

Pulsed Electric Fields assisted protein extraction from *Tenebrio Molitor*: Optimization and effect on colloidal properties

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World's population is expected to reach 9 billion by 2050, which means a challenge in terms of food production. Due to this problem, different food sources have been investigated to reduce the environmental impact. In this way, edible insects such as Yellow Mealworm (*Tenebrio Molitor*) have been identified as a source of nutritional compounds for human consumption. In this study, we employed Pulsed Electric Field (PEF) as a non-thermal technology to extract proteins from the Yellow Mealworm. Freeze-dried mealworms were ground and defatted using ethanol. The resulting powder was then mixed with water and PEF treatment was applied using an experimental design (central composite design) with four factors: electric field (from 1.5 to 5 kV/cm), frequency (from 10 to 1000 Hz), number of pulses (from 200 to 1000) and pulse width (from 1000 to 20000; nanosecond). The yield of extraction, biochemical and physicochemical properties of extracted protein as well as their foaming properties are compared and discussed. The possibility to use PEF as a step-on-add for insect protein extraction for industrial applications will be presented.

Keywords: *Tenebrio Molitor*; pulsed electric field; protein extraction; foaming properties.