

Spicy Chili Tofu Stir Fry Over White Rice

Craving something healthy, easy and delicious? Follow along this recipe to learn to make tofu stir fry. This recipe can be made from any vegetables in your fridge, a cube of tofu and white or brown rice.

Time: 45 minutes

Ingredients

- 1 cup of rinsed broccoli
- $\frac{3}{4}$ cup of shredded or chopped carrots
- $\frac{1}{2}$ cup of onion
- $\frac{1}{3}$ cup of chopped ginger
- 2 cloves of freshly minced garlic
- 2 tablespoons of vegetable oil
- 1 cup of white rice
- 1 package of extra firm tofu
- 1.5 cups of water
- $\frac{1}{4}$ cup + 1 tablespoon of soy sauce
- 3 tablespoons of sesame oil
- 1 tablespoon of chili paste



Instructions:

1. Start off with your extra firm tofu from the packaging, wrap in paper towels and press firmly with a large book. This process will squeeze out excess moisture from the tofu block and make the cooking process easier and faster. Leave the tofu pressed for 20-40 minutes while you prepare the rest of your meal.
2. Next, rinse your white rice under warm water, this will keep your rice clean. Next add 1.5 cups of water in a pot and let it simmer. After water is boiling add 1 cup of white rice, cover with lid and allow rice to simmer on medium heat. Cook for about 17 minutes.
3. While rice is cooking, begin by chopping desired vegetables to a desired size. I like to have mine bite sized. You can use mushrooms, water chestnuts, edamame, broccoli, carrots, onions and any other vegetables. I will only be using broccoli, carrots, ginger, garlic, onions and water chestnuts. Chop your vegetables into bite sized chunks and set aside.
4. Next, chop one block of tofu into cubes about .5 inches by .5 inches. Put your tofu aside.
5. After your prep is done, begin cooking your vegetables. You may use a large frying pan or a large wok. If desired, steam broccoli in a vegetable steamer.



- Pour 2 tablespoons of vegetable oil in a pan and heat. Saute your veggies for 5-10 minutes of medium to high heat and stir often.
- Add 1 tablespoon of soy sauce to allow the vegetables to soak. Your veggies should be soft and tender.
- Throw in the cubed tofu and stir. Cook well until tofu is brown and crispy on each side.
- To make the sauce, we will be using soy sauce and sesame sauce. Add $\frac{1}{4}$ cup of soysauce into a bowl. Combine with 3 tablespoons of sesame oil and stir. Mince garlic, ginger and onion and add one tablespoon of chili paste.
- Mix this sauce into the stir fry and let cook until fragrant. About 1 minute.
- Serve over white rice.

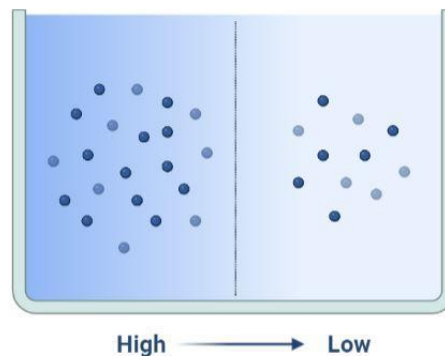
The Chemistry

One aspect about this recipe that I wanted to experiment with was the rice. I was curious to see how salt added into the water would affect the characteristics of the rice. Rice does not dissolve in water, instead it absorbs. This means that the water molecules will just build and build inside of the rice grains and do not reliquify. I learned that when salt is added into water, the solution will go through the process of osmosis in order to reach equilibrium.

Osmosis is the process by which it happens spontaneously. The molecules of a solvent tend to pass through a selectively permeable membrane in order to equalize the solution. In my case, the sodium chloride that was added to the water will pass through our rice in order to stabilize the amount of salt within the water and rice. When salt is added into water it mixes with the water molecules

and creates a new mixture. The salt makes it so that the water molecules have a more

difficult time breaking apart. This raises the specific heat capacity and water gas molecules take longer to form. The rice and water will go through osmosis in order to reach an equilibrium. This means that the rice will absorb as much salt water as it takes to create equilibrium within the water and rice in terms of the amount of salt in both the water and rice grains. The salt will cause the flavors to pop and be more intense since salt is a flavor enhancer.

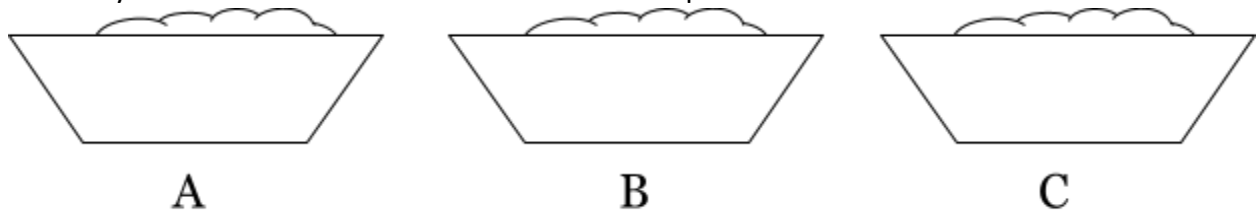


Experiment

To test this science I made three separate batches of cooked white jasmine rice. Each batch of rice was $\frac{1}{4}$ cup of rice, cooked in a rice cooker with approximately $\frac{3}{8}$ cup of water. Each batch of rice had a specific amount of salt. The first batch of rice had no salt in it, the second batch had $\frac{1}{4}$ teaspoons of salt, and the third batch had $\frac{1}{2}$ teaspoons of salt. For each cup of

water, the recommended amount of salt was ½ teaspoons of salt, so our second batch of rice will be closest to the recommended amount of salt per every cup of water. Each batch of rice was cooked for 30 minutes in the same rice cooker.

Since each batch of rice was cooked one after the other, the first batch of rice was sitting out for about an hour before consuming, and the second batch for 30 minutes. I let batch three sit out for 20 minutes and covered all three so that none of the batches were dryer than each other. After 20 minutes, I put each batch of rice into the microwave and cooked each for 30 seconds. After doing so, I put them in identical bowls and wrote on the bottom of each bowl 1, 2 and 3. I asked my brother to swap around each bowl of rice and left the room. This made it so that the taste test was completely blind. When I returned, I gave each bowl a letter that I could see easily. I took 1 bite of each bowl and identified specific characteristics about each one.



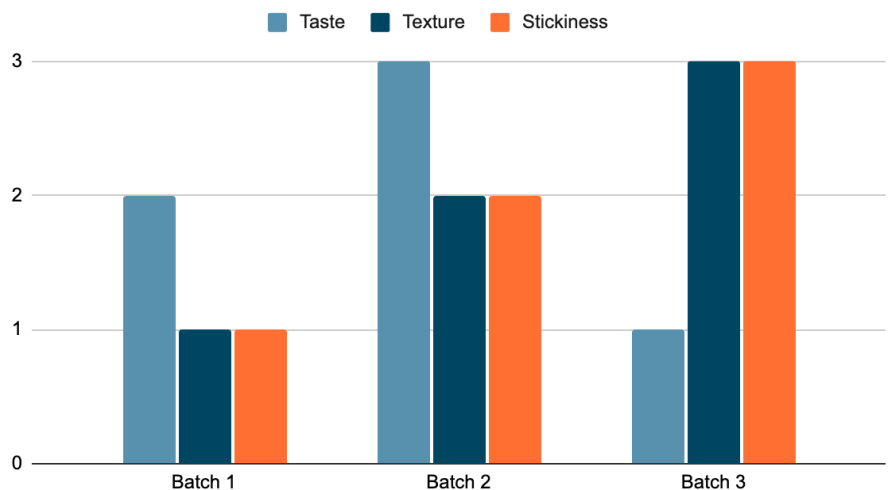
Results

While tasting bowl A I at first couldn't taste much saltiness and the texture of it seemed very average. Not dry or chewy, very well cooked rice with not much taste. After taking time to identify any flavor profile of bowl A, I moved on. After tasting bowl B, it tasted much more bland than bowl A and more dry than bowl A. Bowl B didn't stick to itself as well as bowl A and was slightly more crumbly. When I tasted bowl C it tasted slightly sour and salty. This bowl was cooked the best out of all three bowls. This bowl was slightly too salty for me and I wouldn't try it again. After finishing my blind test taste, I revealed the bottoms of the bowls. Bowl A was batch 2, bowl B was batch 1 and bowl C was batch 3.

I believe that batch 3 was the best cooked because when salt is added to water the rice will desire to absorb the water at a faster pace in order to reach an equilibrium. This is

because of osmosis, which I wrote about earlier. The third batch also had less steam, therefore the rice also absorbed more water, because salt creates a higher specific heat capacity and therefore will create less steam. The flavors of batch 2 were the best simply because the salt

Tastiness of My Rice



enhanced the natural flavors in the rice.

Sources

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