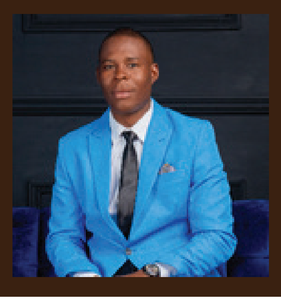
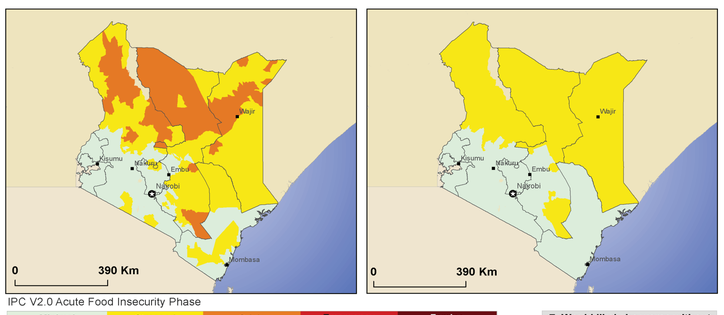
CHEMICAL CHARACTERISTICS AND ACCEPTABILITY OF CEREAL-CRICKET COMPOSITE PORRIDGE.



Danstone Aboge, Mary Orinda & Silvenus Konyole

1. INTRODUCTION

Challenge:
Food insecurity and Malnutrition



Contributing Challenges

- Lack of dietary diversity
- Animal protein ex-pensive & unaffordable
- Complementary foods are of low nutritional density.
- Complementary foods are characterized by poor physico□chemical properties.

Goal

- To generate knowledge on the use of crickets as an alternative source of valuable protein in complementary feeding for improved child nutrition.

Objectives:

- To determine effects of substituting soy flour with cricket flour on the nutritional composition, in vitroprotein digestibility and functional properties of cricket cereal composite complementary porridge.
- To assess sensory evaluation and con□ sumer acceptability of cereal-cricket composite porridge.

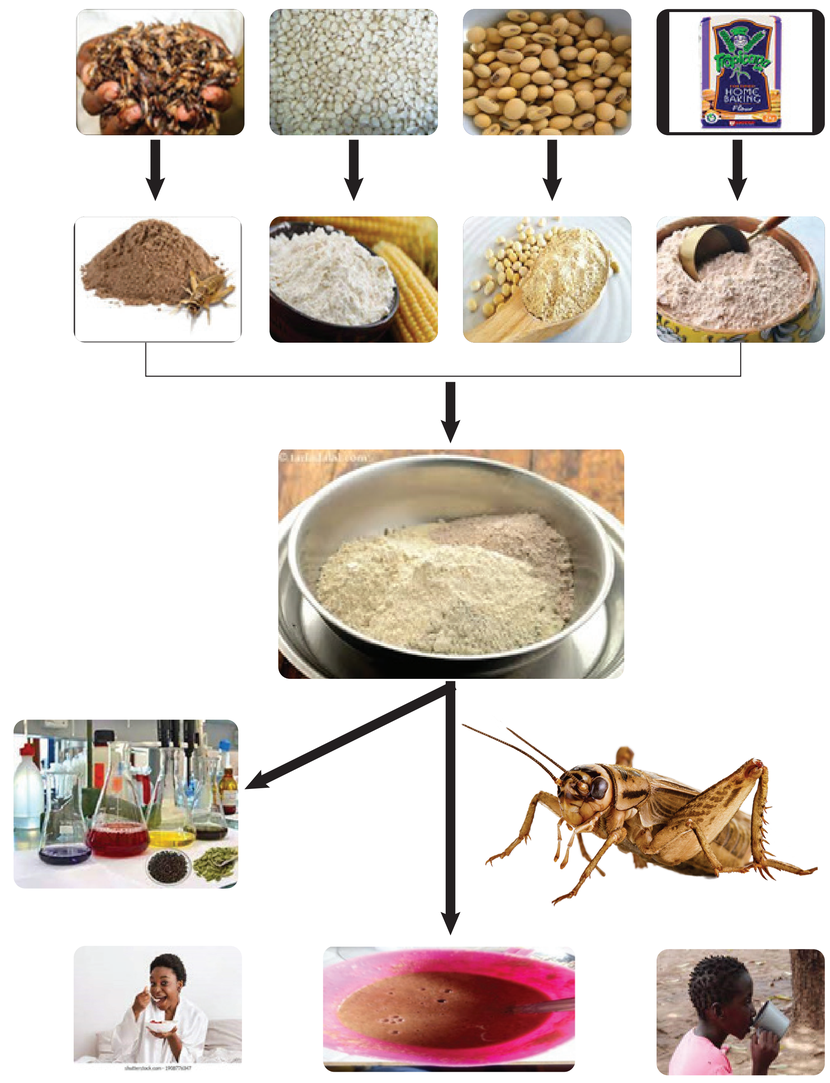
Why Crickets?

- Good source of quality protein (60-70%)
- Good source of fats, fibre and minerals
- Cheap and easy to rear in masses
- Low carbon foot print
- Under-utilized food resource

Why Replacing Soybean?

- Low protein content (40%) compared to crickets
- Protein is of low digestibility
- Has a lot of anti-nutrients
- Difficult and expensive to produce
- It's production contributes to land degradation and biodiversity loss

2. MATERIALS AND METHODS



3. RESULTS

NUTRITIONAL COMPOSITION OF THE FLOURS

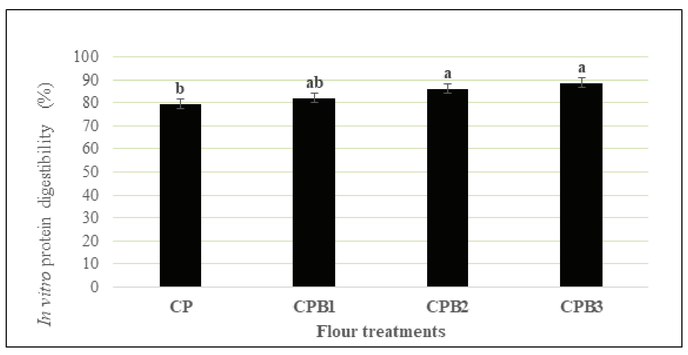
Table 1. Proximate composition of the flours

Flour	Moisture	Ash	Fibre	Protein	Fat	Carbohydrate
CP	9.45±0.15^{a}	1.78±0.32^{a}	4.63±0.18^{a}	17.58±0.23^{a}	9.87±0.75^{a}	56.69±0.55^{a}
CPB1	9.30 ±0.10^{ab}	1.67 ±0.16^{a}	5.41±0.56^{b}	19.18±0.28^{b}	11.04±0.70^{b}	52.77±0.02^{b}
CPB2	9.63 ±0.13^{a}	2.13 ±3.90^{a}	7.45±0.28^{c}	21.04±0.19	14.02±0.35^{c}	45.73±0.55^{c}
CPB3	9.25 ±0.01^{b}	1.72± 0.45^{a}	9.06± 0.12^{d}	22.87±0.45^{d}	15.61±0.3^{d}	41.49±0.51^{d}
p-value	0.0197	0.8536	0.0001	0.0003	0.0002	0.0001

Table 2: Mineral contents of the flours

Flour	K	Ca	Na	Fe	P	Mg	Zn
CP	177.53±0.09^{a}	87.58±0.47^{a}	82.22±0.73^{a}	6.05±0.14^{a}	128.97±1.09^{a}	31.63±0.38^{a}	5.84±0.79^{a}
CPB1	188.28±0.62^{b}	83.19±0.45^{b}	92.35±0.45^{b}	5.43±0.08^{a}	125.44±1.24^{b}		6.34±0.05^{a}
CPB2	194.45±0.71^{c}	78.35±0.23^{c}	110.55±0.12^{c}	4.15±0.15^{b}	121.50±1.07^{c}	41.70±1.87^{c}	8.21±0.72^{b}
CPB3	196.97±0.90	75.90±0.52^{d}	119.05±0.34^{d}	3.12±0.1^{c}	118.42±1.13^{d}	46.07±0.12^{d}	9.44±0.12^{c}
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

In vitro protein digestibility of the flours



Functional properties of the flours

	Viscosity (Centipoises)		Bulk density(g/cm^3)	Water Absorption capacity(ml/100g)	Protein water solubility (%)
	Cold (25ºC)	Warm(45ºC)			
CP	1650.0±0.21^{a}	1420.0±0.16^{a}	0.71±0.02^{a}	199.87±0.32^{b}	49.86±1.23^{a}
CPB1	1570.0±0.40^{b}	1250.0±0.16^{b}	0.68±0.01^{ab}	289.15±1.78^{ab}	43.48±1.96^{ab}
CPB2	1440.0±0.81^{c}	950.0±0.71^{c}	0.64±0.12^{b}	225.17±1.92^{ac}	27.06±0.32^{bc}
CPB3	1250.0±0.11^{d}	960.0± 0.22^{c}	0. 60±1.23^{c}	114.87±1.02^{c}	20.20±0.95^{c}
P-value	0.0003	0.005	<0.0001	0.0006	0.0032

Evaluation of the porridges

Porridge flour	Colour	Texture	Aroma	Taste	Mouth-feel	Overall acceptability
CP	8.08±1.47^{a}	7.60±1.67^{a}	8.25±1.28^{a}	8.35±0.74^{a}	7.65±1.70^{a}	8.5±0.72^{a}
CPB1	6.98±1.14^{b}	6.88±1.52^{a}	6.98±1.42^{b}	6.85±1.48^{b}	6.90±1.48^{a}	7.08±0.94^{b}
CPB2	5.83±1.72^{c}	5.4±1.95^{b}	4.85±1.64^{c}	5.05±1.90^{c}	5.08±1.97^{b}	5.75±1.53^{c}
CPB3	4.25±2.25^{d}	3.35±2.10^{c}	3.43±1.99^{d}	3.65±2.13^{d}	3.40±1.93^{c}	3.60±1.95^{d}

4. CONCLUSION

- Addition of cricket flour improved protein, fats, fibre, Na, K, P & Zn
- It also improves protein digestibility of the flours.
- It reduced viscosity and bulk density of cricket-based porridges making them easy for infant feeding
- Cricket-based porridges with 25% and 50% cricket flour inclusion was the most accepted
- Acceptability reduced with addition of more cricket flour

5. RECOMMENDATION

- Need to improve sensory properties of the porridges to improve acceptability
- More sensitization and awareness creation to improve acceptability

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