World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:11, No:04, 2017

# Protein Stabilized Foam Structures as Protective Carrier Systems during Microwave Drying of Probiotics

**Authors :** Jannika Dombrowski, Sabine Ambros, Ulrich Kulozik

**Abstract :** Due to the increasing popularity of healthy products, probiotics are still of rising importance in food manufacturing. With the aim to amplify the field of probiotic application to non-chilled products, the cultures have to be preserved by drying. Microwave drying has proved to be a suitable technique to achieve relatively high survival rates, resulting from drying at gentle temperatures, among others. However, diffusion limitation due to compaction of cell suspension during drying can prolong drying times as well as deteriorate product properties (grindability, rehydration performance). Therefore, we aimed to embed probiotics in an aerated matrix of whey proteins (surfactants) and di-/polysaccharides (foam stabilization, probiotic protection) during drying. As a result of the manifold increased inner surface of the cell suspension, drying performance was enhanced significantly as compared to non-foamed suspensions. This work comprises investigations on suitable foam matrices, being stable under vacuum (variation of protein concentration, type and concentration of di-/polysaccharide) as well as development of an applicable microwave drying process in terms of microwave power, chamber pressure and maximum product temperatures. Performed analyses included foam characteristics (overrun, drainage, firmness, bubble sizes), and properties of the dried cultures (survival, activity). In addition, efficiency of the drying process was evaluated.

**Keywords :** foam structure, microwave drying, polysaccharides, probiotics
**Conference Title :** ICFPMD 2017 : International Conference on Food Preservation Methods and Drying
**Conference Location :** Paris, France
**Conference Dates :** April 18-19, 2017