



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

<p>Your Name (List all student names if multiple authors.) Catharine M. Kuber</p>	<p>Science Fair Use Only</p>
<p>Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) How Does Temperature Affect Serum Formation in Dairy Cattle?</p>	<p>J0310</p>
<p>Preferred Category (See page 5 for descriptions.) 3 - Biochemistry / Molecular Biology</p>	<p>Division J Junior (6-8) J Senior (9-12)</p>
<p>Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p>Objective: The objective is to determine how temperature affects the speed of clear serum formation in bovine blood. If I can show the fastest rate of clear serum formation under different temperature scenarios, that information would be very helpful and profitable to dairy producers.</p> <p>Methods: In three trials on separate days, 110ml of blood was drawn from the same heifer, divided into 3 sets of 7 test tubes numbered 1-7 with 5ml blood in each tube. One set was placed in a different temperature area simulating a time of year in the San Joaquin Valley: refrigerator 39 degrees F (winter), room temperature 72 degrees F (spring and fall), and halogen (heat) lamp 98 degrees F (summer). A rubric was developed to accurately and consistently measure development of clear serum, and test tubes were evaluated at set times. (#1 from each set at 10 minutes, #2 at 25 minutes, etc.)</p> <p>Results: Room temperature was consistently the fastest way to get clear serum and refrigerator temperature was consistently the slowest way to get clear serum. At 4 hrs. 10 min. the average rubric score for room temperature was 4.667, for the halogen (heat) lamp was 3.833, and for the refrigerator was 2.600.</p> <p>Conclusion/Discussion: I found my hypothesis to be correct; that if whole blood is left at room temperature then clear serum will form the fastest. I am familiar with and have used a commercially available bovine pregnancy test on my 4-H project heifer. This test can be done at 6 days after breeding, significantly sooner than other traditional pregnancy tests. The test requires clear serum, and most dairies do not have a centrifuge to separate serum. In addition, the directions for deriving serum included with the test are not accurate in time needed and no mention of temperature is made. A dairy producer spends \$1.25 per day to raise a dairy heifer. To be profitable he wants to get the heifer bred as soon as physiologically possible. The information from my experiment is helpful to dairy producers because they are better able to use the serum pregnancy test and decrease cost of raising heifers.</p>	
<p>Summary Statement (In one sentence, state what your project is about.) My project is about helping dairy producers find the fastest way to get clear serum so they can use a serum pregnancy test which is more profitable and efficient.</p>	
<p>Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Mother helped put board together, Dr. Jacqueline Reese, DVM drew blood from cow and provided research resources, Andrew Syred, Microscopix gave me permission to use an image.</p>	