

## **The DRYOMATIC 5000**

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### Prototype #1 Testing Summary

Before Drying: 7 oz

After Drying: 2 oz

The bananas were dried by placing them in an oven for six hours, in this method of drying, the bananas were completely dried (figure 1). Five tests were performed to test the overall quality of the tray, these include; the damp cloth test, durability test, capacity test, a test to determine how easy it was to manufacture, and a cost break down to determine the price. The detailed results of these tests are shown in table one.

Table one: Tests Performed, Prototype One

Test	Description of Test	Results / Observations
Damp Cloth Cleaning Test (3rd test ran) Test performed on October 3rd around 2:20 in the wood shop.	Washed the tray for ten seconds with only a damp wash cloth to see how easily the tray could be cleaned.	The tray was not very dirty to start out with and when cleaned, the remaining banana came off very easily and very quickly without much effort. This test can be seen in figures two, three, and four.
Durability (Last test performed) Test performed on October 3rd around 2:30 in the wood shop.	The tray was dropped from various heights of one foot, two feet, and three feet to see if the structure of the tray was sound.	The tray held up well for the most part, while dropping it, one of the corners of the tray broke. The cause of this breakage was due to the fact that the nail was not nailed in properly.
Capacity Test (2nd test ran) Test performed on Saturday	The tray was filled bananas to see how many slices of bananas could be effectively dried.	The tray held a total of 55 banana slices on the half size, with a full size capacity of 110, however for the final product a tray with more capacity would be optimal.
Easy to Manufacture (1st test ran) Test Performed on September 26th from 1:25 - 3:20 in the wood shop.	The prototype was built in a limited amount of time to see how easily the tray could be manufactured.	The prototype was able to be built in the two hour class period, with distractions. If there were no distractions present the tray could be built very easily in a limited amount of time.
Price	The cost of the final product was totaled.	The cost was \$10.59 for a full tray, this was due to the fact that the chicken wire was \$0.25, the wood was \$6.50, and the six screws were \$3.84. This is

		over the designated cost that was provided.
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Redesign Ideas: Our new prototype consists of only placing wood around two of the edges instead of having it around all edges of the tray. This would allow for more flexibility of the tray to allow the bananas to be taken off the tray easier. The tray could then be bended to allow the bananas to come off instead of having some of the scrapped off. Also, the cost needs to be reduced so that it is inside the price range provided.

Figure one: the bananas dried on the tray.



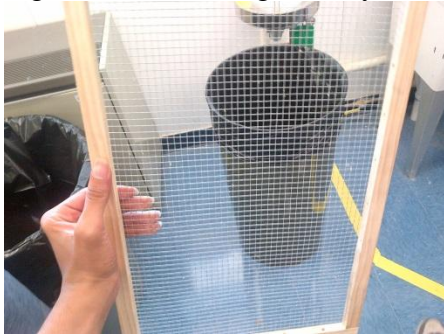
Figure two: the tray was able to be washed with just a damp wash cloth (washing test) .



Figure three: washing the tray.



Figure four: washing the tray.



#### Prototype #2: Test summary

Before Drying: 180.9 grams

After Drying: 177.2 grams

The method of drying this time was by using a hair dryer and placing it on the bananas for 15 minutes, the temperature varied between 54°C - 68°C during the test (figure 5 and 6). The bananas were dried around the edges, however the middles were still moist (figure 7). This is not surprising though since they only had 15 minutes to dry. Seven tests were performed to test the overall quality of the tray, these include; the damp cloth test, durability test, capacity test, a test to determine how easy it was to manufacture, a flexibility test, a cost break down to determine the price, and research to determine if the product was made of only food grade materials. The detailed results of these tests are shown in table two.

Table two: Tests performed, prototype two.

Test	Description of Test	Results / Observations
Damp Cloth Cleaning Test (Last test performed) Test performed on October 10th around 2:40 in the wood shop.	Washed the tray with only a damp wash cloth for ten seconds to see how easily the tray could be cleaned.	The tray was not very dirty to start out with and when cleaned, the remaining banana came off very easily and very quickly without much effort (figure 8 and 9).
Durability (3rd test ran) Test performed on October 10th around 1:40 in the classroom.	The tray was dropped from various heights of one foot, two feet, and three feet to see if the structure of the tray was sound.	The tray held up well, it was dropped numerous times without any part of the tray breaking even a little bit. This is a large improvement from the first prototype.

Capacity Test (4th test ran) Test performed on October 10th around 2:10 in the wood shop.	The tray was filled with bananas to see how many slices of bananas could be effectively dried.	The tray could fit almost 65 slices of banana on a half size, thus 130 on a full sized. This is an improvement from the previous tray and a good amount to fit on one tray. The side walls of wood were shaved to be thinner, allowing two extra rows of bananas to be placed on the tray, then increasing the capacity.
Easy to Manufacture (1st test ran) Test Performed on October 3rd from 2:40 - 3:20 and October 8th at 7:00- 7:30 in the wood shop.	The prototype was built in a limited amount of time to see how easily the tray could be manufactured.	The prototype was able to be built with no more than two people working on it at any period of time, and it was very easy to manufacture. The tray was also capable of being made in an efficient amount of time, with a final time of around an hour and a half.
Flexibility Test (2nd test ran)	The tray was bent to see how flexible the tray was without breaking.	The tray is flexible, it can be bent a significant distance without breaking in anyway. This flexibility can help get the bananas off in an easier fashion. The only downfall of the tray in this testing scenario is the fact that when bent, the wiring of the tray maintained the bent shape slightly, making it not as flat. However, with little effort the tray can be molded back into its original flat shape.
Price	The cost of the final product was totaled.	The final cost of the tray was around \$9.31 for a full sized, less than the allotted amount. This was due to the fact that the chicken wire was \$0.25, the wood was \$6.50, and the four screws were \$2.56.
Food safe material	Multiple options were debated for the wiring of the tray	The final tray used aluminum (1) due to flexibility, cost effective, and the fact that it is a food safe material.

Redesign thoughts/ ideas: If one more prototype was able to be built, sides that are able to slide on and off of the frame should be added. This would allow for the tray to be sturdy while in the dryer and after it is removed from the dryer the tray can be bent so the bananas could be removed easier.

Figure five: Weighing the bananas on the tray.



Figure six: Drying the bananas.



Figure seven: The dried bananas, displayed by Jared A.



Figure eight: After the bananas were dried, they came off the mesh very easily.

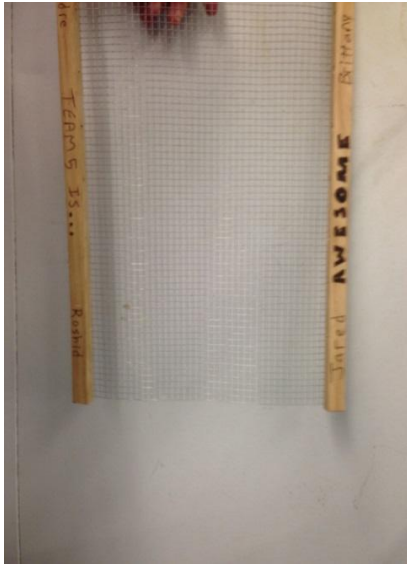
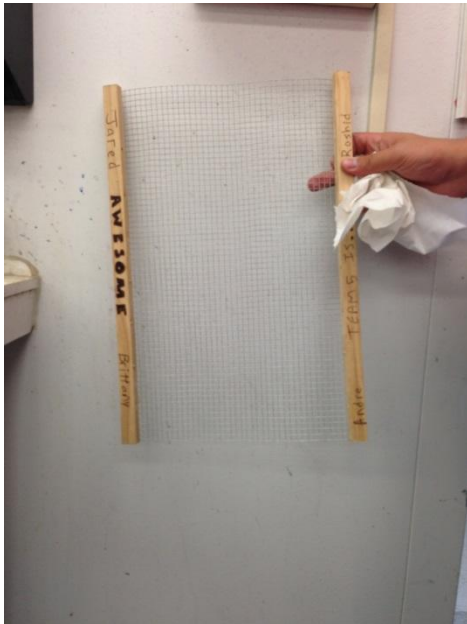


Figure nine: After cleaning the tray, which took very little effort to do.



References: 1. <http://edis.ifas.ufl.edu/fs119> (USDA food grade metals)