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New ingredient for fat reduction in the preparation of bakery products. Rheological, textural, and sensory characterization

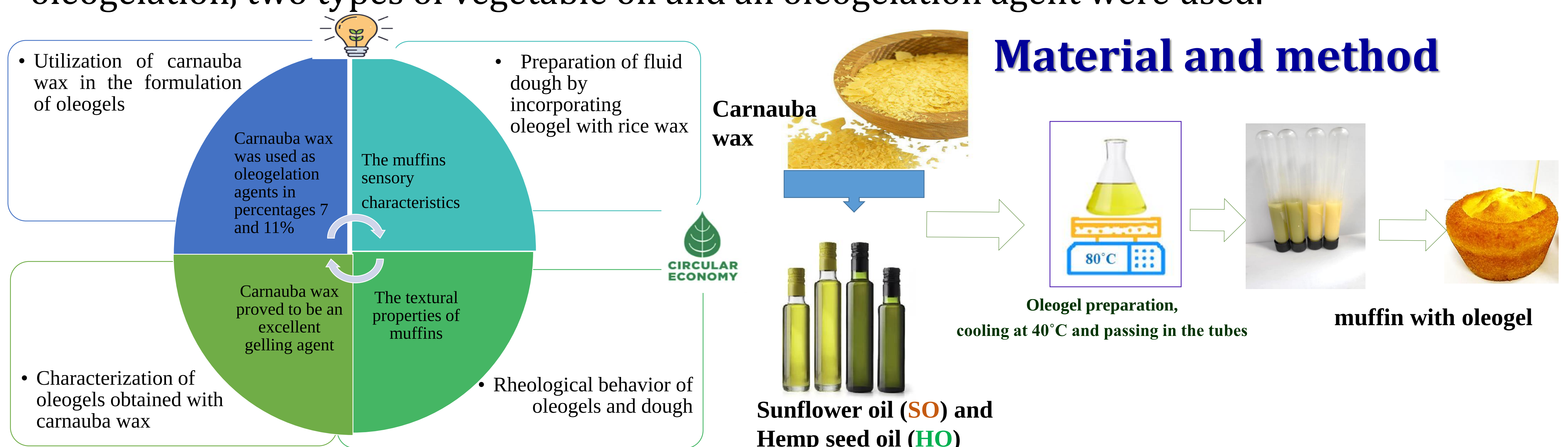
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Abstract: In the food industry and especially in the bakery and pastry industry, the use of margarine remains indispensable, because it ensures the preservation of the sensory qualities appreciated by consumers. The effects of consuming hydrogenated fats on health is a vast topic that is still under research. Replacing with a healthy and chemically safe alternative and keeping the organoleptic properties area of application of our research. In this study, oleogels are presented as a healthy alternative to saturated fats, replacing margarine in well-known pastry products - muffins. Oleogels are unique semi-solid materials consisting of a network of structuring molecules that trap oil in liquid form, resulting in a gel-like texture. Oleogels were obtained using hemp seed (HO) and sunflower seed (SO) oils and carnauba wax (CW) as an oleogelating agent. The percentages of wax added to the oil for oleogelation were 0%, 7% and 11%. The muffin dough was obtained by replacing 100% of margarine with 10% oleogel.

THE PURPOSE OF THE WORK

The purpose of this study was to **REPLACE** margarine with a solid variant of oil - **OLEOGEL** - in pastry products - **MUFFINS** - to **REDUCE** the content of *saturated and trans fatty acids*. For oleogelation, two types of vegetable oil and an oleogelation agent were used.



Results and discussions

Carnauba wax, the most important vegetable wax in terms of economics and possible applications, is extracted from the leaves of the carnauba (*Copernicia prunifera*). Carnauba wax formed a complex 3D network that trapped liquid oil in a gel-like material at a concentration of 7% and 11% by weight. Carnauba wax demonstrated gelling potential for all vegetable oils used in this research.

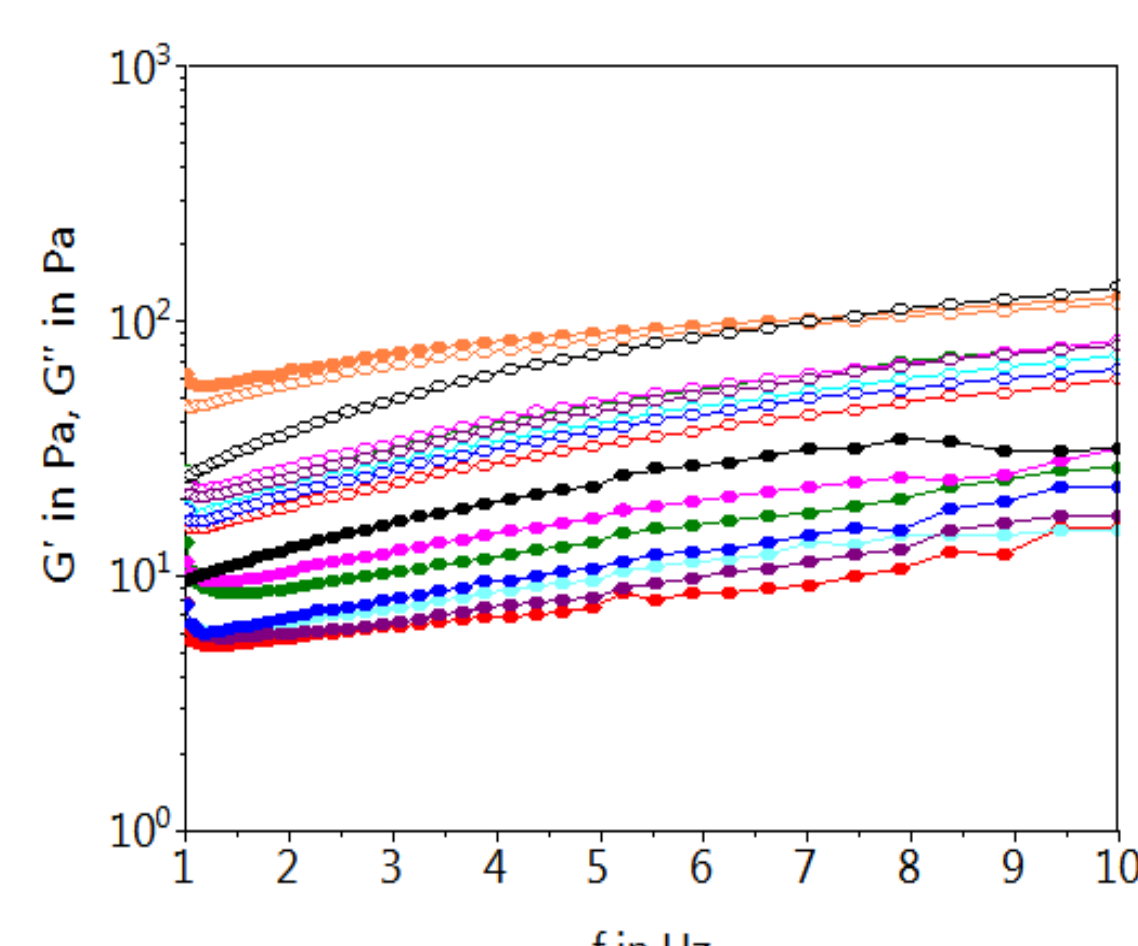


Fig. 1. Representation of the rheological modules of the muffin dough. Elastic and viscous modulus GG

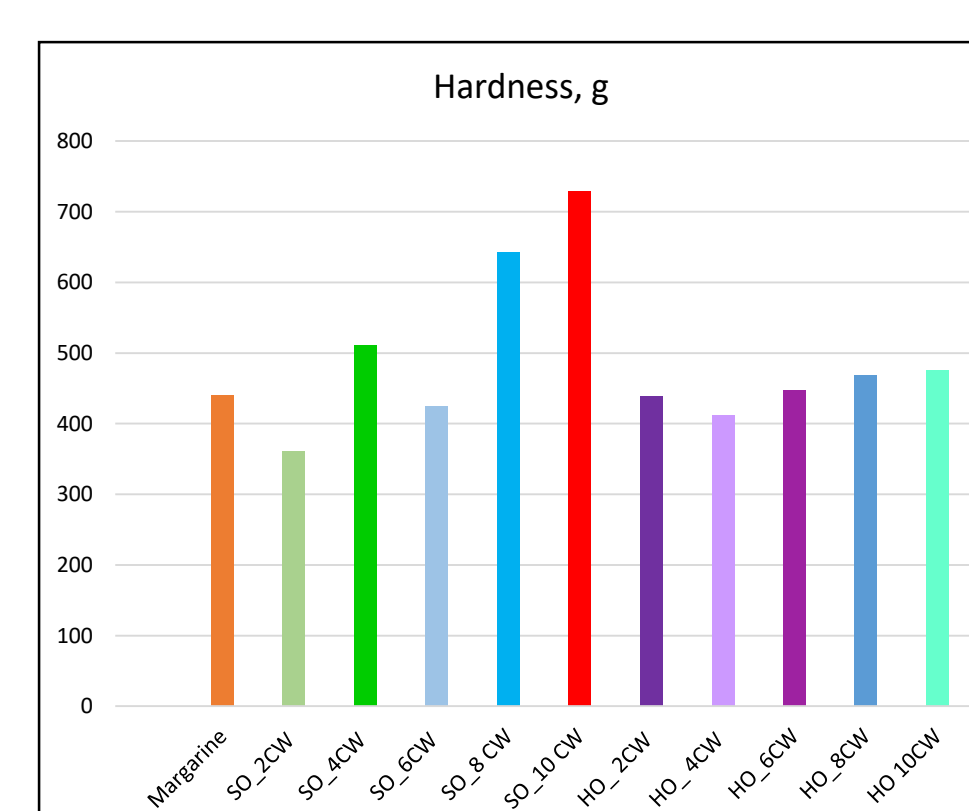


Fig. 2. The hardness values of the muffins

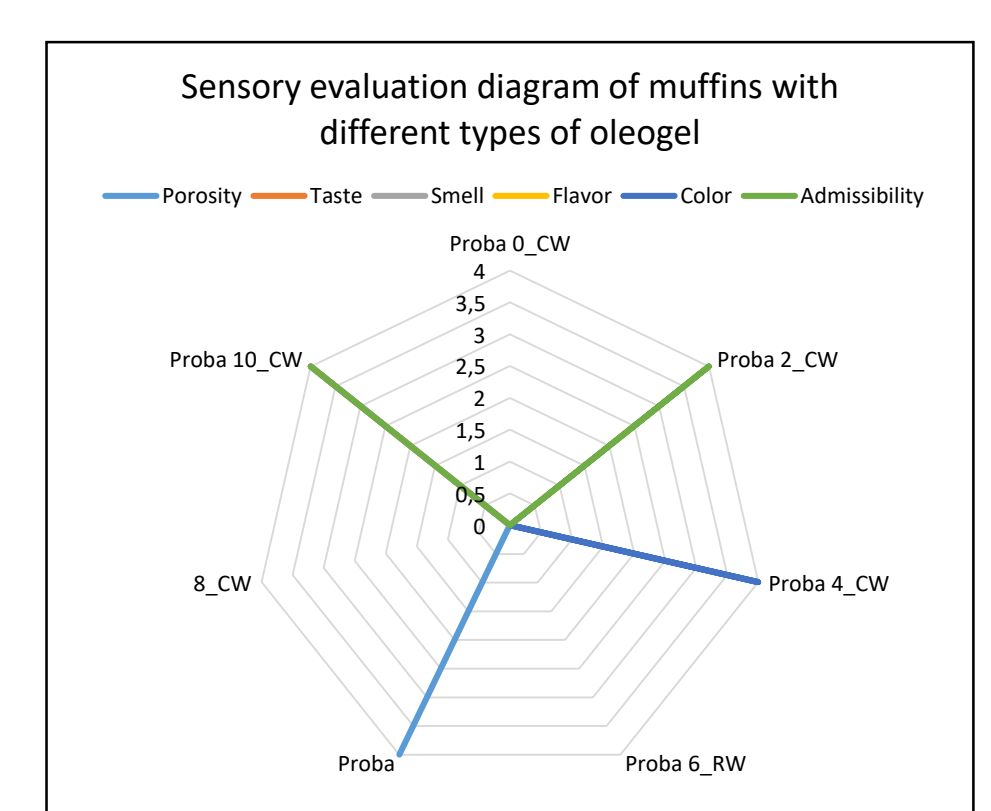


Fig. 3. Scoring scale for sensory analysis of muffins

Conclusions

The use of oleogels to obtain muffins contributes to the nutritional superiority by reducing the saturated fat content. Since oleogel has received considerable attention from the scientific and industrial communities, the application of oleogel to sweet pastry products could offer the possibility of replacing margarine because oleogelation is a simple method and the finished product presents textural and sensory properties appreciated by evaluators. The processing of oleogel in pastry products is encouraging because oleogel has a structure similar to solid fats and in the future the food industry will probably extend the application of oleogels to a greater variety of pastry products.