Carbon Utilization Differences of *Campylobacter jejuni* strains Jennifer Mydosh¹, Kerry Cooper¹

Infection with Campylobacter jejuni produces two different diarrheal outcomes in humans: a bloody, inflammatory diarrhea or a watery diarrhea. However, little is known about the underlying genetics, pathogenesis, or host factors involved in the clinical manifestation differences, but the neonatal piglet model differentiates between these two diarrheal outcomes. Preliminary genomic comparison data from our lab showed few differences between the groups that would indicate their clinical manifestation. In this study, we investigated the utilization of different carbon sources between ten C. jejuni strains with defined and consistent diarrheal outcomes in the neonatal piglet model to better understand the factors associated with different C. jejuni diarrheal manifestations. C. jejuni is unique in its lack of common metabolic pathways and its inability to utilize common carbohydrates, thus it must rely on amino acids as sources of energy. All ten strains were screened for the utilization of 192 different carbon sources and of these, fucose and glutamine were found to be significantly different between the two groups and were investigated further. In the host, fucose is the major component of mucus or mucin lining the gut while glutamine can be found between the tight junctions of the intestinal cells. Growth assays were done at both 37°C and 42°C to compare the carbon utilization at both human and poultry internal temperatures. C. jejuni is a commensal poultry. These studies found statistically significant differences in the utilization of mucin (p value = 4.699e-07), fucose (p value = 2.265e-15) and glutamine (p value 1.483e-09) at 37°C. While at 42°C we only found statistically significant differences in the utilization of fucose (p value 1.721e-07). Collectively, these results begin to indicate a difference in how these two groups of C. jejuni strains survive in the host intestinal tract and interact with their environment, leading to differing clinical manifestations.