TOMATOSPHERE™

Martian Crop Possibilities – Student Investigations

This investigation can be modified for students at different levels. It supplements the Tomatosphere™ Project by looking at a variety of crops that are possibilities for Martian cultivation. It should be used with the chart on Crop Characteristics found with the Martian Crop Possibilities

1. Use the chart "Crop Characteristics";

   1.1 Make a list of the crops based on "time to mature" with those taking the shortest amount of time at the top.
   1.2 Make a list of the crops based on "Energy Produced" with the highest energy crop at the top.
   1.3 Make a list of the crops based on "Storage Time for Crops" with those that will store the longest at the top.

2. Based on a combination of the three lists, which crops might be the best ones as candidates for Martian cultivation?

   2.1 These are only three factors to consider. For example, good taste might be a consideration; garlic has the highest energy produced, but just how much garlic can one consume!?!?! What other factors should be considered?

   2.2 Personal preference is also important! For each of the crops on the list, indicate how you feel about each crop.

"Can't get enough of it"	4 points
"Like it most of the time"	3 points
"I can take it or leave it"	2 points
"Not my preference"	1 point
"Not even if I'm starving!"	0 points

   2.3 As a group (or class) discuss personal preferences around different vegetables and other foods.

   2.4 Why would personal preference be important for astronauts on long term space missions?

3. Based on the factors that can be "quantified" (numbered) AND the other factors that you establish, develop a final rank ordering of the top ten potential crops for cultivation on Mars.

4. Many foods on the International Space Station (and presumably on long-term space voyages will have to be dehydrated (water removed).

   4.1 What are the advantages of dehydrated foods for space travel?

   4.2 What are the disadvantages of dehydrated foods for space travel?

   4.3 What dehydrated foods have you eaten on Earth? Were these eaten in a dehydrated state or was water added? How did you feel about eating these dehydrated foods? In general, did the dehydrated foods taste different (better or worse)?

   4.4 How long could you be happy eating ONLY dehydrated foods?

   4.5 What other methods could be used to "store" foods for long-term space voyages?

Use a standard food guide (eg. Dietary Guidelines for Americans, 2015 – 2020), create a menu for one day that w