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# 1 The influence of natural oils of blackcurrant, black cumin seed, thyme and wheat 2 germ on dough and bread technological and microbiological quality

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## 14 ABSTRACT

15 Plant oils have potential as antimicrobial ingredients in bread. However, they may influence bread  
16 production. This study compares the influence of blackcurrant (BC), cumin seed (CS), thyme (TH) and  
17 wheat germ (WG) oil on the technological quality of dough/bread, as well as their antifungal activity. The  
18 influence of the oils was tested on the water absorption and kneading properties of dough, elasticity,  
19 starch gelatinization and yeast activity and were compared with a control without oil and a reference  
20 with calcium propionate. Bread weight, volume, color and crumb texture were evaluated. The antifungal  
21 activity was tested through a shelf-life test of breads. Results showed that, generally, the addition of oils  
22 resulted in a decrease of dough consistency. WG showed the highest overall resemblance with the  
23 control concerning water absorption and kneading properties of the dough. Additionally, WG and TH  
24 were the only oils that could extend the shelf-life. WG caused a shelf-life increase of 3 days (+ 33%), TH  
25 20 days (+ 100%). However, TH had a negative impact on dough rheology and yeast activity due to the  
26 high presence of thymol. In conclusion, it can be stated that WG showed the most promising combined  
27 technological and microbiological benefits in dough/bread.

28 **Keywords:** plant oils; yeast inhibition; bread quality; crumb texture; shelf-life

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