Investigating Absorption of iron(II) by Apo Lactoferrin Using pH

Musquiz, Daniel (School: John B. Alexander High School)

Iron deficiency anemia is a common occurrence for many, which is caused by low iron levels low Iron absorption. Lactoferrin is a key iron-binding protein and transporter of iron that can help with that iron deficiency. Using Ferrous Sulfate powder and an Apolactoferrin glycoprotein powder this experiment tested the absorption of Iron(II) ions through means of pH and volume analysis. First, mixtures of 3.6g/L Ferrous Sulfate and .46g/L Apolactoferrin were made. Next, Ferrous Sulfate was put into a beaker and Apolactoferrin was then added in small increments. After each addition, volume was measured using a weight scale; pH difference was recorded using a pH tool for later data analysis. In every incremental addition of Apolactoferrin there was an observed pH increase and further graph observations show that the rate of pH increase is said to be increasing at a decreasing rate meaning the rate of absorption was higher in the beginning than compared to the end of all three trials. Furthermore, we can observe two phases in the results: a more linear phase followed by a more horizontal phase of chelation. In conclusion, the findings confirmed an increase in pH which can be linked to Iron(II) absorption. This was observed after every increment of Apolactoferrin added. This confirmed the hypothesis that Apolactoferrin can be used as a supplement to treat low Iron absorption to help improve the binding of oxygen in the blood for a healthier life.

Awards Won:
University of Arizona: Renewal Tuition Scholarship