Experiment

Materials Needed

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| Sufficient # of mice | Asian Ginseng 250mg gel caps | Micropipetter |
| Micropipetter Tips | Mouse Bedding | Leather Gloves |
| Calculator | Holding buckets (2) | Black Permanent Marker |
| A maze | a stopwatch | a large cage |
| mouse food | a source of water | Electronic Scale |

In this experiment, we used 30 common mice to test the effects of ginseng on memory. We fed 15 of the mice a dosage in relation to their body weight.This dose was 1000 times in relation to what is given to adult humans. The other 15 mice were used as a control

Procedure:

(1) Build or obtain a maze that is at least 3x5 ft. in dimensions. The maze should have at least three different paths to go down, with the number of turns in order to get to their destination limited to 2 or 3. With less complexity the experiment time will be significantly shorter.

[maze](http://docs.google.com/maze2)

(2) Obtain Mice from a local pet store. In our case we bought 30 white common mice from Petco.

[control mice](http://docs.google.com/bucket)

(3) With a permanent black marker, blacken a section of half of the mice's tails. These mice will be the experimental group that will be receiving the ginseng. The mice with unmarked tails will be the control.

(4) Mass each mouse in each category to .1 g and record on a data table.

(5) Complete calculations for dosage for the mice who will be receiving the ginseng (blackened tails). The mice should receive 1000 times the amount in relation to body weight than a 175 lb. person would be if he or she was taking 250 mg (1 gel cap) of ginseng.

Sample Calculation:

175 lbs=79.54 kg=79540g

Typical Human dosage then=250mg per 79540g body weight OR 3.14x10^-3 mg ginseng per gram of body weight.

a. Multiply the dosage per gram of body weight by each mouse's mass.

b. Multiply that amount by 1000 to increase the dosage. This will allow the results of the ginseng to come out more obviously and provide clearer results than simply giving them the standard human dosage. Also, the equivalent dosage per gram of body weight would be microscopic and therefore impossible to administer without extremely delicate equipment.

Therefore, if a mouse's mass is 23.3 g, then you would multiply that by 3.14x10^-3 which would yield a result of .073162 mg as a dosage. Then multiply that by 1000 to yield a result of .073162g. This will be the amount of ginseng required for this experiment. (NOTE) Must complete a calculation for each mouse.

(6) Complete calculation for concentration of ginseng in the gel that it comes in. This is important so you can determine how much ginseng is in the gel from the capsules. First, squeeze all of the fluid out of the capsule and mass this liquid accordingly. Next, divide 250mg by the mass of the liquid to get the number of mg of ginseng for each gram of liquid. In our case our liquid had a mass of .41 g. Since we know that .25 g of ginseng is inside that liquid, it would be safe to assume that the concentration of ginseng in the liquid is ,61g per gram of liquid.

(7) Calculate the mass of liquid needed to fulfill each mouses' dosage. Do this by taking your calculated grams of ginseng dosage for each mouse and multiply that by your calculated concentration of ginseng per gram of liquid.

Sample Calculation:

Needed dosage for mouse=.073162g ginseng

Calculated Concentration Ginseng per gram of gel fluid=.61g ginseng per gram fluid

Therefore... .073162g ginseng divided by .61g ginseng/gram of gel fluid=.12g of gel fluid needed to fulfill the dosage for one mouse. (NOTE) This calculation also needs to be done for each mouse.

(8) Load proper amount of ginseng fluid into micropipetter using one of two methods.

a. Suck up a certain amount into the micropipetter and then compare the added weight with the weight of the pipetter without anything in it and correlate this to how much dosage is required. (Harder and less accurate)

b. Calculate the density of the gel cap fluid, and then load the proper volume into the micropipetter. Do this by taking 1 gram of ginseng gel cap fluid and finding its volume. Then you have the number of milliliters that have a 1 gram mass. After that you can simply multiply that calculation by the number of grams of fluid you have to administer. This will finally give you the necessary volume of ginseng gel fluid needed.

(9) Administer proper amount of Ginseng gel cap fluid to the experimental group of mice with the marked tails orally by holding the mouse and inserting the end of the micropipetter into the mouse's mouth. Then simply depress the button on the end of the pipetter to discharge the fluid.

(10) Repeat steps 3 through 9 once each day at a set time period for a total period of seven days, making sure to maintain the food supply and water that they are accustomed to having. Therefore, since both the control and experimental mice live together and have the same living conditions, the only differences between them are that the experimental group is taking ginseng and have black marks on their tails while the control group has neither of these. These marks on the tails are insignificant in the scope of this experiment.

(11) Place maze on the ground with moderate environmental factors. That means that there is only a slight wind, and it is neither too cold nor too hot. Make sure to leave the top of the maze open so that scent is eliminated as an attraction factor. That way the mice have to remember the path by taking the actual path and not just smelling for food.

(12)Deprive mice of food for one hour after giving them their dosage of ginseng for the final seventh day.

(13) Place some food at the end of the path you want the mice to take.

(14) Test the non ginseng Mice for their first run of the maze. Do this by taking the mice without the black marks on their tails and placing them on the opposite side of the maze away from the food. Test all 15 non ginseng mice and note their times (write in Data section). NOTE: Also make note of the real time of day since you will want to test them again after 45 minutes.

(15) Test the mice that were taking the ginseng (black tails) using the same procedure as that for the non ginseng mice. Test all 15 of the ginseng mice and record their running times for their respective first run. Also note the real time at which you started as you will also want to test the mice again after 45 minutes.

(16) After 45 minutes since their first run of the maze, test the non ginseng mice again in the same exact fashion as was done before. Make sure to place them at the same starting point. Note times again and jot them in the data section under second run times.

(17) Return the non ginseng mice back to the large cage.

(18) After 45 minutes since you tested the ginseng mice, start to test them again for their second run times. Again, use the same exact method to test them to obtain viable data. Note these times and write them in data section.

(19) Return the ginseng mice to the large cage.

(20) Return food and living supplies to mice.

(21) Analyze the data. Do this by averaging each of the four categories of times(ginseng mice 1st and 2nd run times, and non ginseng mice 1st and 2nd run times). By doing this we can find a good more accurate result for all the mice instead of just using individual times independently. This also avoids varying factors such as a few individuals with extremely good natural memory, and random fast or slow times.