



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Crystal R. Poole</b>	<b>Project Number</b> <b>J2011</b>
<b>Project Title</b> <b>The Melting Point: A Study of Ingredients in Buttercream Icing</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this experiment was to find an ingredient that would make buttercream frosting heat resistant without changing the main properties of the frosting.</p> <p><b>Methods/Materials</b> In part A of the experiment, 1/8 teaspoon of each experimental ingredient was added to 3/4 cup of buttercream frosting. The frostings were placed in a bacterial incubator at 35 degrees Celsius. After 15 minutes a toothpick was stuck into the frosting at a 55 degree angle. After 10 seconds the angle of the toothpick was measured again. The frostings were tested after 30, 60, and 90 minutes. In part B the experimental frostings were piped into roses. The roses were put into the incubator and the height and diameter were measured at the beginning, 15, 30, and 45 minutes. Part C was a taste test.</p> <p><b>Results</b> In both parts A and B the best ingredient was Xanthan Gum, however, in part B it was discovered that Xanthan Gum changed the texture of the buttercream too much to be used for buttercream decorations. Therefore, the second best performing ingredient was Cornstarch. In part C, it was apparent that the lowest scoring frostings had Xanthan Gum and Agar in them. Agar which was hypothesized to perform the best did poorly in all three tests.</p> <p><b>Conclusions/Discussion</b> The hypothesis was incorrect because the Agar reacted to the citric acid in the orange extract that was in the buttercream. Cornstarch was overall the best performing ingredient and enhanced the recipe without changing the taste or texture too significantly. Xanthan Gum made the buttercream almost like play dough, which cannot be used for buttercream, but could possibly be used as an alternate fondant.</p>	
<b>Summary Statement</b> I was trying to find an ingredient that would make buttercream icing more heat resistant.	
<b>Help Received</b> Erin Schumacher (teacher) supplied bacterial incubator	