***Important notes:***

***Do not*** *write outside the grey boxes. Any text or images outside the boxes* ***will be deleted.***

***Do not*** *alter the structure of this form. Simply enter your information into the boxes. If you alter its structure, your submission will not be processed correctly and will be refused.*

**Title:**

Advancing The Understanding Of Puff Pastry Margarines With LAOS Method

**Authors & affiliations:**

Affiliations must be indicated in superscript placed after each author and refer to each corresponding institution. The speaker has to be underlined.

**A. Chakraborty**[1], C. Blecker[1], R. Detry [2], V. Van Hoed [2], C. Deledicque[2], P. Barthelemy[2], S. Danthine [1]

[1]Gembloux Agro-Bio Tech TERRA, Avenue de la faculté d'Agronomie 2B, Gembloux 5030, Belgium;

[2] Industrialaan 25 Puratos nv Zone Maalbeek, 1702 Groot-Bijgaarden, Belgium.

**Keywords:**

Up to 5 keywords

Non-linear rheology, Large amplitude oscillation shear, puff pastry margarine

**Abstract:**

Your abstract must be in “Normal” style and should be no longer than 300 words. For ease of understanding, figures are accepted.

Abstracts can be written in a French or English language.

Preparation of your abstract:

1- The title should be clear and concise and long enough to indicate clearly the nature of your study. Capitalize the first letter of each word. No full stop at the end.
2- The abstract should state briefly and clearly the purpose, methods, results and conclusions of the work.
3- Literature references are accepted and should be indicated by a number in square brackets (referring to the source at the end of the document).


Puff pastry margarines require a precise balance of elasticity and viscosity to ensure optimal performance during lamination and baking. Conventional methods such as Solid Fat Content (SFC) analysis, hardness measurements, and the thumb test provide limited information, often missing critical nuances in structural behavior. This study explores the use of Large Amplitude Oscillatory Shear (LAOS) to evaluate the complex rheological properties of puff pastry margarines, offering a more comprehensive understanding of their performance characteristics.

For this study lamination margarines were processed using slightly different conditions and subjected to various tempering temperatures, which led to significant changes in their structural and mechanical properties. LAOS not only detected these changes but also highlighted variations in viscoelastic behaviors that were not discernible with traditional techniques. Moreover, advancements in LAOS data analysis enabled us to extract detailed insights into the nonlinear viscoelastic response at higher harmonics, providing a deeper understanding of the internal structure. By comparing LAOS results with conventional methods, we established the superiority of LAOS in detecting subtle differences and its potential as a powerful tool for quality control. These findings pave the way for integrating advanced rheological techniques into routine analyses in the fat and oil industry.

The study discusses the methodology, results and the evolution in data analysis tools in maximizing the potential of LAOS for evaluating complex food systems like puff pastry margarines.