



The Effects of Gluten on Serotonin Levels in *Drosophila*

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In the 1900s, the prevalence of wheat and other grains in the American diet increased drastically when the process of bread making sped up after the late stages of the industrial revolution. In recent decades, researchers have examined how wheat - cross-breeding has contributed to the spike in several illnesses such as celiac disease, irritable bowel syndrome, and depression. The culprit to this related disease was gluten, which alters the gut bacteria in our bodies leading to decreased serotonin levels. Serotonin is most closely associated with regulating mood and emotion, but in previous research on flies and vertebrates has shown it can also affect the speed of an animal's movement. When gluten is introduced in the system, it inhibits the tryptophan availability ultimately leading to decreased production of serotonin. L- tryptophan is crucial for the production of serotonin. We hypothesize that flies fed with gluten-containing food will show similar phenotypes as flies with low tryptophan and serotonin levels. We will perform biochemical approaches to measure tryptophan levels and injection of serotonin as rescue experiments to reverse the observed effects. We are currently collecting data at the behavioral level to examine the effects of gluten in *Drosophila* motor function and other behavioral patterns such as courtship. Our results will glean whether or not a gluten diet phenocopies the effects of tryptophan and serotonin deficiencies. In conclusion, our study aims to establish a new genetic model to study the effects of gluten on brain function.