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COLD PLASMA: A NEW TECHNOLOGY TO MODIFY WHEAT FLOUR FUNCTIONALITY

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Abstract

Atmospheric pressure cold plasma has the potential to modify biological chemistry and modulate physical surface properties. Wheat flour was treated by low levels of cold plasma (air, 15V and 20V) for 60 or 120 s. There was no change in the total aerobic bacterial count or total mould count as a result of treatment. Treatment did not impact the concentration of total non-starch lipids, or non-polar and glycolipids. However, treatment did reduce total free fatty acids and phospholipids and was dose dependent. Oxidation markers (hydroperoxide value and head space n-hexanal) increased with treatment time and voltage, which confirmed the acceleration of lipid oxidation. Total proteins were not significantly influenced by treatment although there was a trend towards higher molecular weight fractions which indicated protein oxidation and treated flour did produce a stronger dough. This study confirms the potential of cold plasma as a tool to modify flour functionality.