

An investigation into milk

- The difference between plant-based milk and cow's milk -

Contents

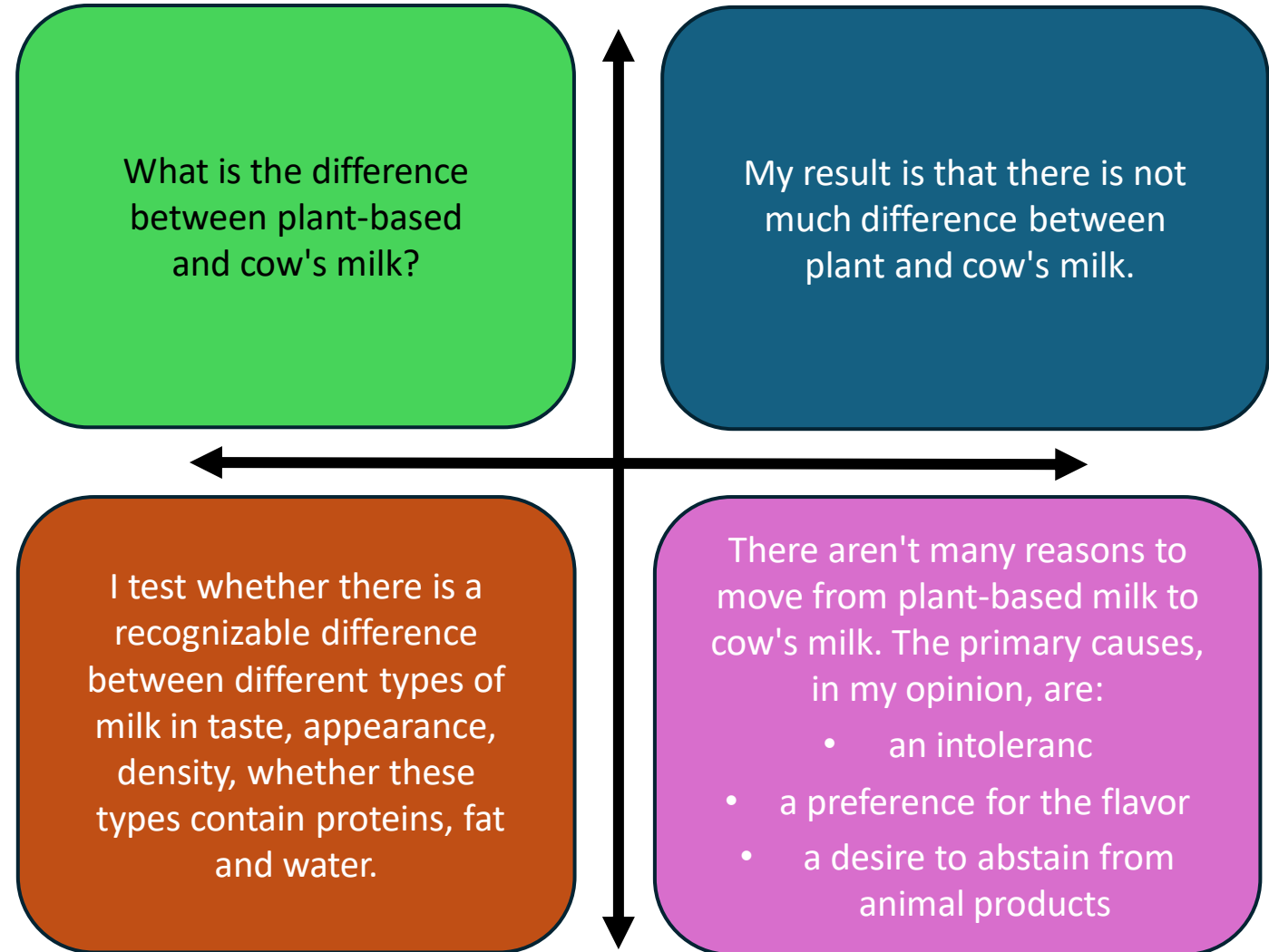
1. Hypothesis
2. Tasting
3. Appearance
4. Water
5. Fat
6. Density
7. Result
8. Products
9. References

Hypothesis

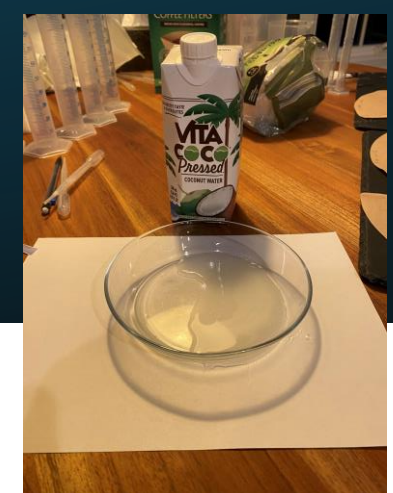
I think that there is a big difference between plant-based milk and cow's milk, in the following criteria: density, taste, appearance, water content, fat and proteins

This was inspired by my belief that plant-based milk is essentially flavor-infused water with a little of milk flavor, giving me a faint but distinct milky taste. Given that coconut milk is meant to taste tropical, some claim that almond milk pairs better with rice milk and coffee due to its sweeter flavor. Right now, I believe it differs from person to person. Furthermore, some milk is essentially flavor-infused water. Furthermore, I believe that there is a significant difference between the proteins in ordinary milk and plant-based milk, since flavorings and water don't include many protein components.

Quad chart



Appearance / Tasting



Type of milk	Appearance - description	Tasting
Normalmilk	It is quite thin, slightly more viscous than water, transparent at the edge and then becomes increasingly yellow-white.	Thin liquid, a little dry and sweet with a greasy sweet aftertaste in the throat.
Almondmilk	Surprisingly viscous in appearance, yellow-white, transparent at the edge and in the middle, yellowish, opaque	Extremely watery, with a little flour and almonds, the taste is not great in my opinion, the taste gets stuck in the throat and mouth.
Ricemilk	Rice-colored, white watery, viscous and amazingly transparent.	Rice-warm taste, with a little tea bag behind it, tastes like a mixture of a little cream, rice and water.
Kokonutmilk	Extremely watery with a little bit of transparency with the color watery white.	Watery with a sweet coconut milk flavor that is very intense and lingers in the mouth and throat.
Cream	Surprisingly, it is quite thick and does not have the tapered edges of milk, all the same height and white color.	Thick, neutral no taste, nothing but a little greasy taste and afterwards a greasy taste in the throat and mouth.

Protein

Implementation (How I did it)

I add two milliliters of lemon juice to the milk to check for proteins. Milk contains proteins if it crystallizes into flakes. There are more proteins in milk the more flakes there are.



Normalmilk



Almondmilk



Ricemilk



Cream



Kokonutmilk



Protein	Yes	Yes	Yes	Yes	Yes
Comment	Surprisingly few proteins compared to the others.	Many proteins, more than the others.	Just as I thought few proteins.	Very few proteins, less than all the others.	As I thought, just a few proteins.

Water

Implementation (How i did it)

Boiling milk allows me to determine whether or not it contains water; if it does, water vapor will form.



by Finn Ulle

Water

Type of milk	Water Yes/No	Comment
Normalmilk	Yes	I did not think that milk also has water in it but when you think about it it just makes sense.
Almondmilk	Yes	These nature based milksorts have a high amount of water in it.
Ricemilk	Yes	The same as in almond, these natural milks are based on water, what means that they have water in it.
Kokonutmilk	Yes	The same answer as slmondmilk and ricemilk, because they are all milktyps who are made of plants.
Cream	Yes	Yes, i was suprised that there is still water in that fat based drink.

Fat

Implementation (How i did it)



To determine whether there is fat in the milk, I pour some milk (1 ml) over a coffee filter and then look at the remaining fat.

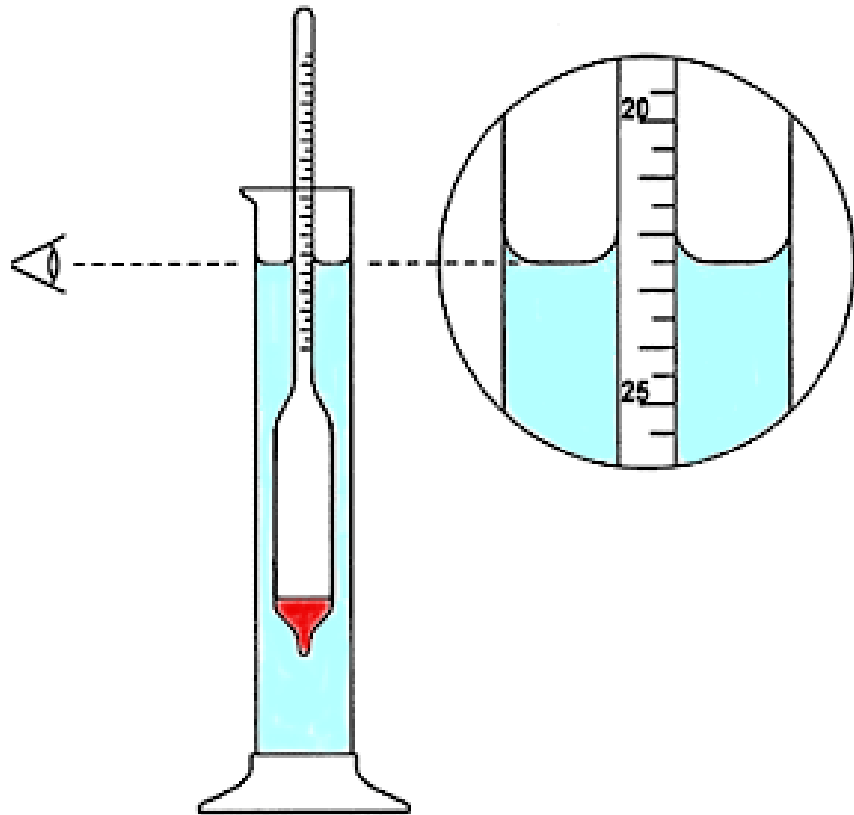
Fat



by Finn Ulle

Type of milk	Fat Yes/No	Comment
Normalmilk	Yes	It was not very surprising that the milk has not so much fat as cream but also not less than kokonutmilk.
Almondmilk	Yes	Had more fat than rice milk, that was surprisingly because I always thought that almonds have more fat than rice.
Ricemilk	Yes	Was very predictable because it is not such fat as cream and not such fat less as kokonutmilk.
Kokonutmilk	Yes	Has the lowest amount of fat.
Cream	Yes	Has the biggest amount of fat.

Density

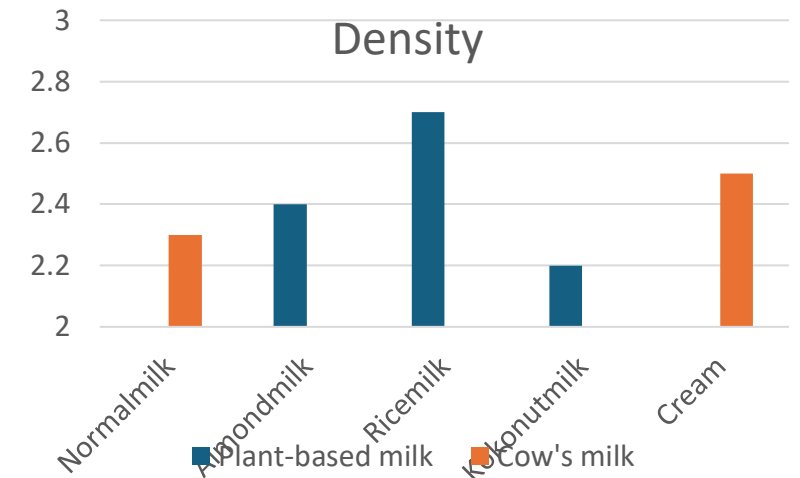


Implementation (How i did it)

I measure the density of the milk by pouring a little milk (ml) into a glass and then adding another glass that floats in the milk with a little sand (always the same amount) and a measuring device (a strip of paper with cm lines to count). Then I write down the value on the measuring scale and there I have my value. That works on the same principle, as the picture shown.

Density

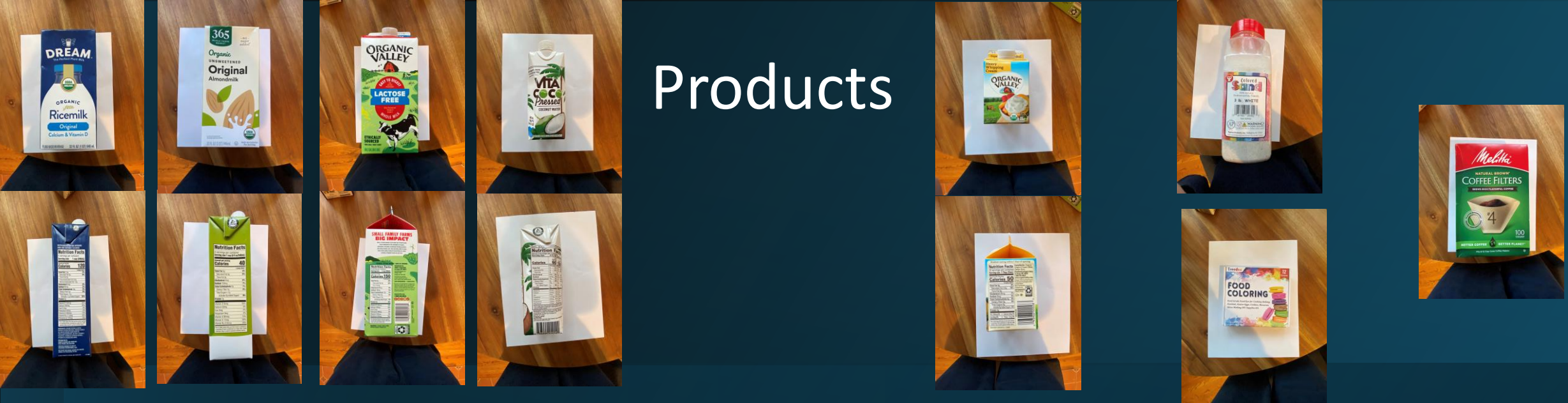
Type of milk	Density	Comment
Normalmilk	2.3	It was surising that the Normal milk is not thiker than the almondmilk because it tasted thiker than the almond and rice milk
Almondmilk	2.4	I don't thought that almond milk gets so near to the cream.
Ricemilk	2.7	It was very suprising that the ricemilk was the thickest milk because it was just so equal to water.
Kokonutmilk	2.2	I already thaud that the kokonutmilk is the thinnest beacause it tasted and lookd like a mixture of normal milk with water.
Cream	2.5	The cream was surprisingly not the thickest milk type.



Result

The result of my experiments in regard to my hypothesis is that there is a difference between vegetable milk and cow's milk, even if it is not very big, it still exists. Cow's milk has more fat than plant-based milk, less water and less protein. So I was correct, because there is a difference, it might not be big, but it still exist.

Products



References

- https://www.supralernplattform.de/images/stories/Naehrstoffe/doks/4_Informationenblatt_Eiweissnachweis.pdf
- <https://www.unterrichtsmaterialien-chemie.uni-goettingen.de/material/7-8/V7-211.pdf>
- https://www.supra-lernplattform.de/images/stories/Naehrstoffe/doks/4_Informationenblatt_Eiweissnachweis.pdf
- <https://forum-raspberrypi.de/forum/thread/34499-dichtemessung-in-fluessigkeiten/>
- <https://cornelsen-experimenta.de/aktuelles/fettnachweis/>
- <https://www.derstandard.de/consent/tcf/story/2000079425830/>