

Flan- It's Flantastic

Scientific Paper-Ori Rehman, 4/15/19

Abstract:

A sweet dessert and interesting food to make, Flan. Flan is in the style of a cake or custard and is sweet with caramel and vanilla. The project is to determine the difference between organic flan and non-organic flan. I am experimenting with this issue because of my vast interest in organic foods, and why they can be better for you. Two flans will be created, one with non-organic ingredients and one with organic ingredients. The same methods of preparation and amount of material are going to be used while preparing the food. The method is to cook the flan the same but with organic material being the independent variable. We are testing what will change in the appearance, and how the texture will differ in the two products. The two flans did indeed differ in both color and texture by a mass difference. These results can help us figure out what is in the ingredients that change the distinct features that were observed. We are left with perfect representations of organic and non-organic food.

Introduction:

The purpose of this project was to create a dessert in two different styles of cooking with different ingredients with each one. The purpose of changing the ingredients was to test organic options against non-organic options. Organic foods tend to have higher levels of vitamins and have antioxidant levels. Organic foods do not have the additives that non-organic, and processed foods possess. The additives that non-organic foods can have are designed to affect the physical appearance of the food, as well as the taste. Going through this process organic can bring the pure definition of natural no-additives of the food that can make the food not physically, and containing the same texture as non-organic.

Looking ahead we are trying to see how organic ingredients such as the eggs, milk, sugar, and vanilla. These are expected to change the flavor as well as the physical aspects. Flan is a Mexican dish originally and is presented in many other different ways. The

traditional Flan with vanilla. Flan is a moist, and creamy dessert that is in a similar structure to a pie topped with caramel.



As many people know, using organic ingredients is the obvious choice for a healthy lifestyle in eating. Many people switched to this way of eating in the fear that processed food is not producing enough nutrients, and vitamins that the everyday person needs. Organic food is non-pesticide, and no preservatives or additives are added. The

These additives are designed to “enhance” the product from its original state.

Organic foods help to prevent disease including reducing the chance of obtaining cancer. Now organic options in the diet are no doubt expensive, however, it is a sure way of obtaining the nutrients that the human being naturally needs.

Effects of eating organic can increase energy in the body. An additional effect can be supporting the skin to resist to UV radiation. Without the pesticides that are added to non-organic, there are indeed more health benefits when consuming.

Methods:

There will be a few, safety concerns during this experiment. Dealing with raw material can be dangerous to ingest, so this will be taken care of carefully. The main concern for safety is dealing with hot objects such as boiling materials and hot pans during the cooking process. The way to avoid this is to wear proper protection such as oven mitts and use your kitchen utensils correctly.

Two products are being made in this experiment, and the two products are a Flan made from non-organic ingredients, and Flan made with organic ingredients. The first product in this process is we are going to make the flan without using organic ingredients. The ingredients are made sure to be processed. This will be the control during our experiment, and we will use this to compare to changing the ingredients to organic for the second Flan. The cooking process and amounts of ingredients will be the same for each Flan being made.

Now that these mixtures are complete, we can now begin the cooking process. The oven is

first step is to gather the materials needed for the two flans. There are two things that are needed for preparing each Flan, this is the mixture for the main flan and the caramel sauce. The caramel sauce is the first thing to make. There are two different kinds of caramel sauce being prepared in this experiment. One will have organic sugar and one will have regular white sugar. For each recipe, 1lb of sugar will be mixed with 2 tablespoons of water, and 1 tablespoon of butter. This mixture will be boiled until a golden brown substance is created. This is caramelizing the sugar with added heat and moisture.



The next step is creating the mixture for the flan. We will be mixing 4 eggs, 14 oz of sweetened condensed milk, 12 fluid oz of evaporated milk, and 1 tablespoon of vanilla. The mixture will begin with the 4 eggs in each mixture (organic and non-organic) whipped in the bowls. After the eggs are whipped and ready, the milk for each one is added to each bowl. After these mixtures are complete the vanilla is added in the final step to making the Flan mixtures.



preheated to 350 degrees Fahrenheit. The mixtures are poured onto the caramel in the baking dishes. The dishes are placed in the oven when the oven is heated. During this whole process, both the ingredient amounts stayed the same along with the techniques on combining the ingredients as well. The time to complete cooking is 60 minutes. Before the flans are put into the oven they are covered tightly in tin foil for conserving the moisture of the flan while cooking. While cooking the caramel on the bottom of the dish metals with the heat and mixes with the bottom layer of the flan in the dish. After 60 minutes. Each dish is removed from the oven with oven mitts and placed on a cooling rack to cool down. I am predicting that the color will change with the organic flan, and the density and texture of the organic flan will be different as well. I believe that with the different egg yolks in color will affect the color of the flan. After the Flans have been cooled they are inverted onto plates. The process is complete from here.

Results:

Beginning with the caramel, I poured the solution when complete into two baking dishes. When the solution was boiling it maintained a liquid stance with the added heat keeping it a liquid. When the heat was removed from the solution it became a solid after poured onto into the dishes. The reason for this was the crystallization process beginning after the heat was taken away. In the pan, I was left with a light brown caramelized sugar. After the 60 minutes when the Flan was removed from the oven. I let them cool for 60 more additional minutes. The reason that I let them cool is to reduce the risk of sticking to the tin foil, and sticking to the edges when they are inverted onto the plates.

Flan Appearance

The following photo is the flan when the tin foil is removed from the surface of each one.



The left flan is the non-organic product and the flan on the right is the organic product. My first reaction was to assume that gas pockets formed on the tops of each flan, but I came to the conclusion that this was from sticking to the tin foil. The flan is inverted onto two plates, and now ready to consume.



The flan on the left is the organic flan, and the flan on the right is the non-organic flan. During the cooking process the caramel re-melted and soaked into the flan and was left on top in a liquid on top of the flan. The sugar fully dissolved over the flan. My family the test subjects as a dessert after dinner. The first reactions were as expected. Appeal leaned towards the left flan, and this was assumed to be the non-organic flan. I would expect this being that non-organic foods are designed to be most appealing, and best in texture. However, this was an organic flan.

Dark	in the middle	Light
A	B	
	A,B	
	A	B
	A	B
	A	B
	A	B
	A	B
		A, B

Flan A is organic and flan B is non-organic. After receiving the information for appearance, the organic flan did indeed to lean more to the darker appearance compared to flan B. My hypothesis was correct on organic affecting the color and appearance of the flan.

Flan Texture

Like Jello	in the middle	Like Cake
	A,B	
	A,B	
B		A
B	A	
	A	
B		
	B	A
	A,B	
B		A

After consuming the flan myself and others you could notice a difference between taste and texture right away. Flan A(organic) contained an abundance of gas pocket that rose and burst during the cooking process. This gave flan A the texture almost relating to cake instead of a custard. Flan B did not contain near as many gas pockets giving it a smooth and creamy texture. I did not focus on taste quality as much as texture, however, the taste was favored to flan A in sweetness. Flan B was more desirable on the texture rating. Overall only one person knew which flan was which. This did not shock me given many

Conclusion:

People believe that organic foods are less desirable to the eye compared to processed or non-organic foods.

Discussion:

I want to begin why the caramel was a light brown instead of a golden brown comparing the two caramels. I believe that the reason for the color was using organic grain sugar instead of white sugar. I believe this occurs because there is a natural molasses in organic sugar that keeps the sugar a naturally darker color. When white sugar is processed all of that molasses is removed, so the browner color is gone.



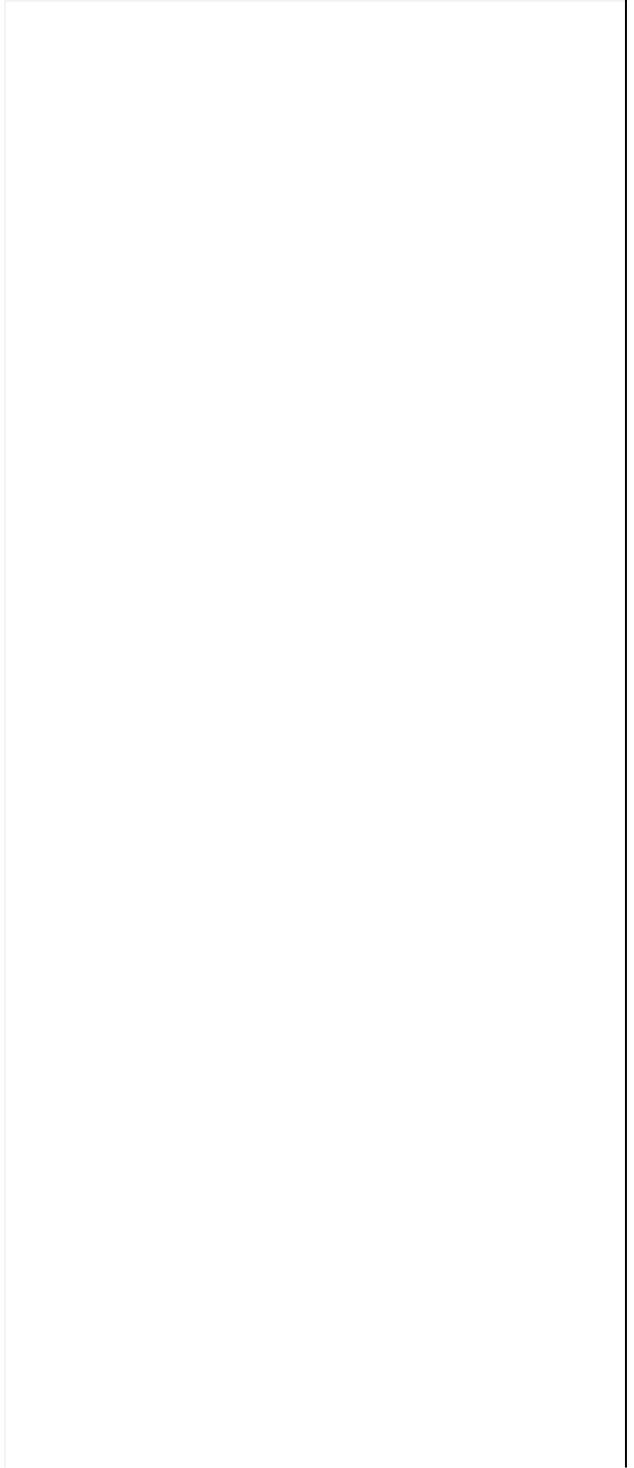
Moving on to the flan appearance one was darker, and one was lighter. This was not from sugar since there was no sugar added. I believe that the color difference came from the egg yolk difference. The organic yolk was darker than the non-organic yolk. The milk and vanilla were the same texture and color, and I believe there was no reaction to affecting the color of the final product. Since the organic yolk was darker I believe this is the reason for the darker colored flan. Focusing on the texture and taste now. The organic flan had many air pockets from the gas during the reaction while cooking the flan. These air pockets caused the texture to be moisture, and be more in the style of a cake. The non-organic flan did not have these air pockets, so the texture was more solid.

The Flan experiment went well, but not in the way that was originally expected. Organic foods have always been an interest of mine, and I gotta put that to the test with dessert. The organic flan was favorable to the taste, however, was not favorable to the texture of the original flan. Chemically the organic created a darker dessert compared to the lighter option with the non-organic flan. The experiment was very helpful in knowing how organic materials can affect food.



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