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## **EFFECT OF AIR PRESSURE IN DEVELOPING POROUS-CRUMB STRUCTURE OF DOUGH DURING FERMENTATION AND GELATINIZATION**

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### **ABSTRACT**

Quality parameters of leavened baked products are related to crumb's mechanical and sensorial properties which can be strongly affected by the micro structural features of the crumb. Development of porous-crumb structure is mainly depends on dough ingredients and processing conditions. Objective of this study was to evaluate the porous-crumb structure of wheat based crumb samples developed under slightly high air pressure conditions during dough fermentation and gelatinization. Two batches of crumb samples were prepared by pressurizing one dough sample in a fermentation chamber and the other was keeping at the normal ambient conditions during fermentation and gelatinization. Mechanical properties (Volume, Specific volume, Moisture content, Hardness) and cellular structure of developed crumb structures were analyzed. Results revealed that the pressurized sample had a significantly higher hardness, specific volume and lower product volume ( $P \leq 0.05$ ) compared to the unpressurized sample. However, according to image analysis, pressurized sample had an improved crumb cellular structure with more fine, stable and uniform crumb cells with a significantly higher ( $P \leq 0.05$ ) cell density. And also pressurized sample had significantly lower porosity along with a significantly lower average cell area ( $P \leq 0.05$ ). Hence, the application of slightly high air pressure during fermentation and gelatinization can have a significant effect on porous-crumb structure development of leavened food products.

**Keywords:** Porous-crumb structure, Pressure, Fermentation, Mechanical properties, Cellular structure