

INFLUENCE OF THE PARTICAL SIZE OF EMULSION ON THE STABILITY OF BEVEREGES

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Introduction. Beverage emulsions containing particles with a size of 1-1000 nm, and treated as objects of classical colloid chemistry. Of great importance to the stability of food products has a particle size. The use of emulsions in the manufacture of beverages is associated with the possibility of reducing the length of the production process while reducing power consumption compared to traditional production methods. This difference is particularly useful in food industry, because of the emulsions are the necessary ingredients that provide flavor, color and aroma of food that greatly simplifies their production technology. Having information about the size of emulsion particles can be controlled their stability and quality. It is known that the emulsion particle diameter depends on the technology of the manufacturing process, the formulation of the emulsion. The key point of the efficiency of the food industry is the introduction of resource-saving and competitive technologies based on the use of high quality components of food and beverages (aromatic emulsions).

Materials and methods. The aim of study was to investigate the effect of particle size by laser granulometry on the emulsion stability during storage and use of the finished product for 180 days. The materials used for the studies two samples of emulsions with particle sizes: one emulsion with a particle size of 0.1 - 1 micron and second emulsion with a particle size greater than 1.0 microns.

Results and discussion. Emulsion stability study was carried out by examining the size of the particle diameter by laser granulometry and resistance to setting and beverage emulsion wherein the emulsion is used for 180 days. During the manufacture of emulsions initially prepared aqueous and fat phases, mixed them with a high rpm stirrer speed and pre-emulsion obtained with a particle size of about 3.0 microns. In the next step: by homogenization with an emulsion particle size of 1.0 microns 0,1mkm and larger than 1.0 microns. It is found that during storage of the product with a particle size greater than 1.0 microns appeared ring, which is associated with breach of the emulsion structure, and the conversion of oil into larger particles and floating them on the surface. In contrast, in the product, manufactured using the emulsion particles with a size from 0.1 to 1 micron above changes was observed.

The paper discusses the main factors controlling flocculation, creaming, coalescence and Ostwald ripening, distinguishing between the differing effects of adsorbing and no adsorbing hydrocolloids. The attention is specifically directed towards new understanding concerning the rheological and microstructural control of emulsion stability by non-adsorbing hydrocolloids, and the great potential of electrostatic protein-polysaccharide interactions at the oil-water interface for enhancing emulsion properties.

In practice, two or more of the phenomena shown in Fig. 1 may happen at the same time, and the presence of one mechanism (flocculation) may trigger or enhance another (creaming or partial coalescence).

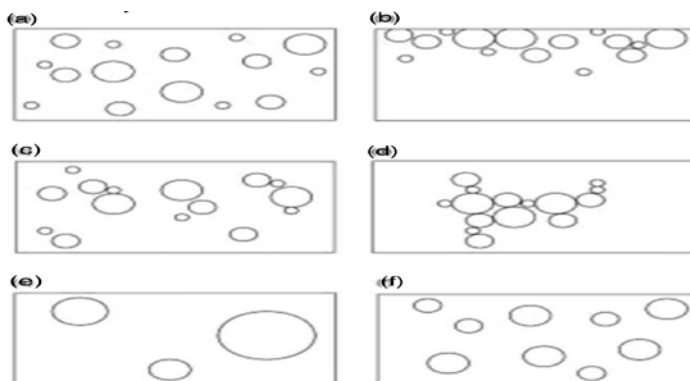


Fig. 1 Schematic representation of the key mechanisms of O/W emulsion instability: (a) stable dispersion of droplets; (b) creaming; (c) flocculation (weak); (d) flocculation (strong); (e) coalescence; (f) Ostwald ripening.

If the particle size is less than 1 micron, the emulsion is highly robust stability and gives some turbidity but less than 1 micron particle size, the less turbidity, if the particle size is not greater than 0.3 micron. The principle of leverage ratio of water and oil phase of emulsions with different stabilizers is the same. In the obtained parameters also affects the nature of emulsions stabilizer.

During storage of beverages prepared from emulsions studied, there was no formation of oil ring or “creaming” bottled, indicating the stability of emulsion systems.

Conclusions.

1. The use of aromatic emulsions in the manufacture of soft drinks has several benefits, including: reduced duration blending, as there is no need to pick up the dye. The use of aromatic emulsions drinks solves the problem of stabilizing the aroma and taste, as in this case acts as an emulsifier adsorbent aroma of providing fine and mild flavor.
2. The process of storing drinks not observed the emergence of oil rings on the surface of the drink, there was no change in color, taste and aroma of the drink. Color Stability ensured using synthetic dyes stable in comparison with natural dyes, direct sunlight during shelf life. The aroma and taste of the drink (excluding Sugar-acid balance) is provided using citrus oil, which is a fat-soluble flavor in the oil phase.
3. The best result of research in emulsions - is to obtain the maximum number of particles of about 1 micron.
4. Result of studies found that the manufacture of emulsion products in order to preserve their stability and quality, it is necessary to take into account the particle size of the emulsions, which must not exceed 1.0 microns.

Creating a stable emulsion system is a pressing issue in the food industry, so these studies are useful and important for the development of new beverages.

References

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