

Document 19.1 Sample Lab Report

Redi's Spontaneous Generation Experiment

Introduction

Until the mid-nineteenth century, most people believed that some forms of life arose through spontaneous generation. Spontaneous generation is essentially life arising from non-living things. People often noticed this phenomenon in decaying matter. People believed that maggots arose in rotting meat through spontaneous generation. Francesco Redi was one of the first scientists to methodically test this idea, using the scientific method, in 1668. Redi's hypothesis was that flies laid eggs on the rotting meat, and maggots developed from those eggs. The purpose of our experiment was to test this same principle of spontaneous generation. Like Redi, we hypothesized that maggots on meat come from fly eggs, not spontaneous generation. Therefore, we expected to see maggots only on meat that flies had access to, and we expected not to see any maggots on meat that flies could not land on.

Methods

To test our hypothesis, we set up an experiment like the one Redi carried out in 1668. We took three 1000-L glass beakers and put two 2-inch cubes of raw beef in the bottom of each beaker. The beef had been purchased 1 week before the experiment was set up, and had been refrigerated until the setup day. We then covered one beaker with a thin layer of gauze, which acted like fine netting, and secured the gauze with a rubber band. We covered the second beaker with plastic wrap, and left the top of the third beaker open. We set up five replicates of this experiment, so there were five of each type of beaker in total.

We let the beakers sit at room temperature for two weeks, making observations once each day to check for maggots. Each day, we made observations between the hours of 12:00 and 13:00. We looked at the meat in each beaker and simply recorded whether or not we saw maggots and where any maggots were in the beaker (on the meat, on the sides of the glass, etc.).

Our independent variable in this experiment was the beaker covering. The control, therefore, was the beaker with no covering. We compared the results of the gauze and plastic-wrap beakers to the control beaker. Our dependent variable was the presence or absence of maggots.

Results

We found that the beakers with no covering all had maggots on the meat and in the bottom of the beaker. The beakers covered in plastic wrap had no maggots at all. Of the beakers covered in gauze, some had no maggots at all and some had a few maggots on top of the gauze (Table 1). The number of maggots on top of each gauze-covered beaker was only about one-fourth the number found in each uncovered jar. During a few observations, we saw flies crawling on the meat in the uncovered beakers.

Table 1. Presence or absence of maggots

	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5
Gauze	+ (on gauze)	0	+ (on gauze)	+ (on gauze)	0
Plastic Wrap	0	0	0	0	0
No Cover	+	+	+	+	+

+ = maggots present

0 = no maggots

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Discussion

Our results did support our hypothesis. Maggots appeared on the meat only when the beaker was left uncovered. This tells us that maggots do not arise from the meat due to spontaneous generation. If they did, we would have seen maggots even in the beakers covered in plastic wrap.

The gauze-covered beakers showed interesting results, also. It seems that the flies tried to get to the meat in those jars, as the scent of the meat could travel through the gauze. The flies walked on the gauze and laid eggs there, but could not get to the meat. This is further reason to believe that maggots come from fly eggs, and not from spontaneous generation.

One problem with the setup of this experiment was that the plastic wrap, over time, loosened a bit around the rim of the beaker. We had to check this every day to ensure a tight seal. It is possible that, if left unchecked, this factor could have altered our results.

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