

Call for Proposals
CSUSM Consortium for Household Chemistry Research (CHCR)

In Fall 2008, the CHCR is supporting research under the following programs:

1. General Science: No Restrictions on Topics; however, all research must conform to the Guidelines described below.

2. Fat Research.

There is currently much interest in dietary fats. Much current research focuses on the molecular nature of these fats and their effect on blood lipoprotein levels, but such studies are obviously beyond the scope of CHCR researchers. However, animal fats have interesting physical changes with temperature that might be explored. For example, the Director of the Consortium has noted that the fat layer on the top of home-made chicken soup changes consistency over a period of days in the refrigerator--much longer than one would expect if cooling alone were responsible. Careful measurements of soup temperature, however, have not been made. The effects of temperature, cooling rate, fat source (poultry vs. beef vs. vegetable fats) and other parameters could be investigated. Calorimetry of these phase changes may also yield interesting results.

Chemical conversion of fats into other useful products such as soaps or fuel are also interesting avenues for research; the nature of the chemicals used for these conversions can be hazardous and your proposal must address these safety concerns. Simple processes such as clarification or purification of animal fats may be important to such processes and may be easier and safer than the conversions themselves.

3. Ice and Snow Research

Although most CHCR researchers live in a climate where ice and snow are uncommon, interesting experiments can be accomplished using a freezer and other cooling agents. "Ice spikes" can be formed when ice cubes are made from deionized water (<http://www.its.caltech.edu/~atomic/snowcrystals/icespikes/icespikes.htm>) and "snow" crystals can also be made using a dry-ice apparatus (<http://www.its.caltech.edu/~atomic/snowcrystals/project/project.htm>). It is probably also possible to develop a method to grow snow or frost crystals in the freezer without using dry ice. There are lots of variables and observables that could be introduced and monitored in this field.

4. Sourdough Research

Sourdough bread is thought to be the product of at least two organisms, a yeast and a lactobacillus bacterium. The "sourness" of the dough is attributed to the production of lactic acid by the lactobacillus. Measurement of pH may be a way to measure the relative activity of the lactobacillus with time as a function of a number of variables such as temperature or amount of inoculant, or to correlate bacterial activity with other dough parameters such as viscosity (which seems to

decrease with increasing incubation time--perhaps as the result of bacterial action, the change in pH, or both.

Guidelines for all research:

1. You must be able to obtain quantitative results.
2. You must be able to justify the study. There has to be a reason for measuring what you're measuring.
3. The project should not involve anything too expensive. Projects with large budgets (>\$20.00 excluding labor costs) will not be approved.
4. The project should not require too much time to complete; you will only have a week or so.
5. The project must not involve human or animal subjects.
6. **The research must be safe.** Do something that involves usual household procedures. Potentially unsafe research will not be approved.
7. Do not proceed with your research until your proposal has been accepted.

Format:

Your proposal must include:

1. Project Title.
2. Name and Title of Principal Investigator.
3. Institution.
4. Project Summary. This should be less than 70 words, written in non-scientific English that even our Board of Directors could understand.
5. Background. Why is this problem interesting? What is already known about the problem from cookbooks, auto repair manuals, books, newspapers, personal experience?
6. Experimental Plan. Explain in detail what you plan to do and why.
7. Institutional Support. This is a listing of all capital equipment (sinks, ovens, dishes, cars, thermometers, dishtowels, etc) available for use by the Principal Investigator.
8. Budget. This must include all expendable materials used in the experiments, plus any additional capital equipment which must be purchased. An estimate of your labor cost plus the labor cost of any assistants must also be included. The budget should be in the form of a table, with estimates of individual costs listed.
9. Institutional Approval. All residents of your household who may be affected by your research must sign the following statement: "I have been fully informed of the nature of the research to be conducted by (*Principal Investigator*) at this location, and I grant full approval and support to this research."