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FOAMABILITY AND FOAM STABILITY OF CASEIN MICELLES CROSSLINKED BY TRANSGLUTAMINASE

Milk contains a large number of proteins called casein micelles which, despite their name, do not have the typical structure of micelles recognized in the literature. There are four different types of fractions of caseins that remain in the so-called micellar structure mainly through hydrophobic interactions, hydrogen bonds and calcium phosphate nanoclusters (Dalgleish, 2010). Caseins are a group of proteins with foaming properties, among other groups. Proteins play a major role in food foam stabilization because their amphiphilic nature allows them to accommodate at bubble interfaces (Germain & Aguilera, 2014). Food foams are important to the food industry because they confer a texture that is valued by consumers (Narchi, Vial & Djelveh, 2009), but their stability is the main concern. Different mechanisms either to produce and stabilize the foam, as the formation of liquid films and foams or to destroy it, such as coarsening, drainage and rupture of liquid film and foams, get involved (Cantat et al., 2013). According to Silva et al. (2013), physical, chemical and enzymatic methods can alter the casein micelles structure and organization, leading to greater stabilization under stress conditions by factors such as temperature, pH and ionic strength. The crosslinking method creates covalent bonds between the proteins which increase the stability of these molecules and, consequently, of the food systems (Stojadinovic et al., 2014), enabling application in aerated food products.

References

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