

# ADEQUATE NUTRITION: A PILLAR OF EARLY CHILDHOOD DEVELOPMENT

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## Executive summary

The Real Reform for Early Childhood Development (RR4ECD) movement is advocating for universal nutrition support to be provided to all eligible children at attendance-based early learning programmes (ELPs) regardless of registration status. This paper emphasises the significance of adequate nutrition for young children and identifies deficiencies in nutrition outcomes, caregiver support, and early learning opportunities.

Insufficient nutrition during early childhood can lead to lifelong impacts such as stunted growth, impaired cognitive functioning, reduced educational outcomes, and increased risk of obesity and non-communicable diseases. Interventions during early childhood have been evidenced both to improve short-term outcomes for children and to continue to benefit them into adulthood. To address the existing challenges, the draft Paediatric Food-based Dietary Guidelines and the Department of Health's Nutrition Guidelines for Early Childhood Development Programmes provide valuable recommendations to promote exclusive breastfeeding for children younger than six months, consumption of diverse complementary foods for children older than six months, and nutrient-rich options.

Collaborating with established civil society or private sector organisations can enhance the effectiveness of nutrition programmes by leveraging their expertise, infrastructure, and networks. This paper reviews a sample of organisations, mostly non-governmental organisations, that are delivering nutrition support to ELPs across South Africa, along with some nutritional information and costing. Practitioners recognise the positive impact of quality nutrition on children's development, and survey data from RR4ECD highlights the commitment of ELP principals to providing daily meals, but it also highlights the challenges they face, including insufficient and unreliable funding, as well as the high costs of nutritious food and equipment.

In order to realise the provision of nutrition to all eligible children at ELPs in South Africa, we make five recommendations. First, we recommend using the existing Nutrition Guidelines and related tools. Practitioners should be provided with training to implement the Nutrition Guidelines fully. This is a



low-hanging fruit. Second, we recommend that the Nutrition Guidelines should be evaluated and updated within a five-year period to ensure their application remains relevant and evidence-based. The third recommendation is for the Department of Basic Education (DBE) to engage with organisations that are currently implementing nutrition support programmes at various scales and in different types of settings. Not only will these engagements be an opportunity to make sense of the current implementation models, but expertise in logistics and procurement can be leveraged. Fourth, we recommend that children's growth is measured and analysed on a regular basis as a means of evaluating the impact of nutrition provision, in addition to accompanying interventions to overcome nutrition disorders that are identified. Finally, the fifth recommendation is that the DBE should roll out training and implementation of the Nutrition Guidelines as part of its pilot as a priority. This will indicate the relevance and usability of these guidelines, which are the foundation of nutrition provision at ELPs.

Advocating for improved nutrition provision requires addressing funding limitations, enhancing training to ELP staff such as cooks, and considering a range of delivery models. By prioritising these actions, we can enhance nutrition support to ELPs and contribute to the optimal development of South Africa's children.



## Acknowledgements

This paper is part of a research series—the Real Reform for ECD Right to Nutrition Series—initiated and coordinated by the Real Reform for ECD (RR4ECD) Steering Committee comprising Patience Voller (Bridge); Kayin Scholtz (DG Murray Trust); Pam Picken (Do More Foundation); Tatiana Kazim (Equal Education Law Centre); Tess Peacock (Equality Collective); Sheniece Linderboom (Legal Resources Centre); Rina Mehlomakulu (Ilifa Labantwana); Lashiwe Mparadzi (New Ithembalabantwana ECD Forum); Eric Mahlo (Save the Children); Nonhlanhla Dzingwa (Sisonke ECD Forum); Hopolang Selebalo (SmartStart); and Ruby Motaung (Training and Resources in Early Education or TREE).

The Steering Committee provided invaluable strategic direction and insightful feedback throughout, and this has been vital in bringing the research, including the synthesis report, to publication. We would like, in particular, to thank the team at the Equality Collective, which serves as the secretariat of the RR4ECD movement, including Tshepo Mantje, Tess Peacock, and Zoe Postman, as well as Kudrat Virk for her editorial support. They played an instrumental role, which included, inter alia, bringing us all together for a workshop in Cape Town in June 2023 and guiding us through the concluding stages of the research and publication process.

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We further owe deep thanks to all the Real Reformers, ECD practitioners, and other partners and stakeholders, who were interviewed and consulted, and gave generously of their time and energy to this project. This includes, inter alia, all our RR4ECD community partners and supporters, as well as nutrition experts, who participated in a series of consultations, held in July 2023, at which we shared our key findings and then draft recommendations.



Finally, the authors of this paper would like to express heartfelt gratitude to the Real Reformers (ECD practitioners) who participated in the survey for the paper, for their inputs and continued dedication to providing children with ECD services to the best of their abilities and capacity.



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## List of abbreviations

Covid-19	coronavirus disease 2019
DBE	Department of Basic Education
DoH	Department of Health
ECD	early childhood development
ELP	early learning programme
IQ	intelligence quotient
LMIC	low- and middle-income country
NFNSP	National Food and Nutrition Security Plan
NIECDP	National Integrated Early Childhood Development Policy
NPO	non-profit organisation
NRV	nutrient reference value
NSNP	National School Nutrition Programme
RR4ECD	Real Reform for Early Childhood Development
RTO	research and training organisation
TREE	Training and Resources in Early Education



# Adequate Nutrition: A Pillar of Early Childhood Development

## Introduction

### Background

The Real Reform for ECD (RR4ECD) movement seeks to advocate for the Department of Basic Education (DBE) to provide nutrition support to all eligible young children at attendance-based early learning programmes (ELPs) regardless of their registration status, i.e. registered and unregistered programmes (see Table 1). This paper aims to describe adequate nutrition for children under the age of five years in that context and forms part of a series of three research papers. In looking at what constitutes adequate nutrition from the vantage point of health, it builds on the paper by Kazim(1), which investigates the right to basic nutrition through a legal lens, while looking ahead to Droomer et al.'s paper(2) focusing on implementation approaches, including modelled cost implications. Further, a synthesis report(3), compiled by the Equality Collective serving as the RR4ECD secretariat, brings together the key messages and recommendations emerging from this Real Reform for ECD Right to Nutrition Series as a whole.

In this paper, we argue that ELPs are a point of aggregation of children below school age and therefore present the DBE with an opportunity to provide nutrition support in an efficient and coordinated manner. Children attending ELPs range in age from as young as a few months to school age (commonly termed 0–5 years). As a result, we include commentary and recommendations for all age groups that are relevant to ELPs. Although the primary responsibility may lie outside the DBE, the presence of children at an ELP requires the department, which is now responsible for early childhood development (ECD) programmes, to have a strategy in place for providing nutrition support to them. (See Kazim(1) in this research series, for more on the state's duty in respect of children's right to basic nutrition.)



**Table 1. Key terms**

<b>Early learning programme</b>
Any early childhood development programme, service, or intervention provided to children from birth until the year before they enter Grade R/formal schooling, to stimulate and promote their holistic development and provide opportunity for early learning. This may include parent support groups, outreach programmes, play groups, childminders, toy libraries, mobile programmes, and early childhood development centres.
<b>Early childhood development (ECD) centre</b>
A facility providing an early childhood programme with a focus on early learning and development, for children from birth until the year before they enter Grade R/formal schooling, typically running a half-day to full-day programme.
<b>Registered programme</b>
A programme that has met the requirements for registration in terms of Chapter 5 and/or Chapter 6 and has been registered in terms of the Children’s Act of 2005. In this paper, registered includes conditionally registered programmes.
<b>Unregistered programme</b>
A programme that has not been registered or conditionally registered in terms of the Children’s Act.
<b>Unfunded programme</b>
A programme that does not receive public funding from the Department of Basic Education, i.e. the early learning subsidy, regardless of its registration status.

The Nurturing Care Framework identifies five key components for optimal early childhood development: good health, adequate nutrition, responsive caregiving, opportunities for early learning, and safety and security.(4) Nurturing care enables human capital development by creating foundations for health, learning, and well-being in young children.(5) In the South African context, the 2015 National Integrated Early Childhood Development Policy (NIECDP) aims to transform the delivery



of ECD services, including all five components, into a comprehensive package that is available to all pre-school children from conception to the year before they enter formal schooling (see Table 2).(6)

**Table 2. Terms used in the Nurturing Care Framework and the Essential Package of ECD Services**

Components of the Nurturing Care Framework	Essential Package of ECD Services
Good health	Primary level maternal and child health
Safety and security	Social services and income support
Adequate nutrition	Nutritional support
Responsive caregiving	Support for primary caregivers
Opportunities for early learning	Stimulation for early learning

The 2019 edition of the Early Childhood Review’s(7) assessment of the current status of ECD service delivery only rated healthcare as *decent*, with *fair* levels of social services and income support. Nutritional support, support for primary caregivers, and stimulation of early learning were classified as *poor*. The five components of nurturing care, as reflected in the ECD services package, work in synergy to achieve optimal child outcomes and require inter-sectoral collaboration to meet that goal. However, this paper is focused on nutrition support.

## Importance of nutrition for early childhood development

***Nutrition is crucial to both individual and national development. ...good nutrition is a fundamental driver of a wide range of developmental goals.(8)***

Given that nutrition is central to our ability to survive and prosper, it is unacceptable that young children are not universally accessing nutrition at adequate levels.(9) Poor nutrition, which includes substandard quantities or poor quality of foods, results in losses in childhood developmental and academic potential and leads to lifelong health and economic disparities. Research shows that good nutrition is essential for young children’s cognitive, emotional, and physical development. A well-



balanced diet with adequate amounts of protein, carbohydrates, and healthy fats is crucial for brain development, immune system function, and overall growth. Poor early nutrition has immediate and short-term biological effects on mortality, physiological health, and cognitive development.(10,11) Over time, children who receive proper nutrition are more likely to perform better in school, have higher cognitive function, develop stronger social and emotional skills, have increased earning power, and have improved health in adulthood, including preventing chronic diseases such as diabetes, heart disease, and obesity.(12) In addition, a well-nourished child interacts with caregivers and their environment in a way that reinforces optimal brain development.(13)

Nutrition is vital across the life course, but the optimal window for intervention is in early life due to the rate of brain development. There is compelling evidence that the first 1,000 days of life represent the greatest return on investment, but also that children older than two years continue to benefit from nutrition support.(14) Figure 1 indicates the nature of interventions across the life course, including ECD centre meals (typically for children between the ages of one and five years).

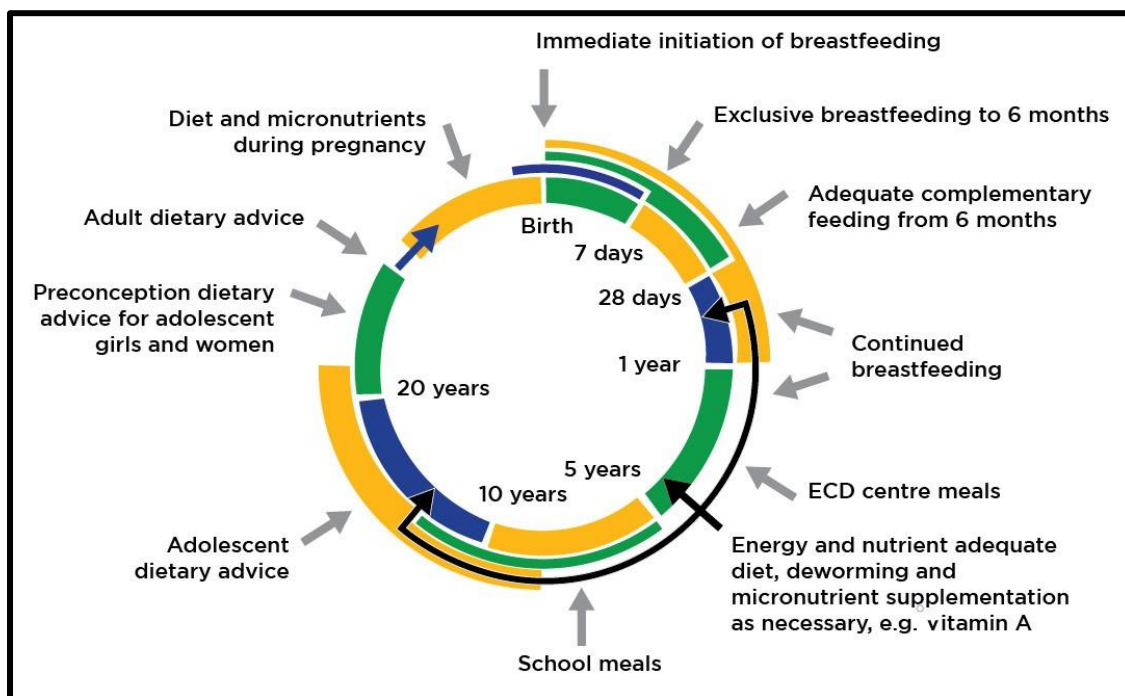


Figure 1. Specific interventions to improve nutrition across the life course(15)



Figure 2, developed by Desmond et al., identifies the conceptual framework depicting the consequences associated with poor nutrition across an individual’s lifespan up until adulthood.(16) It shows the scope of preventative interventions as well as the range of mitigation efforts that can be deployed. It situates the child in the context of the mother, family, and broader social setting.

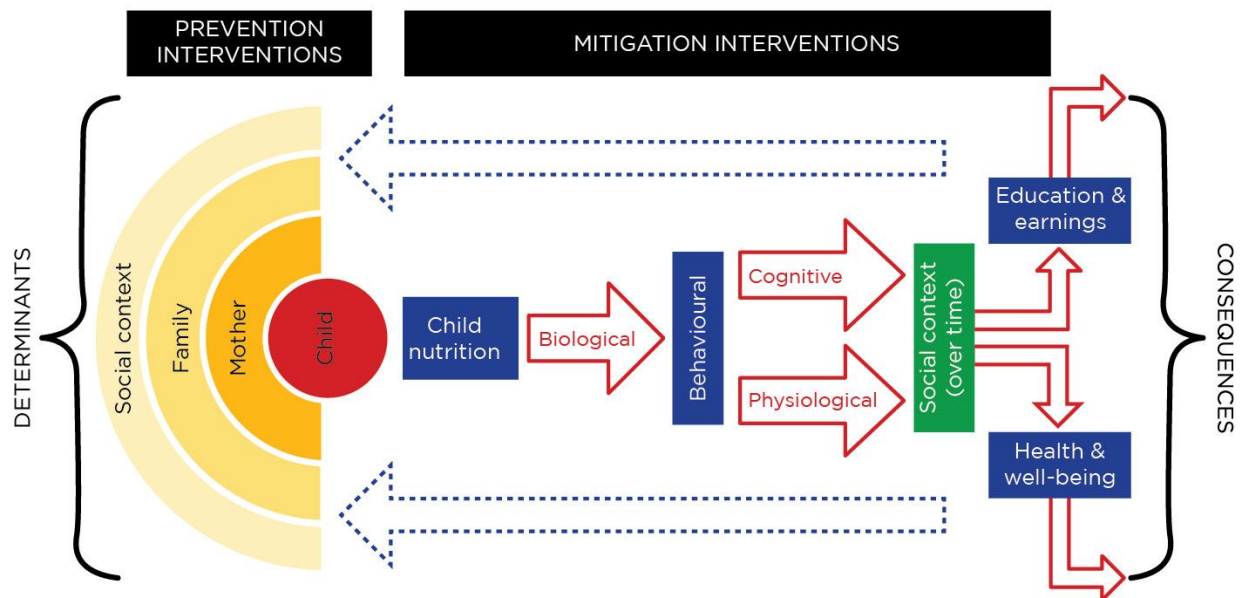


Figure 2. Impact of nutrition on cognitive and behavioural outcomes, and associated impact on educational outcomes, lifetime earnings, and long-term health and well-being(16)

Integration of these frameworks implies that the extent to which and the time frame within which children receive the right interventions will determine the long-term effects of their outcomes.(13,17,18) Human brain development commences in pregnancy and continues through adolescence. As a result, time-dependent genetic-environmental interactions form the fundamental basis for the development of neuronal connections that facilitate the development of skills, including language.(19) Nutrition plays a key role in childhood development during the early years of life as the neurodevelopmental building blocks are being formed and nutritional requirements are high.(20)



Stunting, the condition that results from long-term undernutrition and chronic infection, is the indicator that best captures the failure of inadequate nutrition. Compromised motor and cognitive functioning and development are part of the lifelong impacts of stunting. Impaired cognitive development has an effect on educational outcomes later in life. The outcomes of stunting further include lower earning potential as adults and less productive contributions to the workforce due to compromised intellect, slighter build, and proneness to disease.(21) The intensity to which these deficits develop is strongly correlated to the age when undernutrition is experienced. Stunting in early life is associated with a higher risk of obesity and non-communicable diseases when that infant becomes a child and later an adult.(22,23)

There has been an extensive body of work highlighting the impact of nutrition on mental development through an examination of the correlation between child height and cognition. The literature reveals that stunting increases at a rapid rate after six months of age.(24) Whilst stunting rates have been challenged in the literature as an insufficient metric to detect the failure of children to thrive or progress given the slow changes in child height from month to month and resulting impact on childhood physiological potential,(25) they still represent a key metric of the future health of the country and its economic prospects. The literature emanating from efficacy trials and programme evaluations has demonstrated that the improved diets of pregnant women, infants, and toddlers are effective in reducing stunting(26,27) and translate to improved motor and mental development. Without nutrient-based interventions, the cognitive effects of poor dietary status can make learning more challenging, frequently resulting in early dropout and poorer earnings.(28) Thus, inequities associated with poor nutrition and inadequate early learning opportunities can undermine children's development and long-term prospects in mutually reinforcing ways.(29) Figure 3 shows that early interventions that enable protective factors can reduce inequities and increase the odds of children achieving their developmental potential.





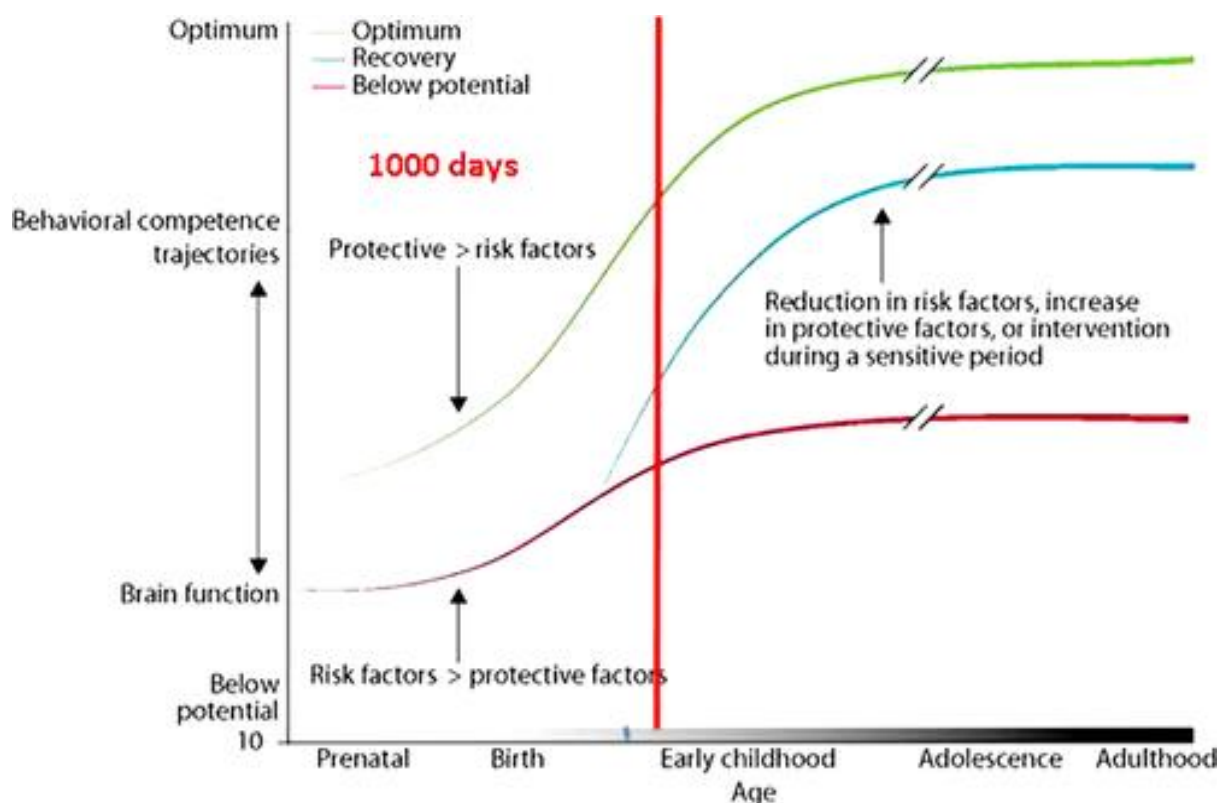


Figure 3. Lifespan development of equity/inequality may be modified by early intervention(26)

A systematic review of a range of studies focusing on nutrition found that iodine-deficient mothers and infants have intelligence quotients (IQs) that are 12–13.5 IQ points lower than other individuals.(30) These findings echo that of another study in India that followed a birth cohort of children reporting that stunted children had IQ points that were on average 4.6 times lower than those of children with normal growth.(31) This likely contributes to the potential for school progression amongst children.

Programmes targeting nutrition are either classified as nutrition-specific interventions—those that address the immediate determinants of nutrition including insufficient nutrient intake and poor-quality caregiving practices—or nutrition-sensitive interventions—those that address the upstream determinants of undernutrition including poverty, food insecurity, and scarcity of water and sanitation services. ECD interventions and other nutrition-specific and nutrition-sensitive initiatives can serve



as platforms for large-scale nutrition interventions.(32) Integrated interventions that focus on nutrition and ECD hold great promise for reducing inequities.(33)

A considerable body of evidence from across other low- and middle-income country (LMIC) contexts has demonstrated that the combined effect of nutrition support and early learning opportunities has facilitated improvements in childhood development, enabling children to get back on track for development. Recently conducted systematic reviews and meta-analyses have explored the impact of ECD and nutrition interventions, delivered both separately and in an integrated fashion, on ECD outcomes. A review published in 2015 examining interventions that have been implemented since 2000 reported that stimulation interventions had medium effect sizes of 0.42 and 0.47 on cognitive and language development, whereas nutrition interventions provided in isolation had a small effect size of 0.09. These findings highlight the synergistic benefits of integrated nutrition being provided alongside ECD interventions.(24) Whilst few studies have quantified the additive benefits of integrated interventions, a literature review highlights that ECD interventions have been consistently found to impact on childhood development, and nutrition interventions have resulted in improved child growth outcomes, with some additional benefits to childhood development.(34)

Evidence has demonstrated that children who are well nourished within the first 1,000 days are 10 times more likely to avoid life-threatening childhood illnesses, successfully complete 4.6 times more grades in school, earn wages in adulthood that are 21% higher, and have healthier families.(35) Beyond this critical window of opportunity, food supplementation during the first two–three years of life improves the cognitive abilities of children at three years of age and older.(36,37) In a South African study that explored point-of-use micronutrient fortification in pre-school children, children aged 36–79 months were randomised into intervention and control groups, with both receiving breakfast maize-porridge but with either added micronutrient or added placebo powder for 52 school days. The study found a benefit for child development with a significant mean difference between scores across the groups.(38) This speaks to the critical need to ensure nutrition support is made up of the necessary micronutrients to adequately support child development.



Another study conducted amongst chronically undernourished children in Colombia evaluated the impact of a centre-based pre-school intervention, with meals providing 75% of the recommended daily caloric and protein requirements. The programme consisted of a combined nutritional, healthcare, and educational intervention. The study found that children's cognitive ability and height-weight-for-age Z scores improved as a result of the intervention.(39) The study demonstrated that by school age, the gap in cognitive abilities across treated children and a group of privileged children in the same city had narrowed. Importantly, the effect was greatest amongst the youngest children exposed to the treatment programme. Furthermore, these gains persisted at the end of the first grade in primary school, which was a year after the experiment had ended.(40)

The long-term impact of nutrition support has also been explored across LMIC contexts, including through three key longitudinal studies undertaken in Guatemala. The first study explored the effects of early supplementation feeding on the cognition of rural children aged 0–7 years who were exposed to nutritional supplementation in the first two years postnatally.(37) The study found that adolescents who had received the intervention scored significantly higher on tests of knowledge, numeracy, reading, and vocabulary, in addition to children reporting faster reaction time related to information-processing tasks.

The second was a follow-up study on the effects of improved nutrition in early life on the educational attainment of women in the same setting (assessed at the age of 22–29 years by knowledge, numeracy, and reading tests) compared to the outcomes of women exposed to the same intervention. The study found that women exposed to the improved nutrition intervention had 2.8 times higher odds of having completed primary school, and amongst those who completed primary school, the improved nutritional intervention was associated with increased likelihood of adult educational attainment.(36)

The third longitudinal study, published later and following the same group of Guatemalan women between the ages of 25 and 42, found that higher height-for-age Z-scores were associated with more schooling years, higher test scores for reading and non-verbal cognitive skills, a higher age at first birth,



and fewer pregnancies and children. They were also associated with increased household per capita expenditure and lower probability of living in poverty.(41)

Another systematic review that explored the sustained impacts of nutrition-based interventions on children under two reported mixed results,(28) although a follow-up evaluation of a trial conducted in Jamaica, 30 years after interventions for stunting were delivered, revealed that adults who had participated in the programme had 43% higher hourly wages and 37% higher earnings.(42)

In addition to the detrimental impact of undernutrition and inadequate caloric and micronutrient intake, overnutrition leading to overweight and obesity is a serious public health concern and affects the development of children. This can include psychosocial problems and initiation of health problems.(29) An Australian study compared the vulnerability of children aged four to six across five domains of the Australian Early Childhood Development Census. The study found that obese children in their first year of school may be exhibiting some developmental vulnerabilities relative to their peers with healthy weight.(43)

This section thus provides ample evidence of the long-term benefits of investing in adequate nutrition during a child's early years, especially during the vital first 1,000 days of life. Despite the evidence being largely focused on this earliest period, the benefits of nutrition interventions accrue throughout the early childhood development stage of the life course, especially in combination with other interventions.(16) Given that poor nutrition and inadequate opportunities for early learning are both risks for poor child development,(44,45) nutritional and early stimulation inputs should be optimised for best developmental outcomes. Where possible, integration of services should be pursued and integrated interventions should be designed to affect not only a single child outcome but multiple outcomes, including growth, health, and development.(46)



## Defining adequate nutrition

The revised draft Paediatric Food-based Dietary Guidelines for South Africa(47) were developed in 2013, but due to delays in testing at the time, they were not published as final guidelines (in contrast to the guidelines for older age groups). Assessment for clarity and understanding among caregivers of children younger than five years has since taken place in the Western Cape and Mpumalanga provinces, with recommendations for rewording some sections.(48) Food-based dietary guidelines are brief, positive dietary recommendations aimed at supporting consumers to achieve an adequate diet that meets nutrient needs. They are developed in line with culturally relevant and locally available foods. See Table 3 for the guidelines per age group.

**Table 3. Draft Paediatric Food-based Dietary Guidelines for South Africa**

<b>0–6 months</b>
Give only breast milk, and no other foods or liquids, to your baby for the first six months of life.
<b>6–12 months</b>
At six months, start giving your baby small amounts of complementary foods, while continuing to breastfeed to two years and beyond.
Gradually increase the amount of food, number of feeds, and variety as your baby gets older.
Feed slowly and patiently and encourage your baby to eat, but do not force him or her.
From six months of age, give your baby meat, chicken, fish, or egg every day, or as often as possible.
Give your baby dark green, leafy vegetables and orange-coloured vegetables and fruit every day.
Start spoon-feeding your baby with thick foods, and gradually increase to the consistency of family food.
Hands should be washed with soap and clean water before preparing or eating food.
Avoid giving tea, coffee, and sugary drinks and high-sugar, high-fat salty snacks to your baby.



### 12–36 months

Continue to breastfeed to two years and beyond.

Gradually increase the amount of food, number of feedings, and variety as your child gets older.

Give your child meat, chicken, fish, or egg every day, or as often as possible.

Give your child dark green, leafy vegetables and orange-coloured vegetables and fruit every day.

Avoid giving tea, coffee, and sugary drinks and high-sugar, high-fat salty snacks to your child.

Hands should be washed with soap and clean water before preparing or eating food.

Encourage your child to be active.

Feed your child five small meals during the day.

Make starchy foods part of most meals.

Give your child milk, maas, or yoghurt every day.

### 3–5 years

Enjoy a variety of foods.

Make starchy foods part of most meals.

Lean chicken or lean meat or fish or eggs can be eaten every day.

Eat plenty of vegetables and fruit every day.

Eat dry beans, split peas, lentils, and soya regularly.

Consume milk, maas, or yoghurt every day.

Feed your child regular small meals and healthy snacks.

Use salt and foods high in salt sparingly.

Use fats sparingly. Choose vegetable oils, rather than hard fats.

Use sugar and food and drinks high in sugar sparingly.

Drink lots of clean, safe water and make it your beverage of choice.

Be active!

Hands should be washed with soap and clean water before preparing or eating food.



The Department of Health’s (DoH) Nutrition Guidelines for Early Childhood Development Programmes (hereinafter Nutrition Guidelines)—described in greater detail later—are designed to meet children’s nutritional needs relative to their age. The Nutrition Guidelines, approved and published by the DoH, are aligned to the above Paediatric Food-based Dietary Guidelines. They include a range of food groups, as dietary diversity is an imperative in order to consume the best mix of macro- and micro-nutrients required for growth and health. A diet of low diversity is likely to result in micronutrient deficiency (also known as hidden hunger), with related health and developmental risks. Thus, if the Nutrition Guidelines are followed, children should consume an adequate diet at an ELP. As described later, the Road to Health Booklet provides advice to caregivers for the home setting and on overall nutrition for children up to age five.

Children who are identified with severe acute malnutrition are referred for nutrition therapy or supplementation, managed by clinicians. This level of nutrition support is to prevent child mortality and should not be seen as part of “adequate nutrition” as the purpose is fundamentally different. Treatment of severe acute malnutrition should be a temporary intervention for a clinically diagnosed condition. In the literature, the extension of child survival to children thriving is a means to promote equity with the goal of “no child left behind” .(49)

## State of children’s nutrition in South Africa

As described in the 2020 Child Gauge, national surveys have consistently found that too many young children in South Africa have suboptimal nutritional status. This includes being too short for their age (stunting), too thin (underweight), and increasingly overweight and obese. Stunting, in particular, has been a persistent challenge, with little change in its prevalence since the 1990s.(15) The last national survey of children’s nutritional status took place in 2016 and found that 27% of children under the age of five were suffering from stunting.(50) There is an urgent need for updated prevalence rates, especially given the impact of the coronavirus disease-19 (Covid-19) pandemic on the ECD sector and the ensuing cost-of-living crisis. The Grow Great Campaign has published a series of stunting scorecards for communities listed as food insecurity hotspots in the 2018–2023 National Food and Nutrition Security Plan (NFNSP). These scorecards indicate a reducing trend for stunting levels since



the 2016 South Africa Demographic and Health Survey.(50,51) The Western Cape Stunting Baseline Survey, conducted in 2022, found a decrease in stunting levels among children under five, but identified overweight and obesity as high public health concerns—providing clear evidence of the ongoing double burden of malnutrition in the Western Cape.(52)

Poor dietary intake is a significant contributor to poor nutritional outcomes—both undernutrition and overnutrition (overweight and obesity). The 2016 Demographic and Health Survey reported that only 23% of children aged 6–23 months were consuming a minimum acceptable diet. This indicator is a composite of the minimum dietary diversity (eating from at least four out of seven food groups) and minimum food frequency (eating at least four times per day for the age group between 6 and 23 months).(50) In other words, a child who does not meet the minimum acceptable diet is not consuming sufficient nutrients or energy to sustain their growth and development. While children are in this age group, solid food starts to replace breastmilk for them. As children start to eat with their families, their dietary patterns are established. For many children, the first place they receive meals outside of the family context is at an ELP. Both the home and ELP environments are thus important for providing appropriate, adequate nutrition to children during the important developmental phases.

## Delivery of adequate nutrition

### Policies

***Optimal nutrition during infancy and childhood is critical to ensuring optimal child health, growth and development. Inappropriate infant and young child feeding practices, for example, sub-optimal or no breastfeeding and inadequate complementary feeding, are significant threats to child health.(53)***

—Department of Health, 2013 Infant and Young Child Feeding Policy

The 2015 NIECDP states that “the right to adequate food and nutrition is protected by many legal and developmental instruments”.(6) Table 4 lists some of these instruments, including mechanisms added since 2015. In terms of responsibility, the NIECDP states that the provision of food is the responsibility





of the Department of Social Development and that nutrition support services are to be provided by the Department of Health. Food provision is the delivery of a programme that provides children with meals, whereas nutrition support services include the supply and distribution of supplements, deworming medication, and growth monitoring. This implies that the achievement of adequate nutrition is an intra-governmental function. However, since the coordination function of ECD services has shifted to the Department of Basic Education, the NIECDP has not been updated.

**Table 4. Mechanisms to respond to children’s nutritional needs**

Legal instruments <sup>1</sup>	Policies, strategies, and programmes
<ul style="list-style-type: none"> <li>• Sections 28 and 29 of the South African Constitution</li> <li>• Children’s Act No. 38 of 2005</li> <li>• National Health Act No. 60 of 2003</li> </ul>	<ul style="list-style-type: none"> <li>• National Integrated Early Childhood Development Policy 2015</li> <li>• Strategic Plan for Maternal, Newborn, Child and Women’s Health and Nutrition Strategic Plan 2012–2016</li> <li>• Infant and Young Child Feeding Policy 2013</li> <li>• National Food and Nutrition Security Plan (NFNSP) for South Africa 2018–2023</li> <li>• Roadmap for Nutrition in South Africa 2013–2017</li> <li>• Road to Health Booklet</li> <li>• Strategy for the Prevention and Management of Obesity in South Africa 2023–2028</li> </ul>

The NIECDP acknowledges that child malnutrition is a huge concern in South Africa, stating that 27% of children aged 0–3 years are malnourished, with the numbers increasing for those aged 0–12 months.(6) The 2018–2023 NFNSP asserts that improvements in this focus area have occurred, with only 8.9% of children under the age of five experiencing malnutrition.(54) This improvement is

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<sup>1</sup> The legal foundation of children’s right to basic nutrition in the South African Constitution is covered in detail in Kazim’s paper, “Early childhood development and the state’s duty to provide basic nutrition to young children in South Africa”, in the Real Reform for ECD Right to Nutrition Series.



attributed to the implementation of the mandated National Food Fortification Programme, in 2003, which required the fortification of maize meal and white and brown bread flour with minerals and vitamins such as vitamin A, thiamin, riboflavin, niacin, iron, zinc, folic acid, and pyridoxine.

To address some of the concerns, the government has implemented the National School Nutrition Programme (NSNP), which focuses on school-aged children, with the programme providing at least one meal a day for every child at participating schools.(54) Where this programme falls short, however, is that children not yet in school do not benefit from it. There is a gap in nutrition provision for younger children.(55) (For more on the NSNP, see Droomer et al. in this research series.)

The provision of adequate nutrition in early childhood forms part of the NIECDP's planned interventions. It identifies several key points including

- promoting breastfeeding for the first six months of a child's life,
- promoting and supporting complementary feeding when exclusive breastfeeding is not possible,
- food and micronutrient supplementation for children experiencing malnutrition or stunting,
- making use of community outreach workers to educate and provide nutritional services, and
- making use of the Road to Health Booklet.

According to the NIECDP, the nutrition support services that the DoH should provide include

- regular growth monitoring at clinic visits;
- micronutrient supplementation such as vitamin A, folic acid, and iron;
- deworming programmes; and
- immunisation.

Although these services are typically performed at a health facility like a clinic, it is possible to implement elements of these services and growth monitoring at ELPs. There is an opportunity for the DBE to support and coordinate the provision of these services at ELPs. It is well documented that home- or community-based programmes, including those delivered by community health workers, can provide excellent growth monitoring, health promotion, and referral services to children and their caregivers.(56) ELPs are an integral part of communities and should be better leveraged to provide nutrition services, where appropriate.



## Public sector guidelines for parents, caregivers, and early learning programmes

The Road to Health Booklet is given to each newborn straight after birth or at their first clinic visit. It is used to monitor all aspects of a child's growth and development. With regard to nutrition, it identifies four age categories and highlights what is specifically needed for each age group (see Table 5). For the ages of 0–6 months, exclusive breastfeeding is recommended, with the encouragement that milk can be expressed and that this expressed milk can be given to the baby when their mother is not available, such as at an ELP. Instructions on how to do so are included in the booklet. For the ages of 6–8 months as well as 9–11 months, complementary feeding is recommended. Mothers are encouraged to breastfeed first and then to provide other foods appropriate for a child of that age. For children between one and two years old, the Road to Health Booklet encourages breastfeeding but then encourages giving other food first and provides a list of recommended foods.

The DoH's Nutrition Guidelines, updated in 2019, also provide recommendations based on children's ages, which are in line with the Road to Health Booklet.<sup>(57)</sup> Caregivers are encouraged to breastfeed exclusively within the first six months of their child's life, while distinctions are made between the ages of 6–12 months and 12 months to six years. (See Figure 4.)

According to the Nutrition Guidelines, the number of meals that should be provided to a child at an ELP depends on the duration of the child's stay at the ELP. Breakfast should be provided for all children since not all the children will have been given this meal at home if the programme opens before 07:00. If children spend five to eight hours at the ELP, a morning snack, lunch, and an afternoon snack must be served. If children spend less than five hours at the ELP, a morning snack and lunch must be served. The Nutrition Guidelines include a suggested two-week menu for ELPs to follow, with recommended recipes for each meal, to ensure variety (see Figure 5). The two-week menu differentiates between the different age groups and includes suggested intake amounts. It also mentions that some ingredients can be replaced with other items in order to make the menu more culturally appropriate. This set meal plan should be followed to meet the nutritional needs of children.



Table 5. Road to Health Booklet nutrition recommendations for children older than six months<sup>2</sup>

6–8 months	9–11 months	12 months–5 years
<p>Iron-rich food (eggs, chicken, dried beans, etc.).</p> <p>Starch (fortified maize meal, mashed potatoes, mashed sweet potatoes).</p> <p>Soft, pipless fruit (bananas, pawpaws, avocados).</p> <p>Water to drink.</p>	<p>Iron-rich food still a must.</p> <p>Different types of food and more of them.</p> <p>Food does not need to be a fully smooth consistency, but do not give small, hard food items like nuts.</p> <p>Give small pieces of food that a baby can hold (like cooked carrots, bread).</p> <p>Water to drink.</p>	<p>Variety of food including iron-rich food, starch, fresh fruit, and vegetables.</p> <p>If not breastfeeding, give pasteurised full cream milk or yoghurt.</p> <p>Give food rich in vitamin A (spinach, pumpkin, liver) and vitamin C (guavas, naartjies).</p> <p>Water to drink.</p>

<sup>2</sup> The Road to Health Booklet recommends exclusive breastfeeding for all children younger than six months.





**TABLE 3.1**  
**MENU WEEK 1**

Meal times	SERVING SIZE PER CHILD			Monday	Tuesday	Wednesday	Thursday	Friday	
	6-8 months	9-23 months	24 months - 6 years						
BREAKFAST	Starch dish	3tbs - ¼ cup	½ -1 cup (125 -250 ml)	1 cup (250 ml)	Maize meal porridge	Mabele (sorghum) porridge	Maize meal porridge	Mabele (sorghum) porridge	Oats porridge
	Milk	Breast milk or 150 ml formula	Fresh/powdered full cream milk ¼ cup	½ cup	Milk	Milk	Milk	Milk	Milk
MID-MORNING SNACK	Starch	¼ slice	½ slice	1 slice	Brown bread	Brown bread	Brown bread	Brown bread	Brown bread
	Filling/topping/spread	¼ teaspoon	½ teaspoon	1 teaspoon	Margarine	Scrambled egg	Peanut butter	Margarine	Peanut butter
	Milk	Breast milk or 150 ml formula	Fresh/powdered full cream milk ½ cup (125 ml)	Fresh/powdered full cream milk 1 cup (250 ml)	Milk	Milk	Milk	Milk	Milk
	Beverage	½ cup	1 cup	As much as the child wants but not less than 1 cup	Water	Water	Water	Water	Water
LUNCH	Meat dish	3Tbs - ¼ cup	¼ cup	¼ -½ cup	Chicken stew	Savoury samp and beans	Savoury mince	Lentil stew	Pilchard fish
	Starch dish		¼ cup	½ cup	Rice		Macaroni	Rice	Potatoes mashed
	Vegetables	Pureed/mashed/blended	¼ - ½ cup	½ - 1 cup	Sweet potato (no sugar added)	Cooked carrots (no sugar added)	Green beans	Pumpkin/ butternut (no sugar added)	Beetroot salad
	Beverage	½ cup	As much as the child wants but not less than ½ cup	As much as the child wants but not less than 1 cup	Water	Water	Water	Water	Water
AFTERNOON SNACK	Soft/mashed/ pureed ¼ fruit	Cut into pieces ½ -whole fruit	Cut into pieces ½ -whole fruit	Fruit	Fruit	Fruit	Fruit	Fruit	

**TABLE 3.2**  
**MENU WEEK 2**

Meal times	SERVING SIZE PER CHILD			Monday	Tuesday	Wednesday	Thursday	Friday	
	6-8 months	9-23 months	24 months - 6 years						
BREAKFAST	Starch dish	3tbs - ¼ cup	½ -1 cup (125 -250 ml)	1 cup	Maize meal porridge	Mabele (sorghum) porridge	Maize meal porridge	Mabele (sorghum) porridge	Oats porridge
	Milk	Breast milk or infant formula	Fresh/powdered full cream milk ¼ cup	½cup	Milk	Milk	Milk	Milk	Milk
MID-MORNING SNACK	Starch	¼ slice	½ slice	1 slice	Brown bread	Brown bread	Brown bread	Brown bread	Brown bread
	Filling/topping/spread	¼ teaspoon	½ teaspoon	1 teaspoon	Margarine	Peanut butter	Margarine	Scrambled egg	Peanut butter
	Milk	Breast milk or 150 ml formula	Fresh/powdered full cream milk ½ cup (125 ml)	Fresh/powdered full cream milk 1 cup (250 ml)	Milk	Milk	Milk	Milk	Milk
	Beverage	½ cup	As much as the child wants but not less than ½ cup	As much as the child wants but not less than 1 cup	Water	Water	Water	Water	Water
LUNCH	Meat dish	3tbs - ¼ cup	¼ cup	½ cup	Beef stew	Chicken livers in sauce	Bean and lentil stew	Pilchard fish	Macaroni and cheese
	Starch dish		¼ cup	½ cup	Rice	Pap	Mealie rice	Mashed potatoes	
	Vegetables	Pureed/mashed/blended	½ cup	1 cup	Cooked cabbage	Cooked morog/ spinach	Cucumber and tomato slices	Cooked carrots	Beetroot
	Beverage	½ cup	As much as the child wants but not less than ½ cup	As much as the child wants but not less than 1 cup	Water	Water	Water	Water	Water
AFTERNOON SNACK	Soft/mashed/ pureed ¼ fruit	Cut into pieces ½ - whole fruit	Cut into pieces ½ - whole fruit	Fruit	Fruit	Fruit	Fruit	Fruit	

**Figure 5. Suggested two-week menu reprinted from the Department of Health’s Nutrition Guidelines for Early Childhood Development Programmes(57)**



## Implications for the provision of adequate nutrition

An assumption that underpins the logic of the Nutrition Guidelines and the training of practitioners in their use is that the menus are affordable and relevant to the facilities and capacity of the ELP. When applying for the ECD subsidy, ELPs are required to place a two-week menu in a visible place at their facility. There is little follow-up of its use after the subsidy is approved. We posit that the presence of the menu and even training on the Nutrition Guidelines are insufficient to achieve adequate nutrition provision for young children, whose nutrition status remains persistently suboptimal. In particular, the guidelines provide no advice on how to manage the cost implications of the menus and recipes, besides noting the importance of planning quantities for grocery shopping purposes. Yet there is a clear need for such advice, especially in the current context of high food prices that are driving a cost-of-living crisis across the country, and given that the ECD subsidy—as both Kazim(1) and Droomer et al.(2) discuss in this research series—has limited reach and is inadequate. There is no mention in the guidelines, for example, of using food gardens as a means to access fresh produce for meals, despite gardening often being referred to as a community-based “solution” for poor dietary diversity or as a means to combat food price spikes.

Further, a training manual that accompanies the Nutrition Guidelines was finalised in 2021,(58) but as of August 2023, it has not been rolled out at scale. This manual would provide practitioners with resources on how to operationalise the Nutrition Guidelines, including sections on healthy eating information, menus, and recipes; health promotion services; and maintaining a safe food environment. The manual includes activities for groups during training, to make the information practical and to support learning and understanding of the importance of nutrition. The National Curriculum Framework for Birth to Four has been identified as a means to increase training on nutrition as part of ECD practitioner training.(55) The Thrive by Five data reveals that only 20.8% of practitioners indicated they received training on the Road to Health Booklet and only 29.8% received training in health promotion, speaking to a significant need to scale up the training of personnel at ELPs in South Africa.(59)

It is important to note that the government only provides subsidies to registered ECD centres.(60) The 2021 ECD Census counted 42,420 ELPs, of which 41% were registered, with only 33% ultimately



receiving the subsidy regardless of registration status.(61) The subsidy of R17 per child per day only allows R6.80 (40%) towards nutrition. Despite the low value allocated to nutrition and the subsidy's low coverage, the ECD Census reports that virtually all programmes (99%) offer at least one meal per day, most often lunch (94%), followed by breakfast (88%) or snacks between meals (81%). This is funded through fees from parents, private feeding schemes, and/or the subsidy. It should be noted that this data was self-reported by ECD practitioners to fieldworkers conducting the survey and thus the reliability of this data has not been validated. Therefore, any recommendations made in this paper for improving nutrition at ELPs must operate within the existing subsidy framework of R6.80 for nutrition, pending future increases in public funding for nutrition at ELPs. (See Droomer et al.(2) in this research series, for more on funding and costing.)

The Thrive by Five index, albeit less representative given that it sampled approximately 13% of ELPs in South Africa, provides additional details that are essential to understand the ELP landscape. The index intentionally sampled from across a range of ELPs and included children from registered and unregistered programmes. According to the 2022 report (sample size of 1,247 ELPs), just over 20% of sites noted that the food that was being provided on the day of the visit was different from the menu that was outlined, indicating compliance challenges with the food guidelines provided to sites. Furthermore, 26% of sites indicated that the ELP did not provide any guidance to parents on the kinds of food they should send in with children. Sites that provided food guidance to parents were twice as likely to have provided food aligning to the menu. Of the sites in the sample that reported on meal provision, 97.2% indicated they provided breakfast, 43.1% and 51.4% indicated they provided a morning or afternoon snack respectively, and 98.7% reported providing lunch. This is similar to the ECD Census findings described above and could be seen to serve as validation of the census data. However, of the food types provided in the meals, 93.5% included carbohydrates (e.g. bread, rice, samp, potatoes, etc.); 89.7% included proteins (e.g. milk, meat, fish, eggs, soy, beans, lentils, etc.); 58.5% included fruit (e.g. apples, oranges, bananas, etc.); 76.2% included vegetables (e.g. beans, peas, carrots, cabbage, etc.); and 31.7% included fresh or vitamin-enriched juice/vitamin drinks. Although the variety of food groups served is good, the portion size may be inadequate. For example, if meat is served as part of a stew, the amount per plate may be very low. Further, the relatively low proportion of fresh fruits and vegetables is of concern from the viewpoint of the adequate nutrition children require. Promisingly, 39.6% of sites indicated that they had a food garden at the programme, with





sites reporting access to a food garden being 1.5 to 1.8 times more likely to provide vegetables and proteins respectively. This finding again underscores the need for the Nutrition Guidelines to include more information on how to implement food gardens at ELPs. This could be an area of collaboration between the Department of Basic Education and the Department of Agriculture, Land Reform, and Rural Development. Many non-profit organisations (NPOs) are also skilled at providing training to create and sustain community or homestead gardens. Some already adapt their training material for the ECD centre context, which can be leveraged by the government departments.

Both the ECD Census and Thrive by Five data indicate that although food is almost universally provided at ELPs, the contents of the meals vary widely and that the quality and diversity can be improved. All data on food provision is self-reported by ECD practitioners and may carry some social approval or social desirability bias. The reality of practically providing adequate nutrition at ELPs must be taken into account when considering policy and regulatory reforms. The (un)affordability of nutritious food baskets remains a challenge for both ELPs and households and therefore the importance of public financing as a means to improve the adequacy of nutrition remains high. Even in the instance of private sector feeding schemes, discussed next, the majority of such programmes are supplementary and do not cover the full Nutrition Guidelines. The contribution by parents, many of whom have limited funds available, is also significant across the ECD Census and Thrive by Five data.

Further, the Nutrition Guidelines include a small section on feeding children with disabilities and special dietary needs, which describes how a range of conditions can affect a child's ability to consume, digest, and behave towards food. The section recommends that practitioners take note of how disability or health conditions may affect the nutritional needs and energy requirements of children. This section could be expanded, or a separate guide for children with disabilities could be developed, as a companion to the Nutrition Guidelines.

## Private sector and civil society provision of nutrition support

### Defining private feeding partners

As a result of limited public financing for nutrition, ECD programmes must gather financial support from other avenues, including non-profit organisations and private organisations, and it is here where



private feeding schemes play a role.(62) These feeding schemes are sponsored by private companies and grant-funded NPOs and focus on providing meals to ELPs that need the additional help. Monthly, weekly, and/or daily menus are developed and then implemented at the identified ELPs, which ensures children younger than five get at least one nutritious meal a day. In principle, meals provided through non-state financing should still follow the Nutrition Guidelines. The private feeding programmes documented in this section form part of how children access nutrition at ELPs, but they should not be seen as the complete picture. Especially in cases where the ELP only provides breakfast, it should be assumed that parents are providing other meals, either indirectly through fees or directly by sending food along to the ELP.

### A selection of privately funded feeding schemes

To gain insight into the management and scope of private feeding schemes, we interviewed 10 research and training organisations (RTOs) or NPOs operating in the ECD sector that are delivering nutrition support to ELPs.<sup>3</sup> The semi-structured interviews were conducted via written correspondence or telephone calls. Three questions were included in all the interviews: a) which meals are provided, b) what are the costs per meal, and c) how is the programme delivered? Below is a summary of the findings, followed by an analysis that draws out the key lessons from the experience of these private feeding schemes. Where possible, the nutritional value of the meal(s) has been included, and the costing is accurate as at December 2022. Further, the information here should be considered as complementary to the research conducted as part of Ilifa Labantwana’s ECD Covid-19 Response Project.(63) (See Droomer et al.(2) in this research series, for more on the Ilifa project.)

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<sup>3</sup> This is a snapshot of feeding programmes operating in the ECD sector in South Africa. It is not an exhaustive list.



## Summary of results

### a. Which meals are provided?

Nine of the organisations we interviewed provide breakfast to ELPs in their network, with one only doing so when funding allows. Lunch is provided by all but two of the organisations in our sample. Snacks are more exceptional, with only two organisations explicitly noting these as part of their offering. (See Table 6.)

### b. What are the typical costs per child to implement privately funded feeding schemes?

Not all the organisations in our sample provided meal costs, but looking at those that did—as shown in Table 6—their costs range from R1.50 to R4.60 per breakfast, and from R3.60 to R10.19 per lunch. These costs exclude the delivery mechanism and other expenditure towards implementing the feeding scheme. Rather, where available, the delivery and preparation costs are included in the organisational summaries further below.

Table 6. Summary of meals provided by private feeding schemes and related costs

Org*	1	2	3	4	5	6	7	8	9	10
<b>Meals provided</b>										
<b>Breakfast</b>	x	x	x	x	x	x	x	x <sup>§</sup>	x	x
<b>Lunch</b>		x	x	x	x		x	x	x	x <sup>¶</sup>
<b>Snacks</b>							x		x	
<b>Costs per meal</b>										
	R1.50 (break- fast)	R2.40 (break- fast); R3.60 (lunch)	N/a	Meals are provided from surplus stock	Meals are provided from surplus stock	R3.24 (break- fast)	R4.60 (break- fast)	R6.00 (lunch)	R2.25 (break- fast); R10.19 (lunch)	R0.70 (break- fast); R3.10 (lunch)

Notes: \*Org 1: Do More Foundation, Org 2: Lunchbox Fund, Org 3: Tiger Brands, Org 4: FoodForward SA, Org 5: SA Harvest, Org 6: Outside the Bowl Africa, Org 7: Pebbles Project, Org 8: TREE, Org 9: Thanda, and Org 10: Zero2Five Trust.

<sup>§</sup> This organisation only provides breakfast when funding allows.

<sup>¶</sup> This is only provided to 18% of children who receive breakfast.



## 1. The Do More Foundation Trust

The Do More Foundation Trust provides only breakfast: a branded porridge—DoMore Porridge—produced by RCL Foods, and which is provided at cost to reach more young children.

### **Product**

Sorghum porridge (breakfast only)

### **Specific costing**

50g/child/day @ R30 a 1kg bag ~R1.50 per meal

### **Nutritional value**

The porridge is made with highly fortified instant sorghum, which is a nutrient packed grain, rich in 12 vitamins and four minerals. It is also a source of fibre, antioxidants, and protein, which add great value to growing young children. A meal is calculated as 50g of dry product for a young child.

### **Delivery model**

Distribution is done through RTOs to ECD centres. Quarterly attendance is tracked, allowing for monitoring and analysis of nutrition support's potential to increase attendance over time, which, in most instances, it has proven to do. Both registered and non-registered centres qualify to receive the DoMore porridge, although preference is given to unfunded centres in key regions.



## 2. The Lunchbox Fund

The Lunchbox Fund provides breakfast in the form of a fortified maize porridge, which is mixed with water. Lunch is prepared daily and consists of a varied menu that includes fresh vegetables and other nutritionally fortified ingredients.(64) The programme covers ELPs, primary schools, and high schools.

### Products

Maize porridge (breakfast); plant-based lunch menu.(64)

### Specific costing

Average total meal cost=R4.31 (65) as averaged against child's age/portion size and meal served: breakfast=R2.40; lunch=R3.60 (66)

### Nutritional value

The porridge provided for breakfast is high in manganese, selenium, and dietary fibre.(66) The monthly lunch menu consists of staple items such as rice, lentils, beans, samp, brown bread, and maize meal. Other items like soya mince, VitaMilk, and VitaDrink are fortified with vitamins and minerals and are provided by the organisation together with items such as peanut butter, sunflower oil, and canned products.(64,66,67) As part of their partnership with the Lunchbox Fund, the participating ELPs or schools must include fresh vegetables in their menus at least three times a week. According to the organisation, each daily lunch box ensures each child receives 50% of their daily micronutrient requirement, based on the food items in Supplementary Figure 1.(68)

### Delivery model

Delivery of ingredients occurs on a monthly basis. Ingredients are obtained through public and private donations, funding, and grants and are then directly delivered to the ELPs or schools.(65) Sites in need of nutrition support are identified through online applications, referrals by other non-governmental organisations and word-of-mouth referrals, as well as by making use of South African statistics.(69) Monitoring of the schools and programmes occurs for at least a year and continues for as long as the Lunchbox programme is implemented at each site.(68)



### 3. Tiger Brands

Tiger Brands provides meals (breakfast and noodles) daily to ECD centres.

#### Products

Enriched sorghum-, maize-, or oat-based porridges (breakfast) (70); noodles sourced from Tiger Brands' in-house supply chain (lunch).

#### Specific costing

Not available

#### Nutritional value

According to Tiger Brands' information, the meals have been produced to ensure they contain the daily nutritional amounts needed by a child.

### 4. FoodForward SA

Twenty-five per cent of the organisation's meals are donated to ECD centres. The organisation has also partnered with two corporations—Kellogg's and PepsiCo—to supply breakfast to 50,000 children across the country.(71)

#### Product/s

Cereal with milk (breakfast) (72); noodles (lunch).(73)

#### Specific costing

R0.68 per meal (both breakfast and lunch) calculated as the cost of distribution.(72)

#### Nutritional value

According to FoodForward SA,(71) 80% of the food collected has nutritious value. The organisation does not measure the nutritional value of what is distributed. The content of the cereal depends on the supplier and what is available to FoodForward SA.

#### Delivery model

The organisation makes use of a model called food banking.(71) This model focuses on gathering excess food that would otherwise go to waste and donating it to communities and organisations that are in need. Food is collected from producers such as farmers, manufacturers, retailers, and wholesalers and then distributed to FoodForward SA's partnering organisations, which include ECD centres.



## 5. SA Harvest

### Products

Diverse

### Specific costing

R0.90 per meal (74) calculated as the cost of delivery.

### Nutritional value

Not available

### Delivery model

Surplus food is collected from multiple types of suppliers, including farms, wholesalers, retailers, and private companies based in the food and hospitality industry.(75) Both perishable and non-perishable foods are collected, with a focus placed on collecting nutritious food. The food is either directly delivered to the partnering organisations, including ECD centres, or taken to SA Harvest warehouses where it is processed and then distributed.

## 6. Outside the Bowl Africa

Two porridge items—SuperV Instant Meal and VitaKidz Porridge—were previously produced by an external manufacturer, but since 2019, Outside the Bowl has been responsible for the manufacturing of its own products, making use of its Paarl-based Super Kitchen.(76)

### Products

Maize-based porridge or shake (breakfast only)

### Specific costing

\$0.17 or ~ R3.24 (June 2023) per serving (76)

### Nutritional value

The porridge is fortified with micronutrients. For more, see Supplementary Table 2.

### Delivery model

Outside the Bowl makes use of its Super Kitchen to manufacture the meal items; these are then supplied to its ministry partners, which form part of its feeding scheme.(76,77) The VitaKidz Porridge and the SuperV Instant Meal are non-perishable items, which allows the organisation to deliver these items in bulk to its partners.



## 7. Pebbles Project: The Pebbles Nutrition Programme

The Pebbles Nutrition Programme provides 1,000 meals to Pebbles Project ECD centres every day, consisting of breakfast, lunch, and two snacks and a further 2,000 lunches to other ECD facilities.(78,79)

### Products

Breakfast, lunch, and two snacks per day.

### Specific costing

R2.50–R3.50/meal on average; average breakfast cost=R4.60/200g (78)

### Nutritional value

Meals are planned and prepared to include the right quantities of the main food groups, including carbohydrates, proteins, and fresh fruits and vegetables. The organisation states that through the provision of breakfast, lunch, and two snacks per day, it ensures that the daily nutritional needs of each child are met.(78)

### Delivery model

Since June 2019, the programme has been manufacturing its meals from the Pebbles Kitchen based in Stellenbosch.(79) Ingredients are sourced from external suppliers, with the majority being donated by large food manufacturers based in the area. The frozen meals are distributed to partnering ECD centres on a weekly or biweekly basis. Meals are sold to each ECD centre at a price that reflects its funding structure. For example, an unregistered, unfunded centre will pay R2.50/meal. Corporate-sponsored or privately funded ECD centres will pay R7/meal. The difference in price is used to fund and support centres that are not as financially strong, allowing the organisation to implement a more sustainable model.(78)





## **8. Training and Resources in Early Education (TREE)**

TREE provides lunch to their partnered ECD centres five days of the week. In addition, TREE provides the ECD centres with breakfast when it has the funding or donations to do so. Breakfast consists of some form of porridge, including Maltabella, or mielie meal.(80)

### **Products**

Porridge, Maltabella porridge, and mielie meal (breakfast); varied menu for lunch.

### **Specific costing**

R4,000 for monthly groceries per ECD centre; ~R6/child/meal.

### **Nutritional value**

Lunch consists of a varied menu, which includes fish, carbohydrates, and vegetables.(80) The menu developed is in line with the DoH's Nutrition Guidelines. It is also informed by the community in which the ECD is based, meaning that menu decisions are based on the community's culture and what is familiar to the children.(80) In principle, this level of adaptation is encouraged by the Nutrition Guidelines.

### **Delivery model**

ECD centres are supplied with groceries on a monthly basis, delivered to their meal-a-day kitchens. Groceries are bought and collected by the organisation's project coordinators, who then deliver the produce when conducting their monthly monitoring and evaluation visits to the ECD centres. If the project coordinators are not able to visit a centre, the money is paid into a nearby store's account and the ECD practitioner is responsible for collecting the goods.(80)



## 9. Thanda

### **Products**

Yabhusta Porridge; lunch including rice, protein, and vegetables; fruit snack.

### **Specific costing**

R2.25 per bowl of porridge; R10.19 per lunch meal.

### **Nutritional value**

Children are given a bowl of porridge made with 50g of dried product, produced by Nhlayisa Nutrition Solutions (see Supplementary Table 6). Lunch varies according to Thanda's menu and no nutritional value is calculated.

### **Delivery model**

Thanda supports a network of centre-based, satellite, and playgroup ELPs. Meals for the centre-based and satellite ECD centres are cooked at Thanda's main community centre. The cost of preparation was R4.36 per lunch in 2022, comprising staff costs, gas, and equipment. For the playgroups, Thanda distributes groceries once a week and meals are cooked in the homes. A specific meal has to be cooked each day according to the weekly menu. As far as possible, fresh produce is purchased from Thanda's farming programme.(81)



## 10. Zero2Five Trust

Zero2Five provides breakfast to over 11,000 children attending ELPs in the Eastern Cape and KwaZulu-Natal, five days per week for 10 months per year. The fortified porridge (MyLife+) for this offering is procured from Truda Foods and is delivered in bulk to three central locations for collection by practitioners, aligned with grant pay-out days. Practitioners have a three-day window to collect their stock, which is monitored by the CommCare app, a digital platform used by Zero2Five. The trust does regular growth monitoring at ELPs in its network. Since July 2023, centres with high stunting rates (>25%) receive extra, nutrient dense meals from Inani Start Well and Genesis Nutrition.

Two thousand children also benefit from lunch, which is provided free of charge by Rise Against Hunger Africa. The meal is fortified rice and soy. Centres are encouraged to add fresh produce to these cooked lunches. This meal is valued at R3.10 per 80g uncooked portion.

### Products

MyLife+ fortified porridge for breakfast

### Specific costing

50g/child/day @ R14.20 per kg excluding VAT and delivered—R0.70 per meal.

### Nutritional value

MyLife+ is a highly fortified, predominantly soy-based, wholegrain porridge. It contains 13% protein and is very low in sugar and high in dietary fibre.

### Delivery model

Distribution is via central collection points where practitioners collect stock in 5kg bags on a monthly basis. The manufacturer delivers to three collection points at no charge, from where transport to the ELP is the responsibility of the practitioner. The cost of the breakfast porridge is covered through donations and grants.



### *Analysis of the existing sampled feeding organisations in the ECD sector*

The above overview of 10 privately funded feeding programmes highlights several crucial points regarding providing adequate nutrition to young children.

- **Balanced and nutritious diet:** Young children require a balanced diet that includes dietary diversity. Breakfast meals are common in ELP offerings; however, lunch and snacks are also a need.
- **Nutrient-rich foods:** It is important to focus on nutrient-dense foods to maximise the nutritional value of each meal. This means choosing foods that are rich in vitamins, minerals, and other beneficial compounds while minimising empty calorie sources like sugary snacks and beverages.
- **Adequate protein intake:** Protein is crucial for growth and development in young children. Including protein-rich foods such as lean meats, poultry, soya mince, fish, eggs, legumes, and dairy products in their diet is essential. These foods provide essential amino acids necessary for building and repairing tissues.
- **Balanced meal portions:** Providing appropriate portion sizes according to a child's age and activity level is crucial, while noting differences in the 0–2-year age group and the 2–5-year age group.
- **Consistent meal schedule:** Establishing a consistent meal schedule at centres could further support adequate nutrition. Ensuring children have at least breakfast and lunch is a helpful model, with the goal to include snacks when funds are available. The gold standard remains the full implementation of the Nutrition Guidelines.

Using existing feeding organisations for lessons and creating benchmarks for implementation can offer several advantages:

- **Utilising established infrastructure:** Existing feeding organisations often have well-established infrastructure, networks, and resources in place. Leveraging their expertise and experience can save time and resources when implementing nutrition programmes for young



children. These organisations may have established distribution channels, partnerships with suppliers, and logistical systems that can facilitate the efficient delivery of food and nutrition support, which is especially useful in settings where ELPs are not close to each other or to urban or rural centres. This would have to be cognisant of procurement rules within the DBE.

- **Expertise and knowledge sharing:** Feeding organisations specialising in nutrition have accumulated valuable expertise and knowledge in the field. Collaborating with these organisations allows for the exchange of best practices, evidence-based approaches, and lessons learned. It can enhance the implementation of nutrition programmes by drawing upon the insights and experience of these organisations, leading to more effective and impactful nutrition-focused interventions.
- **Targeted and tailored systems and interventions:** Existing feeding organisations often have a deep understanding of the specific nutritional needs and challenges faced by young children. They can provide valuable insights into the most effective strategies for addressing these needs. By working with these organisations, benchmarks for implementation can be developed based on their expertise, ensuring that interventions are tailored to meet the specific requirements of the target population.
- **Scale and reach:** Feeding organisations typically have established networks and partnerships that enable them to reach a large number of beneficiaries. By utilising their existing platforms, programmes can be implemented on a larger scale, reaching more children in need. This scale can lead to greater impact and improved outcomes in terms of nutrition and child development.
- **Monitoring and evaluation:** Established feeding organisations often have robust monitoring and evaluation systems in place to assess the effectiveness and impact of their programmes. By collaborating with these organisations, benchmarks for implementation can be developed to track progress and measure the success of interventions. This data-driven approach allows for continuous improvement and evidence-based decision-making.
- **Cost-effectiveness:** Partnering with existing feeding organisations may offer cost advantages compared to building new infrastructure or organisations from scratch. These organisations have already made investments in facilities, supply chains, and personnel. Leveraging their



resources can result in more cost-effective implementation of nutrition programmes, maximising the utilisation of available funds.

In summary, utilising existing feeding organisations for lessons and creating benchmarks for implementation can capitalise on their established infrastructure, expertise, and reach. Any potential partnerships must take cognisance of procurement laws where applicable. By leveraging the strengths of these organisations, efforts to provide adequate nutrition to young children can be enhanced and optimised. There is an opportunity to provide adequate nutrition to young children in South Africa through supporting the existing ecosystem of nutrition support.

### *Limitations*

Only one of the respondents in the private feeding research provided us with data on the preparation costs per meal. However, this did not include transport and delivery, as the meals are centrally cooked and distributed to nearby centres. We do not have sufficient information on the distribution costs of the various delivery models we have included or of the experience of ELPs who benefit from these programmes.

We did not include questions about training of practitioners in the data collection from private feeding schemes. This would have added an important insight into how private and civil society programmes engage with practitioners and cooks on nutrition programme delivery.

## **ECD practitioners' perspectives on the provision of nutrition**

In collaboration with the RR4ECD Steering Committee, we developed a short survey for the movement's members. The intention was to elevate the practical implementation of nutrition support at the ELP level. The survey was distributed to ECD principals through ECD forums and the data was analysed by the ECD Coordinator at the Equality Collective, which, as mentioned earlier, serves as the RR4ECD secretariat. This data is anecdotal and not peer reviewed, but useful to surface some of the challenges that ECD practitioners face. It also points to practitioners' perception of good nutrition as a gain in the programme setting.



Of the 76 centres that participated in the survey, 68 (89%) provide daily meals. On average, the centres had 59 children attending, up to age five. Respondents were based in the Eastern Cape, Gauteng, KwaZulu-Natal, Mpumalanga, and the Western Cape.

At 91% of those programmes, the meals are prepared by a cook who is employed for that purpose. Seventy three percent of the cooks have had no training on nutrition. The remainder received training from a range of institutions, including government departments, RTOs, and civil society organisations.

In terms of challenges, the most frequently listed issue was funding. This includes the limited and unreliable funding received from the state, as well as the high costs of nutritious food and equipment. Other challenges include providing meals to children with disabilities and dealing with load-shedding.

The perception was that children who receive quality nutrition are happier, more energetic, more creative during lessons, and develop better holistically. In contrast, children who do not receive quality nutrition are malnourished, get sick more often, are tired at school, and physically weaker than their peers who consume nutritious food.

We also asked the practitioners which delivery model they would prefer. The results are fairly even, with 34% preferring vouchers, 43% preferring subsidies, and 35% preferring food being provided directly to them.

Although we included questions on the amount of state funding received in 2022, this was only the case for half of the respondents. We could not calculate the proportion spent on nutrition from the data collected. Another limitation is the lack of information on the specific location of the ELP as it would have been useful to draw on possible differences between urban and rural, and formal and informal sites.

## Recommendations

The first recommendation is to use the existing Nutrition Guidelines and related tools as the guiding framework for any intervention scaled up or implemented by the DBE. Do not reinvent the wheel. This



includes providing training to practitioners to implement the Nutrition Guidelines fully. Due to the availability of a new Training Manual, this is immediately actionable and a low-hanging fruit. The training can be presented by a range of allied health professionals in service of the Departments of Health, Social Development, and Basic Education, including dietitians, social workers, and civil society professionals. We suggest that training is implemented primarily by the DoH, but with oversight and coordination by the DBE.

The second recommendation also relates to the available guidance. Due to the number of years that have passed since the Nutrition Guidelines were last updated, we recommend that the Nutrition Guidelines should be evaluated and updated on a five-yearly basis. Such evaluation will assist in identifying gaps and the feasibility of the guidelines. In particular, we recommend that this take place within a five-year period following the DBE's nutrition pilot, so that the content remains evidence-based and appropriate for the contexts in which the guidelines are implemented.

The third recommendation is for the DBE to engage with the sector, including private feeding schemes, RTOs, and civil society partners, who are currently implementing nutrition support programmes at various scales and in different types of settings. Not only will these engagements be an opportunity to make sense of the current implementation models, but expertise in logistics and procurement can be leveraged. The partners would also provide insight into the level of knowledge of the practitioners they typically work with. In particular, given the varying experiences of ELPs or organisations that work in rural settings, it would be useful to tease out the challenges and opportunities as they are presented in different geographical areas.

The fourth recommendation is to increase the delivery of nutrition support services at ELPs, which include growth monitoring, deworming, and vitamin supplementation. This requires close collaboration between the DBE and DoH, as the NIECDP mandates the DoH to take responsibility for this function. Without the collection and use of data on children's growth, there is little opportunity to evaluate the impact of nutrition provision. If the Nutrition Guidelines are fully adopted and implemented, we would expect to see an improvement in the nutritional status of children. In order to confirm this, we need better and more frequently collected data on children's growth indicators.





This is a function that can successfully be implemented by community health workers, who already visit households on a regular basis and can assist with referral of at-risk children. In addition, practitioners can be trained on basic screening methods to screen children for malnutrition. There are examples of civil society organisations collaborating with provincial health departments to do this, including in the Eastern Cape, as a collaboration between the Eastern Cape Department of Health and the Zero2Five Trust, and in the Western Cape between Inceba Trust, Do More Foundation, and the Western Cape Department of Health and Wellness.

The fifth recommendation relates to the DBE's nutrition pilot. We recommend that during the pilot, the DBE should include training and implementation of the Nutrition Guidelines at all the included sites, as this forms the basis of what nutrition should be provided. It would provide a good indication of how feasible the guidelines are and how they are understood and implemented. In particular, the ability of organisations to afford these guidelines would be tested. Given the inadequate nutritional status of children across the country, we can assume that many do not consume a nutritious diet on a regular basis. ELPs offer an ideal entry point to reach children who are not yet in school. Furthermore, if the Nutrition Guidelines are implemented, we should expect to see a benefit in terms of children's nutritional status. Thus, establishing a baseline and end-line sample of anthropometric measurements would be necessary to include in the pilot's design.

## Conclusion

The cost of inaction in terms of nutrition support to young children is high. Due to the specific, time-sensitive window of opportunity for their growth and development, the absence of nutritious food is highly detrimental. This affects them as individuals, their communities, and ultimately the entire nation. There is sufficient global and local evidence of the benefits that investment in early nutrition yield. We thus conclude that the provision of nutrition support and related services, in order to achieve adequate nutrition, is an imperative, and we recommend five actions that should be prioritised. As Kazim(1) argues, the state has a duty to do so. This paper has argued that there is already a set of good guidelines and tools to give support to ELPs and caregivers in providing nutrition support. We should capitalise on this, and any DBE intervention should scale up the implementation of the various



guidelines. Using the existing framework as a starting point towards universal access to ECD services, including nutrition provision, is an investment that holds promise for a generation able to achieve their potential and ultimately create a stronger, healthier, and more prosperous nation.



## References

1. Kazim T. Early childhood development and the state's duty to provide basic nutrition to young children in South Africa. 2023. (Real Reform for ECD Right to Nutrition Series). Available from <https://www.ecdreform.org.za/#downloads>
2. Droomer L, Cooper-Bell T, Linderboom S, Scholtz K, Besada D. Implementation strategies for nutrition support to children in early learning programmes. 2023. (Real Reform for ECD Right to Nutrition Series). Available from <https://www.ecdreform.org.za/#downloads>
3. Equality Collective, Virk K. Providing nutrition support for ECD: synthesis report of the Real Reform for ECD Right to Nutrition Series. 2023. (Real Reform for ECD Right to Nutrition Series). Available from <https://www.ecdreform.org.za/#downloads>
4. World Health Organization. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential [Internet]. Geneva: World Health Organization; 2018 [cited 2023 Jul 25]. p. 55. Available from: <https://apps.who.int/iris/handle/10665/272603>
5. Black MM, Behrman JR, Daelmans B, Prado EL, Richter L, Tomlinson M, et al. The principles of Nurturing Care promote human capital and mitigate adversities from preconception through adolescence. *BMJ Glob Health*. 2021;6(4):1–9.
6. Republic of South Africa. National Integrated Early Childhood Development Policy. Pretoria: Government Printers; 2015.
7. Hall K, Sambu W, Almeleh C, Mabaso K, Giese S, Proudlock P. The South African Early Childhood Review 2019. Cape Town: Children's Institute, University of Cape Town and Ilifa Labantwana; 2019. p. 1–52.
8. The Maternal and Child Nutrition Study Group. Executive summary of The Lancet Maternal and Child Nutrition Series. *Lancet*. 2013;382(9890):1–12.
9. de Onis M, Blössner M, Borghi E, Frongillo EA, Morris R. Estimates of global prevalence of childhood underweight in 1990 and 2015. *JAMA J Am Med Assoc*. 2004 Jun 2;291(21):2600–6.
10. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*. 2013 Aug;382(9890):427–51.
11. Victora CG, Christian P, Vdaletti LP, Gatica-Domínguez G, Menon P, Black RE. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. *The Lancet* [Internet]. 2021 Mar;6736(21). Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0140673621003949>
12. Desmond C, Viviers A, Edwards T, Rich K, Martin P, Richter L. Priority-setting in the roll out of South Africa's National Integrated ECD Policy. *Early Years*. 2019 Jul 3;39(3):276–94.
13. Prado EL, Dewey KG. Nutrition and brain development in early life. *Nutr Rev*. 2014;72(4):267–84.



14. Prentice AM, Ward KA, Goldberg GR, Jarjou LM, Moore SE, Fulford AJ, et al. Critical windows for nutritional interventions against stunting. *Am J Clin Nutr.* 2013;97:911–8.
15. May J, Witten C, Lake L, Skelton A. The slow violence of malnutrition. In: May J, Witten C, Lake L, editors. *South African Child Gauge 2020.* Cape Town: Children’s Institute, University of Cape Town; 2020. p. 24–45.
16. Desmond C, Erzse A, Watt K, Ward K, Newell ML, Hofman K. Realising the potential human development returns to investing in early and maternal nutrition: the importance of identifying and addressing constraints over the life course. *PLOS Glob Public Health.* 2021;1(10):e0000021.
17. Stein AD, Wang M, DiGirolamo A, Grajeda R, Ramakrishnan U, Ramirez-Zea M, et al. Nutritional supplementation in early childhood, schooling, and intellectual functioning in adulthood: a prospective study in Guatemala. *Arch Pediatr Adolesc Med.* 2008 Jul 7;162(7):612.
18. Hoddinott J, Maluccio JA, Behrman JR, Flores R, Martorell R. Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. *The Lancet.* 2008 Feb;371(9610):411–6.
19. McEwen BS. Brain on stress: How the social environment gets under the skin. *Proc Natl Acad Sci.* 2012 Oct 16;109(supplement\_2):17180–5.
20. Ramakrishnan U, Goldenberg T, Allen LH. Do multiple micronutrient interventions improve child health, growth, and development? *J Nutr.* 2011;141:2066–75.
21. Martorell R, Melgar P, Maluccio JA, Stein AD, Rivera JA. The nutrition intervention improved adult human capital and economic productivity. *J Nutr.* 2010;140:411–4.
22. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet.* 2008;371(9608):243–60.
23. Remans R, Pronyk PM, Fanzo JC, Chen J, Palm CA, Nemser B, et al. Multisector intervention to accelerate reductions in child stunting: an observational study from 9 sub-Saharan African countries. *Am J Clin Nutr.* 2011;94:1632–42.
24. Aboud FE, Yousafzai AK. Global health and development in early childhood. *Annu Rev Psychol.* 2015 Jan 3;66(1):433–57.
25. Perumal N, Bassani DG, Roth DE. Use and misuse of stunting as a measure of child health. *J Nutr.* 2018 Mar;148(3):311–5.
26. Allen LH, Gillespie SR. What works ? A review of the efficacy and effectiveness of nutrition interventions. Asian Development Bank with the UN ACC Sub-Committee on Nutrition; 2001.
27. Schroeder D, Martorell R, Rivera J, Ruel M, Habicht J. Age differences in the impact of nutritional supplementation on growth. *J Nutr.* 1995;125:S1051–9.
28. Alderman H, Fernald L. The nexus between nutrition and early childhood development. *Annu Rev Nutr.* 2017;37(1):447–76.



29. Black MM, Dewey KG. Promoting equity through integrated early child development and nutrition interventions. *Ann N Y Acad Sci*. 2014 Jan 29;1308(1):1–10.
30. Zimmermann MB. The effects of iodine deficiency in pregnancy and infancy: effects of iodine deficiency. *Paediatr Perinat Epidemiol*. 2012 Jul;26:108–17.
31. Koshy B, Srinivasan M, Gopalakrishnan S, Mohan VR, Scharf R, Murray-Kolb L, et al. Are early childhood stunting and catch-up growth associated with school age cognition?—Evidence from an Indian birth cohort. *Hong SA, editor. PLOS ONE*. 2022 Mar 2;17(3):e0264010.
32. Ruel MT, Alderman H. Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *Lancet*. 2013;382(9891):536–51.
33. Young M, Wolfheim C, Marsh DR, Hammamy D. World Health Organization/United Nations Children’s Fund Joint Statement on integrated community case management: an equity-focused strategy to improve access to essential treatment services for children. *Am J Trop Med Hyg*. 2012 Nov 7;87(5\_Suppl):6–10.
34. Grantham-McGregor SM, Fernald LCH, Kagawa RMC, Walker S. Effects of integrated child development and nutrition interventions on child development and nutritional status. *Ann N Y Acad Sci*. 2014 Jan 4;1308(1):11–32.
35. UNICEF South Africa. First 1000 Days: The critical window to ensure that children survive and thrive. UNICEF; 2017.
36. Li H, Barnhart HX, Stein AD, Martorell R. Effects of early childhood supplementation on the educational achievement of women. *Pediatrics*. 2003 Nov 1;112(5):1156–62.
37. Pollitt E, Gorman KS, Engle PL, Martorell R, Rivera J. Early supplementary feeding and cognition: effects over two decades. *Monogr Soc Res Child Dev*. 1993;58(7):1–99; discussion 111-118.
38. Ogunlade AO, Kruger HS, Jerling JC, Smuts CM, Covic N, Hanekom SM, et al. Point-of-use micronutrient fortification: lessons learned in implementing a preschool-based pilot trial in South Africa. *Int J Food Sci Nutr*. 2011 Feb;62(1):1–16.
39. Pérez-Escamilla R, Pollitt E. Growth improvements in children above 3 years of age: the Cali Study. *J Nutr*. 1995;125(4):885–93.
40. McKay H, Sinisterra L, McKay A, Gomez H, Lloreda P. Improving cognitive ability in chronically deprived children. *Science*. 1978 Apr 21;200(4339):270–8.
41. Hodinott J, Behrman JR, Maluccio JA, Melgar P, Quisumbing AR, Ramirez-Zea M, et al. Adult consequences of growth failure in early childhood. *Am J Clin Nutr*. 2013 Nov;98(5):1170–8.
42. Gertler P, Heckman JJ, Pinto R, Chang SM, Grantham-McGregor S, Vermeersch C, et al. Effect of the Jamaica early childhood stimulation intervention on labor market outcomes at age 31. 2021. Available from: <http://www.nber.org/papers/w29292>



43. Pearce A, Scalzi D, Lynch J, Smithers LG. Do thin, overweight and obese children have poorer development than their healthy-weight peers at the start of school? Findings from a South Australian data linkage study. *Early Child Res Q.* 2016 32;35:85–94.
44. Walker SP, Wachs TD, Gardner JM, Lozoff B, Wasserman GA, Pollitt E, et al. Child development: risk factors for adverse outcomes in developing countries. *Lancet.* 2007;369:145–57.
45. Walker SP, Wachs TD, Grantham-McGregor S, Black MM, Nelson CA, Huffman SL, et al. Inequality in early childhood: risk and protective factors for early child development. *The Lancet.* 2011 Oct;378(9799):1325–38.
46. Hurley KM, Yousafzai AK, Lopez-Boo F. Early child development and nutrition: a review of the benefits and challenges of implementing integrated interventions. *Adv Nutr.* 2016 Mar;7(2):357–63.
47. Vorster, HH, Badham, JB, Venter, CS. An introduction to the revised food-based dietary guidelines for South Africa. *South Afr J Clin Nutr.* 2013;26(Supplement):S1–164.
48. Du Plessis, LM, Daniels, LC, Koornhof H, Samuels S, Möller I, Röhrs S. Overview of field-testing of the revised, draft South African Paediatric Food-Based Dietary Guidelines amongst mothers/caregivers of children aged 0–5 years in the Western Cape and Mpumalanga, South Africa. *South Afr J Clin Nutr.* 2021;34(4):123–31.
49. Black MM, Trude ACB, Lutter CK. All children thrive: integration of nutrition and early childhood development. *Annu Rev Nutr.* 2020 Sep 23;40(1):375–406.
50. National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC), ICF. South Africa Demographic and Health Survey 2016. Pretoria, South Africa and Rockville, Maryland, USA: NDoH, Stats SA, SAMRC, and ICF; 2019.
51. Grow Great. Nutritional Status of Children Under Five [Internet]. Johannesburg: Grow Great Campaign; 2022. Available from: <https://www.growgreat.co.za/wp-content/uploads/2023/04/GG-STUNTING-SURVEY-SCORECARD-SUMMIT-HANDOUT1-final-revised.pdf>
52. Senekal M, Steyn N, Nel J. Western Cape Stunting Baseline Survey on under-5-year-old children. Cape Town: Western Cape Department of Health and Wellness; DG Murray Trust; 2023 Feb.
53. Directorate Nutrition. Infant and Young Child Feeding Policy 2013. Pretoria: South Africa Department of Health; 2013.
54. Republic of South Africa. National Food and Nutrition Security Plan 2018–2023. Government Printers; 2017.
55. Thorogood C, Goeiman H, Berry L, Lake L. Food and nutrition security for the preschool child : enhancing early childhood development. In: May J, Witten C, Lake L, editors. *South African Child Gauge 2020.* Cape Town: Children’s Institute, University of Cape Town; 2020. p. 96–110.
56. Tomlinson M, Rotheram-Borus MJ, le Roux IM, Youssef M, Nelson SH, Scheffler A, et al. Thirty-six-month outcomes of a generalist paraprofessional perinatal home visiting intervention in South Africa on maternal health and child health and development. *Prev Sci.* 2016 Nov 1;17(8):937–48.



57. Republic of South Africa. Nutrition Guidelines for Early Childhood Development Programmes. Government Printers; 2019.
58. Department: Health, UNICEF. Training Manual for the Nutrition Guidelines for Early Childhood Development Programmes. Pretoria: Government Printers; 2022.
59. Giese S, Dawes A, Tredoux C, Mattes F, Bridgman G, van der Berg S, et al. Thrive by Five Index Report Revised August 2022. Innovation Edge; 2022.
60. Giese S, Budlender D. Government funding for early childhood development. Cape Town: Ilifa Labantwana; 2011. Report No.: 1.
61. Department of Basic Education. ECD Census 2021: Report. Department of Basic Education; 2022.
62. Atmore E, van Niekerk LJ, Ashley-Cooper M. Challenges facing the early childhood development sector in South Africa. South Afr J Child Educ. 2012;2(1):121–40.
63. Ilifa Labantwana. ECD COVID Response Project Final Narrative Report [Internet]. Cape Town: Ilifa Labantwana; 2021. Available from: [https://ilifalabantwana.co.za/wp-content/uploads/2021/11/COVID-response-Final-Report\\_for-website.pdf](https://ilifalabantwana.co.za/wp-content/uploads/2021/11/COVID-response-Final-Report_for-website.pdf)
64. Lunchbox Fund. Why nutrition? [Internet]. 2021 [cited 2022 Dec 6]. Available from: <https://www.thelunchboxfund.org/why-nutrition>
65. Lunchbox Fund. Transforming a child’s education, one meal at a time [Internet]. 2021 [cited 2022 Dec 6]. Available from: <https://www.thelunchboxfund.org>
66. Lunchbox Fund 2019 Annual Report [Internet]. Lunchbox Fund; 2020. Available from: [https://uploads-ssl.webflow.com/5dc9b504aa4ac344e9872359/602eb3cbf7b7a10799f565e6\\_Lunchbox%20Fund%20Annual%20Report%202019.pdf](https://uploads-ssl.webflow.com/5dc9b504aa4ac344e9872359/602eb3cbf7b7a10799f565e6_Lunchbox%20Fund%20Annual%20Report%202019.pdf)
67. Lunchbox Fund 2016 Annual Report [Internet]. Lunchbox Fund; 2017 [cited 2022 Dec 6]. Available from: [https://uploads-ssl.webflow.com/5dc9b504aa4ac344e9872359/5ddd61b17cea35008c8aa338\\_LBF%20Annual%20Report%202016%20Final.pdf](https://uploads-ssl.webflow.com/5dc9b504aa4ac344e9872359/5ddd61b17cea35008c8aa338_LBF%20Annual%20Report%202016%20Final.pdf)
68. Lunchbox Fund. Mission [Internet]. 2021 [cited 2022 Dec 6]. Available from: <https://www.thelunchboxfund.org/mission>
69. Lunchbox Fund. Where we work [Internet]. 2021 [cited 2022 Dec 6]. Available from: <https://www.thelunchboxfund.org/where-we-work>
70. The Tiger Brands Foundation. Nutrition programme [Internet]. 2022 [cited 2022 Dec 7]. Available from: <https://www.thetigerbrandsfoundation.com/index.php?nav=impact>
71. FoodForward SA. About us [Internet]. 2022 [cited 2022 Dec 7]. Available from: <https://foodforwardsa.org/our-foodbanking-model/>
72. FoodForward SA. Home [Internet]. 2022 [cited 2022 Dec 7]. Available from: <https://foodforwardsa.org>



73. FoodForward SA Annual Report [Internet]. 2020/2021 [cited 2022 Dec 7]. Available from: <https://foodforwardsa.org/wp-content/uploads/2022/11/Draft-8-FFSA-Annual-Report-FINAL.pdf>
74. SAHarvest. Let's fill bellies, let's nourish bodies [Internet]. 2021 [cited 2022 Dec 7]. Available from: <https://us19.campaign-archive.com/?u=3d0405ee19ff35fc98a890993&id=26c39344db>
75. SAHarvest. How [Internet]. 2020 [cited 2022 Dec 7]. Available from: <https://saharvest.org/how/>
76. Sivulka D. Why porridge? [Internet]. 2019 [cited 2022 Dec 5]. Available from: <http://www.outsidethebowl.org/blog/2019/10/3/why-porridge>
77. Outside the Bowl Africa. What is a super kitchen? [Internet]. 2022 [cited 2022 Dec 5]. Available from: <http://www.outsidethebowl.org/super-kitchen>
78. Johnson-Allen D. The Pebbles Project. 2022.
79. The Pebbles Project. Pebbles kitchen and nutrition programme [Internet]. 2021 [cited 2022 Dec 6]. Available from: <https://www.pebblesproject.org/pebbles-kitchen-and-nutrition-programme/>
80. Ngobese T. TREE nutrition programme. 2022.
81. Larkan A. Thanda nutrition programme. 2023.
82. Falconer, J. and Donkin, H. Zero2Five Nutrition Programme. 2023
83. Truda Foods. MyLife+ [Internet] 2023 [cited 2023 Oct 16]. Available from <https://trudafoods.co.za/product/mylife/>.





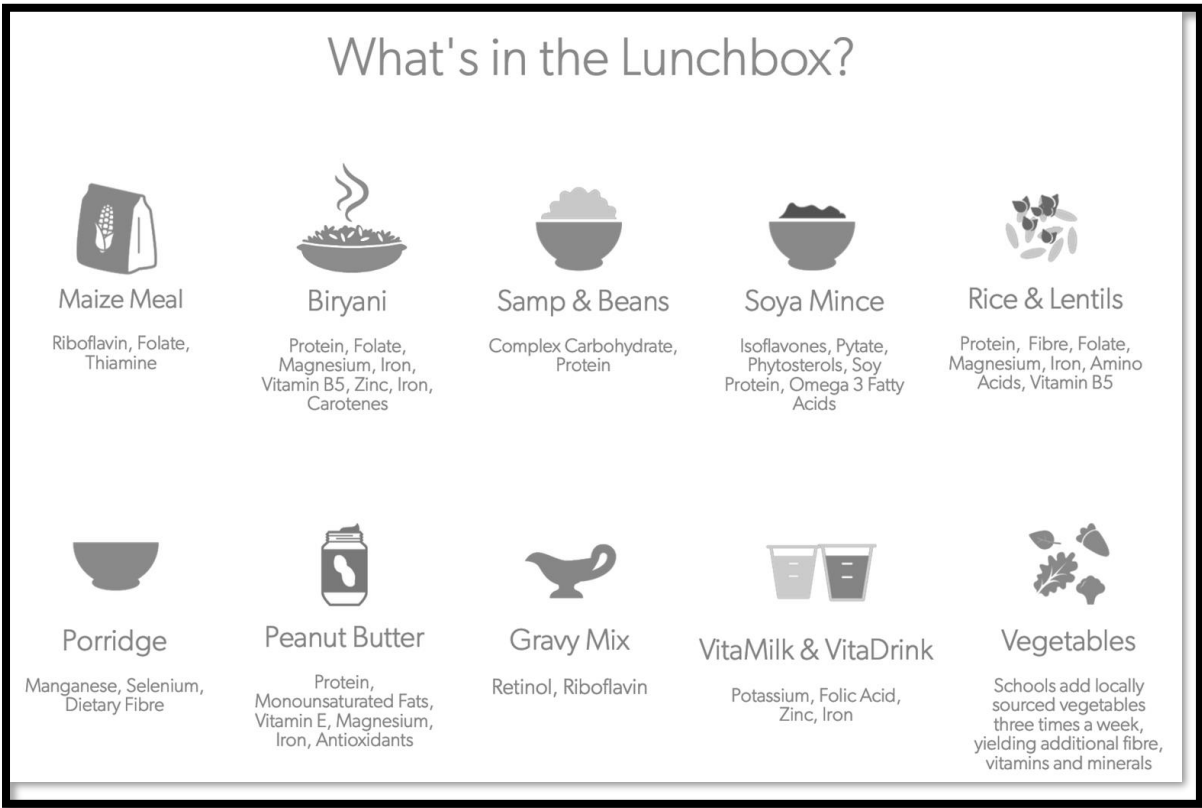
## Supplementary materials

Supplementary table 1. Nutritional value of the DoMore Porridge

	Per 100g	Per 50g serving	% NRV*
Energy (kJ)	1,639	820	
Protein (g)	12.7	6.4	11%
Glycaemic carbohydrate (g) of which sugar (g)	71 12.9	36 6.5	
Total fat (g) of which saturated (g) trans fat (g) monounsaturated polyunsaturated	4.9 1.1 <0.1 1.4 2.4	2.5 0.6 <0.1 0.7 1.2	
Dietary fibre (g)	4.6	2.3	
Total sodium (mg)	60	30	
Vitamin A (µg)	440	220	24%
Vitamin B1 (mg)	0.7	0.4	29%
Vitamin B2 (mg)	1	0.5	37%
Niacin (mg)	10.7	5.4	33%
Vitamin B6 (mg)	1.1	0.6	33%
Vitamin B12 (µg)	2	1	40%
Vitamin C (mg)	76.8	38.4	38%
Vitamin D (µg)	13	7	42%
Vitamin E (mg)	10.6	5.3	35%
Biotin (µg)	25	13	41%
Folate (µg)	230	115	29%
Pantothenic acid (mg)	3.8	1.9	38%
Iron (mg)	9.9	5	28%
Magnesium (mg)	234	117	28%
Zinc (mg)	5.5	2.8	25%

\* NRV stands for nutrient reference value. The NRV percentage refers to the nutrient content per single serving (50g) of DoMore Porridge.





Supplementary figure 1. Lunchbox Fund contents (66)



Supplementary table 2. Nutritional content of the VitaKidz Instant Energy Porridge

Typical nutritional information*	Per 100g
Energy (kJ)	1,656.81
Protein (g)	7.9
Carbohydrate (g)	62.9
of which total sugar (g)	12.8
Total fat (g)	1.8
of which saturated fat (g)	0.8
Dietary fibre (g)	2.3
Total sodium (mg)	209
Calcium (mg)	501
Phosphorus (mg)	155.55
Caffeine (mg)	0
Vitamin A (mg)	137
Vitamin B1 (mg)	2.82
Vitamin B2 (mg)	3.22
Vitamin B3 (mg)	2.4
Vitamin B6 (mg)	4.03
Vitamin B12 (µg)	2.36
Vitamin C (mg)	120
Vitamin D3 (µg)	10.2
Vitamin E (mg)	20
Nicotinamide (mg)	36
Pantothenic acid (mg)	12
Folic acid (mg)	60.4
Biotin (mg)	4.7

\* 80% NRV per 50g serving



**Supplementary table 3. Breakfast menu (Pebbles Project)**

Day 1	Day 2	Day 3	Day 4	Day 5
Eggs	Eggs	Weetabix	Yoghurt	Yoghurt
Beans	Beans		Fruit	Fruit

**Supplementary table 4. Lunch menu (Pebbles Project)**

Chicken (2x per week)	Red meat (1x per week)	Sausage (1x per week)
Pulses	Vegetables	

**Supplementary table 5. Lunch menu (TREE)**

Monday	Tuesday	Wednesday	Thursday	Friday
Rice	Cabbage	Samp	Potato	Rice
Beans	Carrots	Fish	Vegetables	Beans Potato



Supplementary table 6. Nutritional content of the Yabhusta Porridge

	Per 100g	Per 50g serving	% NRV*
Energy (kJ)	1,590	795	
Protein (g)	12.79	6	23
Carbohydrate (g)	69.7	35	
Fat (g)	6.97	3	
Fibre (g)	6.95	3	
Vitamin A ( $\mu\text{g}$ )	510	255	57%
Vitamin B1 (mg)	0.7	0.4	58%
Vitamin B2 (mg)	0.5	0.3	38%
Vitamin B3 (mg)	9.00	0.3	56%
Vitamin B5 (mg)	2.5	4.5	50%
Vitamin B6 (mg)	0.7	1.3	41%
Vitamin B12 ( $\mu\text{g}$ )	1.3	0.4	54%
Vitamin C (mg)	40	0.7	40%
Vitamin D3 ( $\mu\text{g}$ )	5	20	33%
Vitamin E (mg)	5	2.5	33%
Folic Acid ( $\mu\text{g}$ )	200	100	50%
Calcium (mg)	800	400	62%
Iron (mg)	18	9	100%
Zinc (mg)	3	2	27%
Elemental iodine ( $\mu\text{g}$ )	50	25	33%
Sodium (mg)	451.8	226	

\* This is for children aged 4 and older.



Supplementary table 7. MyLife+ nutritional content (83)

Single serving size is 50g	Per 100g	Per 50g	% NRV per 50g
Energy (kJ)	1,670	835	
Protein (g)	13.1	6.6	
Glycaemic carbohydrates (g)	66	33	
of which total sugar (g)	3.2	1.6	
Total fat (g)	9.0	4.5	
of which saturated fatty acids (g)	1.5	0.8	
Dietary fibre* (g)	7.3	3.7	
Total sodium (mg)	9	5	
Vitamin A	3,629	1,814.6	403%
Vitamin B1	0.7	0.3	56%
Vitamin B2	1.7	0.9	133%
Vitamin B3	11	5.5	69%
Vitamin B5	2	1.0	42%
Vitamin B6	1.6	0.8	91%
Vitamin B9	185	92.5	46%
Vitamin B12	2	1.0	100%
Vitamin C	91	45.6	91%
Vitamin D3	441	220.5	2940%
Vitamin E	9	4.4	59%
Vitamin H	8	4.1	27%
Vitamin K	39	19.7	33%
Calcium	423	211.4	33%
Chromin	–	–	–
Copper	1	0.5	70%



Iodine	43	21.6	29%
Iron	9	4.5	48%
Magnesium	154	76.9	38%
Mangenesese	1	0.5	37%
Molybdenum	–	–	–
Phosphorus	583	291.3	47%
Selenium	–	–	–
Zinc	8	3.8	70%
Potassium	720	360.2	15%

*\*Analysed using AOAC 991.43 method*



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