

Reducing the deposition of fat and protein covered particles with low energy surfaces.

ABSTRACT

Deposition behavior of spray dried full cream milk, skim milk and whey particles were observed in a pilot scale dryer. Particle surface dominated with fats exhibit gradual decrease in deposition fluxes when transition from the initial adhesion to the subsequent cohesion mechanism. Whey protein, however, displayed significant differences in the adhesion and cohesion fluxes. Reduction of particle deposition on low energy chamber wall surface is more significant for the hydrophobic whey particles. Further analysis shows that the reduction in droplet–wall contact energy is larger for the more hydrophobic droplet, delineating weaker adhesion interaction. The results suggest that the hydrophobicity of the depositing particles is an important consideration when using lower chamber wall with lower surface energy. This is in addition to the effect of particle rigidity and deposition strength as reported previously.

Keyword: Surface energy; Spray drying; Deposition; Full cream milk; Skim milk; Whey protein.