

## **Protein quality of commonly consumed edible insects in Zimbabwe**

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### **Abstract**

Consumption of edible insects as alternative animal protein-source is a potential longterm solution to curb protein deficiency in resource-limited communities where diets lacking in protein are predominant. Entomophagy has been expressed in both developed and developing countries, and previous studies have proven that edible insects are high in protein. However, there is paucity of information on protein quality of edible insects to adequately guide populations on their utilization as good alternative protein sources. The aim of this study was to evaluate protein quality of three edible insects commonly consumed in most regions of Zimbabwe, namely *Imbrasia belina* (mopane worms), *Locusta migratoria* (locust) and *Encosternum delegorguei* (stinkbug). Kjeldahl method was used to evaluate crude protein of edible insects and a 20-day mice-feeding trial was conducted to evaluate protein efficiency ratio and protein digestibility in comparison to a control protein (casein). Crude protein was higher in *Locusta migratoria* (71.2%) compared to *Imbrasia belina* (57.7%) and *Encosternum delegorguei* (31.3%). Protein efficiency ratio was lower in insect samples *L. migratoria* (2.3), *I. belina* (1.96), *E. delegorguei* (2.0) compared to control casein (2.5). There was a significant difference ( $p < 0.05$ ) in protein efficiency ratio between the three edible insects and casein. Protein digestibility of the three insects (*I. belina*-92%, *L. migratoria*-90%, *E. delegorguei*-92%) was high and comparable to that of casein (96%). There was no significant difference ( $p > 0.05$ ) in protein digestibility between the three insect protein sources and casein. The results showed high protein quality of three edible insects commonly consumed in Zimbabwe comparable to casein, a high quality animal protein. High protein digestibility of edible insects indicated ease in absorption and improved utilisation in the body. The lower PER values for *I. belina* and *E. delegorguei* could possibly indicate that these edible insects may be limiting in the amino acids that support body tissue building and growth. Edible insects are a good source of quality protein that could meet protein requirements in resource-limited populations to curb protein deficiency. There is a strong need to further promote edible insects as a good alternative animal protein source.