



Tropentag, September 20-22, 2023, hybrid conference  
“Competing pathways for equitable food systems transformation:  
Trade-offs and synergies”

## Chemical characteristics and acceptability of cereal-cricket composite porridge

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### Abstract

Undernutrition impacts the lives of many young children in sub-Saharan Africa and it is mainly attributed to low quality diets. Using soybean as a rich source of protein in fortification of cereal-based complementary foods is currently costly and unsustainable, underscoring the need for alternative protein sources. This study evaluated the potential of crickets as substitute for soybean in enriching complementary porridge, owing to their nutritional quality and environmental benefits. Four treatment flours denoted as; CP, CPB1, CPB2 and CPB3 were formulated. Control flour, CP was a composite of maize, wheat and defatted soybean flours in the ratio of 2:1:1 respectively resembling a local infant formula in Kenya. The other flours were formulated in the same ratio but with substitution of soybean with cricket flour at 25 %, 50 % and 75 % respectively. The flours were analysed for nutritional composition, *in vitro* protein digestibility and functional properties using standard methods. Porridges developed from the flours were evaluated for sensory attributes on a 9 point hedonic rating scale by women of reproductive age. A significant increase was observed in the following nutrients from CP to CPB3; protein, fibre, fats, potassium, sodium, magnesium, and zinc. Similarly, the *in vitro* protein digestibility of the flours improved from  $79.45 \pm 0.21$  to  $88.67 \pm 0.33$  percent. However, a significant decrease was observed in carbohydrate, calcium, phosphorus and iron. Further, a significant decrease was observed in the viscosity of cold and warm porridge, bulk density, water absorption capacity and protein water solubility of the flours. The overall acceptability of the porridges were as follows CP ( $8.5 \pm 0.72$ ), CPB1 ( $7.08 \pm 0.94$ ), CPB2 ( $5.75 \pm 1.53$ ) and CPB3 ( $3.60 \pm 1.95$ ). Substitution of soybean with cricket flour improved some nutrient content, *in vitro* protein digestibility, bulk density of the flours and viscosity of porridges, but made their porridges less acceptable. There is need therefore to improve the sensory attributes of the cricket-based porridges to increase their acceptability without compromising their nutritional quality.

**Keywords:** Complementary feeding, edible insects, food security, nutrition, protein