Editorial
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Latest Advances in Electro Sprayed Particulate Matter as Bioactive Encapsulation Systems for Food Use

Ammar A*

Biochemistry Department, Faculty of Sciences, University of Jeddah, Saudi Arabia

Editorial

There are currently two key applications of active ingredients in the food industry: primarily as value-added ingredients to enhance the health-beneficial properties of food; secondly, to create smart packaging that can resist food putrefaction. Nevertheless, most of these bioactive compounds under different conditions are very unstable and easily oxidized, particularly when exposed to the combination of oxygen, light and/or heat during processing and storage. Oxidative degradation of bioactive compounds can lead to free radicals, unpleasant tastes or smells and eventually affect their biological activity [1]. Furthermore, other bioactive compounds such as polyphenols, carotenoids, and omega-3 fatty acids are insoluble in water with low intestinal permeability, resulting in weak oral bioavailability. Consequently, successful encapsulation and delivery methods are important for maintaining bioactivity, achieving controlled release of bioactive compounds and improving bioavailability [2]. Various techniques have been developed, such as spray drying, emulsification, self-assembly and solvent evaporation to encapsulate various bioactive compounds [3,4]. These methods, however, either involve high temperatures or require significant quantities of organic/nonpolar solvents, leading to the degradation of bioactive compounds and the related toxicity issues. Spray drying, for example, is one of the most common techniques for the encapsulation of bioactive compounds because of its simple procedures and the industrial production available [5].

However, this process makes use of a relatively high drying temperature (170°C-220°C), which may degrade thermally labile ingredients [6]. Self-assembly is also a method of encapsulation to protect the bioactive compounds. However, in order to obtain stable solid products, the self-assembled products require more drying. Another common encapsulation technique for conserving bioactive compounds is emulsification. Compared to other techniques, colloidal instability and high initial emulsion burst are among the main negative factors that restrict their practical applications [7]. The key objectives of this mini analysis are therefore to provide a brief overview of electro spraying and its advantages over traditional encapsulation techniques, and to summarize recent developments in biopolymer electrospraying for encapsulation of bioactive compounds. In addition, it also illustrates the potential shortcomings of this strategy and the possible directions for its use in the food industry.

References

1. Wen P, Zong MH, Linhardt RJ, Feng K, Wu H. Electrospinning: A novel nano-encapsulation approach for bioactive compounds. Trends in Food Science &Technology. 2017; 70: 56-68.
2. Ghorani B, Tucker N. Fundamentals of electrospinning as a novel delivery vehicle for bioactive compounds in food nanotechnology. Food Hydrocolloids. 2015; 51: 227-240.
3. Araiza-Calahorra A, Akhtar M, Sarkar A. Recent advances in emulsion-based delivery approaches for curcumin: From encapsulation to bioaccessibility. Trends in Food Science & Technology. 2018; 71: 155-169.
4. Huang S, Vignolles ML, Chen XD, Le Loir Y, Jan G, Schuck P, et al. Spray drying of probiotics and other food-grade bacteria: A review. Trends in Food Science & Technology. 2017; 63: 1-17.
5. Estevinho BN, Rocha F, Santos L, Alves A. Microencapsulation with chitosan by spray drying for industry applications – a review. Trends in Food Science &Technology. 2013; 31: 138-155.
6. Shishir MRI, Chen W. Trends of spray drying: A critical review on drying of fruit and vegetable juices. Trends in Food Science & Technology. 2017; 65: 49-67.
7. Pisoschi AM, Pop A, Cimpeanu C, Turcus V, Predoi G, Iordache F. Nanoencapsulation techniques for compounds and products with antioxidant and antimicrobial activity - a critical view. Eur J Med Chem. 2018; 157: 1326-1345.

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Correspondence:
Al-Farga Ammar, Biochemistry Department, Faculty of Sciences, University of Jeddah, Saudi Arabia.
E-mail: *2259841993@qq.com*
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