cognitive development; and

- School feeding and short- and long-term food security.

The aims of nutrition interventions in primary schools are the following:

1. To contribute to the improvement of education quality and general health by:
 - Enhancing active learning capacity;
 - Alleviating short-term hunger;
 - Improving school attendance;
 - Improving punctuality;
 - Addressing micronutrient deficiencies; and
 - Controlling parasite infestations.
2. To improve nutritional knowledge, perceptions, attitudes and behaviour amongst primary school children, their parents and teachers.
3. To enhance broader development initiatives (WFP 2006, Greenhalgh, Kristjansson & Robinson 2007:859).

The main purposes of school feeding programmes, according to the WHO, are to:

- Alleviate short-term hunger in malnourished or otherwise well-nourished schoolchildren. This helps to increase students' concentration, producing higher levels of cognitive function and learning.
- Motivate parents to enrol their children in school and have them attend more regularly.
- Reduce absenteeism and increase the duration of schooling and performance. Dropout rates and school year repetition diminish with school feeding (WFP 2006).

School feeding must take place within the context of broad, national school reform programmes. Communities must be involved and must take responsibility for school feeding programmes from the beginning. This greatly

increases the likelihood of the success and sustainability of the programmes. They must be targeted towards the most under-served, food-insecure areas, with relatively low rates of school attendance (Drake, Maier, Jukes & Patrikios 2002:9-10, Greenhalgh *et al.* 2007:859). Vorster and Venter (1992:96) recommended that, in the planning of a school feeding programme, the role of socioeconomic factors in the nutritional status of the target group must be evaluated. This will influence the design of the programme, its implementation, and the response of children to the programme. It is suggested that a holistic or integrated approach should be selected, with maximum integration of nutritional intervention with other community development activities. Community participation in both design and implementation of the programme should be encouraged.

The provincial guidelines pertaining to the aims of school feeding in the Gauteng province are the following:

- To alleviate temporary hunger;
- To encourage broader initiatives;
- To encourage the self-sustainability of school feeding; and
- To implement interventions in the most cost effective and efficient way possible (Wentzel-Viljoen 2003:227, DoH 2001:4, DoH 2004:14, Tomlinson 2007:2).

2.3.2 Benefits of school feeding programmes

School feeding programmes are one of the main interventions used to address the challenge of reducing hunger worldwide. School feeding falls directly within the scope of the United Nations declaration and within the first three Millennium Development Goals (MDG 2000), namely:

1. MDG 1: Eradicate extreme poverty and hunger.

- Halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day - hunger perpetuates poverty by reducing productivity.
 - Halve, between 1990 and 2015, the proportion of people who suffer from hunger – poverty prevents people from producing or acquiring the food they need.
2. MDG 2: Achieve universal primary education:
- Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling – hunger reduces school attendance and impairs learning capacity and lack of education reduces earning capacity and increases the risk of hunger.
3. MDG 3. Promote gender equality and empower women:
- Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education, no later than 2015 – hunger reduces school attendance more for girls than for boys, and gender inequality perpetuates the cycle in which undernourished women give birth to children of low birth weight (FAO 2005:2, Tomlinson 2007:4).

If school meals are of good nutrient quality and quantity and the supply is efficient and continues for some time, problems regarding the children's underlying nutritional status, such as wasting and iron deficiency, should improve, which may lead to improved cognition and attentiveness. School meals could increase the amount of time children spend in school. Factors such as enrolment at the correct age, regular school attendance and punctual daily arrival at school are significant predictors of achievement levels. If school meals are provided in areas where poverty is severe, the cost to parents of sending their children to school may be reduced and thus enrolment and school attendance can be increased. Providing food to take home is an even greater incentive to extremely poor communities (Grantham-McGregor 2005:S145).

The Global Food for Education (GFE) programme has demonstrated how much can be accomplished through school feeding programmes. In Pakistan, where girls often marry young and stay at home, enrolment by girls in GFE schools increased by 32 percent because of the school meals and the tins of cooking oil provided as an education incentive to the parents. In the Lebanon GFE project, teachers reported that children have more energy, concentrate better and learn faster since school meals were introduced, while more parents learn the value of education, especially for their daughters (Grantham-McGregor *et al.* 1998:785).

According to Bennet (2003:15), the value and success of school feeding programmes depend on factors such as their timing, their relevance to the type, causes and extent of under-nutrition, the degree of community ownership of the programme, the infrastructure and management capacity for implementation, as well as the resources available to ensure sustainability.

The key concerns that need to be addressed when considering the option of school feeding are:

- Identify the possible goals for school feeding programmes (alleviate short-term hunger; increase enrolment and attendance; improve micronutrient status; improve learning outcomes; raise community participation; improve the general health and nutrition of both schoolchildren and their families when they include take-home rations).
- Identify and target population subgroups according to goals, and clarify who is targeted and why.
- Consider timing: a breakfast or morning snack is generally better than lunch for alleviating hunger and achieving learning objectives.
- Take into consideration when planning a school feeding programme: kilojoule intake, micronutrient content and cost effectiveness of fortification vs. supplementation and prior preparation vs. cooking on

site (Bennet 2003:16, IFPRI 2004b, Greenhalgh *et al.* 2007:859).

Nearly seven million children in 38 countries have been receiving school meals under the initiative of the United States Department of Agriculture (USDA 2003:1). The provision of school meals reduces the cost to parents of sending children to school. It is therefore likely that children will enrol earlier, their school attendance will be more frequent and they will be less likely to drop out, if meals are provided (Grantham-McGregor *et al.* 1998:785). School meals that are quantitatively and qualitatively adequate to reduce protein-energy malnutrition or micronutrient deficiencies significantly are expensive. However, even school feeding programmes that are less nutritionally adequate have shown significant positive effects on children's school attendance (Jamison & Leslie 1990:206). National (Table 2.1) and international studies show that by improving the nutritional status of toddlers and schoolchildren, learning, behaviour and growth are beneficially affected. Well-fed children are stronger, brighter and more cooperative (Roche 2000:2; Kruger *et al.* 2002:8-9) and as a result of consuming school meals together, children's social behaviour and their attitude to school may improve (Grantham-McGregor 2005:S156). Results of the Cochrane review on school feeding, including 18 studies, of which nine were performed in higher income countries and nine in lower income countries, indicated that children who were fed at school gained weight, increased their achievement in mathematics and improved in the performance of short-term cognitive tasks (Kristjansson, Robinson, Petticrew, MacDonald, Krasevec, Janzen, Greenhalgh, Wells, MacGowan, Farmer, Shea, Mayhew & Tugwell 2007).

Although feeding schemes may be a solution to the problem of undernutrition among school going children, such schemes should be well planned to be effective. Reitsma, Vorster, Venter, Labadarios, de Ridder and Louw (1994) evaluated the impact of a school feeding scheme in a primary school in Midrand and reported an unacceptably high prevalence of undernutrition, despite the feeding schemes. They recommended modifications to the

scheme and emphasised the need of nutrition education for the personnel responsible for the planning and implementation of the scheme, together with nutrition education of the children and their parents.

Table 2.1 South African studies conducted on the benefits of school feeding programmes (adapted from Roche 2000:2; Kruger *et al.* 2002:6).

Reference	Study population	Intervention	Results
Reisma <i>et al.</i> (1994)	50 Rural South African children aged 7-12 years in a private school, Midrand	Lunch served at 11am, hot meals or peanut butter and jam sandwiches, second helpings allowed.	Malnutrition still present in high number of children. Feeding scheme should be improved.
Richter <i>et al.</i> (1997)	55 undernourished rural South African children aged 7-14 years (test group); 53 well-nourished urban children 7-10 years (control).	Test group received a school breakfast of fortified cereals with milk and banana for 6 months.	The breakfast had a significant beneficial effects on cognitive and behavioural performance.
Van Stuijvenberg <i>et al.</i> (1997)	115 South African children aged 6-11 years (test group); 113 children in control group.	Cookies fortified with 60% RDA of beta-carotene, iodine and iron, and a drink with 90mg vitamin C, on school days for a one-year period (test group); placebo snacks (control).	Improvement in short-term memory and attention in test group and fewer illness-related absences from school.

If the food provides a well-balanced diet, it may not only improve children's nutritional status, but also help to develop good dietary habits for the future (Grantham-McGregor 2005:S156).

The following examples indicate the need for school feeding programmes:

- Despite the fact that there are huge numbers of children not attending school, there are in fact many more children attending school in the

developing world today than there were two decades ago. Because of its existing infrastructure, the school is, in principle, an important setting for the implementation of cost effective health and education interventions.

- School feeding programmes (SFPs) in principle improve educational outcomes such as increasing the number of years a learner spends in school. This has important implications for other health issues because the longer children stay in school, the less susceptible they are to certain problems such as contracting HIV or becoming pregnant teens (Bennett 2003:43).

2.4 School feeding globally

The following organisations are major role players in the current school feeding situation globally.

2.4.1 World Food Programme (WFP)

The principal objective in the WFP's Strategic Plan for 2006-2009 is 'Build Stronger Partnerships to End Hunger'. Partnerships with governments, United Nations organisations and both national and international private sectors and communities are crucial. In 2005, WFP collaborated with approximately 2200 NGOs in 74 countries (WFP 2006).

The WFP uses a thorough but flexible process to target specific schools or institutions. Firstly, food-insecure areas with the most urgent education needs are identified; these include schools with low enrolment, low school attendance, high dropout rates and notable gender disparity. The WFP apply additional criteria to ensure that the food aid is targeted at schools where it can be used most effectively and efficiently. These criteria include the possibility of forming effective partnerships with national and international agencies working in the same area, the guarantee of minimum hygiene

standards, community involvement, suitable storage and preparation of food, as well as the cost effectiveness of these projects (WFP 2006).

According to the WFP, the standard formula used to calculate the average serving size for pre-school and primary school meals for school feeding is:

- Pre-school children aged three to five years receive on average 6720 kilojoules (kJ) with 32 g protein.
- Primary schoolchildren aged six to twelve years should receive 8400 kJ with 40 g protein (WFP 2005).

The recommended level of protein is based on the average consumed in a local rural diet, assuming an 85 percent digestibility rating. When possible, the WFP uses a school breakfast or light mid-morning snack to boost student energy levels and help students concentrate on their lessons. Results have shown that school feeding and take-home rations, when used in combination, increase school attendance by at least 30 percent, enhancing learning opportunities and reducing dropout rates (WFP 2006).

The number of beneficiaries reached by the WFP was increased to 21.7 million children by 2005 and the aim was to reach 50 million children by the end of 2008 (WFP 2006). Table 2.2 indicates the number of children receiving school feeding provided by the WFP in 2005.

USAID/Haiti has been experimenting with nutrient-rich snack biscuits made from surplus grains, which not only reduce the need for cooking and other preparation at the school, but also provide micronutrients necessary for healthy growth (Drake *et al.* 2002:9). According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), almost 18 percent of schoolchildren in Kenya, for example, suffer from chronic stunting, with a further 34 percent showing mild to moderate growth retardation.

Table 2.2 Children receiving WFP school feeding globally (WFP 2006)

Country	Girls receiving school meals	Boys receiving school meals	Total children receiving school meals
Asia			
Bangladesh	406 288	399 068	805 356
Cambodia	258 306	285 990	544 296
Timor Leste	865	866	1 731
India	388 326	430 057	818 383
Indonesia	284 871	300 680	585 551
Nepal	244 342	233 389	477 731
Sri Lanka	69 156	75 799	144 955
Thailand	6 055	5 200	11 255
Middle East, Central Asia and Eastern Europe			
Afghanistan	485 579	728 368	1.213 947
Algeria	14 925	16 398	31 323
Armenia	14 711	14 929	29 640
Egypt	129 853	128 041	257 894
Georgia	2 271	2 373	4 644
Iraq	513 839	709 816	1223 655
Pakistan	55 000	55 000	110 000
Russian Federation	76 708	77 673	154 381
Tajikistan	140 925	166 896	307 821
Yemen	630	770	1 400
Latin American and Caribbean			
Bolivia	49 485	52 115	101 600
Colombia	74 082	75 962	150 044
Cuba	202 265	210 522	412 787
Dominican Republic	22 374	26 812	49 186
El Salvador	61 652	66 788	128 440
Guatemala	37 172	38 529	75 701
Haiti	152 563	140 827	293 390
Honduras	178 680	286 010	364 690
Nicaragua	184 855	195 534	380 389
Peru	2 077	2 166	4 243

Nutritional deprivation was found to be much more prevalent in arid and semi-arid land areas. It is not uncommon for only one meal to be prepared daily and for children to go to school without eating breakfast. The school

feeding effort in Kenya has confirmed that food is an effective incentive to attract children to school (WFP 2006). In Kenya, biscuits and porridge have been used in school feeding programmes. As part of the school feeding programme, a nutritious drink and high-energy biscuit are given in the morning with porridge added at lunchtime. All food is fortified with vitamins and minerals so that the two meals provide approximately two thirds of the daily micronutrient requirements for children (Hertz 1995).

The Ecuadorian government provides \$25 million each year to deliver breakfasts and lunches to 1.5 million schoolchildren in 15 000 schools through the school feeding programme. Ecuador is a low-income, food-deficit South American country that includes the Galapagos Islands. The school feeding programme is an intervention aimed at children between the ages of five and 14. With food as an additional incentive for attending school, attendance rates are significantly higher, with lower dropout rates. Once in school, a well-nourished child has a greater capacity for learning, with a longer attention span, better concentration and higher retention (Hertz 1995).

In Cameroon, a low-income food-deficit country, the ration distributed amongst schoolchildren is approximately 3000 kJ, with 18 grams of protein and 21 grams of fat, representing 30 to 35 percent of the energy intake recommended for schoolchildren according to UNESCO norms. This ration, supplemented with fresh condiments and vegetables supplied by the local community through school management committees or parents' associations, is served in the morning and in the afternoon. Enrolment levels of girls targeted in the Cameroon school feeding programme have increased by 16 percent over the last three years and by nearly 50 percent since the start of school feeding by the WFP (IFPRI 2004a).

The government in Bangladesh, with the assistance of the United Nations World Food Programme, initiated a school feeding programme in 2002. A mid-morning snack consisting of eight fortified wheat biscuits was provided to

approximately 1.2 million primary school children in food-insecure areas. The biscuit provided 1260 kilojoules (kJ) and 75 percent of the RDA of vitamins and minerals. By providing the fortified biscuits to schoolchildren, Bangladesh has raised school enrolment by 14.2 percent, increased school attendance by 1.3 days a month and reduced the probability of dropping out of school by 7.5 percent. In Bangladesh, participation in the programme raised children's body mass index (BMI) by an average of 7.5 percent and participants scored significantly higher on an achievement test than non-participants did. Mothers also reported that their children were livelier and happier and had greater interest in their studies than before participating in the school feeding programme (IFPRI 2004a).

During the last 40 years, the WFP has become the largest international implementer of Food for Education (FFE) programmes in the developing world. In 2005, FFE programmes reached approximately 21.7 million beneficiaries in 72 countries (WFP 2006) and in 2007, 2.7 million schoolchildren benefited from take-home rations that supported the retention of children in school (WFP 2006). All FFE programmes assisted by the WFP are designed to support equitable access to education amongst the most vulnerable and food-insecure population groups. Table 2.3 indicates the number of school children in Africa supported by the WFP. By supporting FFE programmes that provide school feeding and/or take-home rations, the WFP intends to support efforts aimed at achieving universal primary education and reducing gender disparities in education (WFP 2006, Gelli, Meir & Espejo 2007:149).

Over the past 40 years the FFE programmes have been handed over to host governments in more than 30 countries, enabling WFP to focus its efforts on a growing number of children and schools most in need (WFP 2006).

Table 2.3 Children receiving school feeding from WFP in Africa (WFP 2006).

Country	Girls receiving school meals	Boys receiving school meals	Total number of children receiving school meals
West Africa, East and Central Africa			
Burkina Faso	37 065	48 053	85 118
Cape Verde	47 598	55 377	102 975
Côte d'Ivoire	421 292	586 868	1008 160
Guinea	89 728	129 120	218 848
Liberia	221 318	253 988	475 306
Mali	43 260	52 063	95 323
Mauritania	63 248	51 748	114 996
Niger	22 059	30 497	52 556
Senegal	121 231	137 626	258 857
Sierra Leone	173 989	211 472	385 461
Benin	14 185	18 640	32 825
Cameroon	29 468	44 202	73 670
Chad	39 422	51 755	91 177
Burundi	33,991	38,879	72,870
Congo (Dem. Rep.)	90 597	75 050	165 647
Congo (Rep. of)	9 943	11 141	21 084
Djibouti	4 369	6 515	10 884
Eritrea	37 384	56 911	94 295
Ethiopia	277 540	360 492	638 032
Kenya	850 589	971 940	1822 529
Rwanda	130 383	125 284	255 667
Somalia	3 000	7 000	10 000
Tanzania	91 345	100 425	191 770
Uganda	217 450	232 743	450 193
Sudan	226 645	254 686	481 331
Southern Africa			
Angola	79 265	84 172	163 437
Lesotho	82 305	73 099	155 404
Madagascar	32 151	29 225	61 376
Malawi	111 225	102 669	213 894
Mozambique	76 770	140 468	217 238
Swaziland	34 246	31 461	65 707
Zambia	83 216	80 980	164 196
Zimbabwe	577 550	533 124	1110 674

2.4.2 Food and Agriculture Organization (FAO)

The WFP collaborated with the FAO in supporting countries implementing the Home Grown School Feeding Programme (HGSFP) launched in September 2005 and led by the New Partnership for Africa's Development (NEPAD). This is one of NEPAD's leading programmes and is aimed at increasing food supply and reducing hunger by using locally produced food, promoting school gardens and incorporating agriculture into the school curricula (WFP 2006).

2.4.3 United Nations Children's Fund (UNICEF)

The WFP collaborates with UNICEF to support the provision of water and toilet facilities in 30 countries, as well as hygiene education in 23 countries (WFP 2006).

2.4.4 World Health Organization (WHO)

The WFP worked jointly with the WHO, which provided technical assistance for WFP-supported de-worming programmes for schoolchildren in 31 countries (WFP 2006).

2.4.5 World Bank (WB)

The World Bank's collaboration with the WFP focuses on the preparation of strategy papers aimed at poverty reduction, Food for Education Programmes, food aid distribution to HIV/AIDS-infected people and their families, and post-disaster reconstruction (WFP 2006).

2.4.6 Private sector partnerships

The WFP's largest global corporate partner and donor to school feeding programmes is TNT (Thomas Nationwide Transport) (WFP 2006). TNT is a

global business that serves 200 countries, and is publicly listed on the stock exchange of Amsterdam. The partnership was contracted in 2003 and TNT and the WFP have worked together on numerous projects concerning transfer of knowledge and competence, offering on-site logistic support and participating in several fundraising events. This initiative has implemented more than one thousand school-based projects, including construction of kitchens, storerooms, classrooms, toilets, water tanks/ wells, fuel-efficient stoves, and school gardens (WFP 2006).

2.4.6.1 Tetra Pak

Tetra Pak, a global packaging supplier, established a special unit in 2000, the Food for Development Office (FfDO), which helps coordinate the company's involvement in school feeding programmes. Through public and private partnerships, the company contributes logistical and management support to school programmes. Tetra Pak provides milk to 43 million children, of which 40 percent live in developing countries. In the developed world, the company provides support to governments and NGOs involved in launching feeding schemes (Dairy Reporter 2007).

2.4.7 National School Lunch Program (NSLP)

The National School Lunch Program (NSLP) in the USA has provided meals to students since 1946, and currently provides food to 30 million children. It is overseen by the United States Department of Agriculture (USDA), and provides approximately one third of the Dietary Reference Intake (DRI) (USDA 2003:1) for schoolchildren. Children from low-income families are eligible for free or reduced-price meals (USDA 2003:1, Mahan & Escott-Stump 2004:247, Gunderson 2007, Woldow 2008).

2.4.8 World Initiative for Soy in Human Health (WISHH)

The humanitarian projects under WISHH promote the use of value-added soya products to fight world hunger. Soya is an abundant, economical protein source and offers numerous additional health benefits. WISHH currently has programmes in the Ivory Coast, where the pilot project involves the evaluation of textured soya protein in school feeding programmes. In Honduras, a soya nutrition programme aiming to demonstrate the consumer acceptability and health benefits of soya protein products was introduced in 2003. WISHH donated textured soya protein and soya protein isolate to Senegal for use in its school feeding programme funded by the USDA, and provided technical support to staff in the form of food training and consumer acceptance training. Moreover, WISHH assists countries such as Mozambique, Botswana, Kenya and Afghanistan by providing training and assistance where needed (WISHH 2008).

2.5 School feeding in Africa

2.5.1 NEPAD

The New Partnership for Africa's Development (NEPAD) is a vision and strategic framework for Africa's renewal that was adopted by the Organization for African Unity (OAU) in 2001 (Tomlinson 2007:22-23).

NEPAD's School Feeding Programme is designed to stimulate local production through the purchase of locally produced food for schools. Local small-scale farmers will be given the opportunity, along with initial assistance, to provide schools with the necessary food products. The Home Grown School Feeding Programme aims to ensure adequate nutrition for school going children through diet supplementation with a complete meal that is adequate in energy, protein, vitamins and minerals (NEPAD 2003).

Some of the primary objectives of NEPAD are to eradicate poverty, to enable African countries to develop and ensure sustainable growth and to accelerate the empowerment of women. One of NEPAD's key programmes is food security and nutrition. Part of its philosophy is to acknowledge that, in order to alleviate hunger and undernutrition, long-term solutions are impossible to reach without short-term solutions. NEPAD aims to increase children's direct access to food through school feeding programmes, with a target of 50 million children of school going age by 2015. The reason NEPAD gives for this focus on school going children is the improvement of nutritional status in the formative years. Since primary education is compulsory in most African countries, children can be more easily reached through the schools; therefore, schools can be used as efficient distribution centres. According to NEPAD, school feeding will enhance enrolment and attendance, which will improve literacy (particularly for girls), an important component of poverty reduction (Bowley 2005/3:4, Tomlinson 2007:22-23).

2.5.2 Joint Aid Management

Joint Aid Management (JAM) is a South African-founded, non-profit, Christian relief and development organisation with 22 years' experience in sustainable development (JAM 2004). JAM's programmes focus on nutritional feeding, school feeding, assistance to orphans and vulnerable children, the provision of water and sanitation, as well as skills development and community training. JAM currently assists more than 350 000 children (see Table 2.4) through their nutritional feeding programmes in five different African countries: Angola, Mozambique, Rwanda, South Africa and Sudan. JAM's nutritional feeding programmes are mainly focused on schools; by supplying nutritious food at the schools, it hopes to achieve its main objective, which is to encourage malnourished children to attend school and broaden their education. These programmes prove to be valuable incentives for stimulating school attendance. JAM distributes 100-150 g of food rations to beneficiaries daily. This food ration is a porridge-type blend made of corn, sugar, soya

beans and micronutrients. This provides children with 70 percent of their RDA, as determined by UNICEF. The food is manufactured at JAM's food factories in Beira, Mozambique, and in Benguela, Angola (JAM Report 2006).

Table 2.4 JAM school feeding programme (Adapted from the JAM Report 2006).

Country	Number of schools receiving school feeding	Beneficiaries
Angola	424 schools	183 051 children
Mozambique	606 schools	216 511 children
Sudan	10 schools	2 501 children
South Africa	21 schools	10 521 children
Grand total:	1061 schools	412 584 children

In total, 1 126 programmes and 427 155 children receive school feeding (JAM Report 2006).

2.5.2.1 Joint Aid Management programme in South Africa

JAM currently feeds 10 521 children in the Orange Farms region in primary and intermediate schools; their goal, however, is to feed 350 000 children in South Africa (JAM Report 2006).

The following community and school upliftment programmes in the Orange Farm area in South Africa have been established:

- The development of a training centre to train community HIV/AIDS representatives as well as offer agriculture, computer sciences and other skills development courses;
- The development of community and school gardens;
- Renovations and development of sport facilities for schools and the community;
- A multimedia centre, including a community internet café (JAM Report 2006).

2.5.2.2 School feeding operations and monitoring

The following monitoring systems, based on the World Food Programme model, are being used by JAM:

- The ration is distributed either bi-weekly or monthly;
- The more remote and isolated rural schools receive their rations monthly;
- Rations are delivered to the school and stored appropriately;
- Rations are distributed to the learners by an appointed person before the day's classes begin or during the first break;
- The rations and distribution are recorded by the school in the JAM monitoring report book; and
- At the end of each year, a baseline survey is conducted and the results compared with the original baseline survey.

The evaluation of the impact and the success of the school feeding programme is very important and is done through feedback as well as the above-mentioned baseline survey carried out at the end of each school year.

Some of the results since Jam's nutritional school feeding model has been implemented include the following:

- Increase in school enrolment;
- Increase in the enrolment of girls and
- Improved scholastic results (JAM Report 2006).

2.5.3 School feeding in South Africa

2.5.3.1 Primary School Nutrition Programme (PSNP)

In 1994 President Nelson Mandela introduced school feeding on a national scale in SA as a lead project of the Reconstruction and Development Programme (RDP). The objectives of the Primary School Nutrition

Programme (PSNP) were: to improve the health and nutritional status of South African primary school children, by provision of a nutritious snack; to alleviate temporary hunger in order to improve school attendance; and to improve the learning capacity of children, which would lead to an improvement in the quality of education (Labadarios 1997:91, DoH 2004:14, Tomlinson 2007:2). The National Committee on Nutrition was appointed in August 1994 by the Minister of Health to develop a nutrition strategy for South Africa. The Committee considered the multi-sectoral and complex causes of undernutrition and recommended an Integrated Nutrition Strategy (INS). The INS has been adopted in the Department of Health's White Paper for the Transformation of the Health System in South Africa and has been transformed into the Integrated Nutrition Programme (INP) for South Africa. The INP is implemented as a fundamental part of the Primary Health Care (PHC) and aims at improving the nutritional status of all South Africans (Wentzel-Viljoen 2003:205) through integrated nutrition activities (DoH 2002:20).

Initially the scope of the school feeding programme was summed up as follows: "The provision of an early snack, meeting 25 percent of the energy requirements of 3.8 million children (50 percent of primary school children) in areas targeted on the basis of the poverty criteria". The aims in providing an early-morning snack are primarily to contribute to pupils' active learning capacity, school attendance and punctuality, and to alleviate short-term hunger (Labadarios 1997:91, Tomlinson 2007:2, NSNP 2008).

Annually, the PSNP in SA reaches around 5 million primary school children in geographic areas with high levels of poverty (Roche 2000:3, Steyn & Labadarios 2005:333). The vision of the PSNP is to have a self-sustained school nutrition programme, which is not dependent on funds from the government. To ensure that hunger is effectively alleviated, the snack should be substantial and contain foods that take longer to digest. Table 2.5 depicts the aim and objectives of the PSNP (DoH 2001:3). The programme nowadays aims at providing 25 percent (i.e., a snack and not a full meal) of

the RDA of energy for children between the ages of 7 and 10, and not less than 20 per cent of the RDA of energy for children between the ages of 11 and 14 (McCoy *et al.* 1997:2). The snack provided at school ensures that children are less hungry while having to learn and therefore concentration and learning capacity are increased. The remaining 75-80 percent of the child's daily nutritional needs is still the responsibility of the parents (DoH 2001:4). For the period 1997-1999, there has been a net reduction in the funds allocated to the PSNP, which is the reason for the reduction of the recommended percentage of RDA for energy in the school snack from 30 percent to 20-25 percent (McCoy *et al.* 1997:90, Wildeman & Mbebetho 2005:23).

Table 2.5 Aim and objectives of the PSNP in South Africa (DoH 2001:3).

Aim	Objectives
To alleviate temporary hunger	<ul style="list-style-type: none"> • To determine the hungry school children per grade younger than 14 years • To feed children 100 percent of the feeding days • To feed children daily before 10:00 • To increase by 1 percentage the concentration span of the children being fed

During the period from 1995 to 2000, the number of participating schools was reduced by 15.4 percent, while learner numbers were reduced by 29 percent. After 2000, the number of participating schools was increased from 16 200 in the 2000/2001 period to 17 000 in the 2003/2004 period. According to the 2004/2005 data, learner numbers are still rising, with seven percent more learners participating in the school nutritional programme than originally planned (Wildeman & Mbebetho 2005:3). In 2005/6, the DoE reported that 4.9 million learners from Grade R to Grade 7 received feeding and that nearly 90 percent of the R1.1 billion allocated to the programme was utilised. Furthermore, part-time jobs were generated for 29 222 women, who prepared and served the meals (NSNP 2008).

2.5.3.2 National School Nutrition Programme (NSNP)

The Department of Health managed the PSNP from 1998 to 2004. In April 2004, the responsibility for school feeding in South Africa was transferred to the Department of Education and the programme was renamed the National School Nutrition Programme (NSNP) (van Stuijvenburg 2005:S214, Tomlinson 2007:13).

The NSNP is based on the following legislative framework:

- The Constitution of the Republic of South Africa, 1996 Act 108 of 1996, Section 28 (c) of the Bill of Rights;
- The United Nations (UN) Convention on the Rights of Children as ratified by the Republic of South Africa on 1 May 1996;
- The National Programme of Action for Children launched by the Government in May 1996;
- The South African Schools Act 84 of 1996, Section 34 (1); and
- Targeting of schools for school feeding, as informed by the Norms and Standards for Funding of Public Schools, General Notice 2362 of 12 October 1998 (NSNP 2008).

The NSNP is funded from a conditional grant allocated to provinces according to the Division of Revenue Act (DORA), Act No. 7, 2003, as well as other directives from the Department of Education and National Treasury (NSNP 2008).

2.5.3.3 Targeting criteria of NSNP

Since the focus of school feeding is on addressing short-term hunger that is a direct result of poverty, the targeting strategy for school feeding is to identify geographic areas where poverty levels are high, to prioritise these areas according to the severity of the poverty, and to focus on rural and informal

settlements when identifying needy schools within the selected geographic areas. The current policy and implementation guidelines for school feeding provide for the inclusion in school feeding of Grade Reception (R) learners in the school system. The NSNP will target primary school learners from Grade R to Grade 7 (NSNP 2008).

2.5.3.4 Objectives of the NSNP

The NSNP has the following objectives: to contribute to the improvement of the quality of education by enhancing primary school children's active learning capacity, their school attendance and punctuality, through the temporary alleviation of hunger; to improve knowledge regarding nutrition and perceptions, attitudes and eating patterns amongst primary school children, their parents and teachers through education (either as part of the general education curriculum or through other primary school education feeding initiatives); and to enhance broader development initiatives, particularly in the area of small business development, economic empowerment and the combating of poverty (NSNP 2008).

Since the nutrition programme was transferred to the Department of Education, the feeding scheme has been further developed to include a school food-garden project (NSNP 2008), and seven thousand food gardens have been established in schools to date (Polity 2007). The food gardens were implemented with the support of the Department of Agriculture, local authorities and NGOs; they are used not only to produce meals for learners but also to teach them about food production and management (NSNP 2008).

In a speech in June 2007, the Deputy Minister of Education, Mr. M. E. Surty, commented that NSNP is being successfully implemented in most provinces with nearly six million learners in 18 039 schools being provided with meals nationally (Polity 2007).

2.5.3.5 The Integrated Nutrition Programme (INP)

In 1998, the Department of Health in South Africa developed the existing nutrition programme into the INP for South Africa (Labadarios *et al.* 2005:100). The integration of the school nutrition programme with the INP happened over a six-year period, from 1998/1999 to 2003/2004 (Wildeman & Mbebetho 2005:14). The INP aims at facilitating a coordinated intersectoral approach to solve nutritional problems in South Africa. All nutrition policies, strategies and interventions in South Africa should follow the application of the fundamental nutrition programming process of assessment, analysis and action. The emphasis is on building the long-term capacity of communities to be self-sufficient in terms of their food and nutritional needs while simultaneously improving and protecting the health of women and young children, which is considered vulnerable. To contribute to the success of the programme, intersectoral collaboration and cooperation with other departments, such as health and private sectors as well as non-governmental organisations, is necessary. Building knowledge and skills within communities and within government structures is an important factor that contributes to the success of intervention programmes (DoH 2004:12, DoH 2007).

For the period 1999-2004, the INP focused on the following strategies:

- Contribution to household food security;
- Disease-specific nutritional support, treatment and counselling;
- Growth monitoring and promotion;
- Nutritional promotion, education and advocacy;
- Promotion, protection and support of breastfeeding;
- Control of micronutrient malnutrition;
- Food service management; and
- A nutritional intervention programme for people affected by the human immunodeficiency virus (HIV), the acquired immunodeficiency

syndrome (AIDS), and tuberculosis (TB) (DoH 2002:20, Labadarios *et al.* 2005:100, Bowley 2005/3:7).

The INP prioritised the long-term strategic priorities for the period 2004-2009 and focuses on the following:

- Promotion of healthy lifestyles;
- Reduction of child mortality;
- Improvement of the health of youth and adolescents;
- Maternal mortality reduction;
- Decreasing malnutrition;
- Reduction of the spread of HIV through nutrition interventions;
- Nutrition interventions for people living with TB and chronic debilitating diseases; and
- Emphasis on Millennium Development Goals and targets (DoH 2007).

2.5.3.6 Differences in implementation of school feeding programmes in South Africa

Wentzel-Viljoen (2003:358) noted that provinces have the prerogative of deciding on the types of menus they would like to serve, as well as the price per menu per learner per day, provided that the national criteria are met in terms of nutritional, social and logistic guidelines. Local eating habits of the community are usually taken into account when menus are compiled. A cooked or non-cooked menu or a combination of the two may be served. The food cost of a cooked menu is usually lower than that of a non-cooked menu, but requires more volunteer workers to prepare the food. The national guidelines state that school feeding should provide the maximum energy at the lowest cost. When deciding on the type of menu, each province should take into account its own circumstances and the infrastructure and resources available for implementing the programme.

The following differences exist in the ways in which provinces implement their SFPs.

- In the Western Cape Province, there are three service providers (which won tenders). The largest is the Peninsula School Feeding Association (PSFA), which is the largest non-governmental and non-profit organisation in South Africa exclusively involved in school feeding.
- In the Eastern Cape Province, there are more than 3 000 service providers. The aim of their approach was to stimulate the growth of small businesses and income generation.
- Schools in rich provinces like Gauteng and the Western Cape feed their children five days a week and coverage is from Grade R, which is the year prior to the first year of school, to Grade 7, which is the last year of primary school (Tomlinson 2007:3).

Coverage is worst in South Africa's poorest province and best in its richest. In some cases, because of budget constraints, grades receiving school feeding have been cut to Grades 1 to 4 only. There are a number of schools in South Africa that practise individual targeting, as opposed to school targeting, providing food only for particular children in schools rather than for all children in a targeted school (Tomlinson 2007:3).

2.6 Products used in school feeding

The choice of foods for inclusion in a school feeding programme should be based on the following criteria:

- Food items with a high nutritional value, rich in energy, proteins and micronutrients and moderate in fats and sugar, should be included. Food enrichment may be necessary to achieve the required amounts of vitamins and minerals;
- Food items with a long shelf life, easy to store, prepare and serve with

minimal waste, are the most practical option;

- Food items that are acceptable to children, with an attractive appearance and taste and a variety of flavours, are the ideal; and
- Affordable food items from local raw materials should be identified for inclusion in school feeding programmes (Nutriview 2000/2:4).

2.6.1 Products used in school feeding globally

Children across the world have different tastes and customs. The World Food Programme (WFP) delivers fortified corn soya blend (CSB) for school feeding projects across the world. In the Lao People’s Democratic Republic, villagers follow some unique recipes to prepare it. The cooks, who are usually the mothers of the schoolchildren involved, steam the CSB in a wok over a stove or open fire. Local ingredients such as pumpkin or bananas are added, creating different flavours. Adding coconut, or wrapping the CSB in a parcel of banana leaves before cooking, adds to the taste and nutritional value and is a creative food preparation method (WFP 2006). Table 2.6 illustrates the different food items (either raw or cooked) distributed to children in school feeding programmes (Nutriview 2000/2:3).

Table 2.6 Examples of nutritious food items suitable for use in SFPs (Nutriview 2000/2:3)

Food item	Protein source	Preparation
Enriched cereal, bars, cakes and biscuits	Soya and/or milk powder	Direct from the packet
Ready-to-eat enriched breakfast cereals	Milk	Add liquid before consumption
Instant meals	Soya, milk, cereals	Add boiling water and stir
Dry soup mixes	Soya / bean / pea flour	Add water and boil for a few minutes
Milk beverage powders	Soya and/or milk powder	Add cold water and stir
Long-life enriched milk and yoghurt	Milk	Individual servings (200-300ml)
Enriched nectars and juices	Fruits and vegetables	Individual servings (200-300ml)
Fruit-flavoured drink mixes	All types of fruit	Add cold water and stir

It is evident from the above literature that similar products are used worldwide for inclusion in school feeding programmes. Easy preparation is the key factor and therefore most of the products used are instant or dry ingredients mixed with water. Where possible, cooking is limited and if necessary, done by mothers or caregivers from the local community.

2.6.2 Products used in school feeding in South Africa

The following items are included in the menu for children making use of the PSNP: fortified biscuits, brown bread, margarine, jam, peanut butter, vitamin C-enriched drink, full cream milk, fish, maize meal, soya mince, orange/guava juice, vegetable oil, dried legumes and sugar (DoH 2001:3). In a study conducted by the Council for Scientific and Industrial Research (CSIR) and the University of Stellenbosch, a novel nutrition product was developed. The aim was to use fish waste products in school feeding schemes as a means of improving neurological capacity in young children. The research has resulted in the production of a fish flour that is stable at room temperature, and suitable for incorporation either in food or in health capsules. A 10 g portion of the flour provides RDA values of approximately 11 percent for protein and 70 percent for calcium. The fish flour was selected primarily as a fortification product to be used in school feeding schemes for undernourished children (Timme 2003).

The Medical Research Council (MRC) launched a carotene nutritional biscuit in 2000. The biscuit was developed by Dr. S. Benadé of the MRC. Dr. Benadé decided on the idea of a fortified biscuit because a biscuit is seen as a snack rather than a meal. One of the ingredients in the biscuit is non-hydrogenated red palm oil, which contains no trans-fatty acids and is naturally rich in vitamins A and E. The biscuit has been subjected to four years of scientific tests and the results of the research indicated that children eating the fortified biscuits showed substantial improvements in health. Three biscuits per child per day will address the three main micronutrient

deficiencies, namely, vitamin A, iron and iodine. Results showed that within 12 months, vitamin A deficiency was reduced from 40 percent to 12 percent and anaemia was reduced from 27 percent to 13 percent. One year after implementation of the biscuit, lower absenteeism rates and improved school performance were reported (van Stuijvenberg, Kvalsvig, Faber, Vorster & Benade 1997:1, Stein 2001).

2.6.3 Food items used in school feeding in Gauteng

According to the survey by Wentzel-Viljoen (2003:284), two menus were offered in Gauteng, i.e. a cooked menu and a bread menu. Commercial products such as fortified biscuits and a vitamin-enriched cold drink were used; for the most part, a full cream dairy blend powder was used in schools, and not fresh milk. The bread menu was served more often than the cooked menu; bread was also the food item liked by most learners (33%), whilst fish was the item that most learners disliked (40%).

The following food items were served in Gauteng schools: bread, fortified biscuits, peanut butter, jam, margarine, vitamin C-enriched cold drink, tinned fish, full cream milk, maize, grain sorghum, maize meal, dried legumes, soya mince, oil and sugar. Provincial specifications for schools in Gauteng included the following: for peanut butter, the total aflatoxin should be less than 10 µg/kg and the B1-aflatoxin not more than 5 µg/kg; no non-dairy creamers, blends or any other imitation dairy products should be used; enriched maize meal should contain not less than 10 mg of nicotinamide and 1 mg of riboflavin per 400 g of maize meal; the weight of brown bread should be between 800-850 g; and energy value in kJ must be indicated on the packaging of all soya-based foodstuffs. In some instances, the nutritional value was given for fortified biscuits and no specific requirements were mentioned for edible oils (Wentzel-Viljoen 2003:284). Table 2.7 depicts the nutrient analysis of the menus as approved for the schools in Gauteng and

the menu served in a sample of ten schools on the days that Wentzel-Viljoen visited these schools.

Table 2.7 Energy and nutrient composition of the approved menus and the menu served at schools in Gauteng (Wentzel-Viljoen 2003:320-322).

Energy and nutrients	Energy and nutrient content of the approved cooked menu		Energy and nutrient content of the approved bread menu		Energy and nutrient content of food served in schools (n = 10)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	2259	27.0	1965	23.5	1575	18.8
Protein (g)	14.3	51.0	12.4	44.2	11.7	41.7
Total fat (g) *	16.1		19.2		16.7	
Total CHO (g)*	77.3		58.0		40.7	
Dietary fibre (g)	6.4	22.9	5.1	18.2	4.0	14.3
Calcium (mg)	114	14.3	152	19.0	141	17.6
Iron (mg)	3.4	34.0	4.4	43.9	1.8	17.9
Magnesium (mg)	141	82.8	152	89.1	113	66.6
Phosphorus (mg)	291	36.4	238	29.7	235	29.4
Zinc (mg)	2.1	21.0	1.65	16.5	1.83	18.3
Copper (mg)	0.4	26.6	0.19	12.8	0.23	15.6
Vitamin A (RE)	42	6.0	193	27.6	95	13.7
Thiamine (mg)	0.4	39.6	0.3	29.8	0.16	16.3
Riboflavin (mg)	0.3	24.7	0.35	29.0	0.19	15.5
Niacin (mg)	4.0	30.7	4.3	33.0	3.8	28.9
Vitamin B6 (mg)	0.259	18.5	0.299	21.3	0.124	8.9
Folic acid (µg)	57	56.8	95	95.4	31	30.9
Vitamin B12 (µg)	0.1	8.3	1.5	108.0	1.6	115.2
Vitamin C (mg)	5	11.8	12	27.4	2	5.4
Vitamin E (mg)	4.24	60.6	2.09	29.8	1.12	16.1

* no RDAs

The percentage energy distribution of the approved menus is compared to the menus served in Table 2.8. Wentzel-Viljoen (2003:322) noted that the approved cooked menu complied with the dietary guidelines; however, the menu served at the schools was too high in fat and too low in carbohydrates,

while the bread menu was too high in fat when compared to the dietary guidelines.

Table 2.8 Percentage energy distribution of the approved menu and the menu served at the schools in Gauteng (Wentzel-Viljoen 2003:320-322).

% Energy distribution	Approved cooked menu	Approved bread menu	Food served at schools (n =10)
Protein (%)	10.8	10.7	12.6
Fat (%)	26.4	36.2	39.2
Carbohydrates (%)	63.0	54.5	48.3

Wentzel-Viljoen (2003:320-322) made the following comments on the energy and nutrition composition of the menus used in schools in the Gauteng Province:

- The energy content of the approved cooked menu did not comply with the national criterion that the menu must supply 25 percent of the RDA for energy, but complied with the provincial criterion of 20 percent of the RDA for energy;
- The energy content of the approved bread menu did not comply with the national criterion that the menu supply 25 percent of the RDA for energy, but complied with the provincial criterion of 20 percent of the RDA for energy;
- The energy content of the approved bread menu was lower than that of the approved cooked menu;
- The menu served to the learners met neither the national nor the provincial criteria that suggested the menu must supply 25 percent or 20 percent respectively of the RDA for energy;
- The protein content of the approved cooked and bread menus was more than 40 percent of the RDA;
- The micronutrient content of the approved menus varied; for the most part, no pattern could be established regarding the percentage contribution; and

- The micronutrient content of the menu served at schools ranged from 5 percent to 115 percent of the RDA for vitamin C and vitamin B12 respectively.

The main advantages and disadvantages of both the non-cooked and the cooked menu, according to Wentzel-Viljoen (2003:354), are the following:

Advantages of a non-cooked menu:

- Easy to prepare;
- Not too much time needed;
- Less infrastructure required;
- Based on the type of food, the perception exists that a snack is served;
- Frequent deliveries (bread is delivered daily).

Disadvantages of a non-cooked menu:

- Increased administration owing to the numerous delivery notes;
- Delivery as well as food costs are higher than those of the cooked menu.

Advantages of a cooked menu:

- More cost effective in terms of energy provided;
- Delivery costs as well as food costs are lower than those of the non-cooked menu.

Disadvantages of a cooked menu:

- Volunteer workers take longer to prepare food;
- Based on the type of food, the perception exists that a meal is served;
- Stock is delivered in bulk, which increases the risk of loss – food goes missing;
- Lack of sufficient storage facilities – food deteriorates;

- Larger quantities of food are served, resulting in the stock being depleted before the intended period;
- Infrastructure is required (Wentzel-Viljoen 2003:354).

A comparison between the procurement and logistics of providing a non-cooked and a cooked menu is indicated in Table 2.9.

Table 2.9 Comparison between a non-cooked and a cooked menu (Wentzel-Viljoen 2003:358).

Factors	Non-cooked	Cooked
Menu example	Bread 80 g Peanut butter 15 g Full cream milk powder 200 ml/20 g	Maize meal 60 g Soya mince 25 g Oil 5 ml Dried/fresh vegetables 10/100 g
Perception according to type of food items served	Snack	Meal
Preparation time	15 minutes	2 hours
Preparation utensils	Knife Spoons Mixing buckets	Pots Fire wood /gas Spoons
Number of helpers needed	1 per school	2 per school
Serving	Can take container of food to class to distribute food to learners	Pots are heavy to move Served outside
Budget food cost per learner per day	R0.73	R 0.56
Budget helper costs (allowance per day)	R 0.05 X 100 =R 5.00	R 0.05 X 100 =R5.00
Delivery	Some items in bulk Bread on a daily basis Daily and monthly	Bulk Monthly
Delivery notes	Many	One
Storeroom	Small	Big
Risk of food in stock disappearing	Low because of regular deliveries	High
Risk of prepared food being taken home	Very high	Low
Energy (kJ)	1573	1760
Protein	12.5 g	14.5 g

2.7 Problems in school feeding programmes

2.7.1 Common problems globally

It is well known that school feeding is expensive and logistically complicated. Problems of school feeding programmes across the world include the following:

- Irregular delivery of supplies;
- Food lost through theft and spoilage;
- Culturally unacceptable food being served;
- Inadequate rations in kilojoules and nutrients;
- Disruption of teaching to prepare meals if community workers are not available;
- Burdensome monitoring and reporting of the programme;
- Logistical difficulties in transporting large quantities of food by means of poor transportation to remote areas; and
- Problems with communication systems (Jamison & Leslie 1990:209, McCoy *et al.*1997:11).

Costs of school feeding will generally be high, but will depend substantially on the mechanisms for food preparation and delivery. An important consideration is the extent to which the rest of the family benefits from the programme because of children taking food home to give to younger brothers and sisters (Jamison & Leslie 1990:209).

The failure to guarantee the safety of food served to schoolchildren is one of the major problems experienced by the NSLP. Practical problems in the cafeterias include the following: the requirement that each child hold his lunch card results in the spread of germs from the card to the student; USDA meal regulations limiting sugar and fat apply to weekly averages, not individual components, meaning that the wrong food choices, made daily,

can result in a higher weekly fat intake; vegetarian options are limited; food not served by the end of the meal period is thrown away; and finally, the cut-off for eligibility to participate in the NSLP is unrealistically low (Woldow 2008).

2.7.2 Problems experienced by the PSNP in South Africa

When the programme was still called the PSNP, it experienced a lack of resources such as deliveries, equipment and computers.

2.7.2.1 Areas of concern at national level

Areas of concern identified in the study conducted by Wentzel-Viljoen (2003:229) were that the lack of policy on collaboration with the Department of Education as well as the decentralisation of school feeding activities in provinces made technical support from a national level difficult. The implementation of targeting policies, the lack of monitoring and evaluation of school feeding and the number of school feeding days per province were other problems identified.

2.7.2.2 Areas of concern at provincial level

At provincial level, the following were identified as areas of concern that need to be addressed:

- The defining of the respective roles and responsibilities of the Departments of Education and Health, as well as those of the environment health authority and local authority health inspectors and the nutrition section;
- The extent to which services should be centralised or decentralised;
- Whether to follow the quotation or tender system and ensure compliance with tender specifications;

- Application of the correct targeting policy in selecting schools for participation in the SFP, while taking into account any political pressures that might exist;
- The provision of a low cost nutritious menu and whether to provide a snack or a meal;
- Ensuring that suppliers receive payment on time;
- Monitoring, measuring and assessing the impact of school feeding on an ongoing basis (Wentzel-Viljoen 2003:229).

2.7.2.3 Areas of concern at school level

Schools identified the following areas of concern that need to be addressed to improve school feeding in South Africa:

- Menus should be changed to ensure variety and include learners' preferences;
- Quantities and portion sizes provided to the learners should be increased;
- School feeding should take place from Mondays to Fridays;
- All learners in the school should receive school feeding or take-home rations;
- Food should be served earlier in the day; and
- Payment provided to volunteer workers should be increased and made on a regular basis (Wentzel-Viljoen 2003:230).

2.7.3 Recommendations for successful implementation of the NSNP

The following recommendations, as documented in Polity (2007), were submitted by the Financial and Fiscal Commission: All Provincial Education Departments (PEDs) should adopt and entrench the NSNP as their full responsibility and should assign necessary personnel with appropriate skills to improve the implementation of the programme. Budget allocations for the

NSNP in primary schools should be increased in order to include learners who are presently not covered. PEDs should begin implementing the NSNP in schools that have been declared 'no-fee-schools' by the Minister of Education. Currently, there are no uniform national minimum norms and standards for the NSNP and this lack could encourage inequity in the implementation of the programme. Therefore, the National Department of Education should develop national norms and standards to guide the implementation of the NSNP in the country. Where necessary, PEDs should supplement the NSNP conditional grant with funds from their respective budgets, as is the case in the Northern Cape. Where necessary, improvements in the procurement procedure, kitchen equipment, infrastructure, and monitoring and evaluation require immediate attention. A recommendation was also made that the number of feeding days be increased beyond the prescribed minimum and that the amount of money allocated per learner per day should be increased (Polity 2007:10).

2.7.4 Cost of school feeding programmes

The average cost per student for the SFP of the World Food Programme in 2000 was \$0.19 per day, or \$34 for a 180-day school year (USDA 2003:2). In Ecuador, where meals are provided to the children 160 days a year by the WFP, the annual average cost was about \$24 (£18) per child in 2003 (about R144.00 in 2003). Currently (2008) this would be the equivalent of approximately R192.00 per child.

In South Africa in 1999/2000, school feeding cost the government an average of R79 per learner per year over the three-year period. This cost per learner includes food, transport of the food to the school and administration and helper costs, but excludes any staff costs (Wentzel-Viljoen 2003:349). In South Africa, R2.9 billion was made available for the financial periods of 1994/95 and 2001/02 (Wentzel-Viljoen 2003:349, Labadarios *et al.* 2005:103). For the period from 1995/96 to 1997/98, the school nutrition

budget was reduced by 8 percent and declined by 4.2 percent from 1995/96 to 2000/01 (Wildeman & Mbebetho 2005:14). The transition of the school nutrition programme from the health department to the education department in 2004/05 did not affect the overall spending. The funding made available to Gauteng increased from R1.2 million in 2004/05 to R1.27 million in 2005/06, and in the Northern Cape funding increased from R3.5 million to R11.05 million in the same period (Wildeman & Mbebetho 2005:24-27). In the Northern Cape, the rate per learner per day in 2003 was R0.90c, which increased to R1.15 in 2004, R1.25 in 2005 and to R1.35 in 2007. Learners in farm and rural schools with an enrolment of fewer than 200 children receive R1.45 per learner per day for 174 school days (Northern Cape Department of Education 2007). KwaZulu-Natal received R20 million in 2004/05 and Limpopo province R55.4 million for the 2005/06 period. In 2004/05, the Free State and North West provinces had the highest per learner expenditure of R1.50 per learner per day, while the lowest per learner average was in Mpumalanga at R0.83, and KwaZulu-Natal was R0.90 per learner per day (Wildeman & Mbebetho 2005:24-27). In a briefing by the DoE on school nutrition in 2008, the indication was that the average cost per learner was R1.22 in urban areas and R1.42 in rural areas in all the provinces (Michaels 2008:3).

2.8 Success factors of school feeding programmes

2.8.1 Collaboration between sectors

McCoy (1997) noted that the most effective means of delivering a comprehensive range of school health services is through good collaboration between the health and education sectors. A lack of cooperation can create problems in implementing a SFP. A feature of successful SFPs is that they are not vertical interventions implemented by outside agencies without linkages to other aspects of school health, the health services and the school system.

2.8.2 Targeting and timing of school meals

In order to be most effective, feeding should take place as early in the day as possible. Snacks proved sometimes more appropriate than cooked meals, which take longer to prepare. Targeting should be aimed at schools with the highest proportion of malnourished or hungry children. Programmes should minimise the involvement of schools that have the resources to obtain their own food. According to the WFP, as quoted by McCoy *et al.* (1997:17), SFPs work best for enrolment and attendance in communities where poverty is comparatively high and where education is fairly well established.

2.8.3 Food quality and quantity

The composition of school meals has proved to be a factor that influences education positively (McCoy *et al.* 1997:17). The Cochrane review on school feeding included 18 studies, of which nine were conducted in higher income countries and the other nine in lower income countries. In the low-income countries, children who received school feeding gained more weight, attended school more frequently, and with regard to educational and cognitive outcomes, their mathematics achievement increased and short-term cognitive tasks improved. However, far fewer benefits were seen in high-income countries. Therefore, the authors concluded that school meals might have some benefits for disadvantaged children and that results of studies on the effectiveness of school meals should be reported according to socioeconomic status. At the other end of the spectrum, in situations of absolute poverty, school meals were not helpful because the children then were given less food at home so that other family members could eat (Kristjansson *et al.* 2007).

2.8.4 Private sector involvement in school feeding programmes

Recently there has been a shift towards the use of commercial providers as well as a mix of both public and private financing. Many governments have started to give private enterprises the responsibility for the preparing and delivering of food. This can help to encourage the development of small local enterprises; however, it can also cause large-scale enterprises to displace small food vendors (McCoy 1997:17).

2.9 Guidelines for school feeding

2.9.1 School feeding strategies

According to the Interagency Network for Education in Emergencies (INEE), in school feeding programmes, high health standards must be applied during preparation and storage of the food and steps must be taken to ensure that illness is not spread through school feeding owing to poor storage and preparation (INEE 2004).

The INEE has set down requirements for the preparation of products for school feeding: The following questions are a guide to these requirements:

- Is there sufficient water for cooking and cleaning?
- Is there a place for the food handlers to wash their hands?
- Is fuel available?
- Are the ingredients available to cook the food and make it palatable? (for example, salt)
- Is the food cooked thoroughly? Where possible choose easily cooked commodities, especially for the mornings.
- Is cooked food eaten immediately?
- Is cooked food carefully stored?
- Are locally produced vegetables safe? (When crops are grown on land

with waste water).

- Is contact between raw food and cooked foods avoided?
- Are kitchen surfaces, utensils and cooking pots clean?
- Does the school have sufficient cleaning material for cleaning of pots?
- Are foods protected from insects, rodents and animals? (INEE 2004).

School feeding programmes can operate both as an indirect transfer, in the form of a school meal and as a direct transfer, in the form of a take-home ration (Tomlinson 2007:7).

2.9.2 Steps in developing SFPs that improve education

Del Rosso (1999:11) provided guidelines for improving the effectiveness of school feeding and increasing the benefit to education. The recommendations included the following:

- The establishment of a policy and objectives for school feeding programmes. Programme managers and policy-makers need to identify the problems that school feeding programmes will need to address, and whom these programmes will serve. The most feasible programme models should be provided for implementation;
- The development of targeting criteria, and devices that concentrate programme resources on high-risk children and communities. Targeting is essential if the programme needs to reach families and communities that are unable to provide for their school-age children or those that need to be motivated to enrol their children in school and to have them attend more regularly. Furthermore, programme coverage and targeting is always subjected to a series of political, logistical, technical and informational constraints;
- The financing and cost options for SFPs. The identification of possible alternatives when necessary should be considered. The availability of public resources, or the potential to draw on them, is required.

- The development of appropriate guidelines for the composition of rations, and the timing of school meals. To establish appropriate ration guidelines, programme managers and policy makers need to analyse the nutrition and health needs of school-age children as well as conditions in the education sector;
- Identification and addressing of any potential stumbling blocks in implementation, such as the availability of supplies and other resources, the appropriateness of cooking practices and the management of private sector inputs;
- Development of monitoring systems that focus on how the programme is functioning, and implementing an evaluation system to assess the impact of the programme on specific outcomes; and
- Integrating feeding programmes with other interventions that address the primary nutrition and health problems of the school-age population (Del Rosso 1999:11).

Implementing the recommendations in this guide should help to ensure that SFPs are successfully established and operated.

2.9.3 Recommendations for school feeding in South Africa

In 1997, the Child Health Unit for the Health Systems Trust made three broad recommendations with regard to the PSNP in South Africa:

- Targeting criteria should be more stringent. Because of the particularly poor SFP coverage, it was recommended that fewer schools should be targeted, and that feeding should focus on the children likely to benefit most. Fund allocation should be based on infrastructure and location.
- School feeding management should be improved. Management systems should be developed to work effectively in the rural areas and areas of the country where resources are limited. The active

involvement of both communities and non-governmental organisations should be encouraged. Local needs should be considered.

- The quality and quantity of school meals should be optimised. Meals must be provided early in the morning and their energy content should not fall below 20–25% of the current RDA. The development of guidelines regarding the minimum quantity of micronutrient content should be encouraged, while the use of fortified commercial foods should be discouraged, as they promote unhealthy eating habits (McCoy *et al.* 1997:93, Tomlinson 2007:15). Wentzel-Viljoen (2003:420) recommended that the monitoring and evaluation should form an integral part of any nutrition or nutrition-related programme.

2.9.3.1 Targeting strategies to identify beneficiaries

The identification of poor primary school learners in SA was determined through the school funding norms and the diverse provincial health targeting strategies as displayed in Table 2.10. The criteria included the geographical areas, the specific schools chosen, as well as age and grade. A noticeable similarity in the provincial targeting strategies displayed in Table 2.10 is the recognition that schools in rural and semi-urban areas, farm schools and informal settlements should enjoy the highest priority. This criterion was used by the DoH prior to 2004, when school feeding was its responsibility (Wildeman & Mbebetho 2005:28). After 2004, when the DoE took over responsibility for school feeding, this criterion was changed and now the schools are mainly responsible for identifying children in need. Schools in areas with a concentration of poor households are targeted for the intervention, and all the children at these schools benefit from the programme. The aims of the programme are related to both health and education, combating malnutrition and improving the ability of children to concentrate in school (NSNP 2008)

Table 2.10 Provincial health-targeting strategies (Louw, Bekker & Wentzel-Viljoen. 2001:49-50)

Province	Criteria
Gauteng	100% of learners in urban schools
North-West	100% of learners in rural schools 100% of learners in urban schools 80% of learners in non-urban schools
Limpopo	Rural, semi-urban and farm schools and schools in other informal settlements
Mpumalanga	Poverty gap Per capita income of communities
Free State	>3 km walking distance to school Caregivers unable to provide for learners Social problems Availability of running water, sanitation and electricity at school.
KwaZulu-Natal	Rural schools Disadvantaged schools in townships Farm schools
Eastern Cape	Grade R to Grade 4. All farm schools
Northern Cape	All rural and farm schools
Western Cape	Grade R to Grade 3

2.10 Health and nutrition interventions

To benefit from schooling, children need to attend school on a consistent basis, yet illness keeps millions of schoolchildren at home (IFPRI 2004a). The World Food Programme (WFP) and United Nations Children’s Fund (UNICEF) have included a “minimum package” of health and nutrition interventions to accompany school feeding, including the following:

- support for basic education;
- de-worming;
- micronutrient supplementation;
- drinkable water;
- separate sanitary latrine facilities for boys and girls;
- health, nutrition and hygiene education;

- HIV/AIDS awareness and prevention; and
- malaria prevention (IFPRI 2004a).

Schoolchildren are more responsive to preventative education than any other potential target groups. They understand and take the message home very actively. School feeding appears to be the ideal platform for the introduction of interventions in nutrition, education, health and agriculture. Primary school infrastructure is the same worldwide and is probably the single most universally available public structure which makes it possible to reach large numbers of people cost effectively. School feeding has food as a significant asset, which draws children, parents and communities to the school (IFPRI 2004a).

Treating school-age children for certain infectious diseases reduces the transmission and infection rates for the whole extended family, because school-age children are the carriers who infect other family members (IFPRI 2004a).

2.10.1 Food for Education Programmes

According to the WFP, education is one of the most effective ways to improve food security for the longer term and strengthen coping strategies for times of crisis. Food for Education Programmes have been implemented in two basic forms: children are fed in school (School Feeding Programmes), or families are given food if their children attend school (Food for Schooling Programmes). Food for Schooling is designed to help feed the entire family. Both programmes combine educational opportunity with food-based incentives and use food as an incentive for parents to send their children to school. Food for Education Programmes provide immediate sustenance for the hungry, give hope and empower future generations by educating today's children (IFPRI 2004b, WFP 2006).

In 2005, the WFP's Food for Education programmes reached 21.7 million children in 74 countries, however, this achievement is still a small percentage of the total of 351 million chronically hungry school-age children in the world (WFP 2006:7). In-school meals are used to attract children to school, alleviate their hunger and help them to learn.

The meals aim to:

- increase enrolment and attendance of primary school children, especially among girls, orphans and vulnerable children;
- reduce primary school dropout rates;
- reduce the imbalance between girls' and boys' school attendance; and
- improve learning and concentration by providing a meal early in the day (WFP 2006).

Each school meal is designed according to local tastes and customs, nutritional needs and the availability of local foods and resources, as well as for ease of preparation (WFP 2006).

There are four options for on-site feeding meals:

- breakfast;
- mid-morning snack;
- lunch; and
- dinner (only for boarding schools).

Table 2.11 shows the different types of meals used. The timing and nature of the meals depend on the length of the school day, the local customs and the availability of trained cooks, a well-equipped kitchen and clean water. On-site meals are particularly helpful when children go to school without having breakfast, often after walking a long distance to school. By mid-morning, their attention and concentration decline and learning suffers. A nutritious meal or snack early in the school day enables these children to learn better and gain

most from school. The opportunity for a nutritious meal is an incentive for parents to send their children to school (WFP 2006).

Table 2.11 Sample menu used by the World Food Programme (WFP 2006:12).

Type of meal	Sample menu	Total kilojoules	Country example
Breakfast	Corn-soya blend porridge 8 g Sugar 8 g * Vegetable oil 8 g	1697	Timor Leste
Mid-morning snack	High energy biscuits 100 g	1890	Iraq
Breakfast & lunch	Maize meal 150 g Pulses 40g * Vegetable oil 10 g Salt 3 g	4011	Rwanda
Breakfast, lunch and dinner	Cereals (rice/maize) 450 g Pulses 45g Canned fish 25 g * Vegetable oil 20 g	8513	Benin
* Vegetable oil fortified with vitamin A			

2.10.2 Take-home rations

In poor countries, children are often required to help their families make a living. Their parents depend on them to work in the family fields, attend to the livestock, care for younger siblings, gather firewood or search for food. This means that these children do not have the time, energy or economic means to attend school. When on-site school feeding is impossible to implement or is insufficient to reach particularly vulnerable children such as girls and orphans, WFP provides take-home rations of basic food items. These may include items such as bags of cereal/maize meal or litres of vegetable oil, which are distributed to families in exchange for the schooling of their children, as well as to help compensate for the loss of the children's contribution to the family's livelihood (WFP 2006).

2.10.3 Girls in education

More than half of the children who still do not attend school are girls. One in four girls is likely to drop out of school before completing primary education, compared to fewer than one in seven boys (WFP 2006). Low school attendance is often due as much to tradition and culture as to poverty. In cultures where men traditionally are the providers, education may be deemed “wasted” on girls because it is not believed to lead to paid employment. There may be other factors contributing to the fact that girls do not receive education, as discussed by the WFP (2006). Education influences girls’ economic opportunities, their participation in community decision making, HIV infection rates, the level of literacy, and child malnutrition in the next generation (WFP 2006).

2.11 Conclusion

School feeding may help children’s educational progress, particularly that of undernourished children. However, there are limits to the benefits of both nutrition and health programmes in poor educational settings. The achievement of children is linked to both their biological state and the quality of the school and it is difficult to separate these two contributing factors. If school feeding programmes are successful in increasing enrolment and attendance, but there is insufficient space and too few teachers to accommodate the children, overall performance levels may not improve. If significant advances must be made in children’s education in developing countries, there is an obvious need for integrated programmes combining educational with health and nutritional inputs (Grantham-McGregor 2005:S156). Many school feeding programmes have major health intervention components and are often a significant platform for the distribution of health interventions such as de-worming and iodine supplementation (Tomlinson 2007:4).

School feeding programmes occur in a number of different forms, depending on the context and timing. Broadly speaking, however, the two major goals of SFPs are education and food security (Bennett 2003:30). The educational goals include increased attendance and enrolment (particularly for girls) and improved concentration in class, aided by the food provided. The goals of food security include the reduction of short-term hunger and the improvement of the nutritional status of schoolchildren, thereby reducing levels of malnutrition (Tomlinson 2007:4). School health and nutrition programmes are increasingly seen as important systems for improving the general health and well-being of people in developing countries (McCoy *et al.* 1997:87).

School feeding programmes should be based on a firm understanding of the environment within which they are to operate. Households and communities should be specifically targeted, and programmes and their implementation should be designed with the specific needs of the communities in mind. Therefore, cost effective and sustainable solutions must be tailored to a particular set of circumstances. Better nutrition contributes to the accomplishment of two key development goals: growth in productivity, and distribution of benefits among members of society, in this case schoolchildren. Therefore, well-designed studies on the effectiveness of school meals should be undertaken, results should be reported according to socioeconomic status and researchers should gather robust data both on processes and on carefully chosen outcomes (Kristjansson *et al.* 2008).

In Chapter 3, the different products currently being used as part of school feeding projects in schools in semi-urban areas in the Vaal Region will be discussed. These include vetkoek, existing PSNP, Sejo, CSB and fruit.