Name(s)	Project Number
Haleema F. Abbasi	**J2001**

Project Title

FarmaCowLogy: Comparing Saturated Fat Levels in Different Types of Beef

Abstract

Objectives/Goals
Many people have stopped eating beef, or really cut it out of their diet, because of the health problems caused by saturated fat. Saturated fat can cause heart attacks, stroke and can lead to obesity, which can lead to other problems. With all the different kinds of beef in the markets, all of them at different prices, I wanted to find out of there was a type of beef that would be less harmful to health than others. After my research, I decided that the best way to answer that question would be to find out which of the beefs had the least saturated fat. I called and e-mailed many different companies to understand how they raise their cows and what the cows are fed. Based on my information, I decided to use beef from a national concentrated animal feed operation (CAFO) that feed corn and allegedly, other fillers and maybe beef fat, one from a California CAFO that I had verified as being 100% vegetarian fed, and grass grazing pasture raised cattle company.

Methods/Materials
I had a simple experiment. I got three samples of each type of New York steak from each beef company. I assumed that there was a good chance that each piece came from a different cow. I did not cut them since the fat was unevenly distributed. I boiled the beef and used a broth defatting process that I saw on Good Eats. My negative control was to boil water to see if it added any fat to my experiment. My positive control was to add a measured amount of saturated fat to my experiment and see how much I was able to extract at the end. Then I let the fat cool and I weighed how much fat I got from each beef sample.

Results
I calculated the percentage of fat in each steak, the fat grams per ounce, and the fat grams per three ounce serving (which is the serving size I found most often during my research).

The national CAFO with mainly corn and some other food products had the most fat, the California CAFO that was 100% corn fed was next, and the grass fed pasture raised beef had the least saturated fat.

Conclusions/Discussion
There is a difference between all the types of beef we can buy in the market. For people who are watching their saturated fat levels, grass fed beef is the best choice. For families who have to watch their dollar, consider the California CAFO as a cheaper choice, but a healthier one!

Summary Statement

Comparing Saturated Fat Levels in Beef from a National CAFO, a California CAFO & a pasture raised farm.

Help Received

Mom bought beef and helped with the boiling and working with the hot broth. She also helped with pasting the board.

Name(s)

Alexandra Azua

Project Number

J2002

Project Title

Does Quality in Cat Food Count?

Abstract

Objectives/Goals

The purpose of my experimental project was to determine which brand of dry cat food leaves the most amount of undigested residue after simulating the cat digestive process.

Methods/Materials

To begin my experiment I obtained needed materials such as Vinegar, Meat tenderizer, Fancy Feast dry cat food, Iams dry cat food, Special Kitty dry cat food, Friskies dry cat food, Petri dishes, distilled water, and a strainer. The methods to my experiment involved to first pour ten (10) grams of cat food into each Petri dish. Second, I poured 20 mL of Vinegar into each Petri dish, applied the lid, and let it sit for 24 hours. After 24 hours, I created a mixture of distilled water and meat tenderizer and poured 20 mL of the mixture into each Petri dish, applied the lid, and let it sit for three (3) hours. When three (3) hours pasted, I strained any liquid that was still left and thoroughly rinsed the cat food in the sink. Last, I transferred the dry cat food back into each Petri dish and weighed my results.

Results

The results of my investigation on determining which brand of dry cat food leaves the most amount of undigested residue is left after simulating the cat digestive process indicates that the Special Kitty brand of dry cat food left the most amount of undigested residue, and the Iams brand of dry cat food left the least amount of undigested residue. In order of most undigested to least undigested is Special Kitty, Friskies, Fancy Feast, and Iams.

Special Kitty: least- 25.2 grams, greatest-31.3 grams, average- 28.12 grams
Friskies: least- 25 grams, greatest-29.8 grams, average- 27.92 grams
Fancy Feast: least- 24.9 grams, greatest- 30.5 grams, average- 26.76 grams
Iams: least- 20.6 grams, greatest- 27 grams, average- 23.76 grams

Conclusions/Discussion

In conclusion, I successfully found the results of my investigation. I also learned several things along the way of creating this project such as learning how to simulate the cat digestive process. Although there are positive aspects of my project, others may ask, how does my project help others? Having the knowledge of which brand of dry cat food may leave the least amount of undigested residue, will help families and other to keep their cats healthy.

Summary Statement

I am investigating which brand of dry cat food leaves the most amount of undigested cat residue after simulating the cat digestive process.

Help Received

My mother provided transportation to needed destinations; my coaches helped me create my procedures.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)	Project Number
Marissa A. Blanco-Johnson	**J2003**

Project Title

Don't Touch That Handle! Which Brand of Disinfecting Wipes Kills the Most Bacteria Off of Shopping Cart Handles?

Abstract

Objectives/Goals

The objective of my science fair experiment was to find out which brand of disinfecting wipes, Clorox, Lysol or the Target brand Up&Up, kills the most bacteria off shopping cart handles.

Methods/Materials

Trial One: Choose a random grocery store and pick out three random shopping carts. Take a bacteria sample from each cart with a sterile swab. Wipe each handle with one of the three brands of disinfecting wipes. (Chlorox, Lysol and the Target brand, Up & Up). Wait two minutes and then swab each handle with a new serile swab. Repeat this process at two more locations. After taking bacteria samples insert all 18 petri dishes containing the bacteria samples in an incubator for 7 days. After the 7 days, remove the petri dishes from the incubator and count the bacteria using a 100 square grid. Calculate the growth of bacteria. Calculate the means for the carts that were swabbed before and after using the wipes. Interpret the calculations to determine which brand of disinfecting wipe kills the most bacteria. Trial Two: Repeat complete process again.

Results

Results of this experiment show that the Clorox brand of disinfecting wipes kills the most bacteria off shopping cart handles, killing 96.8% of bacteria compared to Lysol which killed 55.5% of the bacteria and the Target brand Up&Up which killed 68.2% of bacteria from the shopping cart handles.

Conclusions/Discussion

The hypothosis for this experiment was that Clorox disinfecting wipes kills the most bacteria compared to Lysol and the Target brand Up&Up. Results of this experiment show that Clorox disinfecting wipes kills the most bacteria off shopping cart handles with a mean of 2.3% of the petri dish covered with bacteria and 96.8% of the bacteria kliled off of the shopping cart handles compared to Lysol with a mean of 20.4% of the petri dish covered with bacteria and 55.5% of the bacteria killed, and the Target brand Up&Up with a mean of 22.8% and 68.2% of the bacteria killed off the shopping cart handles.Therfore my hypothosis was corect.

Summary Statement

This science fair experiment proves that Clorox disinfecting wipes kills the most bacteria compared to the Lysol and the Target brand Up&Up.

Help Received

My science teacher Ms. Griffith taught me how to count the bacteria from the petri dishes, calculate the percentages, and taught me how to write the abstract. My mother helped me cut the backrounds for the display board.

Name(s) Beth E. Buchanan; Emily E. Pofahl	Project Number **J2004**

Project Title

Going Green to Prevent Green: Do Natural Preservatives Prevent Mold in Bread?

Abstract

Objectives/Goals
To determine how well natural preservatives delay the initial appearance and growth of mold on white bread when stored in the dark or when stored in the light.

Methods/Materials
Design: We had 4 different natural preservatives and a control condition. We had 2 storage conditions (light and dark).
Procedure: 1. We made our 5 loaves of white bread in bread makers (water, butter, salt, sugar, white bread flour, non-fat dry milk, and active dry yeast) so we could control the base ingredients. 2. We added 1 of the 4 preservatives [Stat-N-Plus (made from Rosemary), Ascorbic Acid, Buttermilk, and Ginger] to 4 loaves and added no preservative to the 5th loaf (control condition). 3. We made 8 samples from each loaf for a total of 40 samples (80 grams each). 4. We put the 40 samples in sealable plastic bags and stored 4 samples of each preservative condition on the kitchen counter (light condition) and 4 samples in a brown paper bag (dark condition) 5. We checked the samples daily through a magnifying stool for the initial appearance of any mold. Once mold appeared we carefully measured the mold area (mm ^{2}) with a metric ruler for 3 days.

Results
Overall bread made with the natural preservatives actually did worse than the control bread. Bread made with the natural preservatives had mold appear earlier and grow mold more quickly than the control. The only preservative that did delay the initial appearance of mold was buttermilk, but once the mold appeared on the buttermilk samples, it grew more quickly than the other preservatives. We also found bread made with the natural preservatives grew mold more quickly in the light conditions than in the dark conditions.

Conclusions/Discussion
Overall, our findings suggest the natural preservatives do not prevent mold. We were surprised to find only the buttermilk preservative delayed the initial appearance of mold and all of the preservatives grew mold more quickly than the control. This means we did not find support for claims made in the written literature that these natural preservatives prevent the appearance of mold. Our findings also suggest that bread made with these preservatives grow mold more quickly when stored in the light. We were surprised that the mold appeared earlier when stored in the light for most of the preservatives and grew more quickly in the light for all of the preservatives. Again, this is not consistent with the written research.

Summary Statement

This project examined the effectiveness of four natural preservatives (Stat-n-Plus, Ascorbic Acid, Buttermilk, and Ginger) and two storage conditions (light vs. dark) in delaying mold appearance and inhibiting its growth on white bread.

Help Received

A family friend helped us locate the natural preservatives.

Name(s)	Project Number
Jack A. Claxton	**J2005**

Project Title

When Is the Grass Really Greener?

Abstract

Objectives/Goals

I am interested in the growth of grass and how to make the color of grass look inviting. I noticed large brown spots on my lawn and decided to do some research. I found that ammonia and Epsom salts might do the job. I designed a test to compare the effects of ammonia and Epsom salts, ammonia alone, Epsom salts alone, or Miracle Gro. My hypothesis was that ammonia alone might have a negative effect on the grass and Epsom salts might help the grass grow greener. I first bought all of my supplies, then I planted the grass, weighed out the ammonia and Epsom salts, and began testing.

Methods/Materials

I used household ammonia and Epsom salts in my test. I compared the ammonia and Epsom salts treated grass to grass watered with tap water, grass with Miracle Gro, grass with ammonia solution alone, or grass watered with Epsom salt solution alone. I grew 15 different samples. I had three replicates of ammonia, Epsom salts, Miracle Gro, tap water (the control), and ammonia and Epsom salts combined.

Results

I tested 15 samples and learned that the samples receiving both ammonia and Epsom salts combined were the most successful. The samples with Miracle Gro took the longest to sprout, but every seed sprouted. The samples with plain tap water alone (the control) were also successful similar to the ammonia and Epsom salts combination. The Epsom salts alone had very few sprouts, but the grass had the greatest height. The ammonia pots had many sprouts, but the grass blades were very short and a yellowish color at the tips.

Conclusions/Discussion

I recommend combining Epsom salts and ammonia for grass problems, such as a change of color. A problem that occurred while I was testing was rain. I had to move all of my samples under an overhang and keep them from getting wet with rain water. During my experiments I learned about the nutrients plants need to survive and flourish. I recommend using household ammonia and Epsom salts (magnesium sulfate) when trying to #green up# your grass.

Summary Statement

I tested the effects of household products such as ammonia and Epsom salts on grass growth and grass color.

Help Received

Thanks to my teacher who provided equipment, and thanks to my parents for helping me correct and edit my report.

Name(s)	Project Number
Raju Ivaturi	**J2006**

Project Title

Soda: The Silent Tooth Killer

Abstract

Objectives/Goals

I want people to know that soda is bad for their teeth, which is actually the main purpose of this project. I will take a controll like water or a healthy drink and compare against the harmfullness of Soda. Hopefully, after this project, they will know that taking the small step of quitting or lessening the amount of soda they drink can greatly improve their dental health.

Methods/Materials

Material: Water, Coke, Coca-Cola, Pepsi, Dr. Pepper, Sprite, and Mountain Dew. Make sure the bottles with resalable tops so you can seal in the carbonation. And 6 tarnished pennies
Gather 6 tarnished pennies and place pennies into the soda with out a splash and seal it quickly. Refrigerate and record data for three days. Fnally Repeat the above steps by taking Water as control instead of Soda and record the results

Results

Coke is the most acidic and therefore, the unhealthiest for teeth, because it was the lowest on the chart of brightness. On day 3, Coke proved itself by reducing to 2 while Coca-Cola came to 3. Sprite came to 5, Mountain Dew stayed at 7, and both Pepsi and Dr. Pepper came to 4.

Conclusions/Discussion

My hypothesis proved to come out correct in this experiment. Coke, most likely because of its low pH, beat out the others to become the unhealthiest drink out of all. Now, people will know, due to my charts, which sodas are better to drink and what aren#t.
Further Work: What I can do publicly advertise these findings so people would get some knowledge of what they are doing to their teeth. I can also tell people how to prevent their teeth from getting damaged as part of my further work.

Summary Statement

"Soda: The Silent Tooth Killer" project summarizes how different Sodas can effect the dentin in teeth based on their Ph levels

Help Received

Miss.Ligeti from Medea Creek Middle School Supervised the project

Name(s)	Project Number
Madeline L. Karnes	**J2007**

Project Title

Surviving the Arctic: Which Substance Makes the Best Insulator?

Abstract

Objectives/Goals
Objective and Goals- A mammal living in the Arctic can survive the freezing temperatures because of their blubber, or fat layer. I wanted to test and see which substance, lard, an animal fat, Crisco, a vegetable fat, or Vaseline, a petroleum oil product, would be the best insulator in an ice water bath. From my data, I will conclude which insulator humans could use to survive longer in freezing water.

Methods/Materials
Material and Methods - I made four double-layered pouches out of plastic, quart-size Ziploc bags, and placed 386.0 grams of either the lard, Crisco, or Vaseline in three of them, evenly distributing the "fat" around all sides of the pouch, leaving the fourth pouch as my control with no insulator. My hypothesis was that Vaseline would be the best insulator against frigid temperatures. I then placed them into an ice water bath and took the inside temperatures of the pouches at 30 seconds, and from 1 - 5 minute intervals.

Results
Results - After repeated trials, the control pouch had a percent of decrease of 98%. The pouch containing lard decreased 47%, the one with Crisco decreased 39% and the lowest was Vaseline, with a percent of decrease of just 21% after 5 minutes.

Conclusions/Discussion
Conclusion - These findings proved my hypothesis to be correct. My experiment showed that Vaseline is an insulator a person could use to survive longer in frigid water temperatures.

Summary Statement

After studying the survival of mammals in the Arctic, I wanted to test and see which substance would be the best insulator in a freezing water bath, lard, an animal fat, Crisco, a vegetable fat, or Vaseline, a petroleum oil product.

Help Received

Parents helped purchase supplies

Name(s)

Emma L. Lauterbach

Project Title

What's In Fruit: Brix by Brix

Abstract

Objectives/Goals
The point of my project was to determine if apples ripened in a warmer environment were sweeter than those ripened in a cooler environment.

Methods/Materials
Fifteen similar apples were used for comparison of sugar content using a refractometer. Three were measured immediately. The apples were sliced and crushed with a press to extract juice. The juice was placed on the refractometer and held up to the light. Sugar (in brix) was recorded. Remaining twelve apples were distributed (in groups of three) to locations with different air temperatures: 64 degrees, 77 degrees, 38 degrees and 2 degrees Farenheit. At seven days, the twelve apples were also sliced, pressed and their sugar content was recorded.

Results
The apples in the cooler environments had higher sugar content. Apples in the 2 degree environment had the highest sugar content, followed by the 38, 64 and finally the 77 degree environment.

Conclusions/Discussion
My results contradict my hypothesis, which was that apples in warmer environments would be sweeter. I researched further after finding that the frozen apples were sweeter and found that ice crystals can burst the cells of the fruit, releasing sugar. The frozen apples had a mushy, mealy quality. This is important because grocery stores keep fruit in cold climates before shelving them. This could affect the quality of the fruit we buy.

Summary Statement

Determining if the sugar content in apples ripening in warmer environments is greater than apples ripening in cooler environments.

Help Received

Father helped press apples. Mother helped cut paper for display board and took pictures during the experiment.

Name(s)	Project Number
Alexander R. Lay	**J2009**

Project Title

Bacteria Hysteria: Which Backpacking Water Purification Method Removes the Most Bacteria from a Sample of River Water?

Abstract

Objectives/Goals
The objective of this expirement was to learn which type of water purification works best to remove bacteria from river water. The hypothesis stated that if samples of river water are purified by filtration, boiling, or iodine tablets, then the water samples purified by boiling will have less bacteria colonies growing on agar plates.

Methods/Materials
Materials list: 10 liter water container, river water samples, 22 agar plates, 3 sterile cups, 20 5ml sterile syringes, 48 sterile cotton swabs, insulated cardboard box, electric heating pad, Katadyn Hiker backpacking water purification filter system, iodine tablets (Potable Aqua brand), pot with lid for boiling water, sharpie pen, 70% Isopropyl Alchohol, plastic sheet, timer, thermometer, 1 liter glass beaker. Method: The river water sample was purified in one of three ways; Filtering with a Katadyn Hiker filter, boiling for 60 seconds, or placing 2 iodine tablets in 1 liter of river water for 30 minutes.This procedure was repeated 3 times. Agar plates were prepared for each of the purified water samples and incubated for 5 days.

Results
After 5 days, each plate was observed and the bacteria colonies counted. The filtered water plates showed no growth. The boiled water plates showed no growth. The plates purified by iodine tablets contained one colony on one plate. No growth occured on the control plates that contained no river water and only one of the 3 plates with unpurified river water contained growth of 16 colonies. On day 3 of incubation, the temperature rose to 120 degrees Fahrenheit, which was outside the temperature range for optimum bacteria growth.

Conclusions/Discussion
The result did support the hypothesis that boiling water would reduce the levels of bacteria the most, though the Katadyn Hiker filter worked just as well. The fact that the control plates that contained unpurified river water did not show bacteria in all the plates indicated that the data collected may not be valid to draw a conclusion. The high incubator temperature may have affected bacteria growth. It would be good to repeat the expirement with a constant incubation temperature.

Summary Statement
This project compares purification of river water by filtration, iodine tablets, and boiling for one minute.

Help Received
Mother took photos; Father helped collect the river water.

Name(s)	Project Number
Felicia N. Markfield	**J2010**

Project Title
Hair Control

Abstract

Objectives/Goals
The objective was to determine if a variety of hair samples treated with the Keratin Complex Treatment were stronger and would react less to humidity than hair samples not treated with the treatment.

Methods/Materials
I tested my own hair, natural blonde hair, and highlighted hair. I had the Keratin complex treatment performed on my hair and took samples before and after the procedure. I did the same for other hair samples. I then tested the hair sample#s reaction to humidity by constructing 8 homemade hygrometers. Each hygrometer was made of one of the hair samples. I labeled each hygrometer. I placed the hygrometers in a small bathroom with a hot shower running, and recorded the initial humidity in the room with an electric hygrometer. After 5 minutes I recorded humidity, and measured any expansion of hair samples. I waited 15 minutes and recorded any changes in hair samples. I repeated the experiment two more times over the next days and recorded results in notebook. I then tested the strength of samples with a strength tester. I taped a strand of each hair onto the strength tester. I attached a plastic bag to the other end of the hair with a paperclip. I then added marbles into the plastic bag until the bag broke. I counted the marbles in the bag and recorded results in notebook. I repeated procedure three times for each hair sample.

Results
My untreated hair expanded an average of .83cm when exposed to humidity, while my hair that was treated with the Keratin Treatment expanded an average of .17cm. The natural blonde untreated hair expanded an average of 1.27cm, while the natural blonde treated hair expanded an average of .33cm. The highlighted untreated hair expanded an average of .9cm, while the highlighted treated hair expanded an average of .2cm. All of the untreated hair samples expanded an average of .96cm while the hair that was treated only expanded an average of .18cm. For the strength test my treated hair and the natural blonde treated hair both were able to hold an average of 33 marbles. The highlighted treated hair was able to hold an average of 28 marbles. My untreated hair held an average of 25 marbles, and both the natural blonde and highlighted untreated hair held an average of 24 marbles.

Conclusions/Discussion
My conclusion is that hair treated with the Keratin Hair Treatment does react less to humidity and is stronger than hair that is not treated with the treatment.

Summary Statement
My project examines the strength and resistance to humidity hair has when treated with the Keratin Complex Treatment.

Help Received
Monica Saldana, who helped me collect hair samples, gave me information on hair and the products used, and performed the Keratin Complex Treatment on my hair. Also my mother who paid for the treatment and other supplies. My mother also helped me make the hygrometers.

Name(s)	Project Number
Crystal R. Poole	**J2011**

Project Title

The Melting Point: A Study of Ingredients in Buttercream Icing

Abstract

Objectives/Goals

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.

Methods/Materials

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.

Results

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.

Conclusions/Discussion

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.

Summary Statement

I was trying to find an ingredient that would make buttercream icing more heat resistant.

Help Received

Erin Schumacher (teacher) supplied bacterial incubator

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Katelyn R. Rodriguez

Project Number

J2012

Project Title

Best Calorie Burner: Wii or Reality?

Abstract

Objectives/Goals
The purpose of this project was to determine which burned the most calories: Wii sports or those same sports in reality. The scientist believed that the sports in reality would burn the most calories, however, since the wii gaming system involves physical movement, the scientist was curious to see how close the calories would be.

Methods/Materials
The scientist gathered the materials and found six volunteers that are experienced in either tennis or bowling and would wear a calorie counter watch. The calorie counter and heart rate monitor is worn on the volunteer so it can pick up and calculate the calories burned. The scientist divided the 6 subjects into 2 groups of 3. The 3 experienced tennis players played tennis on the wii gaming system and in reality for thirty minutes each. This group was referred to and recorded as group A in the science journal. The process was repeated with group B and consisted of 3 experienced bowlers with results recorded in the science journal.

Results
The scientist then organized her data into graphs in order to compare results. Group A had an average of 194 calories difference between wii and reality with tennis in reality burning more calories. The scientist was interested to see that the numbers in Group B were closer with only a 42 calorie difference. Reality bowling still burned more calories.

Conclusions/Discussion
The scientist concluded that her hypothesis was correct in how reality did burn the most calories. The scientist hopes that society will benefit from hearing the fact that the wii gaming system does not replace physical exercise; the scientist encourages outdoor activity.

Summary Statement

The scientist was curious to find which the best calorie burner was; playing sports on the Wii gaming system or those same sports in reality.

Help Received

Mother helped type some of report; Parents helped drive to local tennis and bowling locations; Uncle gave instruction on how to use the Heart Rate Monitor and Calorie Counter watch

Name(s)

Andrea R. Rohan

Project Number

J2013

Project Title

Orange You Glad for Vitamin C?

Abstract

Objectives/Goals

The objective of this project was to determine which type of orange juice had the greatest concentration of vitamin C utilizing the titration method to compare vitamin C concentration in four different types of juices.

Methods/Materials

Procedures - Crushed one 500mg vitamin C tablet and put it in a glass of 500ml of water. Stirred the tablet in the water until it dissolved. Put 20ml of the mixture in a separate glass with 4 fl oz of water. Added prepared starch solution.   Used an eyedropper and slowly added drops of iodine until the mixture turned a dark blue color which meant the vitamin C and starch solution had reacted with the iodine. Recorded the number of drops it took for the reaction to occur and calculated the milligrams of Vitamin C per milliliter of water. This acted as the control. Then followed these same steps with each type of orange juice sample. Used the following ratio to figure out how much vitamin C was in the different juice samples:

$$\frac{\text{Sample Concentration (variable)}}{\text{Control Concentration (1 mg/ ml)}} = \frac{\text{Drops of iodine in Sample}}{\text{Drops of iodine in Control (27.5 drops)}}$$

Results

The scientist ran eight trials for each type of orange juice and the vitamin C tablet.   The number of iodine drops taken to titrate the solution was averaged and measured in milligrams of vitamin C per milliliter of water. The fresh squeezed orange juice had 0.7909 mg/ ml of vitamin C, concentrate orange juice had 0.4727 mg/ ml, carton orange juice had 0.436 mg/ ml, and the powder orange drink had 0.27 mg/ ml of vitamin C.

Conclusions/Discussion

The scientist found that fresh squeezed orange juice contained the greatest amount of vitamin C, followed by orange juice from frozen concentrate, then juice from a carton, and last was powder orange drink. My hypothesis was partially incorrect.

Summary Statement

This project tested which type of orange juice contained the greatest concentration of Vitamin C.

Help Received

Received assistance with understanding math computations from Michele Okihiro, PhD, Scipps Institute of Oceanography

Name(s)	**Project Number**
Nilay S. Sawant	**J2014**

Project Title

Effect of Microwaving, Sunlight, and Heat Temperature on Vitamin C

Abstract

Objectives/Goals

The objective is to determine the effect of Sunlight, Heat Temperature and Microwaving on vitamin C content in vegetable and fruit juices. I believe that microwaving and heat temperature will destroy the vitamin C but exposure to sunlight will increase the vitamin C content.

Methods/Materials

Glass cups, 500mg vitamin C tablet, dropper with measurements in ml, 500 ml measuring cup, corn starch, tincture iodine, various fruits, vegetables and fruit juices are needed to do this science project. Iodine Titration method was used to determine the vitamin C content in foods. Iodine-starch solution was prepared by adding tincture iodine drops to starch mixture. Iodine-starch solution was used to perform the titration against different fruit and vegetable juices. The iodine-starch solution was calibrated against vitamin C tablet solution. The same batch of iodine-starch solution was used for all tests. The content of vitamin C in the juices before and after the juices were exposed to microwave radiation, sunlight and heat temperature, was recorded by performing titration against the calibrated iodine-starch solution. Percent decrease of vitamin C content was compared among different juices and across different effects.

Results

Exposure to sunlight, heat temperature and microwave radiation destroyed vitamin C content in foods. The rate of destruction of vitamin C in different juices for different effects was not uniform.
In some cases, the rate of destruction was slower initially but increased later for longer duration readings. Where as in other cases, the rate of destruction was faster initially but dropped drastically for longer duration readings.

Conclusions/Discussion

Vitamin C is very important for humans as unlike other organisms humans cannot make their own vitamin C. Humans get vitamin C from the food they eat. Inadequate vitamin C intake may lead to diseases such as Scurvy and Coronary Heart disease. Hence it is important to find out the changes to vitamin C content during the meal preparation. My hypothesis was correct on the effect of microwaving and heat temperature on vitamin C content. Microwave radiation and heat temperature destroyed the vitamin C content in the food. However I was wrong on the effect of sunlight exposure on vitamin C content. Sunlight exposure also destroyed vitamin C content in the food.

Summary Statement

Exposing vitamin C rich foods to sunlight, microwave radiation, and heat temperature decreases the vitamin C content at differing rates, and we can use these results to alter our cooking methods in order to preserve the most vitamin C.

Help Received

Parents helped me in purchasing materials for the project.

Name(s)	Project Number
Shikha Srinivas	**J2015**

Project Title

The Good, the Bad, and the Saturated Fat

Abstract

Objectives/Goals
To determine saturated fat content in different cooking oils.

Methods/Materials
Materials- Cooking oils ,stove , iodine,test tubes,water, measuring sppons,thermometer,a big pot, test tube stand, prongs

Method- pour measured amount of oil in test tubes, heat water in a pot to 75 degee C,put 3 drops of iodine in a test tube and stir in,immerse it in water, record the time it takes to change color.
repeat with other oils,
do the test 3 times with each oil.

Results
Coconut oil and Peanut oil were the highest in Saturated fat. closely follwed by sesame oil. these are worst for health.
Almond oil mustard oil vegetable oil,and extra virgin olive oil were much lower than coconut oil and are okay to eat, Canola oil safflower oil and corn oil showed the least saturated fat out of all the oils.

Conclusions/Discussion
Cocunut oil has the most saturated fat and is bad for Cooking, Canola oil is the oil with least saturated fat and is the best one for cooking according to my experiment.

Summary Statement
To check which edible oil has the most saturated fat

Help Received
Mother helped doing the experiment

Name(s)	Project Number
Halie J. Swanson	**J2016**

Project Title

Which Brand of Orange Juice Contains the Most Vitamin C?

Abstract

Objectives/Goals
"Which brand of orange juice contains the most Vitamin C?" The purpose of this experiment was to discover which brand of orange juice would contain the most vitamin C. The hypothesis of this experiment was: "If the fresh-squeezed orange juice is the healthiest choice of orange juice, then it will contain the most vitamin C of the three brands." The control of this experiment is a 1 mg/mL vitamin C standard solution made by combining a 250 mg vitamin C tablet with 250 mL of distilled water. This project captivates interest because it could benefit the community by having the knowledge of which type of orange juice is better for your health to drink.

Methods/Materials
Using a fifty milliliter buret, one would titrate iodine into a twenty milliliter sample of orange juice and starch indicator solution until an oxidation-reduction reaction occurred. This process was used six times for each of the three types of orange juice and the vitamin C tablet, resulting in twenty four trials total. When each trial was completed, the product would be the amount of iodine it took to titrate a twenty milliliter sample of orange juice and starch indicator solution.

Results
The Vitamin C tablet contained 13.7 mg of vitamin C. The Florida Natural (premium) contained 9.8 mg of vitamin C. The Minute Maid (concentrate) contained 9.6 mg of vitamin C. The Fresh Squeezed orange juice contained 11.7 mg of vitamin C.

Conclusions/Discussion
These findings were what one would find, and expect to find, while doing this project. However, the most surprising discovery was that the fresh- squeezed orange juice contained more vitamin C over premium and concentrate orange juice. One would believe that fruits grown on trees and then squeezed and drunk right away would not have a higher vitamin C content then orange juice processed with natural cleansers.

Summary Statement

The purpose of this project was to show which brand of orange juice contained the most Vitamin C.

Help Received

mother helped supply materials for experiment

Name(s)

Tatiana C. Trejo

Project Number

J2017

Project Title

Zap! Analyzing the Effectiveness of Oil Free Acne Cleansers and the Eradication of Escherichia coli

Abstract

Objectives/Goals
The purpose of my investigation was to find a store bought acne cleanser to help eliminate bacteria and acne.

Methods/Materials
For my experiment, I used E.coli, Neutrogena Oil-Free Acne Wash, Clean & Clear Oil Free Foaming Facial Cleanser, CVS Oil Free Foaming Facial Cleanser, agar plates, filter paper, test tubes, sterile cotton swabs, distilled water, and chlorine bleach. I had my coach swab E.coli onto two agar plates and I grew them for 3 days. Next, I swabbed the grown E.coli onto 75 different agar plates and then labeled the agar plates with the cleanser's name and trial number. I then mixed water and the cleanser into a test tube and, dipped a filter paper disk into the solution and, place it onto a agar plate with the use of tweezers. I grew the plates again for three days and then I found the width of the killed bacteria by measuring the width between outside edges of the filter paper disk and the circle of killed E.coli. Lastly, I added bleach and water to a bucket and put the agar plates into the bucket and let sit. I disposed of the agar plates into a waste basket.

Results
The results of my experiment showed that the Neutrogena brand cleanser had an average of 3.232 cm of eliminated bacteria while the Clean & Clear had an average of 2.624 cm of bacteria eradicated. Lastly, the CVS brand cleanser had an overall average of 2.204 cm of killed bacteria.

Conclusions/Discussion
From my experiment, i learned that the Neutrogena and Clean & Clear brand can be very effective in eradicating E.coli. The CVS brand, though much less expensive is not as effective and is a generic store brand.

Summary Statement

I chose to do this experimentation because I wanted to find an effective way to help clear acne.

Help Received

Nathan Whittington, a science teacher at the nearby high school, provided the Escherichia coli. Mother and father, helped with the layout and assembly of my board. Carrie Given and Jewely Lopez-Lickey, science teachers, helped me with my procedure.

Name(s)	Project Number
Riley S. Unter	**J2018**

Project Title

Monster Drinks Make Monstrous Teeth

Abstract

Objectives/Goals
The effects of energy drinks, sport drinks, soda, coffee, milk and water on the deterioration and staining of teeth enamel were examined. This study also wanted to study how the drinks affected staining. The results of this studied showed that soda and coffee had the greatest effect of staining on the enamel of the teeth. These drinks also caused the greatest tooth deterioration with severe loss of enamel with no ridges. Water and milk created no harm to the tooth enamel.

Methods/Materials
Materials: 15 cow teeth, 14 containers, 7 different kinds of drinks: Monster Energy drink, Gatorade Sports drink, Coke, Diet Coke, Coffee, Milk and Water.
Procedure: Place each tooth in its container. Put Coke in #1, Diet Coke in #2, Monster Energy Drink in #3, Gatorade Sports Drink in #4, Coffee in #5, Water in #6, and Milk in #7. After 1 week take out first set of teeth to examine and record observations. One week later, repeat. Compare teeth that were soaked for 1 week to teeth that were soaked for 2 weeks. Record observations by appearance for staining and enamel erosion.

Results
The control tooth had a stain rating of 2. The teeth soaked in coke stained the worst with a rating of 15, then diet coke with a rating of 14 and then coffee with a rating of 13. No difference was found in teeth that were soaked in milk or water. Teeth that soaked for 2 weeks had more staining on their enamel than teeth that soaked for 1 week. For week 1, the teeth exposed to Monster energy drink and Gatorade sports drink rated a 3 in deterioration. For week 2, Coke, Diet coke and Starbucks coffee rated a 3 in deterioration. The tooth in water had no change.

Conclusions/Discussion
My hypothesis was partially correct. I thought the tooth exposed to Monster energy drink would deteriorate the most, but Coke, Diet Coke and Coffee also had the same deterioration rates. However, the tooth that soaked in the Monster energy drink for 2 weeks appears to have a white substance speckled on the surface of the tooth. I was incorrect in my hypothesis that the tooth exposed to the Monster energy drink would have the worst staining. Actually, the worst staining occurred to the tooth soaked in Coke, then Diet Coke and finally Starbucks coffee. I was correct that the tooth soaked in water would have no change in deterioration or color.
I learned the sodas, energy drinks, sports drinks and coffee are very harmful to the enamel of your teeth.

Summary Statement

The Effects of Energy Drinks, Sports Drinks, Sodas, Coffee, Milk and Water on Tooth Deterioration and Staining.

Help Received

Mother typed while I dictated

Name(s)	**Project Number**
Veronica L. Villarreal	**J2019**

Project Title

The Citric Acid that Cures Kidney Stone Pain

Abstract

Objectives/Goals
The objective was to determine which home-based citric acidic solution (i.e. lemon juice, lime juice, Sprite, Pepsi) dissolves calcium in a kidney stone fastest and most effectively by testing this on egg shells. I believe that lime juice will prove to dissolve the egg shell the best.

Methods/Materials
In an egg and vinegar project the goal is to dissolve the calcium in the egg so it will become something like a bouncy ball. By replacing the vinegar variable with lemon juice, lime juice, Sprite, and Pepsi, I submerged five eggs in five cups of each solution for 72 hours to determine which dissolved the egg shell best. To figure out which solution dissolved the egg shell most effectively, I would take the egg and apply pressure on it until it popped. Then I would measure the amount of pressure. The more pressure, the more calcium was still in the egg.

Results
The lemon juice ended up needing the least amount of pressure, therefore there was the least amount of calcium still in the egg after being submerged in a cup of lemon juice for 72 hours. This means that this home-based solution would be the one you should drink a lot of when trying to pass a kidney stone because it will dissolve the calcium in the stone most effectively to cause the least amount of pain.

Conclusions/Discussion
My hypothesis that lime juice would dissolve the egg shell the most effectively, was proven wrong though it came very close to the lemon juice. By figuring out which solution best dissolves the calcium in a kidney stone, people who are trying to pass a stone can know a quick and easy relief to the pain.

Summary Statement

My experiment is about trying to find which home-based citric acidic solution best dissolves calcium in kidney stones by testing them on egg shells.

Help Received

Mother helped with materials

Name(s)

Savannah A. Wittman

Project Number

J2020

Project Title

What Hand Cleaners Kill Bacteria the Best?

Abstract

Objectives/Goals
The objective of this project was to determine which of the various household hand cleaners was the most effective in killing bacteria.

Methods/Materials
The project was divided into two phases. In phase one I would wash my dirty hands in various commerically available hand cleaners/gels and then place them on a large agar plate and count bacterial colonies after 24 hours of incubation at 37 degrees celcius. In the second phase of the experiment, a bacterial colony was isolated and diluted into sterile saline and then plated onto numerous agar plates with a sterile cotton swab. The aforementioned hand cleaners/gels were then saturated onto filter paper discs and placed onto the agar plates and incubated for 24 hours at 37 degrees celcius. Zones with no bacterial growth (rings of inihibition) were measured to determine antimicrobial effectiveness.

Results
The the first phase of the experiment Germ-X and Dial Complete had the lowest colony counts. In the second phase of the experiment Dial Complete (triclosan) had the absolute larges ring of inhibition measured at 16 mm, followed by the positive control Avagard (chlorhexidine) and dawn dish soap.

Conclusions/Discussion
It was determined that products that contain antimicrobial compounds in addition to soap were the most effective in killing bacteria. Dial complete (with triclosan) was the overall most effective product tested in killing bacteria. Germ-x hand gel was very effective in the first phase of the experiment and less effective in the second phase.

Summary Statement

I tested various hand cleaners to see which ones were the most effective at killing bacteria I would commonly have on my hands.

Help Received

My dad helped me to take the data and graph it using the computer word processor.

Name(s)	Project Number
Genna T. Abele	**J2099**

Project Title

Dissolve the Pain: How Does the Speed of Dissolution Vary among Name Brand Pain Relievers and the Generic Counterparts?

Abstract

Objectives/Goals
I conducted this experiment to determine which type of pain reliever in name brand and generic brand form (Advil - ibuprofen, CVS Ibuprofen, Aleve - naproxen sodium, CVS Naproxen Sodium, Bayer - aspirin, CVS Aspirin, Tylenol - acetaminophen, and CVS Acetaminophen) dissolves the most quickly in simulated stomach fluid. I wanted to determine which pain reliever would offer the fastest relief.

Methods/Materials
To make the simulated stomach fluid, I poured 150 milliliters of water and 75 milliliters of hydrochloric acid into a beaker. I measured the pH of the fluid to confirm that it was in the proper range. I then split one standard dose tablet in half and placed a half tablet in the fluid. With a stopwatch, I measured how long each half tablet took to dissolve. I repeated this process for each brand of pain reliever. I conducted five trials.

Results
The pain reliever half tablets dissolved, on average, in the following order from fastest to slowest: CVS Aspirin (49 seconds), Bayer - aspirin (54 seconds), Tylenol - acetaminophen (1 minute and 22 seconds), CVS Ibuprofen (1 minute and 53 seconds), CVS Acetaminophen (4 minutes and 6 seconds), Advil - ibuprofen (4 minutes and 23 seconds), CVS Naproxen Sodium (27 minutes and 56 seconds), and Aleve - naproxen sodium (48 minutes and 58 seconds).

Conclusions/Discussion
CVS Aspirin dissolved the fastest. The results and data supported the part of my hypothesis that aspirin would dissolve the fastest, but rejected the part of my hypothesis that Bayer would dissolve faster than CVS Aspirin.

Summary Statement

Of the name brand and generic brand forms of the pain relievers ibuprofen, naproxen sodium, aspirin, and acetaminophen, CVS aspirin dissolved the fastest in simulated stomach fluid and therefore offers the fastest pain relief.

Help Received

I received guidance from my teacher throughout the process. Also, I received help from my parents in obtaining hydrochloric acid and preparing the simulated stomach fluid.