Ziv Bolton
Science Exhibition
12/16/15-1/27/16

Fruits vs Vegetables

Inquiry: Which fruit or vegetable will grow the most bacteria: broccoli, carrot, pepper, lemon, banana, or mango?
Independent Variable: The type of fruit or vegetable
Dependent Variable: The amount of bacteria
Control Variables: Knife, swab, and petri dish
Hypotheses: If I test the fruits and vegetables to see which ones grow the most bacteria, then the banana will grow the most, because it is very soft and rots easily.
Materials: Petri dish, swab, knife, carrot, broccoli, mango, banana, pepper, lemon, plate, human, sharpie, water, agar gel, and incubator.
Procedure:
1. Cut each vegetable and fruit into cube-sized pieces.
2. Put the pieces on a plate and let them sit out in the open.
3. Swab each piece and put it in the petri dishes.
4. Put the pieces in the incubator and let them grow bacteria.
5. Make observations of the bacteria that grew.

Observations:

Day 1 ; 120 hours of incubation
Vegetables:

Pepper sample 1	20 small yellow colonies, 2 very large beige colonies, 3 tiny beige colonies, 1 small beige colony, 3 medium sized clear colonies, and 2 very small clear colonies.
Pepper sample 2	22 tiny clear colonies, 13 medium clear colonies, 1 very large beige colony, 10 tiny beige colonies, and 5 medium yellow colonies, and 4 tiny yellow colonies.
Carrot sample 1	1 curved medium sized beige colony, and 2 small beige colonies.
Carrot sample 2	2 medium sized beige colonies and 1 very small beige colony.
Broccoli sample 1	1 huge beige colony.
Broccoli sample 2	1 medium sized brown colony and one big

	brown colony.

Fruits:

Banana sample 1	Nothing
Banana sample 2	Nothing
Lemon sample 1	Nothing
Lemon sample 2	1 large brown colony
Mango sample 1	Nothing
Mango sample 2	Nothing

Day 2 ; 168 hours of incubation

Vegetables:

Pepper sample 1	1 huge beige colony, 16 small yellow colonies, and 2 medium sized beige colonies.
Pepper sample 2	20 tiny clear colonies, 1 very large beige colony, 9 tiny beige colonies, 6 small clear colonies, and one big beige colony.
Carrot sample 1	5 small beige colonies, and 1 medium sized curved colony.
Carrot sample 2	2 big white/beige colonies and 1 small beige colony.
Broccoli sample 1	1 huge beige colony.
Broccoli sample 2	1 big brown colony.

Fruits:

Banana sample 1	Nothing
Banana sample 2	Nothing
Lemon sample 1	Nothing
Lemon sample 2	1 big brown colony.
Mango sample 1	Nothing
Mango sample 2	Nothing

Analysis:

The pepper samples grew the most bacteria by a vast amount. They also grew bacteria that had a variety of color and size. There were clear colonies, yellow colonies, and beige colonies. The samples also had huge colonies, tiny colonies, medium-sized colonies, and small-sized colonies. There were also different shaped colonies. There were big sloppy colonies, perfect circular colonies, and curved colonies.
I noticed that although all the vegetables grew bacteria, the pepper samples grew significantly more than all of the other samples. The fruits grew almost nothing, I noticed that there was one lemon sample that grew bacteria but the other lemon sample grew nothing. In the end I saw that vegetables grew a lot more bacteria than the fruits.

Conclusion:

Hypothesis: My hypothesis was incorrect. The bananas, grew no bacteria. Neither did most of the fruits. I think this is the case because all of the fruits I tested had strong skins. On the other hand the vegetables, if they had skin, had very thin layers of skin.

Real world application: You should not leave out vegetables, they will grow a lot of bacteria. Think about it, when you buy vegetables do you leave them out: carrots, cucumbers, peppers, zucchinis, broccolis, cauliflowers, and other vegetables you put in the refrigerator. When you get fruits do you put them in the refrigerator, or do you leave them out, think about it, mangos, apples, bananas, oranges, clementines, lemons, and many other fruits, you do leave out!

Errors: I touched the jelly in the petri dish so I may have interfered with the process of growing bacteria. There was also a crack in the dish.

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