* Please note if you do not find a set of abstracts for a Concurrent Session, this is because we did not receive a set of abstracts for that session.
expenses by 60 -- 90 %. They also allow reducing abrasion in high pressure dispersing processes and thus working with particle loaded products. We also used this device for the production of micro- and nano-structured particles to be used not only in functional foods, but also for cancer treatment, novel paints, catalysts, or organic electronics.

**Conclusions:** High pressure homogenization is a well-accepted and well-known technology. Modern engineering and analytical tools improve the understanding of processes taking place in the dispersing units and thus allow adapting the design of these to specific needs or challenging targets. This can be used for energy and maintenance cost savings, sustainable process control and/or the production of nanostructured functional products.

**Detection of Acrylamide on a Novel, Biodegradable Biosensor Platform Using Surface Enhanced Raman Spectroscopy**

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Acrylamide generation during thermal food processing is a growing concern for food industry. FDA has recently released a draft guideline for the food industry on the mitigation of this compound, which is especially formed in baked and fried food products as a result of Maillard reactions. In order to monitor the levels in food, there is a need for a fast, reliable and easy technique. In this research the focus has been on detection of acrylamide via Surface Enhanced Raman Spectroscopy (SERS) on recently developed biosensor chips. Biosensor chips developed for this research are made of a biodegradable polymer, zein, which is a corn prolamin. These chips have been produced by solvent casting on a master mold with nanopatterns with photonic properties that result in hot spots generating strong Raman signatures. The zein nanophotonic patterns were coated with thin layers of gold, which enhance signal intensity by more than 1000 times. For the acrylamide detection, these biosensors are used as a proof-of-concept to analyze the enhanced Raman signature generated by the presence of different concentrations of acrylamide. It was found that acrylamide gives characteristic and highly distinguishable Raman peaks and a calibration curve was obtained on this biodegradable, novel platform. In conclusion, the data suggests that SERS on green biosensors can pose an easy and convenient alternative to other conventional techniques for the detection of acrylamide and might offer another tool in the arsenal to detect and prevent or minimize the presence of acrylamide in food.

**Evaluation of Beta-Carotene Bioaccessibility Encapsulated in Lipid Nanoparticles Produced with Murumuru (Astrocaryum murumuru) Butter by an In Vitro Dynamic Gastrointestinal Model**

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Colloidal delivery systems have the ability to increase bioavailability of lipophilic substances encapsulated within them. Solid lipid nanoparticles (SLN) are one of the most used colloidal dispersions in nanoencapsulation of hydrophobic substances, and can be produced using low energy approaches, such as the phase inversion temperature (PIT), which is based in the change of solubility nonionic polyethoxylated surfactants with temperature. In order to incorporate these systems in foods, it is important studying their behavior under gastrointestinal tract conditions. *In vitro* models aim to achieve an acceptable level of validation of digestive properties compared to *in vivo* behavior, and can...
be static or dynamic. The dynamic model have been developed to simulate more effectively the *in vivo* behavior, and one of the most known is the TIM system (TNO intestinal model), that mimics the major events occurring in the gut lumen. Such model consists of serial compartments simulating the stomach, duodenum, jejunum, and ileum. The jejunum and ileum compartments are connected to filtration units to simulate the absorption in the gut.

This work aimed to investigate the digestibility of beta-carotene loaded SLN produced with murumuru (*Astrocaryummurumuru*) butter (an Amazon oil rich in lauric fatty acids), prepared by PIT method, in a TIM-like system. The samples of nanoparticles (average diameter ~40 nm) were submitted to digestion cycles of 5 h, using flow rates, secretions and enzymatic solutions according to Reis et al (2008). After filtration and the ileal valve, the efflux was collected hourly, for particle size, zeta potential, bioaccessibility and free fatty acids (FFA) analyses. Particle size and zeta potential were also evaluated for the stomach (after 90 min) and duodenum (after 120 min).

Nanoparticles became stable in the stomach, and started to destabilize in duodenum. The amount of FFA released was determined by titration and the results revealed that almost 50% were absorbed. The content of beta-carotene was measured spectrophotometrically and the total bioaccessibility was approximately 40%. The process waste was around 10%, which indicate that the TIM-like system used had a good yield.

The results show the good potential of nanoparticles to serve as encapsulation system for lipid-soluble bioactive compounds and the efficiency of the TIM-like system in estimating parameters as digestibility and bioaccessibility of beta-carotene-loaded SLN produced.