Lentil Beans

The Effects of Microgravity Growth on Lentil Beans

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Experiment Importance

Why is this investigation important for humankind?

The importance of this experiment is because of astronauts muscle mass degenerate in microgravity, which means they go away and lose muscle tone. Lentil beans can help bones and muscles develop as they contain calcium, magnesium, potassium, and protein.

We know that one of the health risks astronauts face while in space is bone density loss. If humankind continues with space exploration and colonization in the environment of microgravity, lentil bean growth could be one of the answers to the bone mass loss issues.

The Reason

Lentil beans are part of the legume family, which are usually inexpensive, nutritionally dense and a great source of protein. They are also a good source of calcium, magnesium, and potassium.

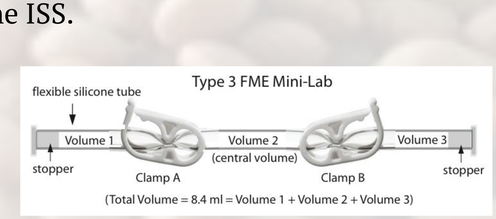
Besides human consumption, lentil beans can be used for livestock feed as well. Lentil beans are a highly nutritious food, rich in minerals, protein, and fiber. Lentil beans are an economical source of protein, meaning it is affordable at a low-cost to prepare the beans.

Proposal Summary

We will be attempting to answer the question: What is the effect of microgravity vs gravity on the growth of a lentil bean? We chose this test subject to determine if lentil beans are a solution to help bone density issues and bone degeneration while onboard the ISS.

The reason we want to put lentil beans in space is because when astronauts are in space bones degenerate which means they go away and lose muscle tone. Lentil beans can help bones and muscles develop as they contain calcium, magnesium, potassium, and protein.

In the experiment, we hope to learn the effects of microgravity on plant growth. We hope to see if lentils grow the same in microgravity and gravity. We can also use the information gathered from the lentils to conclude whether or not microgravity conditions are an adequate environment for farming and developing crops and determine if lentils are an appropriate crop to cultivate while onboard the ISS.

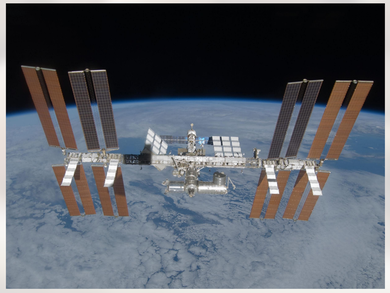


What is the FME tube? An FME tube is a experiment housing that is airtight and can have three variations. It can have no clips, one clip, or two clips. Our experiment requires a Type 3, which has two clips.

Special Handling Requirements During Transportation

FME will need to be refrigerated from Burleson TX. to NASA with a temperature of at least 40℉ or below in order for the experiment to work. It will also need to be refrigerated on its return to Burleson TX from NASA to stop the experiment crystallization.

Travel	Location and destination	Refrigeration	Ambient Condition
PRE-FLIGHT	Shipping from your Community to NanoRacks in Houston	X	
	At NanoRacks until Handover to NASA	X	
FLIGHT	Handover to NASA Until Arrival at ISS	**X (required)**	
	Onboard ISS		**X (required)**
POST-FLIGHT	From ISS until Arrival at NanoRacks		**X (required)**
	At NanoRacks through Return Shipping to Community	X	



Proposed Results

Our hypothesis is that lentil beans will grow faster in space since there is a lesser amount of gravity in the ISS. Our experiment will help us understand how to better provide a sustainable food source for astronauts. Lentil beans, along with exercising, will allow bones and muscles to be strong and healthy in a microgravity environment. With our collected data after the experiment, the science community will understand how the effects of microgravity have on the growth of the lentil bean.

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VI. List of Reference Publications

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