

Superworms

January 11th, 2022

Abstract:

Different methods of fasting are always debated on which is the best. Multiple studies have been done on various types of fasting but there is never a direct answer to which one is most beneficial. This experiment will be testing how the 16/8 hour fasting method, 24 hour fasting method, 12 hour fasting method, and a control group affect the weight and energy levels of earthworms.

Introduction: Fasting has been around for hundreds of years, however recently interest in fasting has peaked due to it aiding with weight loss, however, there are many other health benefits as well. To see which type of fasting increases metabolism, energy, and weight loss in worms, we will be testing multiple types of fasting. First is the 16/8 method, which consists of fasting for 16 hours and having an 8-hour eating window. Second is the 24-hour approach, and as the name suggests you eat at the same time only once every 24 hours. The final method will be the 12-hour approach, which is fasting for 12 hours and having a 12-hour window to eat. Once people realize the many health benefits of fasting and start implementing it within their lives, not only their health will improve, but the world around them will as well. Fasting will decrease the amount of food waste and production around the world, which will then also lessen the load on the environment for growing so much food, which will then also improve the health of multiple ecosystems around the world.

Question: What kind of fasting improves the physical health of earthworms the most.

Hypothesis: If earthworms were to fast for different time intervals throughout the day then the group of earthworms that fast for 16 hours and eat for 8 hours would have the biggest increase in

energy and weight loss because it is the fasting method that is the most in tune with the body's natural circadian rhythm

Variables: Independent Variable(s): How long during the day that the earthworms can eat. (8 hours, 12 hours, 1 hour, and 24 hours)

Dependent Variable(s): Earthworms' mass, metabolism, energy

Control: Having food available 24 hours a day

Control Variables: Habitat, the amount of food the earthworms get, the amount of water the earthworms get, the species of earthworm, the time of day they receive food

Materials:

24 earthworms

24 plastic containers

Earthworm food (9 cups of soil, 2 cups of berries, and 2 cups of shredded spinach)

Paper towels to lay on the bottom of the containers

Procedure: Set up the 24 habitats for the earthworms, by placing a layer of paper towels on the bottom of each container and adding 30ml of water to the paper towels.

Measure the weight of each worm with a scale and log their weight in some sort of table. This will be done again two more times, at the end of each week.

Place the worms in the clear containers (total of 6 containers), placing one pair of female or male worms in each container until you have placed all 12 worms.

Place 3.75 grams of food in the small food containers and place them inside of the 6 Qt. containers, next to the water.

Set a timer (1, 8, 12, or 24 hours) depending on the method you chose to set up, to time how long the worms will have the food for.

Repeat steps 2-4 three more times for each method of fasting, labeling the worms with a different letter to represent each method.

Once the timers for each fasting method go off, remove the food from the worms. Once you remove the food, refill the food containers back up to 3.75 grams. For the fasting worms wait until the next day at the same time you gave them food, to place the food back into the containers, and for the control group place the food right back into the containers.

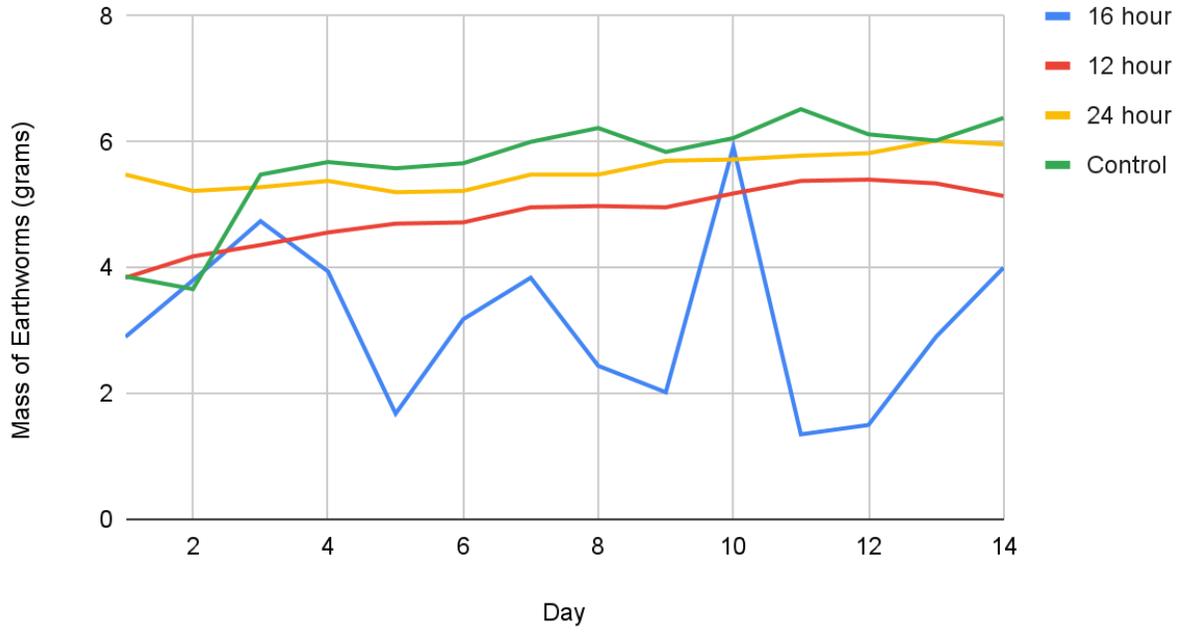
Once it is the next day at the same time you had initially fed them, check to see how many times the worms defecated and record this information. Then replace the paper towels. Once you are done replacing the paper towels, you can place the food back into the containers and start the timers again.

Repeat steps 7-8 every day for the next two weeks.

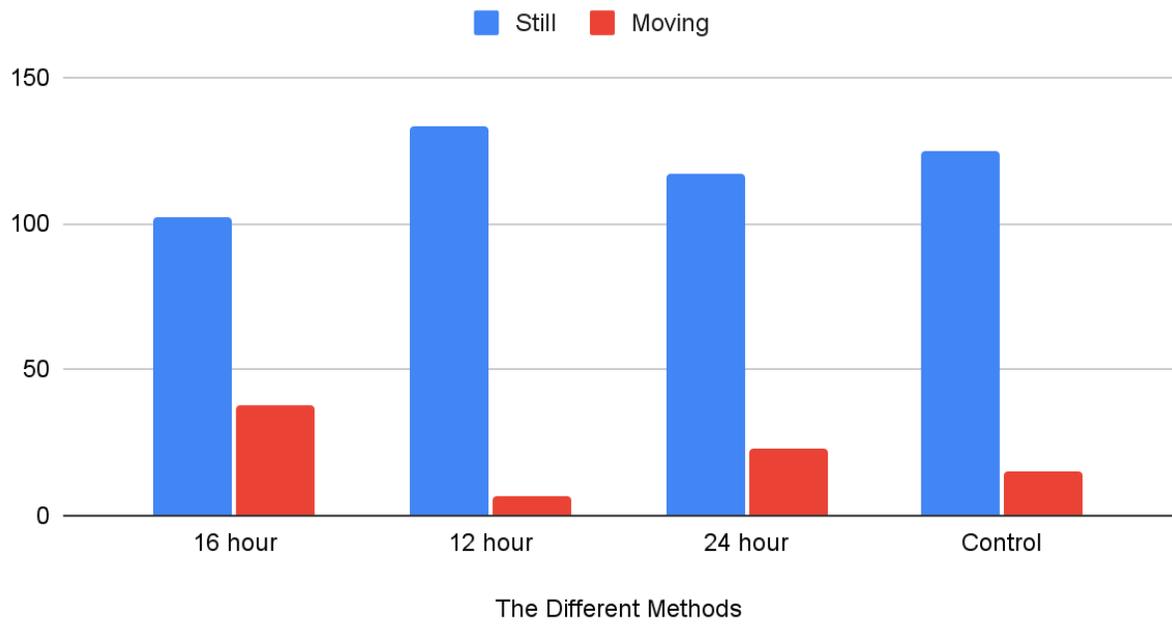
You will also need to record the activity of the earworms every three hours, by logging whether they are sleeping, awake, or actively moving around during the 2 weeks that you conduct the experiment.

Results:

Weight of worms on each fasting method



Energy Levels



Conclusion: The data proved our hypothesis wrong, the 16/8 hour fasting method was not the most beneficial. The 24 hour method turned out to be more beneficial than the rest because the weight of the worms was more stable.

Resources:

-Gunnars, Kris, and Aya Brackett. "6 Popular Ways to Do Intermittent Fasting." Healthline, https://www.healthline.com/nutrition/6-ways-to-do-intermittent-fasting#TOC_TITLE_HDR_4. Accessed 15 December 2021.

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-Leonard, Jayne. "A Guide to 16:8 Intermittent Fasting." Medical News Today, 17 Jan. 2020, www.medicalnewstoday.com/articles/327398#_noHeaderPrefixedContent.

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-Taylor, Marygrace. "9 Surprising Benefits of Fasting." Greatist, 12 Aug. 2020, greatist.com/health/benefits-of-fasting.