

# FOOD CHEMISTRY & NUTRITION

July 24-26, 2017 Vancouver, Canada

## Double emulsions (W/O/W) stability influenced by homogenization technique and formulation for natural antimicrobial delivery in food systems

Maria Teresa Jiménez-Munguía, Nelly Ramírez-Corona, Aurelio López-Malo and Enrique Palou  
UDLAP, Mexico

Water-in-oil-in-water (W/O/W) emulsions have a great potential use for food applications, because they can protect sensitive compounds; however, the main problem about double emulsions is that they are highly unstable thermodynamic systems. Emulsifiers and stabilizing agents are added to achieve the desired stability. The challenge in the food area is to reduce or eliminate synthetic chemical agents and replace them with safe human intake substances. In recent years, biopolymers have been investigated as emulsifiers and stabilizing agents. Besides the different compounds used to prepare double emulsions, the homogenization technique has also been studied to optimize the process conditions used. Among the high-energy methods used to prepare emulsions are: high shear mechanical mixers, high pressure homogenizers, by microfluidization and ultrasound. With these techniques, different emulsion properties (droplet size of the disperse phase, viscosity, density, creaming) are generated according to the severity of the treatment and therefore affecting their stability. Once the stability of the W/O/W emulsions is achieved controlling the previous subjects mentioned, an interesting application of these systems is the delivery of natural antimicrobials. Essential oils chemical components have proved to have antimicrobial and antioxidant properties. Recent applications of nano- and micro-emulsions of essential oils, demonstrate the inhibition of different types of microorganism of food interest, such as bacteria, yeast and molds. The results obtained from the investigation conducted in aim to compare the effect of the different process parameters during the homogenization by ultrasound, high pressure and mechanical shear mixer, used solely and in combination; as well as, formulation factors to attain double emulsions' stability during storage and its application as an effective system for antimicrobial delivery against molds, will be presented.

### Biography

Maria Teresa Jiménez-Munguía has participated in research projects in the area of food processing applying emerging technologies, such as ultraviolet treatments, ultrasound and combined methods, as well as, in powder technology with agglomeration and encapsulation processes, particularly for functional products development and nutraceuticals. She is actually member of the National System of Researches (SNI) of Mexico, with the distinction level I, since 2015. She is an active member of national (AMIDIQ, AMECA) and international associations (IFT and IFA).

[maria.t.jimenez@udlap.mx](mailto:maria.t.jimenez@udlap.mx)

### Notes: