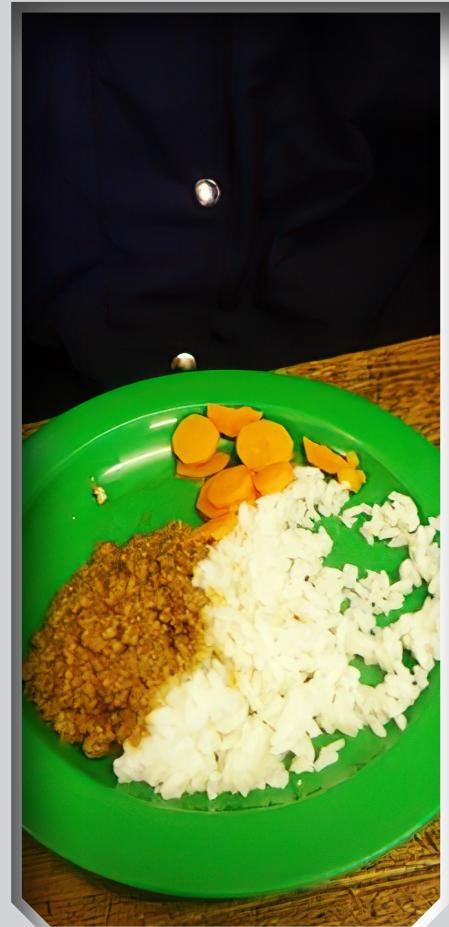


# The Effects of COVID-19 on in-school Nutrition



## A REPORT BY THE:

Centre for Social Development in Africa (CSDA) and Food Evolution  
Research Laboratory (FERL), University of Johannesburg

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For  
The Tiger Brand Foundation

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## List of Acronyms

**BMI** – Body Mass Index

**CSDA** – Centre for Social Development in Africa, University of Johannesburg

**DBE** – Department of Basic Education

**FERL** – Food Evolution Research Laboratory

**GHS** – General Household Survey

**ISAK** – International Society for the Advancement of Kinanthropometry

**NSNP** – National School Nutrition Programme

**SANHANES** – South African National Health and Nutrition Examination Survey

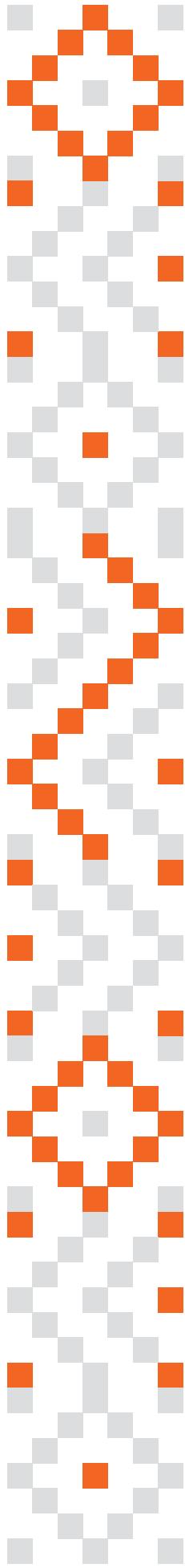
**STH** – School of Tourism and Hospitality

**TBF** – The Tiger Brands Foundation

**WHO** – World Health Organization

**HSRC** – Human Sciences Research Council

**VFH** – Volunteer Food Handler



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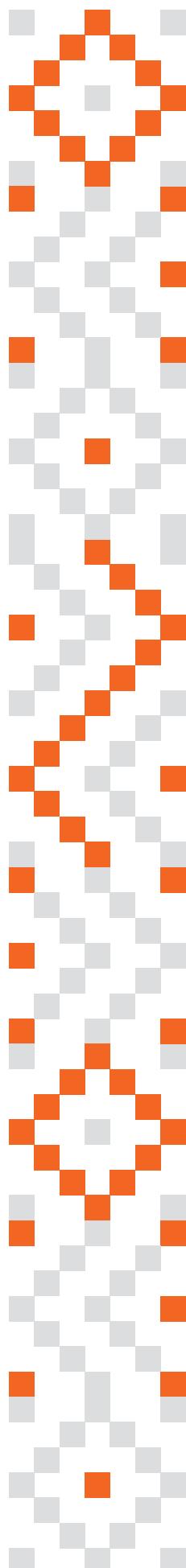
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## Executive summary

Significant progress has been made over the past three decades in improving child nutrition in several countries. In South Africa, however, the rates of malnutrition and stunting continue to be worryingly high; one in four children are stunted and acute malnutrition accounts for one-third of all in-hospital deaths (Whitten & Lake, 2020). These trends are indicative of low levels of nutritional intake, often due to high levels of food insecurity. Recognising this, the South African government introduced the National School Nutrition Programme (NSNP). To date the NSNP feeds over nine million children each school day. The programme is intended to meet 30-40% of a child's recommended dietary allowance per day. In the past several years the NSNP has partnered with a range of public and private organisations, like the Tiger Brands Foundation, to expand their in-school nutrition offerings and in many schools an additional breakfast is now also provided. Together, these are crucial food security and poverty alleviation policy interventions (Devereux et al., 2018).

The COVID-19 pandemic however exacerbated food insecurity and significantly disrupted the ability of schools to regularly feed children. Evidence demonstrates that during the initial lockdown period in April 2020, 47% of households ran out of money to buy food and 15% of households reported child hunger (van der Berg et al., 2021). During the initial period of COVID-19 regulated restrictions, the NSNP stopped altogether. This cessation of the programme prompted a public outcry and a legal challenge. In spite of the court ordered resumption of the programme, logistical and service delivery difficulties created additional challenges (Mohohlwane & Shepherd, 2021). Enhanced health and safety protocols placed additional burdens on volunteer food handlers and many schools struggled to procure the required foods. Although the courts mandated schools to continue providing the NSNP meal even during school closures, the realities of delivering the food with the abovementioned difficulties in place most likely resulted in children receiving diminished access to the meals, and meals with fewer nutrients through in-school nutrition (Machaira, 2021). This study sought to ascertain the impact of this.

The aim of this study was therefore to understand, firstly, from the perspective of children, how they were affected by the shifts in in-school nutrition programmes during the COVID-19 pandemic and, secondly, to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces.

The study was conducted in Gauteng, Western Cape, KwaZulu-Natal and the North-West (Schools in these provinces had breakfast and lunch as part of the TBF and the NSNP programmes). In each province, one district was randomly selected, and within the district two to three schools were identified, one from each eligible quintile. A mixed method approach was employed and included the use of individual interviews and focus group discussions at selected schools (qualitative method) and calculating nutritional values of the menus (quantitative method). Data was collected from April to June 2022. To capture the voices of children, we employed a child-centred qualitative approach that incorporated participatory visual methods that are deemed suitable for and sensitive to data collection with children. Two focus groups were conducted within each school with children aged 10-12 years. At each school the principal, a teacher and the food handler were also interviewed. To evaluate the nutritional/health status of the school-fed children, a pre-determined observational checklist was used. The weekly menus at each school were obtained, and dietary intake data were evaluated using the NutriSurvey application and the South African Food Composition table. The values were compared with recommended dietary allowances (RDA) to ascertain the percentage contribution of the school-fed diets to the children's RDA. Qualitative data were analysed thematically using an inductive approach, which allowed the themes to emerge from the data without pre-imposed ideas. Quantitative data were analysed using Microsoft Excel 365.

Findings show that the pandemic negatively impacted children's well-being across multiple domains. Children articulated that many depended on the in-school nutrition programme, and it was noted that not having access to it for a period was detrimental to some children and their families. Children were aware that having regular, healthy meals contributed to their ability to concentrate in class, their learning and also to their physical and emotional well-being. Children observed that after the lockdown the quality and quantity of the food they received differed compared to what they received previously. They had less variety, less fruit and proteins, and the portions were not enough to fill them. They also reported that the quality was diminished in that it was without flavour, and sometimes not prepared well.

The menu evaluation showed that most of the NSNP lunch meals were not providing up to 25-30% of the children's RDA but the Tiger Brands Foundation breakfast augmented this by providing an additional 10-20% of the RDAs. Analysis of the health checklist showed that, generally, the nutritional status of the children was good. Some meals met few micronutrient RDAs such as the B vitamins and calcium. The children were not given fruits frequently (mostly once a week).

## Recommendations

The following recommendations are based on the findings of this study and will go a long way in improving the quality and effectiveness of the in-school nutrition programmes:

- An increase in supply of fresh fruits should be incorporated into the menus. Fruits were not provided frequently (only once a week).
- Meat or even eggs to be added into the menus as this will boost protein supply and increase the percentage met of the RDAs.
- An increase in quantities fed will also be necessary in order to meet the 25-30% target per meal, especially in KwaZulu-Natal (standardisation of portion sizes and recipes).
- Some of the schools need a larger kitchen space and better storage facilities such as refrigerators in order to reduce food waste and ensure consumption of safe foods.
- Sponsoring school gardens again will help to provide more fresh herbs, fruits and vegetables. These gardens were useful when they existed a few years ago.
- Schools need to avoid deviating from the menus when possible and to ensure that a variety of foods are served to the learners.
- The Volunteer Food Handlers (VFHs) need further training on portion per serving, food preparation skills, basic nutrition knowledge and hygiene and safety skills. This will aid in improving the quality and quantity of food served at the schools.
- While children showed appreciation and acknowledgement of the value of the school food programme, they wished that there could be improvements in the quality and quantity of food, and distribution/frequency of food items. On the quality of food, children commonly recommended that sugar, salt and spices be added to food.
- Other recommendations on the quality of food were related to the way it is prepared, which generally affected children's enjoyment of the food. When asked about what were their least favourite foods, it should be noted that the children did not necessarily point out that they did not like a certain type of food; however, the problem was the way the food was prepared.



## 1. Introduction

It is globally observed that urbanisation, modernisation, and technological development have brought rapid demographic and epidemiologic changes to most countries of the world, with concurrent shifts in diet, physical activity, and body composition (Nasreddine et al., 2014). These shifts are the basis of the multidimensional phenomenon of the nutrition transition, which is characterised by an increase in the intakes of energy, fat (especially of animal origin), added sugars, and salty foods (Nasreddine et al., 2014; Popkin et al., 2012). Amid the threat of transitioning to high-energy, nutrient-poor diets and the parallel menace of food insecurity, young children may be the most vulnerable to the ongoing societal, lifestyle, and dietary changes in countries of the region (Moghames et al., 2016). It is worthy of note that, although significant progress has been made over the past three decades in improving child nutrition in several countries, the overall proportion of underweight children younger than five years has continued to rise (from 14% in 1990 to 17% in 2004) (WHO, 2010). The nutrition situation of infants and young children is thought to have further deteriorated after the food crisis of 2008, the escalating political instability, the threats of mounting conflicts and now the coronavirus pandemic (Hendricks et al., 2021; UN, 2010; WHO, 2010).

Due to the fact that optimal nutrition is a prerequisite for proper growth and development (WHO, 2009), and because malnutrition in early childhood may predict disease risk later in life (Biro and Wien, 2010), it is essential to put in place cost-effective strategies aimed at preventing and combatting child malnutrition. Malnutrition is caused by deficiencies, excesses or imbalances of nutrients; and it may also be an outcome of food insecurity, or non-food factors (FAO, 2008). Nutrition is now seen as a major modifiable determinant of chronic disease, with scientific evidence increasingly supporting the view that alterations in diet have strong effects, both positive and negative, on health throughout life (FAO, 2008). Effective planning for such interventions should be guided by accurate and comprehensive data on the nutrition situation of children.

In South Africa, which has high levels of food insecurity and related stunting as well as overweight and obesity, in-school nutrition programmes are a crucial intervention. The National School Nutrition Programme (NSNP) reaches over nine million children every school day and is intended to provide 30-40% of a child's recommended dietary allowance (RDA). In many quintile 1-3 schools in South Africa breakfast is provided in addition to the NSNP lunch, either through the NSNP programme itself or via public or private partners, like the Tiger Brands Foundation. However, the COVID-19 pandemic significantly disrupted the ability of schools to regularly feed children. Public health measures resulted in school closures and rotational schooling. Heightened health safety measures may also have delayed food preparation and serving and there were some anecdotal reports of difficulties sourcing ingredients, particularly proteins. Although the courts mandated schools to continue providing the NSNP meal even during school closures, the realities of delivering the food with the abovementioned difficulties in place most likely resulted in children receiving diminished access to the meals, and meals with fewer nutrients through in-school nutrition (Machaira, 2021). This study sought to ascertain the impact of this.

## 2. Aims and objectives

The aims of this project were to understand, firstly, from the perspective of children, how they were affected by the shifts in in-school nutrition programmes during the COVID-19 pandemic and, secondly, to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces.

The objectives aligned to these aims were to:

- a. Document changes to in-school nutrition, at school level, over three critical time periods:
  - ◆ The initial lockdown phase (Apr – Jul 2020)
  - ◆ The initial return-to-school phase (Aug – Nov 20)
  - ◆ The current “new normal” phase (2021)
- b. Profile how children were affected by these changes, with particular reference to their learning, energy, and physical and emotional well-being.
- c. Understand, from the perspective of children, how they and their families coped during these periods.
- d. Make recommendations regarding the importance of in-school nutrition and building the resilience of such programmes to better attend to children's needs.
- e. Assess the nutritional value of one week of meal servings currently being served.
- f. Interview principals and food handlers to assess the nature of public health measures at the school and how this affected the in-school nutrition programme.
- g. Estimate the nutritional value that children are receiving in the current format of the in-school nutrition for each school.
- h. Estimate the possible health outcomes (either positive or negative) that the shifts in feeding may have had. Subsequently, based on the results from the study, develop a strategy to improve children's access to healthy diets especially for those provinces found to have higher rates of malnutrition.

### 3. Literature review

In their review of the health and nutrition concerns of school-age children in South Africa, Wenhold et al. (2007) found that young children are most at risk of nutritional deficiencies. However, in a context of food insecurity and social instability, the nutritional problems of young children typically continue into school-age or may even be exacerbated. The nutritional status of school-age children is primarily described in terms of their growth (anthropometric) which is a result of dietary intake on the one hand and their specific circumstances (e.g. ill-health) on the other. Dietary intake by school children is influenced by many factors which can be grouped into (i) personal, (ii) interpersonal (social), (iii) community (culture) and the immediate physical environment, and (iv) societal, macro-environmental. Schools and school-age children are often viewed as an ideal audience for health and nutrition promotion, because schools reach many children for many years on a regular basis and at a stage when habits are formed. Furthermore, schools are a setting in which healthy and safe eating, including how to resist social pressure, can be practised and taught by skilled available personnel (Department of Planning, Monitoring and Evaluation/Department of Basic Education - DPME/DBE, 2016). Households and communities may be reached through their children, thereby helping to break the inter-generational cycle of malnutrition, poverty, and chronic disease - particularly in the girl child.

#### 3.1 Food security and poverty

Food security has been defined by Tomlinson (2007) to be the availability and accessibility to food of sufficient quality and quantity in a socially and culturally acceptable manner. Furthermore, nutritional security "acknowledges that gender, education, access to water and sanitation all impact on nutrition status, over and above the simple problem of food availability", and food sovereignty suggests that securing the right to food includes people's access to the means of food production, such as, land, fishing resources, and seeds. (DPME/DBE, 2016). In 2012, the Human Sciences Research Council (HSRC) conducted the first South African Health and Nutrition Examination Survey (SANHANES-1); using other survey data, SANHANES-1 found that hunger had decreased from 52.3% in 1999 to 25.9% in 2008, and 26.0% in 2012 with some provinces like the Eastern Cape (36.2%) and Limpopo (30.8%) recording higher rates in 2012 (Shisana et al., 2014). While there was a significant decrease in reported child hunger from 30% in 2002 to 16% in 2006, it seems much progress has not been made since then. This suggests that "despite expansion of social grants, school feeding schemes and other efforts to combat hunger amongst children, there may be targeting issues which continue to leave households vulnerable to food insecurity" (Hall et al., 2013, p. 98).

Currently, household food security, including children's access to school feeding, emerges as an important determinant of adult worry and depressed mood. Prior analysis using the balanced panel from the National Income Dynamic Study Coronavirus Rapid Mobile Survey (NIDS-CRAM) Waves 2, 3 and 4 indicated erratic access to school meals even across time points when schools were open. School feeding at the beginning of the 2021 academic year had neither deteriorated nor improved from the final quarter of 2020. In April 2021, access to food at school increased significantly from 49% in November 2020 to 56% in April 2021, although part of the increase may be driven by a change in the reference period of the question between the two periods.

#### 3.2 Nutritional and health status of school-aged children

Malnutrition is a challenge for a large portion of the world's population: under-nutrition accounted for 53% of all under-five deaths in the past (Tomlinson, 2007), and, while this figure has decreased globally, UNICEF estimates that nearly half of deaths of children under five years are still attributable to under-nutrition (UNICEF, 2015). While the health and nutrition of South Africa's poor children is improving, it still needs to shift radically. According to Hendricks et al. (2021), before the COVID-19 pandemic, children in South Africa already faced a triple burden of under-nutrition, over-nutrition and micronutrient deficiencies that compromised their health, survival, cognitive development, school achievement, and economic productivity in adult life. These high levels of child malnutrition have persisted for many years, and it is against this worrying baseline that the COVID-19 pandemic exacerbated poverty and hunger.

Malnutrition has grave consequences for children. Micronutrient deficiency is also called 'hidden hunger'. It is most insidious when it involves a person eating adequate energy (calories/kilojoules), but inadequate micronutrients. As reported by Hendricks et al. (2013), studies have shown that there is a correlation between correct height-for-age and cognitive or language ability at age five, school enrolment and grades achieved by adolescents, and formal employment and psychological functioning between the ages of 20 and 22.

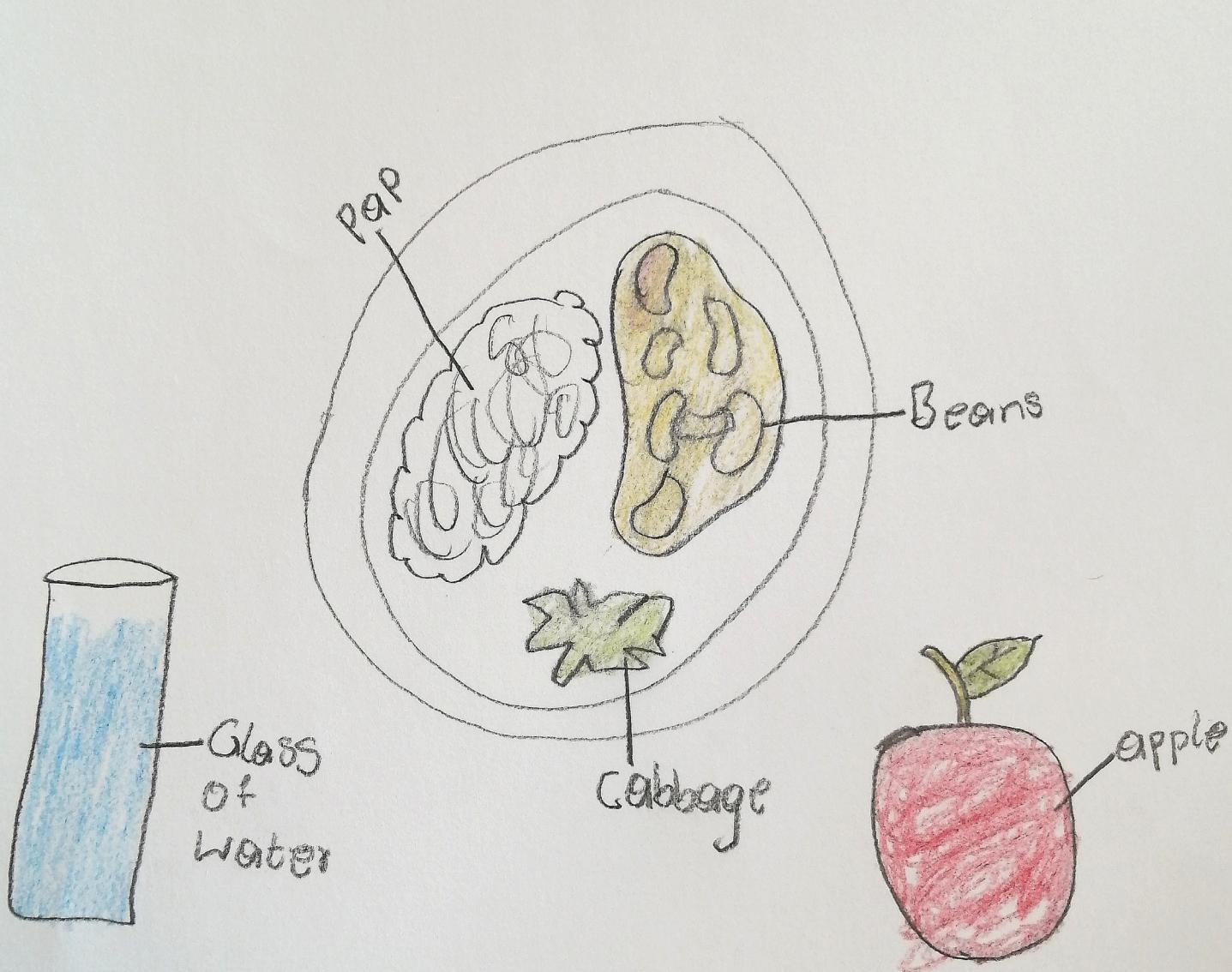
A child who suffers any form of malnutrition, especially stunting, in the first 1,000 days of life is prone to health problems such as fewer neural connections in the brain, leading to poor cognitive development. This damage is irreversible, and stunted children are observed to perform poorly at school and in the workplace, which can negatively affect the nation's gross domestic product and reduce the prosperity of future generations (Desai et al., 2015; Umeokonwo et al., 2020). A lack in basic nutrition in a child's early development can impact their physical growth, mental growth, and social aspects (Farmer et al., 2007).

In addition, under-nutrition in a child and the excess consumption of kilojoules can lead to a susceptibility to obesity in adult life (Scientific Advisory Panel, 2014), and obesity carries its own severe health risks. South Africa is characterised by a "double-burden" of nutrition-related health problems, that is, under-nutrition and obesity, often in the same household (Vorster, 2013). There is evidence of micronutrient deficiency in South Africa: 43.6% of children surveyed by SANHANES-1 in 2012 were vitamin A deficient (Hendricks et al., 2013), although this figure had decreased since the 2005 National Food Consumption Survey (NFCs). However, according to World Health Organisation (WHO) guidelines, this figure places vitamin A deficiency in the "severe public health importance category" (Shisana et al., 2014).

Hendricks et al. (2021) highlighted the following of children in South Africa:

- 27% of children under five years were stunted – or too short for their age. This is a sign of chronic malnutrition that stunts the developing body and brain.
- 13% of young children were overweight with rates increasing across the life course and driving a burden of hypertension, heart disease and diabetes in adult life.
- A high proportion of children were deficient in micronutrients that are essential for survival, a healthy immune system and cognitive development.
- 2.5% of young children were wasted – their weight was too low for their height – a sign of recent weight loss and a key driver of under-five mortality.

Despite the rise in child hunger, the incidence of severe acute malnutrition cases presenting to facilities decreased substantially from 2019 to 2020. According to results on the District Health Information System (DHIS), there was also a decrease in hospital admissions due to severe acute malnutrition and moderate acute malnutrition by 40% and 55%, respectively (Hendricks et al., 2021). There may have been an increase in childhood malnutrition and stunting that is not reflected in the administrative data because the cases were not seen and recorded – and therefore not treated. Unfortunately, COVID-19 disrupted young children's access to routine health care services.



### 3.3 School feeding programmes: The South African context

Children's rights to basic nutrition are enshrined in the South African Constitution. Section 27 (1) (b) states that: "Everyone has the right to have access to health care services; sufficient food and water; and social security." Section 27 (2) requires that, "the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights." In addition, Section 28 (1) states that, "Children have the right to basic nutrition, shelter, basic health care services and social services." (Hendricks et al., 2021). The state must use legal measures to ensure that children's parents and families can care for them and meet their basic nutritional needs; and provide for the nutritional needs of children whose parents are absent, too poor or lack the capacity to do so, through policies and programmes such as the Child Support Grant (May et al., 2020).

School nutrition programmes, school feeding schemes, Food for Education (FFE) programmes, and take-home rations are all responses to poverty and the poor nutritional status of children. There are two main reasons for feeding children in schools: the first is a nutritional one and the second is an educational one. Both work hand-in-hand, since well-nourished children are assumed to perform better at school (DPME/DBE, 2016). School nutrition programmes are meant to support education through two main pathways: 1) increased access to and participation in school - as the programmes act as an incentive to attend school - and 2) increased learning ability – through improved nutritional intake (Kristjansson et al., 2016). Schools are excellent avenues for health and education interventions because many children attend schools. There are quite a number of reasons to provide school meals and these include:

- Nutrition: Meals improve the nutritional status of children; school meals can address micro-nutrient deficiencies if they contain the micronutrients children are deficient in (Leatt et al., 2005). This is important given that SANHANES-1 found the presence of high vitamin A deficiency (Shisana et al., 2014).
- Short-term hunger: Meals reduce short-term hunger, which improves concentration in class, and time-on-task usually results in improved learning.
- Attendance: Meals act as incentives for families to send their children to school, which encourages attendance and enrolment (particularly of girls) (Vermeersch and Kremer, 2004). Longer stay in school and attainment of higher literacy levels is thought to have a positive effect on issues such as teen pregnancy and vulnerability to contracting HIV (Tomlinson, 2007).
- Time in school: It is assumed that the presence of school meals encourages learners to spend more productive hours in school.
- Educational outcomes: This is seen to be a secondary aim of nutrition programmes; the primary aims of enrolment, attendance, time in school, and nutrition may lead to improved academic performance (McEwan, 2010).
- Orphaned and vulnerable children: Children infected and affected by HIV and AIDS, and those living in poverty and in child-headed households may rely on the school meals to provide most of their daily intake of food.
- Agricultural stimulation: Some nutrition programmes have an agricultural stimulation outcome - if the food is sourced from local farmers, this will offer them a sustained market, stable prices, and may encourage better production techniques (Korugyendo & Benson, 2011).



The NSNP's current goal and objectives define improved health and nutritional status as the overarching purpose of the programme and enhanced learning as one of four objectives (albeit the objective which receives the majority - 96% - of funding). Given limited budgets – particularly in developing country contexts – targeting is recommended to ensure that the benefits of school nutrition programmes are maximised. The two main approaches to targeting are geographic – whereby the programme is offered in particular geographic areas of need and/or particular schools, and individual – whereby children are targeted on the basis of need or vulnerability. The NSNP covers all quintile 1-3 schools and all learners attending these schools. However, in some provinces there is feeding in some quintile 4 and 5 schools due to the socioeconomic conditions of parents (Rendall-Mkosi et al., 2013).

It is good practice that menus are developed in consultation with nutritionists, taking local preferences, habits, and cultural practices into account (Kristjansson et al., 2016). Bundy et al. (2009) advise that the recommended energy content of the meals depends on the duration of the school day: if learners are at school for half a day, the meals should provide 30-45% of their energy requirements. They also recommend that the meals include fortified ingredients, as without these, the school meals may not provide adequate micronutrients. The NSNP menus are developed by Provincial Education Departments (PEDs) in consultation with the Department of Health (DoH) and approved by the Department of Basic Education (DBE). They are reviewed and updated annually and aim to provide 33% of the RDA of energy requirements for children aged 7-10 years (DBE, 2010b). The menus specify the type and quantity of food that should be prepared daily. However, an assessment of the NSNP menus undertaken by Rendall-Mkosi et al. (2013) found that, in general, the nutritional value of the meals provided by the NSNP offered learners only about 15% RDA of energy and 26% of protein requirements. There are advantages to giving children breakfast, particularly if they come to school hungry. Kristjansson et al. (2016) advise that skipping breakfast is particularly problematic for those children who are the most undernourished. Bundy et al. (2009), indicate that if short term hunger is a problem, the school meal should be provided in the morning - ideally when children arrive at school - if the meal is to have a beneficial effect on children's ability to concentrate and learn.

The TBF nutrition programme delivers breakfast in the form of fortified cooked porridge. In 2014, approximately 41,000 children were served nationally, primarily in quintile 1 and 2 schools (Graham et al., 2015). The programme, which began in 2011, is designed to complement the NSNP and is organised as follows:

VFHs cook and serve the breakfast; TBF encourages schools to use the same VFHs as for the NSNP. They are paid an extra R300 per month for these services, paid by TBF;

Breakfast is served between 7:30 am and 8:00 am. Each child is provided with one plate and a set of eating utensils;

Breakfast consists of either a fortified sorghum, maize or oats-based porridge.

An evaluation of the TBF programme found that a factor in its success is that the food provided is sufficient to include school staff who therefore support the programme. This also encourages educators to arrive at school on time. The evaluators found that the breakfast acts as an incentive for children to get to school on time, and school starts on time with most learners present (Graham et al., 2015).

### 3.4 COVID-19 and child nutrition

Early investments in children's nutrition provide a solid foundation for lifelong health and economic development. It is therefore vital that the relevant stakeholders put in place measures to uphold children's rights to basic nutrition, health care services and social assistance, and take decisive action to protect children from both the immediate shock and long-term effects of rising hunger. Before the pandemic, 59% of South Africa's children lived in households with an income below Stats SA's poverty line of R1 183 per person per month, while 30% of children lived below the food poverty line of R585 per month or R20 a day (Hall & Sambu, 2019). This meant that a third of children lived in households with not enough money to meet their daily energy requirements. In 2018, child hunger affected 2.1 million children (11%) nationally, of whom 197 000 lived in the Western Cape (Sambu, 2019).

Hard lockdown measures precipitated a dramatic increase in unemployment and food insecurity, and intensified the threats to children's nutrition and health. A study by Jamieson and Van Blerk (2021) found that the first stringent COVID-19 lockdown led to joblessness, poverty and isolation from protective social networks stripping many families of the resources they needed to care for children. In April 2020, the month of level 5 lockdown, 47% of households reported running out of money for food. Child hunger was reported in 15% of households (Van der Berg et al., 2020). Food prices rose dramatically with a 12.6% increase in the cost of a basic household food basket between March 2020 and March 2021 (Pietermaritzburg Economic Justice and Dignity, 2021). These challenges at household level were compounded by the closure of schools and the suspension of the National School Nutrition Programme (NSNP) that provides daily nutritious meals to more than nine million children during the school terms. Early childhood development (ECD) facilities were also closed, so that young children fed at these facilities lost this form of nutrition. In May 2020, national government launched its disaster relief programme to mitigate the effects of the lockdown through top-ups to

social grants, the introduction of the COVID-19 Social Relief of Distress (SRD) grant and COVID-19 Caregiver Allowance, the Temporary Employer/ Employee Relief Scheme (TERS), and emergency food assistance (Van der Berg et al., 2021a). The positive effect of these programmes was evident in the lower rates of household and child hunger recorded in July/August. Yet, by November/December, household and child hunger increased sharply following the termination of the top-up grants and Caregiver Allowance at the end of October. Households receiving the Child Support Grant were worst affected by the withdrawal of the grant top-ups and Caregiver Allowance. Levels of food insecurity remained persistently high with one in seven households reporting child hunger in February and April 2021 (Van der Berg et al., 2021b). Food insecurity and hunger predominantly affected poorer populations, those living in rural areas and in larger household.

COVID-19 disrupted young children's access to routine health care services. According to the DHIS, in the Western Cape this led to a 23% drop in the under-five primary health care utilisation rate between 2019 and 2020. The NSNP provides a daily meal to over nine million learners in South Africa, but the closure of schools and NSNP during hard lockdown prevented children from accessing this essential source of nutrition support. Unlike other provinces, the Western Cape tried to find innovative ways to keep the NSNP running by allowing eligible learners to collect meals from schools, allowing those living far from school to collect food from a school closer to home, and providing food parcels in rural areas. Despite these efforts, the programme reached only 9% of eligible learners in May 2020 (Kendricks et al., 2021). South Africa has an established social assistance programme to support poor children as well as the elderly and people with disabilities. Before COVID-19 arrived, over 18 million individuals were receiving social grants every month. Social assistance was a central pillar of the disaster relief response. As soon as the lockdown was announced, economists started to simulate the likely impacts of shutting down the economy and to explore different options for expanding social assistance. The analyses showed that increasing the Child Support Grant (CSG) would not only protect children from extreme poverty and hunger but was also by far the quickest way to channel income support to millions of vulnerable households, including those that rely on informal sector income and would not qualify for income protection. (Bassier et al., 2021). The COVID-19 Social Relief of Distress (SRD) grant was an important complementary measure to reach vulnerable households who were not receiving the CSG (mainly unemployed adult men), but would take longer to implement.

### 3.5 Outcomes and impact of school nutrition programmes

School feeding schemes may alleviate short-term hunger, allowing children to concentrate (Grantham-McGregor et al., 1998) and perform more complex tasks, and they may encourage attendance and punctuality, thereby increasing time in school (Beesley & Ballard, 2013). However, for short-term hunger to be alleviated, food must be provided every day, and if it is not, due to delays in delivery or lack of gas, learners will be hungry in class. It is reasonable to assume that if parents are not warned about the lack of a meal on a particular day, they will not make provision for their children, and those children will go hungry. There is also evidence that school nutrition programmes increase enrolment, especially of girls (McDonnell & Probart, 2011; Tomlinson, 2007). Significant, positive effects were also found on school attendance and learner performance in mathematics. Poswell and Leibbrandt (2006) argue that school feeding is a strong motivation for children to attend school, but there is "weak evidence" the feeding improves learning outcomes. The impact of the COVID-19 pandemic during which schools were closed, children lacked outdoor activities and aberrant dietary were likely to disrupt children psychologically (Chatterjee et al., 2020).

The review by Kristjansson et al. (2016) also included a process evaluation component which identified factors which impact on the effectiveness of school feeding. Without an appropriate learning environment, school feeding only creates food security outcomes, not educational ones (WFP, 2010). Tomlinson (2007) argues that short-term hunger can lead to poor concentration, recall, and verbal fluency, and he marshals evidence from other studies which show that provision of a good meal improves performance and cognitive ability. However, it is not clear that this automatically results in improved educational outcomes. Thus feeding "cannot compensate for poor school facilities, insufficient trained teachers, or poor fit between curriculum and local job market" (Korugyendo & Benson, 2011). In terms of improving the nation's nutrition, a take-home ration might be most effective for reaching those children who need it most (Kazianga et al., 2009; Korugyendo & Benson, 2011). One of the challenges to the nutrition argument is that school meals will not improve a child's nutritional status if the family adjusts the food given at home, knowing the child will be fed at school (Aliyar et al., 2012; Beesley and Ballard, 2013). Greenhalgh et al. (2007) report on a number of studies where 'substitution' occurs. The SANHANES-1 data also show that a significant number of South African children do not eat breakfast at home: 19.0% of respondents reported this, which is almost one in five children. However, it is not clear why this is the case, i.e., whether children do not eat breakfast at home because there is no food to eat or because parents withhold it because of the school meal.

## 4. Research methods and design

### 4.1 Study design

The study employed a child-centred qualitative approach to elicit in-depth and a more nuanced understanding of the perspectives of children on how they were affected by the shifts in in-school nutrition programmes during the COVID-19 pandemic. A child-centred qualitative approach was suitable as it involves participatory methods that are suitable for and sensitive to data collection with children.

To address the second aim, which was to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces, a mixed methods designs (that is using both quantitative and qualitative research methods) was employed.

### 4.2. Location of the study

This study was a survey carried out over a period of two months (From April 2022 to May 2022) in four South African provinces, namely – Gauteng, Western Cape, North West and KwaZulu-Natal (all of which have breakfast and lunch programmes as part of the NSNP in-school nutrition programme). In each province the researchers randomly selected one district. Within that district three schools were selected from the district lists – one from each eligible quintile. For more details on the selected provinces and districts see Table 1 and Figure 1 below.

### 4.3. Sampling procedure and data collection

Random sampling technique was used in selecting the districts and the three schools per district, based on the list provided by the TBF. The school representatives were called on phone and the study explained to them. Upon acceptance, dates were scheduled for the visit to the different schools. All children in Grade 5, 6 and 7 were given caregiver consent forms and children were conveniently selected from those whose caregivers returned the forms. Selecting older children allowed for more confidence amongst the children to engage in discussions, as well as potentially better recall of their feelings and experiences over more than a year. The sample included 182 children aged 10-12 years. Figure 1 provides a breakdown per province.

Within each school at least one principal/coordinator, teacher and food handler were approached and interviews were conducted with a total of 36 of those who volunteered to participate in the study (see Table 1 for the breakdown per province).

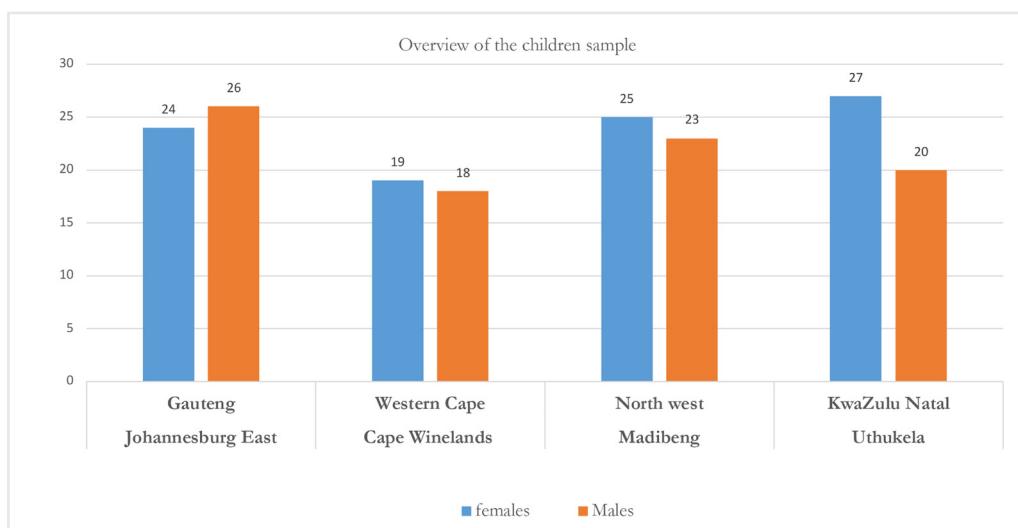


Figure 1: Sample of children in each province per selected district

**Table 1: Sample of principals/coordinators, food handlers and teachers in the study**

Province	Gauteng	Western Cape	North West	Kwazulu-Natal	Total
Districts	Johannesburg East	Cape Winelands	Bojanala	Uthukela	
Principals/ Coordinators	3	3	3	3	12
Food handlers	3	3	3	3	12
Teachers	3	3	3	3	12
<b>Total</b>					<b>36</b>

#### 4.4. Research methods and instruments

Focus group discussions with children were conducted and employed participatory methods such as drawing and games to elicit responses in a safe and sensitive way. Hypothetical situations were also used in the discussions to depersonalise the experiences as far as possible.

There were three interview instruments used in this study – one for the principals or NSNP coordinator, one for the food handler, and one for a teacher. Dietary intake data, including energy, macronutrient, and micronutrient intakes, was evaluated using the NutriSurvey application and the South African Food Composition table. The values were compared with reference intake values to ascertain the percentage contribution of the school-fed diets to the children's RDA (for ages 7-10 years). A checklist was also used to evaluate the nutritional/health status of the children, and the hygiene conditions in the kitchen.

The survey instruments were piloted at two schools in Gauteng Province with six participants; these were excluded afterward from the main study.

#### 4.5. Data analysis

The interviews with principals/coordinators, teachers and food handlers were transcribed and analysed with the use of ATLAS.ti software version 22.0. The checklists were analysed using Microsoft Excel 365.

Focus group discussions with children were transcribed and quality controlled by the researchers and then analysed thematically using an inductive approach; this method allowed themes to emerge from the voices of the children without pre-imposed ideas. This analytical approach ensured that the children's perspectives were foregrounded. The data was also managed on Atlas ti® version 22.0.

#### 4.6 Ethics

Ethical approval for the study was sought from the University of Johannesburg, Faculty of Humanities Research Ethics Committee. Permission to access and conduct the study was sought from the Provincial Departments of Education in all four provinces. All ethical principles were abided by. Caregivers, children, food handlers, and principals were fully informed of the nature and purpose of the study as well as what their participation would involve. Participants volunteered to participate in the study and provided informed consent before they were engaged in the study. In addition to the caregivers providing consent for their child to participate in the study, children themselves were asked if they wanted to participate and needed to provide signed informed assent forms before being included in the study. The information sheet for the children was written in an accessible manner and fully explained by a researcher trained to conduct research with children using the children's most spoken languages in each school. The data collection was conducted in a child-sensitive and friendly manner. One of the researchers has expertise in conducting research with very vulnerable children and youth and had trained the research team to conduct the research appropriately, with sensitivity and care. Further, provision was made for a social worker to provide support to children who were upset by the process.

Survey participants were assured all data would be used for research and recommendation purposes only. Participants were permitted to provide their names on the interview forms strictly for tracing/follow-up purposes. Data was anonymised in the analysis phase and in the findings.

## 5. Findings

In the sections that follow we share how children experienced the in-school nutrition programme during the pandemic, thereafter we present findings on the nutritional value of the programme.

### 5.1. Children's perspectives

#### 5.1.1. Children's view of the in-school nutrition programme

Across all the schools it was clear that children appreciated the food they received through the programme. In the quote below, a child from KwaZulu-Natal (KZN) notes that, without the food, they would not be healthy and would only eat limited types of food. The participant said:

*"I think if we didn't get food here at school, we wouldn't be healthy because other people at home survive on cabbage. Here at school they help us by giving us other food. You can't survive on cabbage every day. I don't think there's anyone who would enjoy living on cabbage". Participant from KZN*

Similarly, another child mentions the importance of the food for maintaining adequate energy levels, and building the immune system. The participant said:

*"Because the school food gives you more energy to work during the day and it's very tasty. It builds your immune system to function". Participant from WC*

From the statements above, it is clear that children understood that the food they received through the NSNP is maintaining good health. This confirm findings from studies that evaluated the impact of the school feeding programmes on children's health and found positive effects such as the provision of nutrients in their bodies (Mostert, 2021; Jomaa, McDonnell, & Probart, 2011).

#### 5.1.2. The COVID-19 lockdown and food access

Findings show that children were negatively impacted by restrictions imposed during the pandemic, speaking of the inability to access food during this period. In the quotes below, children from all four provinces report similar hardships as a result of the pandemic, and school closures. They said:

*"So ever since COVID-19 started, it destroyed literally everything because we couldn't even come to school and eat". Participant from WC*

*"And I think COVID-19 had an effect on the school because a lot of children don't have access to food at home to eat. Now that because the school is being closed, they didn't get enough to eat at home". Participant from NW*

When asked how COVID-19 affected children and their access to food one child in Gauteng said:

*"They were struggling to get food because others are poor at home". Participant from GP*

In the quote below, a child from KwaZulu-Natal noted the difference in the in-school nutrition programme during this period, as children were no longer receiving food parcels before holidays as they usually did:

*"When we are going to holidays, they gave us porridge and breakfast, Before COVID, they did give us every time when we go on school holidays, but then COVID came and then things changed". Participant from KZN*

These quotes highlight the challenges faced by children, and their families, in terms of accessing food during the pandemic. Consistent with research conducted during this period, children in this study also reference the worsening economic conditions, and the ways in which it impacted families (Jamieson & Van Blerk, 2021).

### 5.1.3. Returning to school and access to food

Once school resumed full-time, children reported that they still had to social distance during meals and observed that there were changes in the food menus at school. Children shared that food portions started getting smaller as all children returned to school, and noted that the quantity received was insufficient: The children said:

*"Now that we are all coming to school, the food is becoming less again. It's just one spoon. The food that we get is so little. We don't even get full". Participant from KZN*

*"Like the time COVID had not arrived we had food that is enough. But now, even the cabbage is no longer there. Now they give us little food". Participant from GP*

Similarly, children from the Western Cape noted they were no longer receiving food they received before. The children below said:

*"Also, not in the maize meal anymore. But before COVID we used to get maize meal, yes, a lot of maize meal". Participant from WC*

*"No, there were cabbage and there were pumpkin soup and carrots as well but not anymore". Participant from WC*

*"We used to get fish food as well but not anymore". Participant from WC*

Children in Gauteng schools also commented on the changes, with one saying they used to get a variety of fruits before, but this was no longer the case:

*"We stopped getting bananas and then oranges sometimes, but then pears we always get them. And apples, I think it was last year since...we didn't get apples". Participant from GP*

The sentiments shared by the children was that access to food had changed compared to before the COVID-19 pandemic. Children were no longer receiving the same portions they used to receive before. For example fruit, vegetables and staple foods such as maize meal were no longer provided in Western Cape.

### 5.1.4. Quantity of the food

Children in all provinces were concerned with the size of the food portions they received as part of the programme. They reported food portions were smaller than they were accustomed to and inconsistently served, resulting in some children going hungry. The children said:

*"In our class we are forty seven, but we get 5 litres only". Participant from WC*

*"Like maybe you're the number one in line, they'll give you enough food and next small food like they don't measure well. And then some cry about like we are still hungry". Participant from GP*

*"Maybe, just about the food that they dish up. The food that they dish is not enough to fill us". Participant from KZN*

Children expressed concerns about children who depended on the food from school, and had no food at home. They said:

*"We feel pain because other children at home they don't eat". Participant from GP*

*"I felt sad because other children survive with food that we get from school". Participant from GP*

It appeared that in Gauteng, Western Cape and North West, one reason for the differing portions could be attributed to the food handler's inconsistent measurement of food portions. In KwaZulu-Natal, it appeared that this could also be attributed to the number of children who were not registered in the programme, but were accessing it. One child said:

*"Because at school there are many of us. Some children didn't put their names down when they came and counted how many needed food". Participant from KZN*

### 5.1.5. Quality of the food

Following on from their observations regarding the quantity, and variety of food, children also commented on the quality of food they were receiving. Participating children reported that the food lacked flavour, was lumpy and not always cleaned properly. They had this to say:

*"The sorghum porridge has lumps. So, when you try to eat it, there is raw sorghum inside. That's why we don't like it". Participant from NW*

*"Yes, something like that because there are not many spices. Sometimes they don't even put salt or spices". Participant at WC*

*"Yeah, Covid-19 was really bad because like the previous (chef or cook) uh, they used to cook very good food and now we are (worrying) they are not preparing that much of good food". Participant at GP*

Similar findings were noted by Graham, Hochfeld, Stuart and Van Gent (2015) on a study they conducted to evaluate the NSNP and the TBF feeding programmes in the Eastern Cape Province. In their analysis the authors found instances in which children were not entirely happy with the quality of food and the portion sizes. Findings from the children in this study suggest that, post lockdown, the quality and quantity of the in-school nutrition programme had declined. In the section below, we describe the impact of this, as reported by participating children.



### 5.1.6. Impact of changes of the in-school nutrition programme on children

Children were asked to reflect on the consequences of not receiving food. It appeared that the majority of children linked food insecurity to difficulties concentrating and learning at school.

*"Iam not able to answer the teacher properly when they ask me a question. I feel lazy". Participant from KZN*

*"You might not hear what the teacher says. You can't concentrate in class. So, it is very important". Participant from NW*

*"We will lack concentration because we are hungry and cannot hear what the teacher is saying. So everyone will fail". Participant from NW*

*"So, when I'm hungry at school, I try to concentrate, but I can't concentrate, but I just don't remember what I learned after. So, it might look like I'm concentrating, but my brain is not taking in the knowledge". Participant from GP*

*"When I didn't get food coming from home, it really affects me because I don't concentrate at school. My stomach is going to (call me) and busy disturbing me, so I can't focus. My mouth becomes white, and it shows that I'm hungry I need to lick my mouth all of the times and then I don't concentrate. And then the teachers will (check) on you and they think that you don't concentrate". Participant from GP*

*"If a child does not eat, something that the teacher is talking about it would never come in mind, stay in mind". Participant from WC*

*"No, you get hungry, your brain cannot function". Participant from WC*

From the responses above it is clear that changes in the food programme in terms of availability and quality affected the children's learning practice in different ways. Children's responses point to being distracted and focusing on hunger instead of what is being taught, which may result in them failing at school. The views of the children is supported by Afriti et al (2019) who assertion that hunger and malnourishment can adversely affect students' school performance by lowering their effort and cognition during school hours.

Similarly, Wall et al. (2022) note that malnutrition and hunger can lower a child's ability to learn effectively. In this study, children also mentioned how limited food impacts on energy levels, and again the ability to learn.

*"They get weak, their immune system as well. They don't get enough energy. They get sick and they get nauseas. So they must eat". Participant from WC*

*"Other children were a bit lonely and tired because they had low energy". Participant from NW*

Another child from North West added, *"When the teacher is teaching, I will feel like I want to sleep because I won't have energy".*

In addition to the impact on learning, not receiving food at school or not having enough also affected children's emotional well-being. They commonly expressed feeling sad and disappointed by the quality and quantity of food they received at school during the pandemic.

One child from KZN said: *"I feel Sad, because the food doesn't fill our tummies"*, and another child from GP added, *"I feel like crying"*.

In addition, a participant from WC stated: *"At the other side, I'm happy, because I get the food, other side, I'm not happy because we get fruits on Wednesday, how about Monday, because others don't eat at home"*.

These findings are consistent with research that shows that when children experience food insecurity they often notice the situation, they worry and feel tired and hungry due to food running low (Fram, Frongillo, Ritchie & Rosen, 2015). Seekings and Nattrass (2020) found that that children who did not receive enough food as a result of the suspension of the NSNP, missed out on two school meals daily.

Children consistently reported that the changes that occurred in the in school nutrition programme during the pandemic negatively impacted their physical well-being. Some children did not have enough food from school and from home and reported health conditions and weight loss.

*"Oh when I get hungry my stomach is always like sore and like I get a little dizzy sometimes"*. Participant from NW

*"So, when we- when I couldn't get enough food, I would actually just sleep. So, when you're sleeping, your hunger doesn't change, so that actually helped go through when I'm hungry"*. Participant from GP

The result show lack of access to food resulted in children experiencing health challenges, such as dizziness and weight loss. These responses are consistent with Miller, Morrissey and Thomas (2019) who noted that food insecurity causes physical health problem in children.

During focus group discussions with children, children often referred to the broader impact of the pandemic, which included loss of employment, loss of life and limited financial resources at home, all of which appeared to impact negatively on their well-being, and increased food insecurity.

*"Sometimes, some kids' parents got laid off because of their co-workers who got the symptoms and COVID. So, they had to close down their job and they couldn't afford food because the parents don't work."* Participant from NW

*"They were doing okay before COVID, but now COVID has ruined people's lives, and it has cost others their jobs, and others lost their houses and were left homeless"*. Participant from GP

*"Other children were hungry because some children get food at school because they don't have food at home"*. Participant from KZN

Although many families were already dealing with socio-economic issues before the pandemic, the situation worsened as they could not fully access food from school during the pandemic. According to a study by Jamieson and Van Blerk (2021) the first stringent COVID-19 lockdown led to joblessness, poverty and isolation from protective social networks, stripping many families of the resources they needed to care for children. It is salient to note that the severity of the disruption of the COVID-19 pandemic was felt far beyond the running of the programme in school but also to the children's families and the communities.

### 5.1.7. Coping mechanisms

Children and their families appeared to draw on external and internal resources to cope with food insecurity during the pandemic. The food parcels, social protection grants and community support appeared to be instrumental in helping families.

Children mentioned that they could receive ready meals and their parents or care givers would collect the food parcels.

*"Others when they get home and they didn't eat at school, there is no food. But, Tiger Brands helps by giving masks, food, plates- mass plates". Participant from NW*

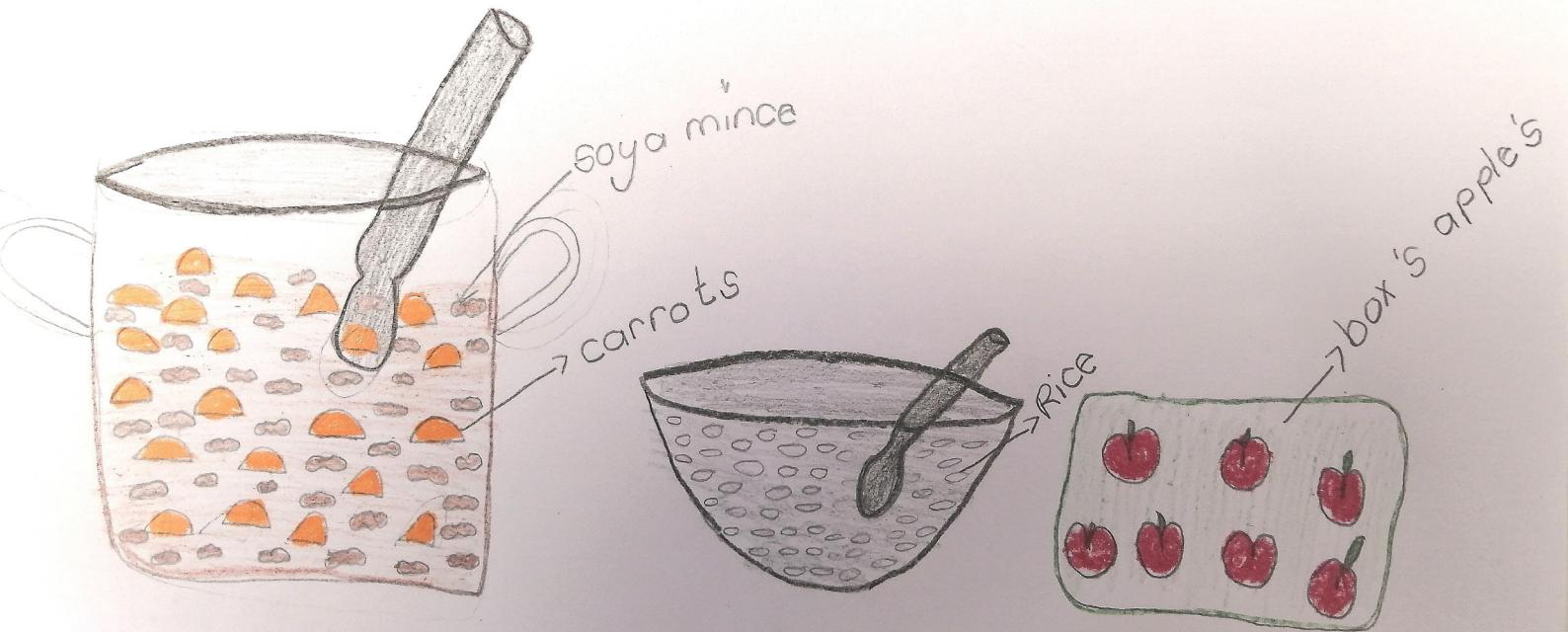
*"Children came here, and they received food and go back home so that for those who don't have food at home, they can eat. The cookers came to work and cooked for us. We came with our containers and ate. We even got food parcels". Participant from NW*

*"Some other children here at school, lost their parents to the pandemic and the food parcels was the only thing they had to eat". Participant from KZN*

*"The food parcels we get here at school were very helpful because we know that even if there is no food at home, we get the food parcels here at school". Participant from KZN*

Children, and families also appeared to rely heavily on the grants they received, including the temporary COVID-19 social relief grants, and the Child Support Grant and pension. "R350 is a lot, it's better than not having anything". (Participant from KZN)

*"Even other children in Alexander township during lockdown they survived by going- there's a place that supports children who stay with their grandmothers and depend on the SASSA grant. And they need to wait on the dates one to seven come, and then it is when they get to buy food and pay rent. Thusong is very helpful one day it will more successful more than (famous)". Participant from GP*



*The food is very nice*

*The people make it with love*

Support from within the community was also noted by children. This support also included children assisting fellow school children by sharing the food they received from school and those they brought from home.

*"Uh, when I saw people not having food like maybe when we had leftovers at home, we would give them and sometimes when we made extra food, we'd give them so that some of, we can't help them all, but at least someone slept er full at that night". Participant from GP*

*"Our friends they do not have lunch, we share our money [overlapping conversation] even if I have 1 rand, then we go to the kitchen to get food". Participant from WC*

*"Not the whole school, in my class we share, we share very much". Participant from WC*

Children also mentioned the community support in terms of neighbours, friends and the schools providing food to families that did not have enough food. Most children shared their meals with friends who did not have enough food.

In more difficulty cases, some children reported that, in order to survive, they had to resort to criminal activities, and maladaptive coping mechanisms. This was mostly reported in the Western Cape and Gauteng Provinces.

*"They get angry if you don't give them a piece of bread then they want to fight with you". Participant in WC*

*"When my friends don't have money, and they are ready to dish food, some of them go to drink water, but some of them steal some food to eat". Participant in GP*

*"I don't know them but I would see some of them young children since COVID started they have changed and they now do drugs and stuff like that. They are getting out of line, they no longer sleep at home, they drink alcohol and stuff like that". Participant from GP*

Children reported that the situation was particularly difficult for some of their peers, they shared example of children getting into conflict, stealing food and not sleeping at home and using illegal substances. Some appeared to link food insecurity to increased vulnerability to criminal activities. This resonates with a study by Chaudhuri, Roy, McDonald and Emendack (2021) on coping with food insecurity in which children's coping behaviors primarily included dropping out of school, begging, stealing, and food Seeking.

## 5.2. Nutritional value of the meals

In the sections that follow, the nutritional value of the meals are presented as well as feedback from adult participants.

### 5.2.1. Nutritional value of provincial menus and percentage RDA met

The results of the menu evaluation showed that most of the NSNP lunch meals were not providing up to 25-30% of the children's RDA for most micro and macro nutrients. Only a few meals like the chicken liver with rice, which was only fed in the Gauteng Province (Tuesday – lunch) and pap with milk - Ace instant (Thursday – lunch) seemed rich in most essential nutrients. The nutrient breakdown for two sample meals is shown below in Tables 2a and 2b. The first shows a breakdown of a Tuesday breakfast meal (Jungle oats) and the second one shows the nutrient analysis of the Thursday lunch for Gauteng Province (Pap with milk and fruits). These two meals stand out as they seem to have most of the highest percentage values for RDAs met among the breakfast and the lunch meals respectively.

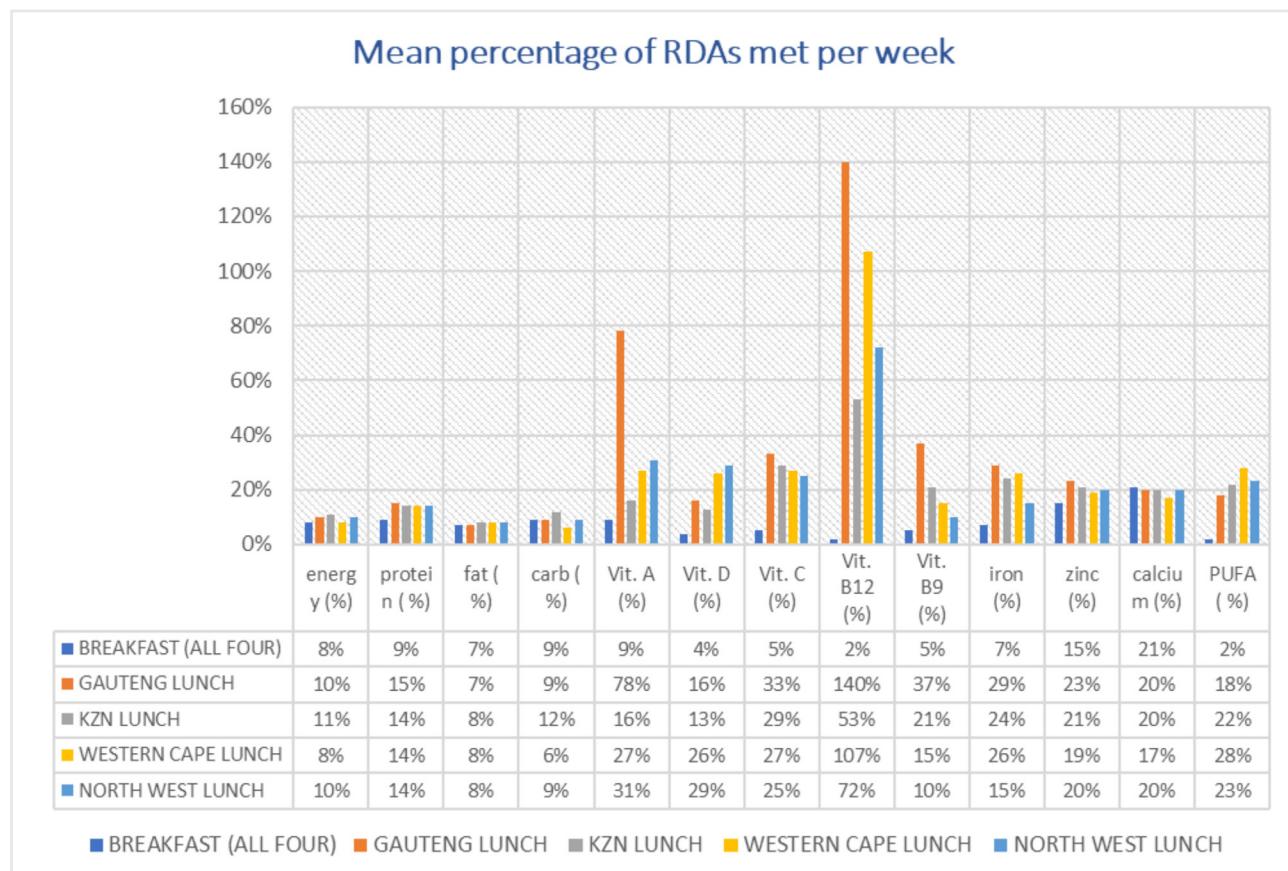
**Table 2: A sample of nutrients analysis for TBF breakfast -Tuesday meal**

Food	Amount	Energy	Carbohydrate
<b>BREAKFAST</b>			
Jungle oats	35 g	23.3 kcal	3.4 g
UHT milk	207 g	129.6 kcal	9.9 g
Sugar	10 g	40.6 kcal	10.0 g
Drinking water	200 g	0.0 kcal	0.0 g
Meal analysis: energy 193.5 Kcal, carbohydrate 23.3 g			
<b>Result</b>			
Nutrient content	analysed value	recommended value/day	percentage fulfillment
energy	193.5 kcal	2036.3 kcal	10 %
water	412.0 g	1800.0 g	23 %
protein	7.2 g (15%)	60.1 g (12 %)	12 %
fat	7.6 g (35%)	69.1 g (< 30 %)	11 %
carbohydrate	23.3 g (49%)	290.7 g (> 55 %)	8 %
dietary fibre	0.6 g	25.0 g	2 %
minerals	1.5 g	-	-
Vit. A	83.5 µg	800.0 µg	10 %
Vit. D	0.1 µg	5.0 µg	1 %
Vit. E	0.7 mg	9.5 mg	7 %
Vit. B1	0.1 mg	1.0 mg	8 %
Vit. B2	0.3 mg	1.1 mg	27 %
Vit. B5	0.7 mg	5.0 mg	14 %
Vit. B6	0.1 mg	0.7 mg	9 %
biotine	4.8 µg	17.5 µg	28 %
total folic acid	12.1 µg	300.0 µg	4 %
Vit. B <sub>12</sub>	0.0 µg	1.8 µg	0 %
Vit. C	2.1 mg	80.0 mg	3 %
sodium	104.1 mg	2000.0 mg	5 %
potassium	324.4 mg	1500.0 mg	22 %
calcium	255.1 mg	900.0 mg	28 %
magnesium	18.7 mg	170.0 mg	11 %
phosphorus	207.0 mg	800.0 mg	26 %
iron	0.5 mg	10.0 mg	5 %
zinc	1.2 mg	7.0 mg	17 %
copper	0.1 mg	1.3 mg	9 %
manganese	0.2 mg	1.5 mg	15 %
PUFA	0.4 g	10.0 g	4 %

**Table 3: A sample of nutrient analysis for NSNP lunch - Thursday meal for Gauteng**

Food	Amount	Energy	Carbohydrate
<b>LUNCH</b>			
Ace Instant flavours	40 g	146.7 kcal	31.2 g
UHT milk	207 g	129.6 kcal	9.9 g
Table salt	1 g	0.0 kcal	0.0 g
Orange fresh	140 g	65.9 kcal	12.9 g
Drinking water	200 g	0.0 kcal	0.0 g
Meal analysis: energy 342.2 Kcal, carbohydrate 54.0 g			
<b>Result</b>			
Nutrient	analysed	recommended	percentage
content	value	value/day	fulfillment
energy	342.2 kcal	2036.3 kcal	17 %
water	506.9 g	1800.0 g	28 %
protein	10.0 g (13%)	60.1 g (12 %)	17 %
fat	7.3 g (20%)	69.1 g (< 30 %)	11 %
carbohydr.	54.0 g (68%)	290.7 g (> 55 %)	19 %
dietary fiber	4.0 g	25.0 g	16 %
minerals	3.3 g	-	-
Vit. A	157.8 µg	800.0 µg	20 %
Vit. D	0.1 µg	5.0 µg	1 %
Vit. E	0.3 mg	9.5 mg	4 %
Vit. B1	0.2 mg	1.0 mg	23 %
Vit. B2	0.4 mg	1.1 mg	39 %
niacine	1.6 mg	6.0 mg	27 %
Vit. B5	1.3 mg	5.0 mg	26 %
Vit. B6	0.2 mg	0.7 mg	35 %
biotine	8.5 µg	17.5 µg	49 %
total folic acid	67.9 µg	300.0 µg	23 %
Vit. B12	0.0 µg	1.8 µg	0 %
Vit. C	78.1 mg	80.0 mg	98 %
sodium	570.5 mg	2000.0 mg	29 %
potassium	552.1 mg	1500.0 mg	37 %
calcium	391.5 mg	900.0 mg	43 %
magnesium	31.1 mg	170.0 mg	18 %
phosphorus	213.8 mg	800.0 mg	27 %
iron	1.9 mg	10.0 mg	19 %
zinc	1.8 mg	7.0 mg	26 %
copper	0.2 mg	1.3 mg	15 %
manganese	0.1 mg	1.5 mg	4 %
PUFA	0.3 g	10.0 g	3 %

A calculation of the mean percentage of RDA met shows that for the TBF breakfast, among the essential nutrients for child nutrition, the least mean percentage met was 2% for Poly Unsaturated Fatty Acids (PUFAs) and the maximum met was 21% for calcium. The Gauteng lunch seemed to have a higher percentage of RDAs met for most essential nutrients when compared to that of other provinces' menus. A previous report (DPME/DBE, 2016) shows that in 2013 the NSNP was meeting between 15-26% of the RDAs which is similar to the results (10-27%) seen in this study except for vitamin B12 which had mean percentage values above 50%. The results of the school feeding evaluation show that the schools are following the menus (both breakfast and lunch) assigned to each province but quantities fed vary slightly. The TBF breakfast provides between 10-20% of the RDAs. Figure 2 below shows that only the mean percentage of RDAs met for vitamins B12 and A were up to the desired 25-30% for each meal as targeted by the NSNP lunch. The findings of this study are in line with those of the previous evaluation of the in-school nutrition carried out in 2013 by Rendall-Mkosi et al. (2016). In that report (DPME/DBE, 2016), they noted the low percentage of RDAs met (e.g. protein 18%, energy 15% and vitamin A was 2%) and they recommended an increase in the quantity and quality of the meals fed to the learners.



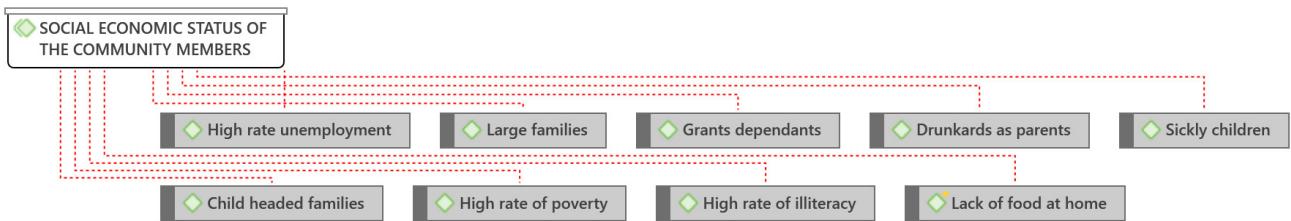
**Figure 2: Graphic representation of the average RDAs met per week for different provinces**

### 5.2.2 Feedback from interviewees/stakeholders on the school feeding programmes

The interviews report that the school feeding programmes have added value to the schools and their communities. They affirmed that the school feeding had improved school attendance, punctuality and children's alertness in class. Academic improvement (in certain cases) was also noted by the school teachers. From observations and interviewees' reports, fruits are not served frequently to the children and, even when served, there is no variety. Children get easily bored by eating, for example, only oranges every time fruit is to be served.

#### 5.2.2. Socio-economic status of the school communities

As generated from the interview responses, in figure 3 key characteristics of the communities are presented. We discuss each of these below.



**Figure 3: Social economic status of the communities**

Below is the explanation of the findings on socio economic status of learners as presented in figure 4 in the following page.

Common to all the provinces was the issue of high rate of unemployment and lack of food at home.

#### High rate of unemployment

*“...the majority of our learners they come from two hostels just behind the school, so the majority of them come from the two hostels. And also from the informal settlements. And I would say 90% of the parents are unemployed” a principal in Gauteng.*

Another respondent from the same province also asserted that:

*“...the parents that we are dealing in mostly they are unemployed...the poorest of the poor and they are unemployed”.*

The situation is the same in other provinces. According to one of the coordinators,

*“...it’s just a poor community. Most of the parents are unemployed and then most of them they are working at the farm and then at the farms you know that it’s not a permanent job” (a coordinator in North West).*

In the words of one of the teachers the only time when *“...there is work for everyone is the season of the peaches or naartjie (tangerine), now other times they have to stay at home. Then the factory also, but when the season is finished for the factory then they can’t, they don’t have work”*. (A teacher in Western Cape)

**Grant dependent:** The level of unemployment has made most of the community members depend on grants from the government.

*“Most of them, almost all of them depend on grants and those who are working are working in farms. But majority of them depend on grants,”* commented one of the coordinators.

Likewise, a principal from KZN also mentioned that:

*“Many people are unemployed in this area. And the diseases like coronavirus and HIV have caused many children to live with and be raised by their grandparents, this situation makes them to depend on the grants”.*

**Large families:** It was also observed that most of the families in the community are large. A principal from Western Cape asserted that:

*“The community has “...big families in small houses. You can imagine 4 or 5 people in a house like this size,” while another principal expressed that “normally you’d find three to four. But the worst that I came across it was seven kids with the mother, eight”.*

**Lack of food at home:** Respondents from the four provinces expressed that most of the learners came from homes where they lack food to eat.

*"Some of our learners at home they don't have something to eat. So normally they eat breakfast here at school and they eat lunch"* (a teacher in North West). A food handler from the Western Cape added that "... many of their circumstances at home is not very good, many of them don't have breakfast at home."

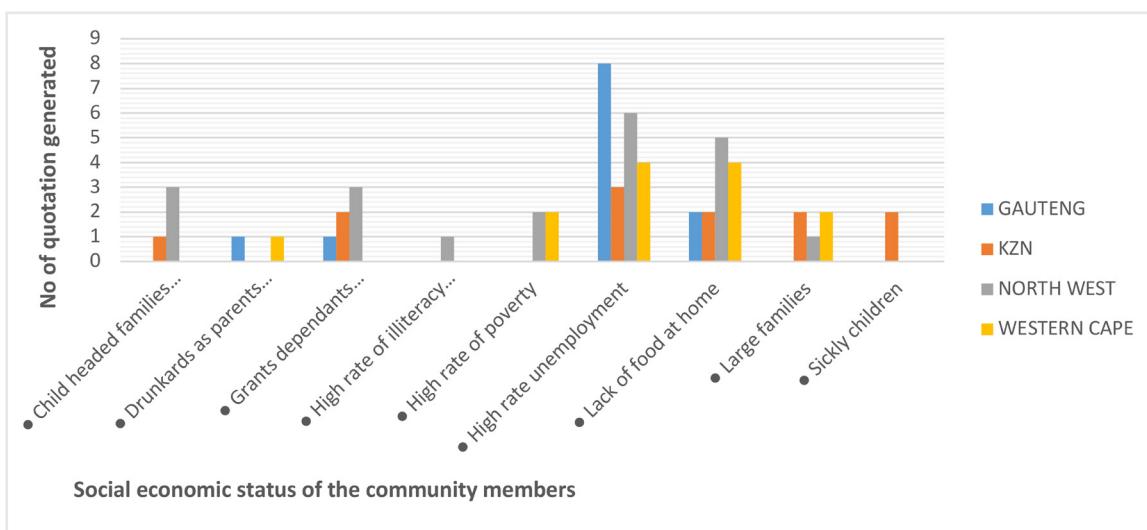
**Drunkards as parents:** One of the respondents complained that some of the parents

*"...drink in such a way that you know sometimes they don't sleep at home"* (a principal in Gauteng). In the words of a coordinator from Western Cape, the learners' *"circumstances are terrible because of the abuse of alcohol by parents..."*

**Sickly children previously:** The family condition of the learners made them to be sick and absent from school before the feeding programmes commenced.

A coordinator from KZN noted that *"the children were sick because of malnutrition and had rashes."*

Other characteristics of the community are: child headed families (orphans living together, no parents), high rate of poverty and high rate of illiteracy.



**Figure 4: Chart on social economic status of the learners**

### 5.2.2.1. Economic impact of school feeding on the community

The respondents expressed that the feeding programmes had positively impacted the economic condition of the community members.

Through the feeding programmes, some community members were engaged as food handlers and also to help in the schools' gardens (especially some years back), and this created employment for some. A coordinator from Gauteng expressed that:

*"In terms of employment at least people are being employed. Yes, they are parents but at least they get something at the end of the month, it creates jobs".*

Similarly, a food handler in KZN shared her experience that:

*"Since I arrived here, there were women who had nothing and the programme took and employed them and said they must come and work. Like us who were not working they took us in and at least there is something we put on the table".*

Food parcels were also provided to help families in the communities. One of the teachers from North West affirmed that the programme is:

*"a very very good thing because most of the learners are coming from ooh you know disadvantaged backgrounds and some of them are child headed families, some parents are not working, some they don't have parents, some are staying with their grannies you know... sometimes the Tiger Brands foundations they bring food parcels for each and every family".*

#### 5.2.2.2. Impact of school feeding on school attendance and lateness

The respondents asserted that the school feeding has really aided the school attendance and reduced lateness. *"It has made a lot of differences because since we did introduce this feeding scheme we no longer have kids who are absent from school from sickness"* (Food handler in Gauteng).

A principal from KZN also affirmed that the feeding programmes have:

*"...helped us a lot with absenteeism, both late coming and absenteeism have dropped a drastically. Kids no longer arrive late because at half past seven we eat our porridge".*

Likewise, a coordinator from the North West stated:

*"It has minimised late coming and absenteeism because they know if they come late they won't get breakfast".*

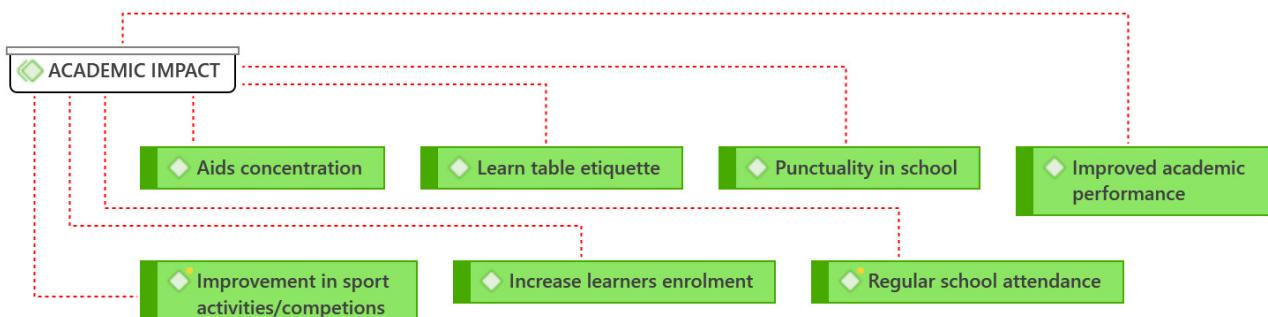
#### 5.2.2.3. Impact of school feeding on child alertness and emotion

It was also observed by the respondents that the learners now relate better with each other as a result of the feeding programmes. A teacher from KZN expressed that *"Kids are free, you see after eating they are just excellent. They ask questions, they play. There's no tension. They enjoy their work and they come in to school"*. Also, a coordinator from North West affirmed that the programmes have *"improved their teamwork and they also participate in extra mural activities a lot"*. In addition, it was observed that the learners are happy because of the feeding. Further still, respondents mentioned that after eating, the learners are highly active in the class. From his observation, a principal from KZN expressed that *"I can see the physical change and also in class they are very active. They are no longer as sickly...they are fine now"*. A teacher from North West also commended that the *"...kids are very active they are just running all the way from seven o'clock until they leave the school yards"*.

#### 5.2.2.4. Impact of school feeding on academic performance

Respondents also mentioned that the feeding programmes have greatly impacted the academic performances of the learners. As observed by the respondents, the programmes have aided their concentration in class. One of the teachers from Gauteng commented that the learners *"perform well because they concentrate because of this feeding scheme"*. Another teacher from North West commented that *"most of the learners are performing very good. They are performing very good, because you can't listen to the teacher with an empty stomach"*.

The level of the learners' concentration has also impacted their general academic performance. As asserted by one of the principals, *"...they are doing remarkably well and we have so many trophies. There is no competition we don't get involved in, not so long ago we were in a spelling bee competition"* (a principal in KZN). Figure 5 below shows the impact of school feeding on academic performance.



**Figure 5: Impact of school feeding on academic performance**

### 5.2.3. General evaluation and comparison of the breakfast and lunch school feeding programmes

The two major feeding programmes (provided by TBF and through the NSNP) were assessed by the respondents. During the interview sessions, the respondents expressed their views about the smooth running of the programmes. Below are some excerpts from the different provinces:

Respondents from Gauteng expressed that there was no problem with the programmes since their inception. *“Generally it has been running smoothly since inception day”* (principal). Likewise, the deputy principal in another school asserted that *“Since it started it is running smoothly...”*.

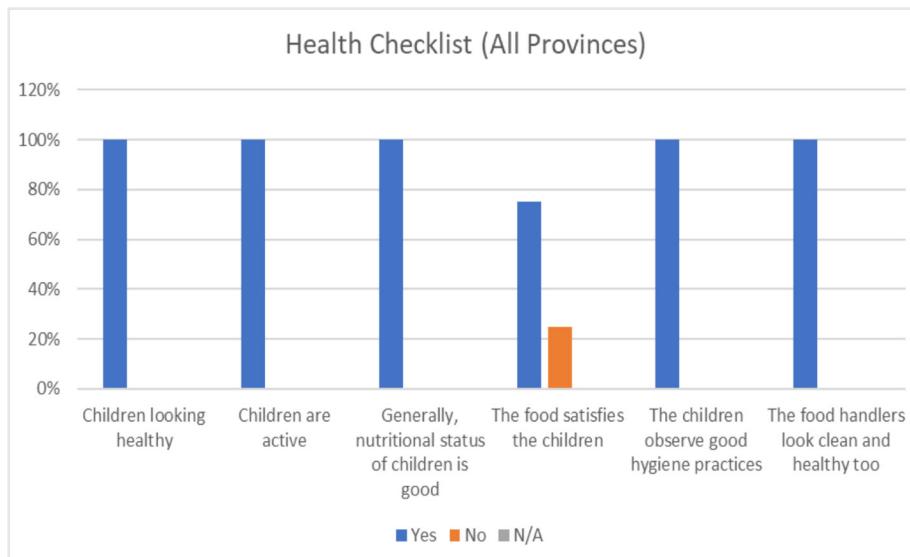
Respondents from KZN schools mentioned that the programmes took like a week before running smoothly. According to one of the coordinators, the smooth running of the programme was not difficult, *“it was just a week...”*. Another principal also asserted that within a week the programmes had started running smoothly.

A coordinator expressed that the programmes *“...were running smoothly from the beginning. Because [they] use parents of the learners to cook for them,”* while another school feeding coordinator indicated that the programme stabilised within a week.

One of the respondents (a coordinator) from the Western Cape indicated that the programme took almost a month before it was running smoothly.

### 5.2.4. Nutritional/health status of the school-fed learners

The analysis of the health checklist showed that, generally, the nutritional status of the children was good and the food handlers followed good hygiene practices in the four provinces surveyed. Hence, there has only been positive outcomes on the health of the school children. This is similar to the reports of some previous studies (DPME/DBE, 2016). It is an established fact that adequate nutrition yields positive health outcomes and vice versa. Continuous feeding of the learners with nutritious food (in recommended quantities) and good health care, will thus ensure that they grow up strong and healthy. Figure 6 below shows the 100% positive responses with regards to the impact of the school feeding programmes on the nutritional and health status of the school-fed children. The negative responses (25%) on food not satisfying the children were recorded only in KwaZulu-Natal.



**Figure 6: Interviewees' responses on learners' nutritional/health status**

## 6. Discussion and conclusion

Consistent with other studies (Jamieson and Van Blerk, 2021; Sambu, 2019; van der Berg et al., 2020), our findings show that many families and children struggled to cope with the impact of COVID-19 and the disruptions to the school nutrition programme. Food insecurity was exacerbated for many families. Participating children spoke of the negative impacts of the pandemic, observing that people lost their jobs, and as a result many had limited access to resources for food. Children astutely noted that lack of nutritious food impacts on concentration and energy levels, and ultimately on their ability to learn. The lack of access to food also resulted in children experiencing physical and emotional strain. Children observed that following the lockdown period, the quality and quantity of the meals they received through the

programme differed to what they received prior to lockdown. The portions were not consistent, and the food lacked taste and flavour. It appeared that the usual food handlers may have been replaced by those not adequately trained. The continuation of the in-school nutrition programme, the food parcels, the social protection grants and community support all enabled families and children to cope. Maladaptive coping was also noted by some children in Gauteng and the Western Cape.

Findings show that most of the NSNP lunch meals were not able to meet up with the 25-30% benchmark per meal of the children's RDA. The TBF breakfasts provided between 10-20% of the RDAs which went a long way to augment the NSNP meals. Some meals met a few micronutrient RDAs such as the B vitamins, vitamin A and calcium. The children were not also consuming fruits frequently. Despite this, their nutritional status was generally good and the adult role players reported that the school feeding programmes have positively affected school attendance, punctuality, attention in class and academic performance of many children.

## 7. Recommendations

The following recommendations are based on the findings of this study and will go a long way in improving the quality and effectiveness of the in-school nutrition programmes:

- An increase in supply of fresh fruits should be incorporated into the menus. Fruits were not provided frequently (only once a week).
- Meat or even eggs to be added into the menus as this will boost protein supply and increase the percentage met of the RDAs.
- An increase in quantities fed will also be necessary in order to meet the 25-30% target per meal especially in KwaZulu-Natal (Standardization of portion sizes and recipes).
- Some of the schools need a larger kitchen space and better storage facilities such as refrigerators in order to reduce food waste and ensure consumption of safe foods.
- Sponsoring school gardens again will help to provide more fresh herbs, fruits and vegetables. These gardens were useful when they existed a few years ago.
- Schools need to avoid deviating from the menus when possible and to ensure that a variety of foods are served to the learners.
- The Volunteer Food Handlers (VFHs) need further training on portion per serving, food preparation skills, basic nutrition knowledge and hygiene and safety skills. This will aid in improving the quality and quantity of food served at the schools.
- While children showed appreciation and acknowledgement of the value of the school food programme, they wished that there could be improvements in the quality and quantity of food, and distribution/frequency of food items. On the quality of food, children commonly recommended that sugar, salt and spices be added to the food.
- Other recommendations on the quality of food were related to the way it is prepared, which generally affected kids' enjoyment of the food. When asked about what were their least favourite foods, it should be noted that children did not necessarily point out that they did not like a certain type of food; however, the problem was the way the food was prepared.



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## Appendices

### Appendix 1: Checklist for assessment of nutritional value of in-school feeding programmes



FERL - FOOD EVOLUTION RESEARCH LABORATORY

UNIVERSITY OF JOHANNESBURG

Checklist for assessment of nutritional value of in-school feeding programmes

NAME OF SCHOOL \_\_\_\_\_

DATE \_\_\_\_\_

KITCHEN HYGIENE CHECKLIST	YES	NO	N/A
Hand wash basins located closely			
High touch surfaces cleaned regularly with detergent			
Dirty surfaces cleaned immediately			
Damp mopping over dry mopping is used			
Food contact surfaces cleaned (with hot water, bleach/alcohol solution)			
Prevention of cross contamination between utensils & chopping boards			
Detergents and sanitisers used to clean contact surfaces			
Face masks always worn			
Clean dish cloths used to clean contact surfaces			

HEALTH CHECKLIST	YES	NO	NOT SURE
Children looking healthy			
Children are active			
Generally, nutritional status of the children is good			
The food satisfies the children			
The children observe good hygiene practices			
The food handlers look clean and healthy too			

NUTRITION EVALUATION CHECKLIST	YES	NO	N/A
Meals served on time			
Meals served in good condition/hygiene			
Meals incorporate the various classes of food			
The children generally finish their meals			
Fruits and vegetables served after the meals			
Fruits and vegetables served on certain days only			
Varieties of meals served on different days of the week			
Some learners bring additional food/snacks from home			
All learners bring additional food/snacks from home			

ASSESSMENT OF THE MENU PLAN	YES	NO	N/A
Food handlers follow the agreed NSNP menu for each day			
Actual and correct food portion sizes served			
Feeding times adhered to			
Number of learners fed			
Number of learners not fed			
Additions to the meals served			
Please tick: Drinks <input type="checkbox"/> Fruits <input type="checkbox"/> Pastry snacks <input type="checkbox"/> Others <input type="checkbox"/>			
Day of the week:			

## Appendix 2: Interview for teachers



### FERL - FOOD EVOLUTION RESEARCH LABORATORY

### SCHOOL OF TOURISM AND HOSPITALITY

#### FERL/TBF Project

You are being invited to participate in a research study titled "**Assessment of the nutrient content of school-feeding programmes in South Africa: Effect on nutritional status of school children**". This study is being done by The Food Evolution Laboratory of the University of Johannesburg in conjunction with Tiger Brands Foundation and Peninsula School Feeding Association.

The purpose of this research study is to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces, namely – Gauteng, KwaZulu-Natal, North West and Western Cape. The study will estimate the nutritional value that children are receiving in the current format of the in-school nutrition programme for each school. In addition, this research will estimate the nutritional value that children are receiving in the current format of the in-school nutrition and the possible health outcomes (either positive or negative) that the changes in feeding may have had. Subsequently, based on the results from the study, a strategy to improve children's access to healthy diets may be developed especially for those provinces found to have higher rates of malnutrition.

Should you agree to participate in the research study you will be asked to sit down for an interview for approximately 30 minutes with the researcher. Participation in this project is completely voluntary and you are free to decline to participate, without consequence, at any time prior to or at any point during the interview. Any information provided will be kept confidential, used only for the purposes of completing this research, and will not be used in any way that can identify you. By signing below and returning this form, you are consenting to participate in this research study.

Participant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you agree to the interview, please can we audio record our conversation? The recording is for research purposes and we will NOT give it to anyone. The audio recording and interview material will be kept safely and after five years we will destroy it.

DATE		SCHOOL	
POSITION		NAME	
I understand the above and have had a chance to ask questions. I agree to be interviewed.		SIGN	
I agree to be audio recorded.		SIGN	

INTERVIEWER NAME & SIGNATURE	
START AND END TIME	

1. How long have you worked as a teacher in this school?
2. Do you like being a teacher here? Why or why not?
3. What do you think about the feeding scheme?
4. Have you noticed any differences that the feeding programme has made for learners? Please explain.
5. Do some learners need it more than others? Why?
6. Have you noticed any differences that the feeding scheme has made to the school? Please explain.
7. Has it made any difference to the community? How?
8. What do you think the learners like to eat / don't like to eat in the school meals?
9. What do you think about the food? Is it enough? Is it good quality?
10. Do the children wash their hands before eating?
11. Do you think the facilities are clean enough for cooking?
12. Do you think the learners sometimes waste food? If yes, what quantity? (Estimate please)
13. What works well about the feeding programme? Why?
14. What doesn't work well about the feeding programme? Why not?
15. Do you have any suggestions on how to make it better?
16. Who do you speak to if there are problems that you need help with?
17. Is there anything else you'd like to tell us about the feeding scheme?
18. Is there anything else you'd like to tell us about the school or the learners' health or their academic performance?

## Appendix 3: Interview for Principals/NSNP Coordinators



### FERL - FOOD EVOLUTION RESEARCH LABORATORY SCHOOL OF TOURISM AND HOSPITALITY

#### FERL/TBF Project

You are being invited to participate in a research study titled "**Assessment of the nutrient content of school-feeding programmes in South Africa: Effect on nutritional status of school children**". This study is being done by The Food Evolution Laboratory of the University of Johannesburg in conjunction with Tiger Brands Foundation and Peninsula School Feeding Association.

The purpose of this research study is to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces, namely – Gauteng, KwaZulu-Natal, North West and Western Cape and to estimate the nutritional value that children are receiving in the current format of the in-school nutrition programme for each school. In addition, this research will estimate the nutritional value that children are receiving in the current format of the in-school nutrition and the possible health outcomes (either positive or negative) that the changes in feeding may have had. Subsequently, based on the results from the study, a strategy to improve children's access to healthy diets may be developed especially for those provinces found to have higher rates of malnutrition.

Should you agree to participate in the research study you will be asked to sit down for an interview for approximately 30 minutes with the researcher. Participation in this project is completely voluntary and you are free to decline to participate, without consequence, at any time prior to or at any point during the interview. Any information provided will be kept confidential, used only for the purposes of completing this research, and will not be used in any way that can identify you. By signing below and returning this form, you are consenting to participate in this research study.

Participant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you agree to the interview, please can we audio record our conversation? The recording is for research purposes and we will NOT give it to anyone. The audio recording and interview material will be kept safely and after five years we will destroy it.

DATE		SCHOOL	
POSITION		NAME	
I understand the above and have had a chance to ask questions. I agree to be interviewed.		SIGN	
I agree to be audio recorded.		SIGN	

INTERVIEWER NAME & SIGNATURE	
START AND END TIME	

## Background Information

1. How long have you been a principal and/or working at this school?
2. What quintile school is this?
3. Please describe the economic status of the community which your school serves.

## Probe: Poverty / unemployment amongst parents

Levels of need income sources (e.g. grants)

Household sizes and composition

What kind of food availability / access do children have at home?

General health and illness

4. Do you have a breakfast programme at the school: [If school has TBF programme]
5. Has your school participated in any breakfast feeding programmes before the TBF project?
6. Why do you think your school is not part of the TBF programme? [If school does NOT have TBF programme]
7. Do you have a breakfast feeding programme at this school (not TBF)? Please describe, including funding, implementation and functioning.

## *Impact of the feeding programmes on learners and the school environment*

8. Have you noticed a change since the feeding programme/s at your school started?
9. How have the school feeding programmes affected the following?
  - i. Late coming? ii. Absenteeism / regular attendance? iii. The school's enrolment figures? iv. Class participation? (Probe participation and concentration)
  - v. Learner performance at school? (Probe: grades better, children performing better in class)
  - vi. Social interaction between learners?
10. Which learners would you say the school feeding programmes have helped the most and the least? (Probe for age, gender, grade, other)
11. If this is a TBF school: Are there differences between the impact of the TBF and the NSNP programmes? If yes, what are the differences?

## Functionality of the programme/s

12. Operational issues
  - 12.1 Describe how the programmes work
  - 12.2 How many learners are fed daily (TBF / NSNP)?
  - 12.3 How many food handlers do you have employed?
  - 12.4 How long did it take until the feeding programme operated smoothly after the start of the programme?
  - 12.5 What has worked well and what hasn't worked so well – what would you change?
  - 12.6 Do you have problems with getting the food for the NSNP programme?
  - 12.7 Do you have the right facilities and skills at the school for buying, transporting, storing, preparing and serving the food? Are the facilities clean enough for cooking?
  - 12.8 Do the children wash their hands before eating?
13. Food preference of learners (differentiate between TBF and NSNP)
  - 13.1 What food do the learners like most on the programmes?
  - 13.2 What do they like least on the programme?
  - 13.3 What food would the learners PREFER to have if they could choose?
14. Is the feeding programme supplemented or linked to other initiatives? If yes, please describe. (Probe: Take home or weekend food for very poor learners, Deworming of learners, the education of learners and parents on nutrition).
15. How much has the feeding programme cost the school (money, staff time, etc.) in addition to what the NSNP and TBF has supplied?
16. What has been the response of different stakeholders (teachers, food handlers, parents, children and the surrounding community) to the school feeding programmes? (Differentiate between TBF and NSNP)
17. Do you have any recommendations for TBF or NSNP?
18. Any further questions or comment?

## Appendix 4: Interview for food handlers



### FERL - FOOD EVOLUTION RESEARCH LABORATORY SCHOOL OF TOURISM AND HOSPITALITY

#### **FERL/TBF Project**

You are being invited to participate in a research study titled "Assessment of the nutrient content of school-feeding programmes in South Africa: Effect on nutritional status of school children". This study is being done by The Food Evolution Laboratory of the University of Johannesburg in conjunction with Tiger Brands Foundation and Peninsula School Feeding Association.

The purpose of this research study is to comparatively assess the nutritional value of the in-school nutrition programmes delivered at selected schools in four South African provinces, namely – Gauteng, KwaZulu-Natal, North West and Western Cape and to estimate the nutritional value that children are receiving in the current format of the in-school nutrition programme for each school. In addition, this research will estimate the nutritional value that children are receiving in the current format of the in-school nutrition and the possible health outcomes (either positive or negative) that the changes in feeding may have had. Subsequently, based on the results from the study, a strategy to improve children's access to healthy diets may be developed especially for those provinces found to have higher rates of malnutrition.

Should you agree to participate in the research study you will be asked to sit down for an interview for approximately 30 minutes with the researcher. Participation in this project is completely voluntary and you are free to decline to participate, without consequence, at any time prior to or at any point during the interview. Any information provided will be kept confidential, used only for the purposes of completing this research, and will not be used in any way that can identify you. By signing below and returning this form, you are consenting to participate in this research study.

Participant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you agree to the interview, please can we audio record our conversation? The recording is for research purposes and we will NOT give it to anyone. The audio recording and interview material will be kept safely and after five years we will destroy it.

DATE		SCHOOL	
POSITION		NAME	
I understand the above and have had a chance to ask questions. I agree to be interviewed.		SIGN	
I agree to be audio recorded.		SIGN	

INTERVIEWER NAME & SIGNATURE	
START AND END TIME	

1. How long have you worked as a food handler for the Tiger Brands/NSNP feeding scheme?
2. Do you like being a food handler? Why or why not?
3. What do you think about the feeding scheme?
4. Have you noticed any differences that the feeding programme has made for learners? Please explain.
5. Do some learners need it more than others? Why?
6. Have you noticed any differences that the feeding scheme has made to the school? Please explain.
7. Has it made any difference to the community? How?
8. What do you think the learners like to eat / don't like to eat in the school meals?
9. What do you think about the food? Is it enough? Is it good quality?
10. Do the children wash their hands before eating?
11. Do you think the facilities are clean enough for cooking?
12. Please describe in detail what you do for the feeding scheme every day.
13. What works well about the feeding programme? Why?
14. What doesn't work well about the feeding programme? Why?
15. Do you have any suggestions on how to make it better?
16. Who do you speak to if there are problems that you need help with?
17. Is there anything else you'd like to tell us about the feeding scheme?
18. Is there anything else you'd like to tell us about the school or the learners' health?

## Appendix 5: Information Sheet /Letter – Parents/Caregivers



Dear parent/Caregiver, thank you for your time to allow me to explain the research I am doing and invite your child to participate.

### **The effects of COVID-19 on in-school nutrition: the voice of the child**

I am inviting your child to take part in a research study on the effects of COVID-19 on in-school nutrition. The main aim of the study is to understand, from the perspective of children, how they were affected by the shifts in in-school nutrition programmes during COVID.

I would like your child to participate in this research as he/she attends a school that offers in-school nutrition. I am interested to understand children's perspectives on how the shifts in in-school nutrition programmes during COVID affected their learning, energy, and emotional and physical well-being. I would like to also understand from the children's perspective how they and their families coped during these periods.

If you agree for your child to participate I would like to ask your child to participate in two focus group discussions that will be held with other children in the school. The focus groups will take place in a big room with enough ventilation, hand sanitizers will be available and social distancing will be implemented for the safety of the children.

Your child's identity will remain completely confidential. I will not report his or her name or any other identifying features and will rather use a pseudonym (fake name) of your child's choice. The **only** time when we may have to break confidentiality is if the researcher witnesses something which would put a child in serious danger. In this case, we would need to report the incident to the relevant authorities.

To ensure that I accurately capture what your child says, with your consent, I will record the audio of the session. Also with your permission, I may include selective quotes from the transcription to illustrate points in the final research report and any resulting publications. These will be anonymised and great care taken to ensure that any quotes cannot be attributed to him/her.

Notes and recordings will be stored within an encrypted folder, accessible only to the principal investigator, lead researcher, and research assistant.

Your child's participation in this study is completely voluntary. Your child may choose to withdraw his/her participation at any time during or after the interview session up until any publication of the findings.

There are no direct benefits for participating, nor do I anticipate that any harm will arise from your child's participation. As a reminder, if you have any questions, please do not hesitate to contact me on the contact details provided below.

If you would like a copy of the completed report, please let me know and I will get one to you at the end of the project. Thank you for reading this information sheet and we hope to speak with you soon!

Sadiyya Haffejee  
[sadiyyah@uj.ac.za](mailto:sadiyyah@uj.ac.za) 083 450 5987

## Appendix 6: Information Sheet /Letter-Assent form- Children



### The effects of COVID-19 on in-school nutrition: the voice of the child

Hello!

We are a research team from the Centre for Social Development in Africa at the University of Johannesburg. In this time of the corona virus, we think it is especially important to learn about how it has affected you as a child who receives food at school.

We want to hear from you about **how this has affected your learning, energy and emotional and physical well-being, and how you and your family coped during these periods**

#### What are we asking you to do?

- We will like to find out what you think about the food you receive at school and how the corona virus affected the way you received the food.
- We might ask you to have a conversation with us and other children from your school.
- The questions we will ask you are related to the food that you receive from school and how they make you feel
- To answer some questions we might ask you to draw pictures and also play games with us
- We would like to record our conversations, if that's alright with you, to help us remember what we talked about.
- We might also have a notebook at hand. If that is okay with you we would like to write down a few words while you answer some questions so that we don't miss any important information you share with us.
- We may ask you to explain what you mean by some of your drawings and answers you give just so we understand properly.
- Only you and the researchers will have access to this. If we write about this, we will use a pretend name and keep all your information private.

#### Remember:

- You don't have to take part if you don't want to.
- If you do decide to take part you will be asked to sign a form.
- We will also ask your parents or someone who looks after you if they are happy that you take part.
- You should ask as many questions as you need to.
- You can also drop out at any time without giving a reason. We will ask you a few times during the project if you are happy to still be a part of it
- There are no right or wrong answers! We just want to listen to you and learn about your life through your discussion.
- Everything you say will be kept private and we will keep it stored in a safe place with a password.
- We will write about what you tell us for reports for government but also for the news and university papers. We will use a pretend name for you and no one would be able to tell you took part. If you write down something, we will not share this unless you say it is okay.
- We will talk about lots of things, and if you say there are things in your life that you are worried about, we might need to tell another adult who could help. We will talk to you about this first. Otherwise, our conversation will stay private.

#### Why is it important?

Hearing about how COVID-19 affected the way you received food is important as it may help government and other bodies to get a better picture of how this virus has affected society and give information which will help improve your in school nutrition programme.

Do you understand this research study and are you willing to take part in it?

YES

NO

Has the researcher answered all your questions?

YES

NO

Do you understand that you can STOP being in the study at any time?

YES

NO

**If you are worried:**

If you have any worries or questions about the study, you can contact Sadiyya Haffejee (sadiyyah@uj.ac.za or 083 450 5987)

---

Signature of Child

---

Date

## Appendix 7: Informed Consent Form – Caregiver/Parent

### The effects of COVID-19 on in-school nutrition: the voice of the child

Having read/ had the information about this study explained to me I confirm (please mark with X in the box next to the statement if you agree):

- I have read the information sheet or had the information about the study explained to me.
- I have had the opportunity to ask questions about the study
- I understand that the information my child provide will be treated as confidential
- I understand that my child may withdraw from the study at any time either permanently or temporarily
- I agree for my child to be involved
- I agree for my child's responses to be recorded. I understand that recordings will be kept secure and destroyed within ten years after the end of the project. I know that all data will be kept using data privacy guidelines.
- I understand that my child's anonymised words may be quoted in publications and outputs of research
- I understand that any drawings my child draws will not be used without my permission
- I understand that in exceptional circumstances anonymity and confidentiality would have to be broken, for example the researcher witnesses something which would put a child in serious danger

If applicable: (for children's involvement)

- I am happy for my child/children, to take part in the research project. This includes, keeping a diary (voice recorded, written texts, drawings and photos), during his/her participation in the focus group discussion of the project

Children's names and ages

.....  
.....  
.....  
.....  
.....  
.....

Name: .....

Signature/ verbal consent recorded: .....

Date: .....

## Appendix 8: Informed Consent Form – Principal/Food handler

### Assessment of the nutrient content of school-feeding programme in South Africa: Effect on nutritional status of school children

I..... hereby consent to take part in the above-mentioned research project.

1. I understand the purpose, conditions, and procedures of the study as they have been explained to me and I have had an opportunity to ask questions before making the decision to participate.
2. I understand that my participation in this project is completely voluntary and that I may withdraw and discontinue participation at any time without penalty.
3. I understand that my participation involves being interviewed by a researcher from the University of Johannesburg about my experiences as a gig worker.
4. I understand that the interview will last approximately one hour, during which an audio recorder will be used, and notes will be written.
  - ◆ I give consent for the audio to be recorded
  - ◆ I do NOT consent to the audio being recorded
5. I understand that there are no direct benefit to me for participating.
6. I understand that there are no expected harmful experiences involved in participating in this research study.
7. I understand that my identity will remain confidential and that when extracts from this interview are used in publications resulting from the study a pseudonym (fake name) will be used.

My choice of a pseudonym is: \_\_\_\_\_

By signing this informed consent form, I confirm that I have read and understood the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I also understand that I will be given a copy of this signed consent form.

Name of Participant.....

Date.....

Signature.....

Name of Researcher.....

Date.....

Signature.....

## Appendix 9: Focus group guidelines for children



CENTRE FOR  
SOCIAL DEVELOPMENT  
IN AFRICA

I'd like to invite you to make two drawings for us. After you draw, please write a few sentences explaining what you drew. REMEMBER, IT IS NOT ABOUT HOW WELL YOU DRAW, BUT ABOUT WHAT YOU DRAW.

For the first drawing I'd like you to make a drawing of a plate of food. The plate should be a picture of the food you get at school.

Probe:

- What is your favourite food on this plate?
- What don't you like on this plate?
- What do you wish you had more of?
- How often do you get this food?

Following this, we will do a brief recap about COVID-19 and some of the changes that children experienced.

For the second drawing, I'd like you to make a drawing of the plate showing us the food that you ate most of the time during COVID-19.

- Is the food on this plate same as or different to the food you got at school?
- What did you like about it/what didn't you like about it?
- Tell us a bit more about how COVID-19 felt for children and their families in your community?
  - ◆ For example: how did COVID change things for children and families?
  - ◆ Were these changes good or bad? Probe why.
  - ◆ Do you think that some children and families didn't have food during Covid?
    - ▶ If yes, why do you think so?
    - ▶ What do you think happens to children when they don't eat enough food?
    - ▶ (Probe for impact on learning, energy, physical and emotional well-being).
    - ▶ How do you think these families, that didn't have enough food, coped during COVID-19?
    - ▶ Was there any times/months during COVID-19 that were really bad for children and families in your community?
    - ▶ Do you remember, not so long ago, when you came to school on some days and not others, what type of food did you get at school? Was it the same as the food you get now/usually get or different? If yes, how so?

## Appendix 10: List of schools visited

**Gauteng Province:** Johannesburg east district

1. Ikage primary school
2. MC Weiler primary school
3. Ekukhanyisweni primary school

**Western Cape Province:** Cape Winelands district

1. H.Venter primary school
2. Prospect primary school
3. Ashton Combined school

**North West Province:** Bojanala district

1. Kgwanyape primary school
2. Leokeng primary school
3. Tebogo primary school

**KwaZulu-Natal Province:** UThukela district

1. Masumpa primary school
2. Woodford primary school
3. Hoffenthal primary school

