CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
S1519

Project Title
Comparison of the Insulating Value of Farm Animal Fats within Warm and Cold Environments

Abstract

Objectives/Goals
The purpose of the experiment was to determine whether pig, chicken, cow, or sheep fat offers better insulation. If 1 pound of pig, chicken, cow, and sheep fat are tested individually in 4 different temperature environments (inside, outside, heated room, and refrigerator) then the insulation qualities can be measured and the best insulator can be determined. Knowing the insulation values of the fats in addition to the other known insulating elements that these animals have, will help farmers raise their animals more effectively.

Methods/Materials
Four plastic bags were filled with 1 pound of pig, chicken cow, and sheep fat. A thermometer was positioned in each bag. All 4 bags plus an empty bag, as the control, were placed in cold environments (outside and refrigerator) and in warm environments (inside and pre-heated room) for a period of 2 hours. The 5 bags were adjusted to the same initial temperature, placed in one of the four temperature environments, and the temperature of each bag was recorded every #ö hour.

Results
Based on the data collected during the experiment, the chicken fat maintained the most constant temperature for the majority of the experiment duration for the cold environments. The chicken fat changed an average of 3.6¢ª over the period of 2 hours, for the 6 days. This is the smallest average degree change for the cold environments. (The animal fat that offers the best insulation will have the least average degree change.) The sheep fat on the other hand, maintained the most stable temperature for the duration of the experiment for the warm environments. The sheep fat changed an average of 7.29¢ª over the period of 2 hours, for the 6 days. This was the smallest average degree change for the warm environments.

Conclusions/Discussion
All in all, chicken fat offered the best insulating qualities in cold environments, while sheep fat offered the best insulation in warm environments. These findings, along with further research and experimentation concerning other insulating factors (skin/hide, feathers, fleece) could yield a more specific conclusion pertaining to what kind of thermo-neutral zones these animals should be raised in most effectively. The thermo-neutral zone is defined as the range of temperatures that an animal finds comfortable.

Summary Statement
The purpose of the experiment was to determine whether pig, chicken, cow, or sheep fat offers better insulation.

Help Received
Mother helped paste material on display board. Father helped proofread research paper.