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Functionality of Milk Fat In Foam Formation and Stability

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The objectives of this study were to investigate the functional properties of different fats emulsified in food foams. Quantitative descriptions of the formation and subsequent stability of food foams containing a dispersed lipid phase were generated to examine the effects of fat phase plasticity on foam dynamics. Formation and stability of foamed oil in water emulsions of vegetable oil, milk fat, or milk fat fractions separated by crystallization were characterized. Foams were generated in a sparging apparatus utilizing magnetic resonance imaging as a measurement probe. Whole anhydrous milk fat was fractionated by melt crystallization. Milk fat fractions derived from crystallization separation possessed distinct functional characteristics that were due primarily to the presence of long-chain saturated triglycerides in the hard fraction. The increased plasticity of the hard fraction affected the formation of foams and their subsequent stability. The stratification of foam density from top to bottom, determined by magnetic resonance imaging, varied inversely with increasing lipid hardness. Composition and physical state of the dispersed lipid particles contribute to foam formation and stability.