



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>David A. Colton</b>	<b>Project Number</b> <b>S1506</b>
<b>Project Title</b> <b>The Survival of the Probiotic <i>Lactobacillus acidophilus</i> in a Model Stomach System</b>	
<b>Objectives/Goals</b> This project tested the viability of the probiotic <i>Lactobacillus acidophilus</i> in the acidic environment of the stomach using an in vitro stomach model consisting of artificial gastric juice maintained in an anaerobic environment at 35°C. <i>L. acidophilus</i> was incubated in the model and samples were taken at time points reflective of minimal stomach transit. MRS agar plates were inoculated with the <i>L. acidophilus</i> samples and colonies counted at 2-11 days. As a control <i>L. acidophilus</i> was incubated in deionized water under the same conditions.	
<b>Abstract</b> <b>Methods/Materials</b> MRS Agar (Remel) Tomato juice, yeast, milk medium and <i>L. acidophilus</i> (Carolina Biological) Artificial gastric juice (Carolina Biological) Anaerobic chamber with GasPak (Fisher Sci.) <i>L. acidophilus</i> capsules (Sprouts) Tums	
<b>Results</b> Data from experimental incubations in the stomach model with the probiotic <i>L. acidophilus</i> capsules shown in Figure 10 were analyzed using a 2-tailed unpaired t-test. Data is not shown from the time zero incubation, because there were no colony counts recorded for any of the data groups. Results indicate significantly increased colony counts at 30 and 60 minutes for capsules incubated in deionized water with and without Tums compared to gastric juice with and without Tums as well as gastric juice without pepsin ( $p < 0.05$ ). No significantly higher values were observed with any of the incubations containing gastric juice alone or with either Tums or in the absence of pepsin.	
<b>Conclusions/Discussion</b> <b>Conclusions</b> <i>L. acidophilus</i> delivered as a capsule or liquid culture lost significant viability as measured by colony growth after incubation in an in vitro stomach model. This data supports the original hypothesis for this project. When <i>L. acidophilus</i> was co-formulated with the antacid it was found that there was a no statistically significant improvement in the viability. This data, along with other probiotic research, hints that the viability of bacteria may not be the real reason that probiotics show significant health benefits.	
<b>Recommendations</b>	
<b>Summary Statement</b> Testing the survival rate of probiotics in a model stomach.	
<b>Help Received</b> Supervised in the school's lab.	