Investigating the quality of soya as served in the National School Nutrition Programme

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The South African National School Nutrition Programme (NSNP) is a government programme that provides at least one meal a day on school days to pupils in less affluent primary and secondary schools throughout the country. The objective of this programme is to provide nutritious meals to pupils in an attempt to improve their ability to learn.

Adequate nutrition from birth throughout childhood lays the foundation for good health and is necessary for children to learn, as nutritious meals provide food for the brain. Under-achievement in schools is a major problem and is most prevalent in developing countries. Therefore, schools are a priority when it comes to improving nutrition outcomes in a country.

The meals that are provided at schools are therefore intended to provide essential nutrients for mental and physical activities, and to ensure pupils are alert and receptive during lessons.

Helping millions of pupils

The South African NSNP was introduced in 1994 as part of the reconstruction and development programme of the newly founded democratic Republic of South Africa. Upon its inception, the programme only assisted primary schools. During the 2006 survey by the fiscal and finance committee of the Department of Education, it was confirmed that a need exists to extend the programme to secondary schools.

In October 2008, the minister of finance at the time announced a budget for the inclusion of secondary schools in the programme. Currently, the programme assists more than nine million pupils in 19 393 quintiles 1, 2 and 3 primary and secondary schools. The NSNP is critical for furthering pupils' constitutional rights to basic nutrition (Section 28(1)(c) of the *Constitution*) and basic education (Section 29(1)(a) of the *Constitution*).

The programme is funded through a conditional grant that is transferred to provinces on a quarterly basis, according to the *Division of Revenue Act, 2013 (Act 2 of 2013)*, or the *DORA*, and other directives from the Department of Basic Education (DBE) and the National Treasury. The allocation criteria for provinces are based on the poverty distribution table used in the *National Norms and Standards for School Funding* as gazetted by the former minister of basic education on 17 October 2008.

Guided by the relevant legislation and policies, National and Provincial DBEs are accountable for the management and utilisation of the funds as well as the monitoring of implementation, therefore each province's approach differs.

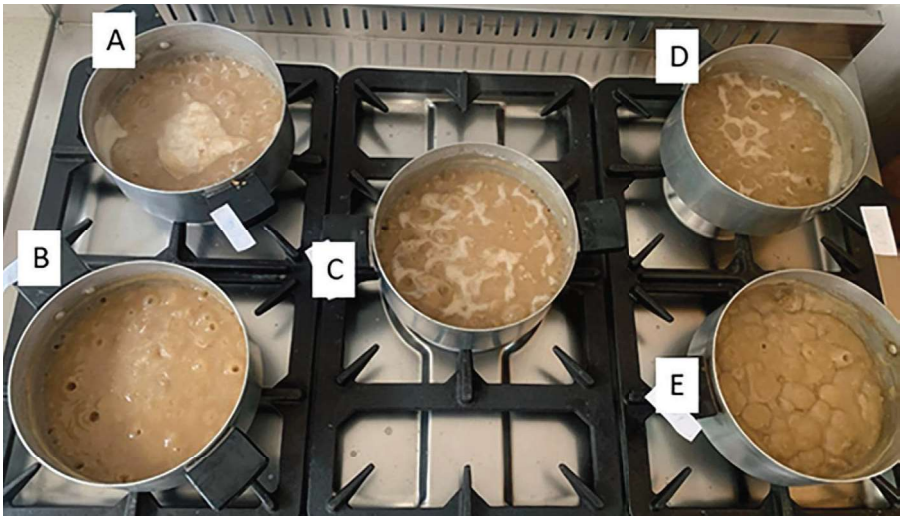
Quality, not quantity

In a previous study that was conducted in 2020 titled 'The role of soya in the National School Nutrition Programme', as well as in the review of the NSNP, it was reported that pupils did not enjoy the soya meals that were served at schools. Negative connotations due to bad experiences with the consumption of soya in the NSNP can lead to unwillingness to purchase the product later in life.

The 2020 study questioned the quality of soya served at schools and the quality of the soya supplied to schools. Schools in the Tshwane district were visited to assess the meals served to pupils and to identify soya suppliers.

Prepacked bags of soya as delivered by suppliers were found to contain large amounts of additives, which were assumed to be maize meal and flavouring. Results from this study showed that up to 60% of a bag of soya, as supplied by registered and accredited vendors to schools, were additives. This brings to question whether the supplied soya mince complies with the specifications as stipulated by the DBE.

The current unprecedented focus on health and nutrition has seen the food system undergo rapid changes, including an increased offering of various products in the same category. The food industry operates in a highly competitive environment and fraudulent practices are often reported in the media. One such



Soya from different blenders being cooked.

Table 1: Labels and analysed nutrient values of different soya suppliers.

Suppliers		Macro-nutrient results per 100g dry product						
		Moisture[+] (g)	Energy (kJ)	Protein (g)	Carbohydrates (g)	Fat (g)	Dietary fibre (g)	Sodium (mg)
Blender A	Label		–	27,4	47,1	–	17,7	2,04[#]
	Results	8,53	**1 279,8**	**23,3**	47	2,29	8,38	**3 220**
	Difference (%)			-15%	0%		-53%	157 743%
Blender B	Label		1 372	26	45,3	3,32	10,2	1 392
	Results	7,71	**1 363,8**	**22,6**	51,9	2,63	7,97	**2 101**
	Difference (%)[*]		-1%	-13%	15%	-21%	-22%	51%
Blender C	Label		1 443	28,3	42,8	5,8	8,3	830
	Results	6,55	**1 297,4**	28,2	36,8	5,2	13,8	**2 622**
	Difference (%)[*]		-10%	0%	-14%	-10%	66%	216%
Blender D	Label		1 559	24	48	7,2	9,1	919
	Results	7,75	1 453,7	**21,2**	47,4	7,77	8,59	**1 798**
	Difference (%)[*]		-7%	-12%	-1%	8%	-6%	96%
Blender E	Label		1 431	28,51	50,9	4,93	12	–
	Results	**9,76**	**1 303,6**	**22,4**	45,1	4,22	8,34	**3 109**
	Difference (%)[*]		-9%	-21%	-11%	-14%	-31%	
Supplier	Label		1 227,2	47	38	2,29	21	43,3
	Results	7,46	**1 231,7**	47,6	19,3	2,43	17,8	19
	Difference (%)[*]		0%	1%	-49%	6%	-15%	-56%
NSNP guidelines		<9	>1 365	>24			4	<1 500

**Percentage difference = [(analysed-label)/label]*100. [#]Assumed typing error on packaging. [+]Moisture is stated in the NSNP guidelines but is not required on package labels. Values in bold do not comply with the NSNP guidelines.*

practice is to bulk products with cheaper alternatives to increase profit. Legislative actions by governments, including regulations relating to the advertising and marketing of food, are continuously being updated to control this volatile market and ensure there is some form of adherence and consumer protection.

Only the real stuff

Soya mince, as served within the NSNP, is supplied to schools via accredited distributors managed by the programme co-ordinator within each school. In South Africa, there is a limited number of distributors that prepare soya as texturised vegetable protein (TVP) for human consumption.

The main supplier of TVP supplies soya chunks to blenders. Blenders further process the 100% soya chunks and add all sorts of additives such as maize meal, flavouring, sugar, salt, citric acid, a vitamin premix, colourants, herbs, spices and monosodium glutamate to create their own unique product that is then supplied to schools.

Since one of the aims of the NSNP is to serve quality nutritious meals, the DBE has published a document titled 'Food Specifications for products marketed to the NSNP'. The rationale behind the document is to ensure standards, improve the quality of meals served to pupils, and to make information available that can guide service providers on the expectations of the NSNP. This document covers both general and specific legislation for foodstuffs included in the programme. It aims to improve the understanding of the current industry to inform food control for future policy and programme development.

This study evaluated compliance to guidelines by the suppliers as set out by the DBE for soya mince (TVP products) served in the NSNP. In order to do this, suppliers in the NSNP were identified and samples were randomly and anonymously drawn from five vendors (n=5). The original soya chunks as provided to processors were also sourced for analysis (n=1).

Probing compliance

To investigate the label compliance of soya served in the NSNP, nutritional analyses (energy [as calculated], protein, carbohydrates, fat, dietary fibre and sodium) were conducted on the soya and compared to each respective product label. To estimate the amount of potentially cheaper, non-nutritive bulking agents added to the soya to increase product weight, a gravimetric ratio was determined by sieving the respective products to separate the TVP from the additives. These ratios of TVP chunks/mince to other products were compared to the guidelines as set out for soya served at schools.

Table 1 shows the label and analysed values for the dry soya mince product as

Table 2: Results depicting the gravimetrical ratio and percentages of soya to additives in a pack.

Supplier	Ratio soya to additives (g:g)	Percentage soya in pack	Percentage ratio additives to soya
Blender A	5 314g:7 239g	42%	58:42
Blender B	2 225g:2 213g	50%	50:50
Blender C	410g:587g	41%	59:41
Blender D	2 656g:2 390g	53%	47:53
Blender E	2 448g:2 545g	49%	51:49
Supplier	No additives	100%	0:100

Table 3: Soya mince cooking methods.

	Soya	Water	Cooking instructions
Blender A	1 part	3 parts	Add 3 parts water to 1 part soya mince and cook for 20 minutes or until tender.
Blender B	1kg	6 litres	Bring to a boil and then simmer for 20 to 30 minutes and serve.
Blender C	1 part	5 parts	Mix well and soak for 15 minutes, bring to a boil and simmer for 20 minutes. Stir regularly until mince is ready to be served.
Blender D	1kg	5 litres	Mix with cold water and bring to a boil, allow to simmer for 5 minutes. Serve as required.
Blender E	1kg	4 litres	Heat while stirring. Allow to simmer before serving.

supplied and sampled. Each nutrient will be discussed separately. The guidelines as set out by the DBE do not state the allowance of variance of values as shown on the labels.

Regarding the composition of soya mince, which is to be served in the NSNP, the DBE stipulates the following contents per 100g dry product:

- Moisture content must not exceed 9g.
- Protein content must be at least 24g from soya protein.
- The energy content should not be less than 1 365kJ.
- The sodium content must not exceed 1 500mg.
- The calcium content must be 150mg.
- The iron content must be 13,3mg.
- Zinc must be 3,7mg.
- Dietary fibre must be 4g.
- The product should not contain more than 10% fat from other sources than specialised protein products (SPPs) or poly-unsaturated vegetable oil.

From *Table 1* it is seen that there are numerous inconsistencies between what is stated on the label and the true analytical value. One of the most concerning findings is the discrepancies in protein values as soya is defined as the protein source in the meal. Four of the five suppliers did not comply with the requirements for protein.

The guidelines of the NSNP state that "the SPP shall remain the main ingredient of the final product". This statement can be argued from various points, since it does not stipulate exactly what the ratio of soya to optional ingredients may be. However, this study finds that only the product of Blender D had a higher soya:additives ratio.

Currently, soya is prepared as stated on the back of the supplier pack. The cooked product then has a slush-like consistency. This is an unappealing meal and is most likely the reason for low consumption of food on days that soya is served in the NSNP. From a previous recipe development study where recipes were developed, a ratio of 70:30 soya to additives was deemed reasonable. However, none of the samples attained this ratio (*Table 2*).

The five soya products all had different cooking guidelines to prepare the soya. These cooking guidelines are summarised in *Table 3* and are visually presented in *Photograph 1*.

The importance of guidelines

These findings provide constructive information to the soya industry to address the concerns of young consumers of soya. Soya, as currently served in the NSNP, is not enjoyed by pupils. Research has shown that this may not be due to soya as a product itself, but rather due to unappealing additives present in the soya as provided by suppliers. Guidelines, as currently stipulated by the DBE, state that soya should be the main ingredient available in the soya packs. These guidelines need to be updated to specify what the maximum acceptable ratio of soya to additives may be.

Regarding the labelling of foodstuffs in South Africa, a level playing field between food operators in order to meet label legislation has not been achieved. Some operators have reformulated their products, due to changes in legislation, as well as in preparation for the establishment of nutrient profiles, while other operators have not, creating unfair competition as claims are not standardised and, in some cases, not regulated. Food business operators may also be sceptical to apply label claims due to associated costs and a lack of knowledge in terms of regulations and compliance.

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For more information, go to *www.education.gov.za/Programmes/NationalSchoolNutritionProgramme.aspx*.