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Nanoencapsulação para Aplicação de Óleos Essenciais em Alimentos

Nanoencapsulation for Application of Essential Oils in Foods

The application of essential oils (EO) as natural antimicrobial compounds in food products has recently drawn attention from the scientific community, because of the need to meet the consumers' demands for natural products. The direct incorporation of EO in foods is limited by several technological challenges, which concern their adequate dispersion in the food matrix, the control of their interaction with other ingredients, as well as the maintenance of their activity for the necessary time. In order to overcome such challenges, EO can be encapsulated in suitable delivery systems. Several encapsulation systems, with different formulations and size distributions, have been tested for the delivery of EO in foods. Among these, nanoscale delivery systems have shown the capacity to potentialize the antimicrobial activity of these compounds by increasing the passive cellular absorption, reducing the mass transfer resistances, and improving the physical stability of bioactive compounds. In addition, nanoencapsulation can increase the concentration of the bioactive compounds in food areas where microorganisms are preferably located, such as water-rich phases or liquid-solid interfaces. Among the formulations of the nanoencapsulation are nanoparticles, nanoemulsions and nanoliposomes formed by a variety of materials including alginate, chitosan, soy lecithin and phosphatidylcholine. Nanoencapsulation is a promising alternative for the incorporation of EO in food, as it may increase its stability and antimicrobial activity. However, several aspects still need to be better studied such as the factors related to encapsulation efficiency, effective release of the encapsulated compound and the effects of EO on the sensory attributes of food. Moreover, these studies can serve as ground for the development of regulations about the use of nanoencapsulated EO in food, which are currently lacking.

References

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