# Jack Solar Dryer

Test 1: Clean tray covered with banana goo (Figure 1). Use a wet cloth to scrub the banana goo off of the tray and record the time it took to clean tray using a timer.

Figure 1: dirty tray

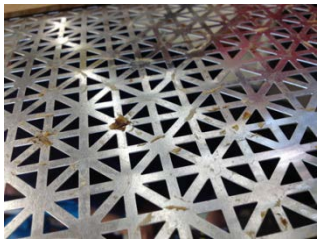
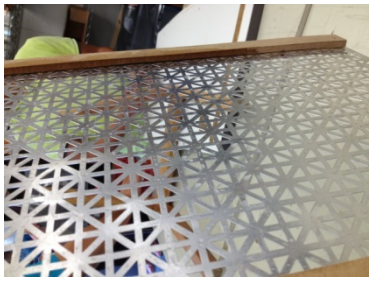


Figure 2: clean tray



Result: A great success, clean with no trace of banana to the naked eye. After cleaning the tray with a wet cloth for 40 seconds the tray was completely spotless (Figure 2) thus passing the test. The prototype passed the test because we were able to clean the tray with a wet cloth in under a minute.

Test 2: Durability drop test

So in order to test durability drop the tray from different heights (.5m, 1m, 1.5m) and see how much damage it can take.

Figure 3

Figure 4

Result: After observing the tray it barely took any damage and had just a few insignificant dents as a result from the test. Thus this test was a success and our prototype passed because the tray hardly took any damage from being dropped at different heights.

Test 3: Weight endurance

Place weights on the tray to see how much weight the try can withstand without bending or breaking.

Figure 5

Figure 6

Results: The tray was able to withstand more than 5 kg of weight without bending or breaking. Thus the prototype passed the test because it shows that the tray can hold a high capacity of fruit without bending or breaking.

| Prototype 1 | | | |
|---|---|---|---|
| Tests | Time to clean (sec) | Durability (damage done to tray) | Weight endurance |
| 1 | 56 | 2-3 dents | +5kg |
| 2 | 50 | 2-3 dents | +5kg |

| Prototype 2 | | | |
|---|---|---|---|
| Tests | Time to clean (sec) | Durability (damage done to tray) | Weight endurance |
| 1 | 48 | 2-3 dents | +5kg |
| 2 | 46 | 2-3 dents | +5kg |

Cost analysis

The current prototype Jack Solar dryer cannot meet the cost restraint of $10 because the estimated cost for the tray is $13 dollars. Although the cost is slightly over the desired cost limit, there are also great benefits that outweigh the minor faults, such as the quality and durability of the metal material which gives the tray a life expectancy that makes the tray usable for a long period of time.

Summary for prototype 2: Based on these test results, the design is excellent because the tray can be cleaned fast due to the exposure of lots of surface area, food grade , highly resistant to damage and able to hold a high capacity of fruit for drying. For the next prototype, we must be aware of the cost by seeing if we can use the same design with a less costly material. It may be a simple tray, but simplicity is what all engineers strive for.