Galoá

ISSN: 2447-2840

THE USE OF EMERGING TECHNOLOGIES ON ASSISTING WHEY β-LACTOGLOBULIN HYDROLYSIS AIMING LOW-ALLERGENIC INGREDIENTS

Luísa O. L. Rosa (/slaca/slaca/autores/luisa-o-l-rosa?lang=en);
Leda Muzzi (/slaca/slaca/autores/leda-muzzi?lang=en);
Carlos Conte Junior (/slaca/slaca/autores/carlos-conte-junior?lang=en);
Ana Iraidy S. Brígida (/slaca/slaca/autores/ana-iraidy-s-brigida?lang=en);
Caroline Mellinger-Silva (/slaca/slaca/autores/caroline-mellinger-silva?lang=en);
Lourdes Maria Correa Cabral (/slaca/slaca/autores/lourdes-maria-correa-cabral?lang=en)

#71322

Track

Engenharia de processos e tecnologias emergentes (ET)

Keywords

Whey Protein, Ultrasound, Microwave

Whey-based products are well known for their technological and biofunctional properties, which allow their application into different food products. However, its wide use has raised a health concern as its main protein, β-lactoglobulin (β-Lg), hides some allergenic epitopes which are resistant to key digestive proteases due to the protein's stable globular conformation. In this manner, the present

study investigated the use of ultrasound, microwave and autoclave technologies as pre-treatments for the hydrolysis of whey proteins, particularly β-Lg, aiming the future development of a whey-based ingredient with reduced allergenicity. Whey protein concentrate (WPC 88%) solutions (1.25% w/v; pH2; 100mL) were used for all treatments. For the ultrasound assays three potencies were applied (100W, 200W and 300W/ 5 min), while for microwave five conditions were evaluated (100W, 300W, 400W, 500W and 600W/ 5min). The experiments using autoclave were conducted for 10 min with 100°C/ 0.00kPa; 110°C/ 49.03kPa; 120°C/ 98.07kPa. All pre-treatments were followed by pepsin hydrolysis (1.91% w/w) at 37°C for 3h and further enzyme inactivation. Results showed that β-Lg was just partially hydrolyzed (from 39 to 69%) in all ultrasound treatments, being more intensely degraded when lower potencies were applied, probably due to the formation of β-Lg aggregates according to the increase of the potency. In contrast, microwave experiments showed that β-Lg hydrolysis was directly proportional to the potency used, with complete β-Lg being achieved in the treatment using 600W, generating a varied peptide profile manly between 16 and 26 min of retention time. Similar profiles were observed in the autoclave treatment using 120°C, with total β-Lg hydrolysis and a vast peptide profile formation. Thus, both microwave-600W and autoclave-120°C pre-treatments generated conformational changes on β-Lg which was further hydrolyzed by pepsin, showing great potential to generate a future whey ingredient with reduced allergenicity.