

Dietary Supplements

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Dietary supplements including vitamins, minerals and other substances such as energy drinks have become increasingly popular over the past years. Many see these supplements as substitutes for physical exercise or a healthy diet. Unfortunately we are looking for quick fixes to improve our looks or performances on an athletic field. These supplements however can have very serious side effects. One such type of dietary supplement that has been increasingly popular is the energy drink. The energy drink's purpose is just what its name implies, to give you an extra boost of energy. It is different from other soft drinks in that it usually contains high levels of caffeine, and sugar as well as additional ingredients such as taurine, ephedrine, ginseng and many other substances that are thought to improve human performance. The caffeine content of energy drinks can vary widely. The FDA sets a limit on the amount of caffeine that food products can contain (71 mg per 12 Ounce can). Some companies will have large amounts of caffeine in a can, but increase the number of servings per can. Energy drinks are designated as dietary supplements, not food products so the manufacturers can load their drinks with caffeine and not have to put warning labels on the can! Excess caffeine can have differing effects. Some individuals will experience no effects while others will experience increased heart rate, blood pressure, irregular heartbeats, increased rate of breathing as well as other serious side effects. Taurine is an amino acid that is not really understood. It is thought to be involved in brain development and forging new connections between cells. Another interesting branch of dietary supplements is the field of nanoceticals. Nanocetical technology uses nanotechnology to take nutritional factors and send them directly to the cells. The body is be able to absorb the nutrition easier and quicker.

The effects of all of these dietary supplements are really unknown. There are many differing opinions on whether or not there is a true benefit. You will be looking at a few different types of dietary supplements and the effect the supplements have on fruit flies.

WHY FRUIT FLIES?

1. Can reproduce quickly
2. Hundreds of fruit flies can live in a small container. (Big Sample = Good Data!)
3. Small size will increase the metabolic effect.
4. Fruit flies and humans share many genes, cellular processes, brain cell development, and behaviors.
5. Researchers found that both fruit flies and humans had the same response to sweet molecules.

Part ONE:

POWER POINT PRESENTATION

With a partner you are to research a dietary supplement. You will then present your findings to the class in the form of a PowerPoint. Your presentation should contain the following information:

1. Name of dietary supplement.
2. Ingredients found in the supplement.
3. What the ingredients are supposed to do for the consumer or the purpose of the ingredients. Example: The product will give you more energy.
4. Who is the product targeted to help?
5. How does the product work? What process or system is supposed to be effected?
6. What happens under natural conditions? (When you do not take the supplement?)
7. Have there been any studies done to show that there is a positive effect or any studies showing that it may be of a concern?
8. The results of your fruit fly experiment.

RUBRIC

| | Unsatisfactory (1 pts) | Satisfactory (3 pts) | Good (4 pts) | Excellent (5 pts) |
|-----------------|---|---|---|---|
| Mechanics | Presentation had 4 or more spelling or grammar errors | Presentation had 3 spelling or grammar errors | Presentation had no more than 2 spelling or grammar errors | Presentation had no spelling or grammar errors |
| Organization | Audience cannot understand the presentation because there is no sequence of information | Audience has difficulty following, topics jump around | Logical sequence, audience can follow | Logical, interesting sequence which audience can follow. |
| Technical | Transitions are not used, slides have major technical mistakes | Bullets and transitions are used ineffectively, or are distracting | Bullets and transitions used, but there are some problems with flow | Bullets and transitions used effectively, presentation flows smoothly |
| Information | Presentation has major gaps in knowledge, audience is not likely to leave with useful information. Few assigned questions are answered. | Presentation has some major gaps in knowledge, or is presented in such a way that the audience has trouble understanding Few assigned questions are answered. | Presentation provides information on the topic, some elements are missing (No more than 1 question left unanswered.) | Presentation provides a wealth of information on the topic, all questions are answered in a way the audience can understand |
| Information 2 | Information is way too technical for an average person to understand, information is cut/paste from sources | A majority of the information seems copied from sources, group attempts to make it understandable | Some information seems cut and paste from sources, too technical for a layperson to understand completely | Group presents information in their own words, with consideration to the audience |
| Speaking | Speech was not well presented, members seems confused, or lost. Failed to answer the audience's question | Not all of the members spoke on the topic, more than one of them seemed unknowledgeable | All members spoke, though some seemed to not understand issues, or questions were answered inaccurately | All members spoke, and appeared to understand the issues of the topic. Questions were answered accurately |
| Lab Information | Lab Data not incorporated into the PowerPoint. | Lab data incorporated but data does not support conclusion. | Lab data incorporated, data does supports conclusion, group members do not seem to understand the results. | Lab data incorporated, data does supports conclusion and group members understand the results. |

Part Two:

FRUIT FLY INVESTIGATION

Problem: What effect will the dietary supplement have on fruit flies?

Materials: Vial of approximately 20 fruit flies with fruit fly medium
Assigned Dietary supplement
Cotton Ball
Hand lens/Magnifier

Procedure:

Day One:

1. With your partner take your fruit flies and note their behaviors. Be very detailed. Note where they are in the vial, how active they are, the number of female and male fruit flies etc.
2. Count the number of eggs. They will be visible with the naked eye. If you are having trouble seeing them use the magnifier.
3. Once you have **carefully** observed your fruit flies get another vial.
4. Take a cotton ball and saturate the cotton with your supplement.
5. Place the fruit flies on ice. This should anesthetize the fruit flies.
6. Once the flies have **stopped moving** transfer them to the new vial.
7. Leave the vial on its side until the fruit flies have "woken up" to make sure that they will not drown in the moisture in the cotton ball.
8. Observe the fruit flies until the end of class. Take notes at 15 minute intervals.
9. Place in the room where they will not be disturbed.

Day Two:

1. Take your fruit fly vial and note their behaviors. Be very detailed. Note where they are in the vial, how active they are, the number of female and male fruit flies etc.
2. Count the number of eggs. They will be visible with the naked eye.
3. When you are done give the fruit flies to your teacher.

Observations

Day One: (No Dietary Supplement)

| | Initial Observations | 15 minutes |
|------------------|----------------------|------------|
| # of Fruit Flies | | |
| # of Males | | |
| # of Females | | |
| # of Eggs | | |
| Behaviors | | |

Day One (With Dietary Supplement)

| | Initial Observations | 15 minutes | 30 min | |
|------------------|----------------------|------------|--------|--|
| # of Fruit Flies | | | | |
| # of Eggs | | | | |
| Behaviors | | | | |

*****If you have additional Time be sure to keeping writing down observations. Note their response to the supplement. Do they seem to like it? Are they more active? Do they go to the same part of the vial?

Day 2

| | Initial Observations | 15 minutes | 30 min | |
|------------------|----------------------|------------|--------|--|
| # of Fruit Flies | | | | |
| # of Eggs | | | | |
| Behaviors | | | | |

References

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