

Contribution of National Homegrown School Feeding Program to the Recommended Nutrient Intakes of School-aged Children in Zaria-Nigeria.

Halliru Zailani^{a,b,c}, Abdullahi Balarabe Sallau^c, Jane Pei-Chen Chang^{a,d}, Olumuyiwa Adeyemi Owolabi^c

^aMind-Body Interface Laboratory (MBI-Lab) & Department of Psychiatry, China Medical University Hospital, Taichung, Taiwan, ^bGraduate Institute of Nutrition, China Medical University, Taichung, Taiwan, ^cDepartment of Biochemistry, Ahmadu Bello University Zaria, Nigeria, ^dCollege of Medicine, China Medical University, Taichung, Taiwan

ABSTRACT

Background and Objectives: National Homegrown School Feeding Program (NHSFP) was introduced in Nigeria in 2016 to ameliorate short-term hunger and improve the nutritional status of school-aged children (SAC). Moreover, at least 33% of the Recommended Nutrient Intake (RNI) for the enrolled students should be met by the school meals. However, to our knowledge, the contribution of school meals served through NHSFP to the RNI of the SAC in Zaria, Nigeria remains to be explored.

Methods: We conducted a school-based cross-sectional study between October 2019 to November 2019 among 276 eligible SAC in the study area. Portion sizes of the meals served through the NHGSFP were measured and meals were analyzed for nutrient analysis after which the contribution of meals to the RNI of the SAC was estimated.

Results: The portion sizes recorded were 199.3±20.6 g, 263.9±11.5 g, 242.1±16.8 g, 311±17.3 g, and 160.3±1.9 mL, respectively for Moi-Moi; jollof rice and beans; beans porridge; jollof rice and boiled egg; and yogurt. The meals contributed 18.2 to 19.1%, 102.8-183.7%, 13.04-13.6%, and 26.1-35.8% RNI for carbohydrates, proteins, fiber, and energy, respectively. Furthermore, 137-175%, 314.3-502.2%, 87.6-142.1% of iron, zinc, and calcium daily requirements respectively were contributed by the meals

Conclusion: The NHGSFP has provided at least 33% RNI for energy, protein, iron, calcium, sodium, vitamin A and Zinc. However, the NHGSFP could not meet the RNI for carbohydrates, fiber, and potassium.

INTRODUCTION:

- Malnutrition among school-aged children (SAC) is a public health problem in developing countries and countries in transition (Best et al., 2010).
- National Home-grown School Feeding Program (NHSFP) aims improve the nutrition of SAC in public primary schools (Government of Nigeria, 2017).
- Meals served through NHSFP should provide at least 33% of the Recommended Nutrient Intake (RNI) of the enrolled SAC.
- The contribution of the school meals served through NHSFP to the RNI of SAC in Zaria LGA remains to be explored.

Aim:

To assess the contribution of the school meals served through the NHSFP to the RNI of SAC in Zaria-Nigeria.

Objectives:

- To assess the portion sizes, nutrients and energy contents of the school meals served to the SAC.
- To assess the nutrients and energy intakes of the SAC from the school meals.
- To assess the contribution of the school meals to the RNI of the SAC.

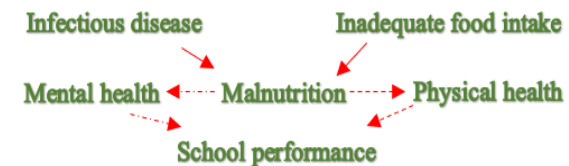
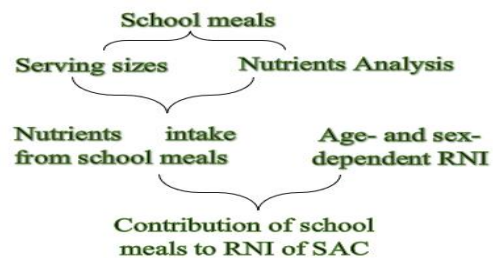


Figure 1: Relationship between malnutrition and school performance

METHODOLOGY:

Study Design: School-based quantitative cross-sectional study conducted in Zaria, Nigeria.



Ethical Approval: Committee on Use of Human Subjects for Research, Ahmadu Bello University, Zaria (ABUCUHSR/2021/12), Informed consent was obtained from the guardians of the participants.

RESULTS

Table 1: Portion sizes of the subjects

Food type	Males (n=132)	Females (n=144)	Average	p-value
MM (g)	198.2±20.4	200.3±20.7	199.3±20.6	0.409
JRB (g)	262.3±11.5	265.4±11.5	263.9±11.5	0.042
BP (g)	241.2±16.6	242.7±17.0	241.9±16.8	0.448
JRBE(g)	309.6±17.8	312.4±16.8	311±17.3	0.102
Y (ml)	160.3±1.8	160.2±1.9	160.3±1.9	0.689

Notes: MM: Moi-Moi, JRB: jollof rice and beans, BP: beans porridge, JRBE: jollof rice and boiled egg, Y: yoghurt.

Table 2: Nutrients and energy composition of the school meals

Nutrients	MM	JRB	BP	JRBE	Y
P%	19.21±0.06	12.36±0.18	24.50±0.00	8.77±0.02	7.25±0.35
F%	2.18±0.04	1.74±0.05	2.45±0.00	0.91±0.01	0.00±0.00
CHO %	29.74±0.13	8.20±1.92	2.19±0.58	12.41±0.62	2.02±0.54
E %	324.81±1.47	185.80±9.76	282.21±8.08	183.56±5.12	330.57±4.15
Fe %	8.00±0.10	8.60±0.20	0.42±0.20	6.55±0.10	0.08±0.01
Zn %	13.40±0.20	10.71±0.10	12.5±0.20	9.10±0.20	10.40±0.10
Ca %	711±5.00	489±3.00	554±4.00	484±3.00	245±2.00

Notes: MM: Moi-Moi, JRB: jollof rice and beans, BP: beans porridge, JRBE: jollof rice and boiled egg, Y: yoghurt.

Table 3: Nutrient intake of the subjects from the school meals

Nutrients	Males (n=132)	Females (n=144)	p-Value
CHO (g)	23.94±1.45	24.19±1.22	0.208
P (g)	34.64±1.43	34.92±1.22	0.076
F (g)	3.36±0.16	3.39±0.13	0.089
E (kcal)	583.63±21.43	588.1±18.23	0.112
Ca (mg)	1127.77±47.83	1138.45±38.72	0.091
Fe (mg)	13.79±0.53	13.91±0.41	0.062
Zn (mg)	24.90±0.96	25.12±0.78	0.072

Notes: CHO: Carbohydrates, P: Protein' F: Fiber; E: Energy, Fe: Iron, Zn: Zinc, Ca: Calcium

Table 4: Contribution of school meals to the RNI of the subjects

Nutrients	Age Groups (RNI)	Males (n=132)		Females (n=144)	
		Mean Intake	% RNI	Mean Intake	% RNI
CHO	6-8 years (130g)	23.71±1.30	18.2	24.21±1.23	18.62
	9-12 years (130g)	24.77±1.20	19.1	24.14±1.32	18.6
P	6-8 years (19g)	34.43±1.10	180.5	34.91±1.06	183.7
	9-12 years (34g)	35.40±1.04	104.1	34.95±1.05	102.8
F	6-8 years (25g)	3.33±0.15	13.3	3.39±0.17	13.56
	9-12 years (26g)	3.44±0.13	13.2	3.39±0.15	13.04
E	6-8 years (1742kcal)	580.41±21.40	33.3	587.87±22.1	35.80
	9-12 years (2279kcal)	595.23±21.62	26.1	588.29±20.14	28.41
Fe	6-8 years (10mg)	13.72±0.45	137.2	13.92±0.45	139.2
	9-12 years (8mg)	14.07±0.47	175.9	13.92±0.43	174.0
Zn	6-8 years (5mg)	24.77±0.74	495.4	25.11±0.75	502.2
	9-12 years (8mg)	25.43±0.70	317.9	25.14±0.76	314.3
Ca	6-8 years (800mg)	1120.57±42.5	140.1	1138.21±41.2	142.3
	9-12 years (1300mg)	1154.51±40.2	88.8	1139.17±38.5	87.6

Notes: RNI: Recommended nutrients intake, CHO: Carbohydrates, P: Protein' F: Fiber; E: Energy, Fe: Iron, Zn: Zinc, Ca: Calcium.

MAJOR FINDINGS: No differences in portion sizes of the SAC in all the meals except jollof rice and beans (Table 1). No sex differences in nutrient intakes from the school meals exists (Table 3). The school meals could not provide at least 33% of carbohydrate and fiber (Table 4).

IMPLICATION: Optimal contribution of the school meals to the RNI of almost all the nutrients analyzed hints at the potential of the program to improve the overall health and nutritional status of the SAC.

CONCLUSION: The NHSFP has provided at least 33% RNI for energy, protein, iron, calcium, and Zinc. However, the NHSFP could not meet the RNI for carbohydrates and fiber.

RECOMMENDATION: We recommend the maintenance and institutionalization of NHSFP as it has the potential to boost the intake of essential nutrients by the SAC. In addition, increasing the serving sizes of the meals can address the suboptimal contribution of the meals to the RNI for carbohydrates and fiber.

REFERENCES

- AOAC, *Official methods of analysis of AOAC*. International 17th edition ed. 2000: Gaithersburg, MD, USA Association of Analytical Communities.
- Azua, S., Youngu, T., Aliyu, Y., Usman, I., Abdulafeez, K., 2020. Geostationary Modelling of Soil Erosion in Zaria LGA, Nigeria, 34-50.
- Best, C., et al., *The nutritional status of school-aged children: why should we care?* Food Nutr Bull. 2010. 31(3): p. 400-17.

