



CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY

<b>Name(s)</b> Chris S. Kuber	<b>Project Number</b>  22416
<b>Project Title</b> <b>How Does L. buchneri 40788 Affect Silage Quality?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b>          The objective is to decrease mold and yeast growth in silage fed to dairy cows. My hypothesis was that Lactobacillus Buchneri 40788 inoculant would control mold and yeast growth better than silage treated only with standard Lactobacillus Acidophilus.</p> <p><b>Methods/Materials</b>          One hundred fifty pounds of corn silage was cut, chopped and treated with standard Lactobacillus Acidophilus inoculant. Seventy pounds was also treated with Lactobacillus Buchneri 40788, leaving 80 pounds untreated. Silage was ensiled in PVC tubes, 4# diameter, 4 feet long, and sealed with end caps. Silage was left to ferment 90 days. PVC silos were opened and silage exposed to air. Temperatures were monitored every three to four hours, an increase indicating mold and/or yeast growth. A sample of silage was prepared and sent to a forage-testing lab in Wisconsin (Note: this was not a test that could be done at home, and in-state labs were unable to perform the tests. I chose this lab because of the large volume of tests run and high level of accuracy, and on the recommendation of university scientists I worked with.)</p> <p><b>Results</b>          Overall, less yeast grew in silage treated with Lactobacillus Buchneri 40788 and the standard Lactobacillus Acidophilus. Less mold grew in the silage treated only with Lactobacillus Acidophilus.</p> <p><b>Conclusions/Discussion</b>          Silage is fermented forage and makes up a large portion of a dairy cow's diet. It is harvested, sealed, going from an aerobic to anaerobic state. When the silo is opened for feeding to cows, the silage is exposed to air again, and mold and yeast grows. This causes actual feed loss and loss of feed quality, which leads to loss of money and sick cows. Lactobacillus Acidophilus has successfully been used for several years as a silage inoculant to speed the fermentation process just after ensiling. Lactobacillus Buchneri 40788 is a new inoculant, recently studied for its ability to inhibit mold and yeast growth at the feedout stage, when the silage is again exposed to air. The data suggests that dairymen should use Lactobacillus Buchneri 40788 combined with Lactobacillus Acidophilus to control mold and yeast growth at all stages of silage fermentation and feedout.</p>	
<b>Summary Statement</b> Helping dairy producers feed better quality silage for healthy cows and thus, more good California cheese!	
<b>Help Received</b> Dr. Bob Charley, Mr. John Zmich, and Mr. Roland Poirier explained silage fermentation and how silage inoculants work over several conversations, California State University, Fresno Dairy Unit provided silage and advice from Dr. Jon Robison, Dad helped with procedure and research, Mom helped type	