

ANALYSIS OF GLUTEN PROTEIN AFTER REPLACING PART OF WHEAT FLOUR WITH AMARANTH IN MUFFINS

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Abstract

Amaranth belongs to the group of pseudocereals. This pseudocereal is rich in proteins and does not contain gluten. Therefore, it is suitable for people on a gluten-free diet. In recent years, the number of people suffering from celiac disease or who are allergic to gluten has been increasing every day. The aim of this paper was to examine how the partial replacement of wheat flour with amaranth in muffins, in different ratios, affects gluten proteins (gliadins and glutenins). The aim was also to examine how the storage time of muffins for 0, 2 and 4 weeks affects gluten proteins (gliadins and glutenins). Gliadin protein was extracted with 70% (v/v) ethanol, and glutenin with 50% (v/v) 1-propanol with the addition of Tris-HCl (0.05 mol/l), urea (2 mol/l) and dithioerythritol (1%). Gluten protein separation was performed by reverse-phase high-pressure liquid chromatography (RP-HPLC). Absorbance measurement was at 210 nm. After separation, the total amount of gliadin and glutenin protein was determined, as well as the amount of protein within the fractions. Based on the obtained results, the highest amount of gliadin protein was obtained from muffin samples made from 100% wheat flour and stored for 4 weeks and is $X_{av}=20.33$, and the lowest amount of protein was obtained from muffin samples made from 50% wheat flour and 50% amaranth and stored for 0 weeks and is $X_{av}=12.00$. The highest amount of glutenin protein was obtained from muffin samples made from 100% wheat flour and stored for 4 weeks ($X_{av}=26.67$), and the lowest amount was obtained from samples made from 25% wheat flour and 75% amaranth and stored for 0 weeks ($X_{av}=17.33$).

Keywords: gliadins, glutenins, amaranth, muffins, RP-HPLC.