



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) James A. Fraser	Project Number J0406
Project Title Digestion Is the Question	
Objectives/Goals For my project, I recreated the digestive system and digestive enzymes. I wanted to see if starch could break down and combine with glucose. If this does happen then it proves that not only glucose, but starch travels through your bloodstream and gives vitamins and minerals to your cells. I was also trying to find out if both starch and glucose could break down without without digestive juices and acids. I also decided to test real foods with various levels of starch we as humans eat daily (potatoes, corn, Cheerios, pasta, and white bread).	
Abstract Methods/Materials Cornstarch, two slices of white bread, half of a cup of any type of pasta, half of a cup of corn kernels, half of a brown potato, half of a cup of Cheerios, distilled water, 1-pint jar with a lid, Glucose enzymatic strips (glucose test strips), starch enzymaticstrips (starch test strips), sugarless apple juice, and 6-foot long (30 cm) sausage casings. First collect all of your materials. After you have done that, assemble your experiment. First fill your sausage casing with 1/4 of a cup of the starch solution, 1/4 of a cup of sugarless apple juice, and 1/4 of cup of distilled water. Fill it until only one inch is not filled, and then tie the end very tightly. Fill the jar with your distilled and place the sausage casing softly on the bottom of the jar and leave it. After ten minutes, check the water for glucose, and starch. Repeat this procedure for the next hour. Repeat this test with each of the six foods(pasta, white bread, Cheerios, potatoes, and corn).	
Results My results turned out to show that all of the six tests released glucose and starch during the one hour period. The tests released these substances at different times because of their textures.	
Conclusions/Discussion For all of the six tests my hypothesis was wrong. The starch was shown to be "digested" and broken down. The glucose, starch, and distilled water were all able to escape the semi-permeable membrane. This lead to shrinkage in the sausage casing because like your intestines it gave the glucose and starch to the body fluids to be transported to your cells for energy.	
Summary Statement Can starch break down small enough and fast enough to exit a semi-permeable membrane in the second stage of digestion?	
Help Received	