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## Improvement of the nutritional quality of a local germinated sorghum-based complementary food: effect of sorghum (*Sorghum bicolor*) and shea caterpillar (*Cirina butyrospermi*) combination

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### ABSTRACT

**Objectives:** This study aimed to improve the nutritional composition and functional property of complementary foods developed from a formulation of sorghum seeds and insect larvae, *Cirina butyrospermi*, one of the most widely eaten larvae in the Northern part of Côte d'Ivoire as alternative protein source.

**Methodology and results:** After germination, sorghum seeds and shea caterpillar were milled into flour and formulated in the ratio 90-10 (sorghum/shear). Physicochemical analyses were conducted on the 10%-shea caterpillar enriched sorghum flours, germinated (GSSCF) and ungerminated (USSCF) and their traditional counterpart using standard methods. Proximate composition of the studied sorghum flours showed for traditional and enriched form significant differences ( $p < 0.05$ ) with the enriched flours recorded the highest acidity, ash, fat, proteins, fibres, total sugar and energy values. These sorghum flours also exhibited lower value in phytates and in tannins and oxalates, and significantly influenced functional characteristics except for emulsifying and foaming capacity.

**Conclusion and application of results:** Overall, the present study has shown that shea caterpillar can be used to develop complementary foods that are nutritionally and functionally adequate to meet the dietary intake of infants at an acceptable level compared to their traditional counterpart. The incorporation of shea caterpillar flour in proportions of 10% in the germinated (GSSCF) and ungerminated (USSCF) sorghum flours has improved significantly ( $p \leq 0.05$ ) nutritional and functional properties of sorghum flours and significantly reduced the negative impact of antinutrients on mineral assimilation. Thus, these results have the merit of indicating a level of incorporation of *C. butyrospermi* larvae in germinated and ungerminated sorghum flours favourable to their use in human diet to prevent undernourishment due to protein and could be recommended for formulations in food industries as good alternative for the nutritional management.

**Keywords:** physicochemical composition, sorghum, infant flour, complementary food, shea caterpillar