



VNEX

Textile Bio Material made with Food Waste

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“In many places in the developed world, we eat or waste probably twice as many food calories as we really need. We’re wasteful of food. We ship all over the world. We’re now realizing that generating the energy to ship the food around the world is also ruining our climate.”

– American Molecular Biologist Nina Fedoroff

Every year, **the world wastes approximately 1.3 billion tonnes of food**. That’s about 1/3rd of global food production. In the best case it ends up in the compost. Worst case it goes to the landfill. I discovered this while staying here in Malaysia with my family during the 2020 pandemic. One day, I was helping my mum prepare dinner and saw her trash a lot of "ugly" vegetables. So I decided to follow my dad to go to the market and saw the vendors with baskets of these “ugly”, “reject” vegetables that would probably just get thrown out. After asking, sometimes the vendors will even just give away this food because it can’t be sold. This experience gave me the motivation and the idea to do something - can we use food waste to make something useful? I started experimenting with how to combine use fibers made from food waste and biomaterials with my major of textile design. What kind of materials could you make? What prints and designs look good in this very organic medium? Climate change and sustainability are so important for the planet, so I took this as an opportunity to investigate and experiment - **How can I use what’s freely available around me to make useful, beautiful things?**



Is Food Waste a Problem?



Can We Make
Something Useful
With Food Waste?

Yes, We Can!

After 3 experiments, I found a
biomaterial made from food waste
with some great useful properties.

EXPERIMENT

1

EXPERIMENT

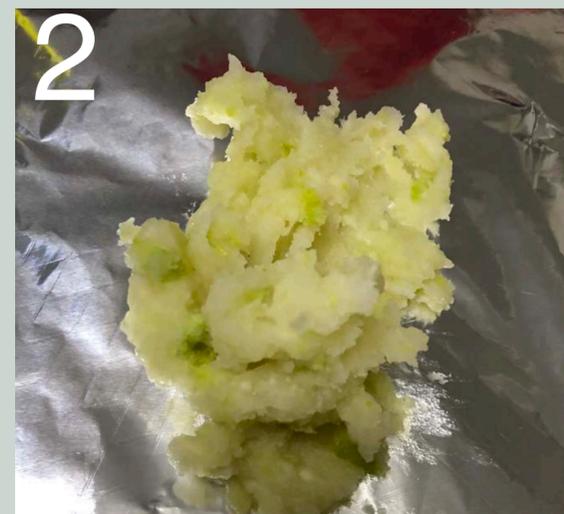
2

EXPERIMENT

3

1 EXPERIMENT

1. Add blended orange peel, cornstarch, water, agar-agar, and glycerin to pot.
2. Spread out on aluminum foil to approx. 1cm thickness.
3. Bake at 160°F for 30 minutes.
4. Final Result.



Note: This method was also tested with different vegetable, fruits and leftover flower petals

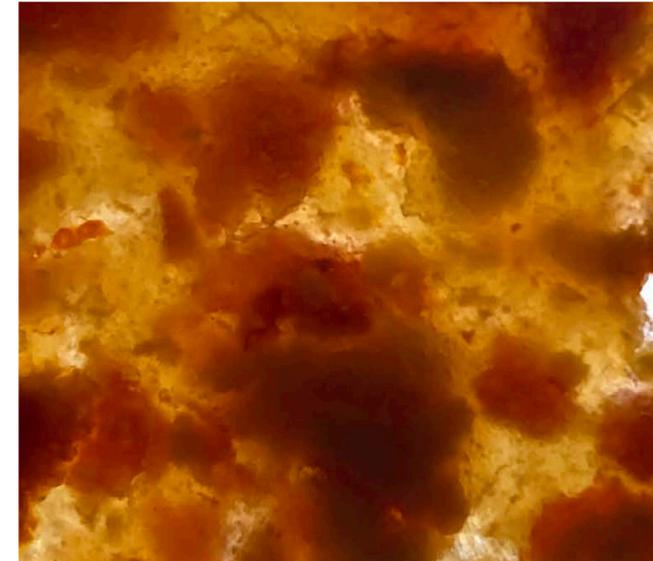
1

RESULT OF EXPERIMENT

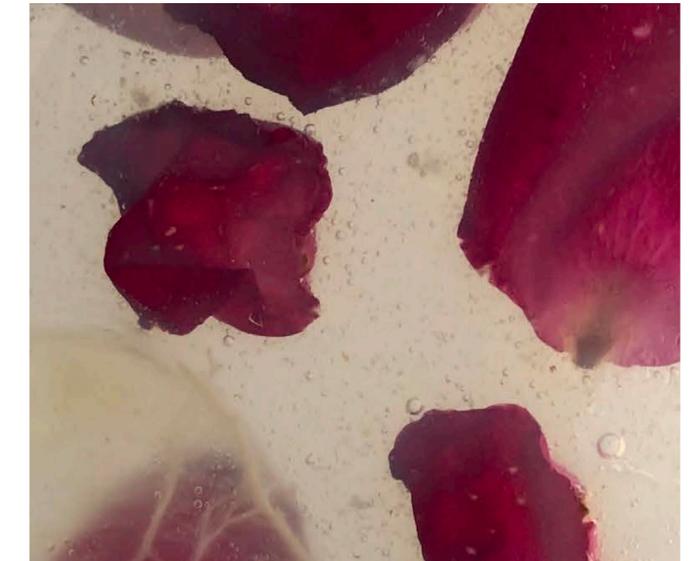
Material was pliable and colorful. However, mold developed after a few days. The results of this experiment indicated I should try to keep the humidity level low to inhibit mold growth.



Agar-agar + leftover petals



Cornstarch + Glycerin + Orange peel



Agar- agar + Glycerin + Leftover petals



Agar-agar + leftover petals



Cornstarch + Glycerin + Pomelo peel



Agar- agar + Glycerin + Pomelo peel

EXPERIMENT

2

1. Blend food waste into a pulp, mix with water, strain through a fine screen.
2. Add Konjac Flour to increase stability.
3. Add soap to inhibit mold growth.
4. Shape on a container.
5. Let dry under the sun.
6. Final outcome.



*Note: Konjac flour is also known as glucomannan, and is an herb that grows in parts of Asia.

2

RESULT OF EXPERIMENT

This material was interesting - flexible and semi-opaque. However, I wanted something more waterproof.



Konjac flour with leftover petals



Konjac flour with soap



Konjac flour with leftover petals and soap

3

EXPERIMENT

1. Food waste collected from the local market.
2. Blend with cornstarch, glycerin and water.
3. Using banana tree fiber to weave on a fine mesh screen.
4. Pour concoction onto mesh covering banana tree fiber.
5. Remove excess water with sponge.
6. Flatten and let dry in the sun.



3

RESULT OF EXPERIMENT

The results of this experiment were good, with different textures depending on the type of waste used.



Bok Choy



Guava Peel



Leftover Rose Petal



Baby Bok Choy



Choy Sum



Leftover Chrysanthemum Petal

MOLDING

3 EXPERIMENT

- 1, 2, 3. Experiment 3 works well when molded on a recycled bottle.
4. Mold thinly over plastic wrap and check for holes against a light.
5. Let dry under the sun.





WATERPROOF TEST

Beeswax can be used for a waterproof finish on the all-natural material.



All vases / planters used a combination of some of the following materials:

Beeswax

Cornstarch

Food waste

Glycerin

Konjac flour

Leftover flowers

Recycled paper

Salt

Soap

Vinegar



EXPERIMENT 1, 2, 3 ARE COMPOSTABLE

All ingredients are compostable and will safely biodegrade in a landfill after re-use

ADDING LEFTOVER WATER BASED HOUSEHOLD PAINT







Plant without planter



Plant with non waterproof planter

POT AS A PLANTER



Photo Citation : "Monstera Leaf Print Monstera One Line Drawing Wall Art Wabi." *Etsy*, [www.etsy.com/listing/580211272/monstera-leaf-print-monstera-one-line?](https://www.etsy.com/listing/580211272/monstera-leaf-print-monstera-one-line?ref=landingpage_similar_listing_bot-11&epik=dj0yJnU9a0FuQUZObjNEb2lCQmVkUkxEaWhmam5uQ0RBX1R6cXlmcD0wJm49ODFPTlFKUGM2WUVJMjNBUW5HbDZpZyZ0PUFBQUFBR0NCcWUw)

BENEFITS

Non-toxic Materials

Waste minimization

Reuse of resources

Natural Materials

Reduces Pollution

Environment Protection

Waterproof

Interior Decoration



Photo Citation : "Lorne Beach House by Georgina Jeffries: Australian Interiors: Est Living." *Est Living Interiors, Architecture, Designers & Products*, 29 Apr. 2020, www.estliving.com/lorne-beach-house-2/.

Thank You!