

# Oxidative stability and characterization of oleogels made from safflower oil-based beeswax and rice bran wax and their utilization in cake production

Şebnem Badem<sup>1</sup> and Ayhan BAŞTÜRK<sup>2</sup>

<sup>1</sup>Van Yuzuncu Yil University

<sup>2</sup>Van Yuzuncu Yil University, Faculty of Engineering

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## Abstract

In this study, oleogels based on safflower oil were produced from beeswax and rice bran wax at different ratios. It was aimed to produce cakes with high level of unsaturated fatty acids by using these oleogels as a shortening replacer. The characterization and oxidative stability of oleogels were investigated. Oil binding capacity (OBC), solid fat content (SFC) and crystallization time (CT) were determined in oleogels. Moisture content, pH, texture and sensory analysis were performed in the cakes. In addition, fatty acid composition, free fatty acidity, peroxide value, conjugated diene-triene and 3-monochloropropane-1,2-diol (3-MCPD) and glycidyl analyzes were performed pre- and post-cooking in oleogels and shortening. SFC increased as gelator concentration increased. Beeswax showed the highest OBC. The shortest CT was determined in rice bran wax. No changes were observed in the fatty acid composition of safflower oil following oleogelation. The change in major fatty acids post-cooking was also not significant. Cakes made with oleogel were acceptable in terms of texture and sensory properties compared to cake produced using shortening. Sensory results showed that some cakes produced with oleogels more acceptable than control. This study revealed that oleogels produced with safflower oil-based beeswax and rice bran wax with high unsaturated fatty acid content can be used in cakes rather than commercial shortening.

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Figure 1. Sensory parameters.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Figure 2. The imaging appearances of oleogels and cakes..docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Table 1. Oleogel and cake codes.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Table 2. Some physical properties of oleogels.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Table 3. Some physical properties of cakes.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Table 4. Textural properties of cakes.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>

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Table 5. Physicochemical properties of shortening and oleogels before and after cooking.docx available at <https://authorea.com/users/519608/articles/593270-oxidative-stability-and-characterization-of-oleogels-made-from-safflower-oil-based-beeswax-and-rice-bran-wax-and-their-utilization-in-cake-production>