

Fried Mahi-Mahi Taco Topped With a Delicious Mango Sauce

Our dish is inspired by our Mexican culture. That is why we decided to make fried mahi-mahi tacos. In our dish, the mahi mahi is laid on top of a tortilla and topped with a delicious, sweet and spicy mango sauce, along with shredded pepper jack cheese, fresh onions, tomatoes and lime juice.

Pure oil doesn't jump when heated. That is why if you heat oil alone, it will be calm. But when you add water or some type of food like chicken or fish, which is moist, it will jump. Water will sink to the bottom of oil because water is denser. Small pockets of water get stuck under the oil and turn to steam. When there are pockets of steam under the oil, the pressure breaks off the pocket explosively. When that happens, oil is kicked up from the small pressure explosion from the water and that is what makes the oil jump everywhere. The reason why pure oil doesn't jump like other types of oils is because it's has no water, so other oils would jump because it has water.

When we take the tortilla right out of the bag after buying it from a store, it tends to be more breakable and have a little less elasticity. They also taste a lot more bland when not heated up. When we heat up the tortilla for our tacos, it is simply undergoing a physical change because the tortilla is only changing in temperature. This physical change still makes the taste much more desirable. It would only be a chemical change if some browning occurred on the tortilla, which isn't required for it to soften.

When you eat a spicy food, you feel a hot and burning sensation in your mouth. The reason why that happens is because capsaicin, which is an ingredient in spicy food, binds to a vanilloid receptor in your mouth called a VRI receptor. After capsaicin binds with these receptors, a signal is sent to the brain indicating the presence of spicy. A VRI receptor's purpose is to keep us from burning ourselves while eating, but they were not made to recognise capsaicin, which is in spicy food. Water will not get rid of spice because water doesn't bond or mix with capsaicin due to its hydrophilic(water resistant) properties. A way to get rid of the burning sensation is with milk or peanut butter. The reason why it gets rid of the burning sensation is because fat contains casein (a fat loving compound) which binds with spicy capsaicin and makes the burning sensation go away.

When food is cooked, the texture of the food sometimes changes. An example of this is frying fish. Before frying there were different textures on the fish however, after frying it all transforms into the same texture. For example when the fish and the breading are raw, it feels slimy and the breading sticks onto your fingers. When you put this in 350 degrees oil, it fries the fish and makes the texture even. This happens when you put the fish in fat (oil) and it completely sinks. The surface of the fish dehydrates. Through a series of the Maillard reaction, the sugars and proteins break down to create flavor and a golden brown color.

The reason why we chose to use bell pepper for our mango salsa was because it has no spiciness and wouldn't take away the mango flavor from the sauce. The reason why bell peppers aren't spicy is because they have no capsaicin due to a recessive gene which stops the production of capsaicin. Capsaicin is the compound found in peppers that stimulates the heat and pain receptors in your mouth and that we perceive as spiciness. Peppers are ranked on the Scoville scale based on the amount of capsaicin they contain. The Scoville Scale is the measurement of spicy heat. The hottest pepper is the Carolina Reaper. With most peppers, if you handle them without gloves you will most likely get a chili burn. However, with bell peppers you won't need any gloves because bell peppers don't have any capsaicin, which means you won't get burned.

Conduction is the flow of heat from an area with high temperature to one of lower temperature. Conduction is caused by the interaction of particles. For example, the movement of molecules is caused by the heat that comes from the bottom of the pan where a liquid is set to boil. The particles of the liquid start moving faster and faster at the bottom and then start traveling through the liquid, carrying energy with them. These particles then bump into others, creating a mass effect of collisions, extending the heat particles and heating up the liquid. The heat from the fire on the stove is what heats up the pan. In this recipe, the pan that holds the oil that will be used to fry the bread/chip crumbs for the mahi-mahi fish is heated up on the stove through conduction. But, conduction is not the only process that is used to cook the mahi-mahi. After conduction, comes convection, which is the flow of heat through fluids. In this case, the heated fluids are moving away from the source of heat, carrying energy (heat) with them. During the cooking of our dish, heat travels through the entirety of the oil and reaches the fish floating in the oil. Then, the process of conduction is repeated as the heat travels through the fish, heating and cooking it.

When we fry the fish and it cooks, something is happening to it that gives it a different flavor and aroma. The Maillard reaction is responsible for the changes in texture, look, smell and taste. When the fish is cooked to a temperature of 285 °F, the reaction begins rapidly accelerating. Because of this, the Maillard reaction typically doesn't take place in wet foods or foods submerged in water because water's boiling temperature is 100 degrees Celsius (at surface level), below the point where the Maillard reaction really starts taking place. However, oil has a much higher boiling point and can reach 285 °F, allowing for the Maillard reaction to take place in foods in oil. Once this process is done, the fish comes out of the frying pan browned and with a lot more flavor compounds that have been produced, tasting a lot better than it would have before.

The tongue has 5 taste receptors; bitter, sweet, salty, sour and umami flavors are detected by particular proteins on our taste buds. Your brain and nose play a big role in "tasting". There are dedicated receptors for each taste on the tongue, and each class of receptor sends a specific signal to the brain. The brain is what puts meaning to the 5 basic taste receptors. When you chew, you are forcing air through nasal passages carrying the smell of the food with it. Without this you would not be able to grasp complex flavors. In our dish, we activate all of the taste receptors in some way. From our basket ingredients alone we are activating umami with the Mahi-Mahi and cheese, salty with the potato chips, sweet with the mango, and bitter with the cilantro.

When you cut an onion, your eyes experience a burning feeling and your eyes start to tear up. The reason why this happens is because onions produce a chemical irritant known as syn-propanethial-s-oxide. The chemical stimulates the eyes' lachrymal glands, which makes eyes release tears. Cutting an onion is both a chemical and physical change. When you cut it, it is physical because you are just chopping it to make it into smaller pieces, and no new substance is formed. An onion is also chemical because when you cut it, Lachrymatory-factor synthase is released in the air, then the synthase enzyme (that links together the two macromolecules) converts the amino acids of the onion into sulfuric acid. The acid gets into the air and gets to your eyes. That is why cutting an onion is both a physical and a chemical change.

