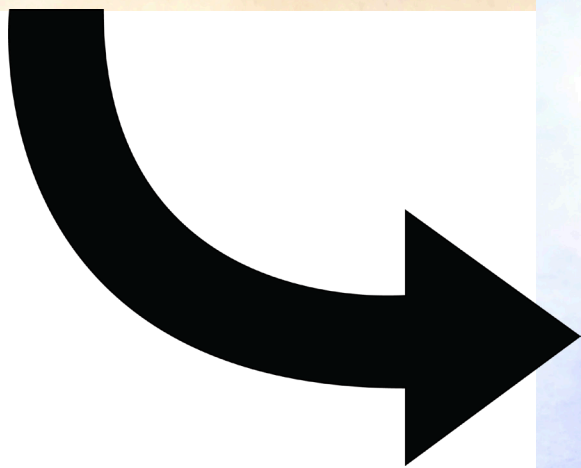


# Food Fibers

Turning meals into materials



# We Are What We Eat

The need for sustainable textiles in all industries from fashion to space exploration has fueled more interest in biomaterials. Silk can be woven from orange juice waste<sup>1</sup>, and leather can be grown from mushroom structures<sup>2</sup>. These recipes are inspired by the connection of historical agricultural uses and the pioneers of science today. They have been simplified so they can easily be made at home, while getting a simple meal or snack out of it.

These biomaterials can be made into temporary coasters, or even jewelry pieces and buttons if encased in resin.

Please note that the biomaterial recipes require molds to dry in. There are multiple easy DIY ideas you can try as shown on the last two pages of this document.

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1 Orange Fiber - <http://orangefiber.it/en/>

2 BoltThreads - <https://boltthreads.com/>





## Grilled Corn Salad with Honey Vinaigrette

Total Making Time: : ~20 minutes

Serves: 2

### Ingredients:

- 3 corn on the cobs (Needs the husk on for biofiber making)
- 4 oz. of lettuce
- 1 tablespoon of butter

### Vinaigrette

- 3 tablespoons of olive oil
- 2 tablespoons of honey
- 1 ½ tablespoons any choice of white wine vinegar, red wine vinegar or apple cider vinegar
- Pinch of salt
- Pinch of freshly ground black pepper

### Instructions:

- Step 1 - Prepare the salad dressing by mixing all of the vinaigrette ingredients in a small bowl until emulsified. Set aside for later.



- Step 2 - Peel away the corn husks and corn silk from the cobs and save for biofiber making later. Use a knife to cut the kernels from the cobs.





• Step 3 - Put 1 tablespoon of butter in a pan and set on a stove over medium heat. Put the corn into the pan and cook for 6 minutes, stirring occasionally.



• Step 4 - Prepare the lettuce in a large bowl and pour in the corn and vinaigrette dressing. Mix until combined and serve.







## Corn Husk Biofiber

Total Making Time: : 1-2 days depending on room temperature

**This recipe is safe to use with regular kitchen utensils.**

Makes 1 3½-inch round biofiber

### Ingredients:

- 3 corn on the cob husks
- 5 cups of water

### Instructions:

• Step 1 - Boil 4 cups of water in a large pot over high heat and place corn husks inside. Reduce the heat to medium/medium-low and allow the corn husks to simmer for 15-20 minutes until the leaves become translucent and lose their green color. Make sure all the leaves are submerged. You may need to add more water depending on how large your husks are. Drain the water from the husks and let it cool for at least 15 minutes.



• Step 2 - Cut the husks with scissors to make it easier for blending. Put the husks in a blender or food processor with 1 cup of water and blend until pulpy. If the mixture becomes too tough to blend then slowly add in a tablespoon of water at a time, up to 4 tablespoons total.





• Step 3 - Drain the pulp thoroughly. You can use a fine mesh sieve lined with paper towels to drain the water out. Squeeze out any remaining moisture in the paper towels.



• Step 4 - Place a few paper towels or a dish towel under your mold\*. Put the corn husk fibers in your mold and pack it tightly in the bottom. Then place another paper towel or dish towel on top of the mold and put a weight on top.



• Step 5 - Allow the corn husk fiber to dry for 1-2 days until dry to the touch and carefully remove from the mold.



**Please Note: Biofibers are NOT meant to be consumed or kept for long periods of time. Biofibers can be composted.**

\*For easy DIY mold ideas, please refer to the last two pages of this document.







## Citrus Jello

Total Making Time: : 10 minutes prep/ 2 hours to chill

Serves: 3

### Ingredients:

- 3 oz orange jello mix
- 3 oranges or tangerines (Need the peels for biocomposite making)
- $\frac{1}{2}$  cup of boiling water
- $\frac{1}{2}$  cup of cold water
- 3-4 ice cubes

### Instructions:

• Step 1 - Pour orange jello mix into a glass measuring jug. (Using a measuring jug instead of a bowl makes it easier to pour into serving cups later.) Boil  $\frac{1}{2}$  cup of water over the stove then pour the hot water into the jello mixture.



• Step 2 - Measure  $\frac{1}{2}$  cup of cold water and put 3 or 4 ice cubes in the cup. Then pour the ice water into the jello mixture. Stir until the ice cubes and jello powder are fully dissolved. You may need to add more hot water if the jello powder does not dissolve after mixing.





• Step 3 - Set the measuring cup in the fridge for 30 minutes. In the meantime, peel your oranges and save the peels for biofiber making.



• Step 4 - Take the jello mixture out of the refrigerator and pour into individual serving cups. Place the orange slices inside, then put the cups back into the refrigerator to fully set for 1 to 1 ½ hours.







## Orange Peel Biocomposite

Total Making Time: : 2-5 days depending on room temperature

**This recipe is safe to use with regular kitchen utensils.**

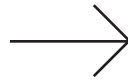
Makes 1 6-inch round biocomposite

### Ingredients:

- 3 oz orange jello mix +  $\frac{1}{4}$  cup of cornstarch  
OR 3 oz gelatin + 2 tablespoons of corn syrup
- 3 orange or tangerine peels
- $\frac{1}{4}$  cup of water

### Instructions:

- Step 1 - Take your orange peels and, using a knife or the side of a spoon, scrape away as much of the white pith on the inside of the peel as you can.



- Step 2 - Place the peels on a tray to dry in a sunny area (ideally by a window) anywhere from 1-3 days or until completely brittle. If the peels start to spoil and become mushy you must start over. This will happen if the area they dry in becomes too humid.

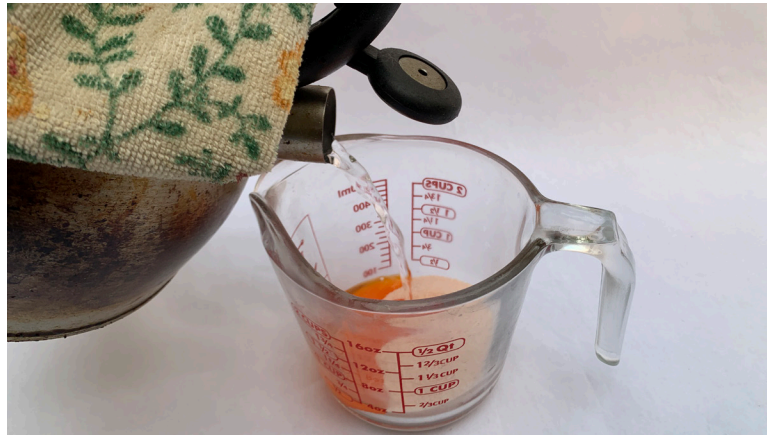




• Step 3 - Once the peels are completely dried, break them up into small pieces and crush them into a fine powder in a blender or food processor. You can also do this by hand with a mortar and pestle, or by crushing them in a small bowl with any tool that has a flat end (i.e. a meat mallet or flat end of a spatula).



• Step 4 - Boil the water in a pan. If using orange jello mix, combine with the hot water until mostly dissolved. If using gelatin, place in the boiling water with the corn syrup and mix until fully dissolved.



• Step 5 - Pour the powdered orange peels into the gelatin mix and stir until combined. Pour into your mold\* and tap it against a counter top to make sure no air bubbles are trapped inside.





• Step 6 - If using the orange jello mix, allow it to set in the fridge for 3 hours, then carefully remove from the mold and cover with corn starch. Place it back in the mold, cover with plastic wrap, and let it dry at room temperature for 24 hours, then brush the remaining corn starch off to get rid of the stickiness. If using the gelatin mix, cover the mold with plastic wrap and let it dry at room temperature for 1-2 days until dry.



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\*For easy DIY mold ideas, please refer to the last two pages of this document.





## Ideas for DIY Molds

Don't have silicon molds at home? You can try some of these ideas below instead. Remember, the biofibers can be made into any flat shape you can think of. Please note if you use a different sized mold from the original material's dimensions then you may need to adjust your ingredients as necessary. Thickness of the material will affect drying time.

- **Use cookie cutters and a baking tray.** Take a baking tray and line the surface with parchment paper. Lay cookie cutters on the surface and hold them in place as you pour your liquid material inside. If your cookie cutters are lightweight then you can put plastic wrap on the bottom and stretch it taut until there are no wrinkles. Put a rubber band around the plastic wrap and cookie cutter to secure it. Then put the plastic wrap side down on the baking tray to ensure that the liquid material doesn't flow out while pouring.

- **Use a tart pan or springform cake pan.** Cut out a circular piece of parchment paper to line the bottom of the pan, then pour the liquid material inside. Once dry you can carefully remove the sides of the pan as you would with a pastry or cake.

- **Use a shallow pie dish.** Cut out rectangles of parchment paper long enough that it comes out of the pie dish when pushed inside. These ends will be used as "handles" to pull out the material once fully dry. Arrange 2 or 3 pieces of rectangles in the pan until most of the sides are covered. Be sure to press down on the parchment paper once the liquid material is poured inside to ensure it doesn't get in between the layers of parchment.

- **Use a plate.** Cut out a circular piece of parchment paper to line the plate and pour in the mold. Plates with a flat center are recommended as it will allow for an even surface. However you can try using shallow plates, just note that the material will become thicker in the middle as the liquid settles and dries.

- **Use a cardboard box.** You can take any sized cardboard box and cut off one flat side. Outline the center square or rectangle of your mold and draw the sides of the mold as rectangles along the sides. Be sure to cut out squares from each corner so the sides can come together neatly. Then carefully bend the sides of the cardboard until you have a shallow rectangular mold. Tape or hot glue the sides and corners to secure them. Line the bottom and sides with plastic wrap then pour your liquid material inside.



# DIY Mold Step-by-Step Examples

Cookie cutters and a baking tray



Springform cake pan

