



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

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<b>Project Title</b> Effects of Gastric Mucous with Chemically Raised pHs on Lumen Mass Retention	
<b>Abstract</b> <b>Objectives/Goals</b> This project investigated whether or not gastric mucous with chemically raised pHs would better protect the stomach's lining from gastric acid damage and mass loss, as a potential surgery-free treatment of Zollinger-Ellison syndrome. <b>Methods/Materials</b> Uniform pieces of beef, modeling the stomach walls, were coated in gastric mucous models with varying levels of basicity: pH 7, 9, 11, and 13, as well as a control group with no mucous. The pieces were soaked for 50 hours in a .01 M HCl solution to model the acidity and environment of the human stomach; afterwards, the percentage of original mass retained was calculated. <b>Results</b> The pieces with no gastric mucous experienced the most corrosion, retaining only 59.4% of their original mass; the group that experienced the least corrosion was the group with pH 13 mucous, retaining 84.8% of their original mass. The emerging trend suggested a more basic gastric mucous better protects the lumen walls from being corroded and losing mass. <b>Conclusions/Discussion</b> The concept of chemically enhanced gastric mucous is worth serious thought and exploration; it would allow the excruciating lumen corrosion experienced by Zollinger-Ellison syndrome patients to be mitigated without complicated surgeries or chemotherapy.	
<b>Summary Statement</b> The project determined that a more basic gastric mucous better protects the lumen (stomach cavity) walls from peptic-ulcer associated acid corrosion.	
<b>Help Received</b> A chemistry teacher prepared the acid concentrations from stock; I consulted with a doctor for background information about the stomach; I borrowed a scale, beakers, and tongs from the school science department's supplies.	