Evaluation of the techno-functional properties of cricket (Acheta domesticus) flours produced from two body fractions.

DE LA BRENA A. (1), TEJADA-ORTIGOZA V. (1)
1 Tecnologico de Monterrey, Monterrey, Mexico

Abstract: This study aimed to determine differences in the techno-functional properties of powders from whole dried edible crickets (Acheta domesticus L.), the leg and antennae fraction, and the head and body fraction. Additionally, the effects of defatting on the techno-functional properties were evaluated. Samples were obtained by separating the legs and antennae with a Mesh 12 sieve. Defatted samples resulted from a petroleum ether extraction process. Then, the proximal characterization, water, and oil holding capacity, foaming activity, emulsion activity, and swelling capacity were evaluated. The dry-weight protein percentage remained unaffected in all powders (54.73%). However, the fat content of the head-body powder was 10% higher than the whole cricket powder, while the leg-antennae powder was 46% lower. Both leg-antennae and head-body fractions showed an increase in the water-holding capacity of whole cricket powder from 1.37 to 1.65 and 2.04 grams of water/ grams of sample, respectively. The water-oil emulsion capacity grew by 1.3 and 1.5 for the head-body and leg-antennae powders compared to the whole cricket powder. The swelling capacity increased from 122% for the whole cricket powder to 131 and 142% for the head-body and leg-antennae powder, respectively. In contrast, the head-body and leg-antennae powders' oil holding capacity was 25 and 19% lower than the 1.73 g water /g of sample value for the whole cricket powder. The head-body powder showed the highest oil-water emulsion capacity at 69.3%, while the leg-antennae powder had the lowest at 56.3%. The foaming capacity was highest for the whole cricket powder at 23.57%, followed by the leg-antennae and head-body powders with 20.33% and 18.33%, respectively. Defatting increased the evaluated functional properties in all powders except for the water emulsion activity of the defatted leg-antennae powder, which was reduced by 46% after defatting, and the foaming capacity of the defatted head-body powder, which decreased by 61%. Differences in the techno-functional properties from the evaluated cricket fractions could be due to protein/fat proportions changes. These results confirmed that protein-rich cricket powders could be obtained from different parts of crickets depending on the adequate functionality for the desired product.