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Characterizing Peristalsis during a High-Fat Meal compared to a Low-Fat Meal in Zebrafish larvae (*Danio rerio*).

Obesity is a far too common issue in the Appalachian region. Because larval zebrafish (*Danio rerio*) are optically transparent up to fourteen days post fertilization (dpf) and have high synteny with humans, it makes them ideal research models to study biological responses that include metabolic and physiological processes. The intestines perform a wave like, autoregulated, continuous series of muscular contractions and relaxations called peristalsis to push food through the digestive system. Diets spiked with fluorescent polystyrene beads were used to visualize consumption of the diet to determine an optimal feeding period. Once determined, seven-dpf larvae were fed two different diets, visualizing which diet causes the most peristaltic movement. One diet was prepared with high fat contents and another with low fat contents. The larvae were fed for 3 hours at 20 minutes apart to ensure all larvae fed for the same period before being imaged. Each diet was fed to 25 larvae to allow a good sample size in analysis. Using the Zeiss Discovery V8 microscope, an image sequence was captured at 1 image per second for 5 minutes. For analysis, using NIH Image J and RStudio, we are recording pixel movement through 5 different regions of interest (ROI) in the intestinal tract of the fed larvae. For the experimental data, pixel movement will represent peristaltic movement between different diets. Analysis has yet to be concluded, but we expect the results to show that the larvae being fed the high fat diet will have a higher rate of peristaltic movement.

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