Analyzing the Protein Content of Selected Flours

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This project aims to determine the concentration of gliadin in the soluble proteins of gluten, and five different flour types (all purpose, bread, cake, pastry, and self-rising flours), with pancreatin and pepsin enzymes. The hypothesis predicts that pancreatin will digest the gluten proteins into smaller, more manageable polypeptide chains, so that the concentration of gliadin proteins may be calculated. Dependent variables explored in this project are the potential hydrogen (pH) concentration of chemical, flour and enzymatic mixtures, and the digestive process of gluten proteins. Testing with pH paper and meters determined the chemical balance of all solutions, and indicated that urea decreased hydrogen ion activity to create a weak acid, and moderate bases. Biuret reagents positively identified the presence of soluble proteins in all mixtures containing flour and enzymes, except for those also containing sodium bicarbonate and hydrochloric (HCl) acid buffers. Paper chromatography was used to determine that urea and pancreatin together were the most effective at digesting the polypeptide chains in proteins, to smaller, but still detectable sizes. Average properties of gliadin were determined at a distance traveled of 33.5mm, rate of flow at 0.32, and a density of 0.30. Gel electrophoresis was performed in two trials but did not register any recordable data. This may be due to variables such as run time, voltage, and the presence of HCl acid.