

## Regulation of enzyme activity in white wheat flour treated by supercritical carbon dioxide

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The main chemical components in wheat flour are starch, gluten, lipids, non-starch polysaccharides, trace amounts of minerals and enzymes. Enzymes such as hemicellulases, xylanases, lipases and oxidases can directly or indirectly improve the strength of the gluten network and so improve the quality of the finished bread. However, some enzymes may cause undesirable oxidation processes in wheat flour during storage. One of the main problems affecting the use of flour is the shorter shelf life due to the presence of some enzymes. During storage of wheat flour, lipids readily affect its persistence due to lipase-catalyzed enzymatic hydrolysis. This is followed by oxidation, which results in loss of flour functionality, taste and nutritional properties.

In this work, supercritical carbon dioxide (scCO<sub>2</sub>) was used to reduce the enzyme activity in white wheat flour. Enzymatic activity was determined in the extracted supernatant of with scCO<sub>2</sub> treated wheat flour after a specified time using spectrophotometric method.

One of the undesirable process, which should be avoided is enzymatic browning that occurs during food processing and storage and definitely affects customers' acceptance. Enzymatic browning is generally associated with the oxidation of phenolic compounds catalyzed by polyphenol oxidase (PPO) and leads to the occurrence of off-flavors and loss of nutritional quality of wheat flour, which leads to quality reduction. Therefore, it is imperative to use methods to regulate the enzyme activity and maintain the edible value, quality and competitiveness of flour and bakery products.

