WHEY PROTEINS DIGESTION IN O/W EMULSIONS STABILIZED BY WHEY PROTEINS AND CARBOXYMETHYLCELLULOSE AT DIFFERENT pH
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Whey proteins and polysaccharides are well known to improve stability of emulsions. Emulsification of proteins is one of processes that changes proteins structure and it usually influence the way that the proteins are digested. The aims of our study: 1) to investigate stability of concentrated o/w emulsions stabilized by whey proteins (WP) and carboxymethylcellulose (CMC); 2) to determine the digestibility of WP in these emulsions using artificial digestion juices (ADJ). Emulsions were made using simultaneous adsorption (WP and CMC mixed prior homogenization with oil) or consecutive adsorption (WP homogenization with oil with subsequent addition of CMC) methods at different pH (5 and 7). The stability of emulsions was characterized by creaming stability, flow behavior, oil droplets size distribution and emulsifying activity. The digestibility rate of emulsions was characterized by proteins hydrolysis rate, changes in droplet size distribution, rheological characteristics of emulsions during digestion by HDJ. More stable emulsions were obtained by consecutive adsorption method at pH 5 and by simultaneous adsorption method at pH 7. All emulsions stabilized by WP and CMC were longer resistance to hydrolysis comparing with emulsions stabilized only by WP. It was shown that during digestion process because of the hydrolysis of the interfacial proteins layer by pepsin the adsorbed layer of emulsions became thicker. Emulsions became susceptible to flocculation, therefore the increase in larger droplets was observed. Higher rate of peptic hydrolysis was observed in emulsions made by consecutive adsorption method. In emulsions made by simultaneous adsorption method proteins were longer resistant to proteolytic enzymes.