



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

<b>Name(s)</b> <b>Michael Baghdassarian</b>	<b>Project Number</b> <b>J2002</b>
<b>Project Title</b> <b>Can You Prevent Unrefrigerated and Unpasteurized Milk from Spoiling by Adding a Commonly Available Substance?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project is to see if the manuka honey can help preserve raw (unpasteurized) and unrefrigerated milk for a longer period than just the milk itself. The secondary objective is to see if someone who does not have refrigeration available can use a natural substance such as manuka honey to help preserve the milk for several days.</p> <p><b>Methods/Materials</b> 10 beakers, digital pH meter, manuka honey, agave nectar, honey (regular)</p> <p>Tested manuka honey, agave nectar, and honey to see if either substance can be added to raw unpasteurized milk to prevent it from spoiling while the milk is unrefrigerated and left at room temperature. Measured the pH of the milk to check if the milk had spoiled over given time.</p> <p><b>Results</b> The substances I used did preserve the raw milk as measured by the the digital pH meter. Out of the three substances manuka honey preserved the milk better than the regular honey and agave nectar. I repeated the test with a higher concentration of manuka and found that the manuka could preserve the raw unrefrigerated for over ten days compared to the plain milk which spoiled in three days. The likely explanation is that manuka honey contains anti-bacterial properties such as methylglyoxal, hydrogen peroxide, and dihydroxyacetone.</p> <p><b>Conclusions/Discussion</b> The amount of manuka honey used did make a difference in how long the raw unpasteurized unrefrigerated milk lasted. The real world benefits of this project is that manuka honey may be used in underdeveloped countries where pasteurization and refrigeration are not available. The second benefit which I would like to study in the future is the use of manuka honey to treat cuts or illness instead of an antibacterial cream or in lieu of an oral medication.</p>	
<b>Summary Statement</b> I showed that manuka can preserve raw, unpasteurized, and unrefrigerated milk for over ten days.	
<b>Help Received</b> Dr. Sevada Chamras at Glendale Community College loaned the digital pH meter and beakers to me and showed me how to properly use and clean the instruments.	