

Hong Kong Student Science Project Competition 2023

Marymount Secondary School

Team Number: JDBC105

Project Title: Alternatives for ginger and factors in ginger milk curd

Project Type: Investigation Design Proposal

To our best knowledge, there are * similar works in the field; (if there are,) related research links are as below:
Ginger milk curd - BASFbasf.com

<https://www.basf.com> › sustainability › kids-lab

The enhancement our project proposed / the difference with related research are:

In the project, more substitutes such as honey will be used. We would also try to investigate the difference between old ginger and fresh ginger, the effect of the temperature and enzyme reactions. We would like to enhance and investigate low-protein milk and high-protein milk.

I. Background

- As the history of the ginger curd milk is in Guangdong Province, Panyu City which is the same as Hong Kong, it is important to promote it to Hong Kong and become an Intangible Cultural Heritage.
- We would like to investigate and understand the science behind the Chinese traditional dish, ginger curd milk.
- Principle behind: The protein in the milk coat with a hydrophilic layer (water soluble). The protease in the ginger will take away the layer. The protein in the milk binds together and causes coagulation.

II. Objective(s)

- Find suitable conditions for making ginger milk
- Alternative of ginger
- determine the key factor that affects the product, under what circumstances will the milk curd form
- As less and less people make ginger curd milk, we would like to promote it to the new generation and introduce
- Make ginger curd milk into an intangible cultural heritage through scientific investigation

III. Hypothesis

- Ginger curd milk is made when milk heated almost to its boiling point is poured and mixed with ginger.
- Similar food with similar enzymes will have the same coagulation effect as ginger curd milk.

IV. Methodology

- Watch glass	- Grater/shredder
- Heater	- Whole milk
- Beakers	- Soybean milk

- Rubber stopper	- Ginger
- Thermometer	- Kiwi
- Electronic balance	- Honey
	- Canned pineapple

Experimental protocol

1. Ground the ginger to get the fresh ginger juice
2. Measuring weight of milk
3. Heat Heating samples to 70-75 degrees Celsius
4. Pouring milk into ginger juice
5. Place the product in room temperature for around 15 minutes
6. Place the rubber stopper on top to test the hardness of the product

Analysis

The level of the coagulation of the product will be tested by placing a rubber stopper on the surface. If the rubber stopper sinks, it means the level of coagulation is 0 (no coagulation happened) We demonstrated with the rubber stopper to show the density difference between coagulated and non-coagulated substances.

V. Expected Results and Impact of research

Expected result:

Combination of coagulated product	Non-coagulated
○ old ginger + whole milk	○ fresh ginger + whole milk
○ kiwi + whole milk	○ old ginger + soybean milk
○ canned pineapple + whole milk	○ honey + whole milk

Limitation:

- ratio of milk and ginger does not investigate
- temperature of the milk does not investigate
- small scale and portion of milk is used instead of large scale

Importance and impact:

spread chinese culture and make it into an intangible heritage cultural

Ginger curd milk is a classical Chinese hot dessert, it's speciality and tastiness grabs people's attention. Our research studies different aspects of the ginger curd milk, modernizing the dessert, combining Chinese culture and science into one. Hopefully spreading this unique dessert to more people, turning it into an intangible heritage, becoming a signature of Chinese food culture.

VI. If your team will compete for the Sustainable Development Award, please indicate the specific sustainable development goal the project is related to, and provide justification for competing for this award. (Word limit: 300 words)

Sustainable Consumption

Nowadays, Chinese culture is being overtaken by other cultures like Western, Korean etc.. More and more Chinese people in different parts of the world do not know much about their own culture and are causing our unique culture to be lost. Ginger milk curd is one of the ‘victims’.

The ICH Advisory Committee deliberated on and endorsed the selection criteria of the Representative List as follows:

- (1) the item has been inscribed onto the ICH inventory of Hong Kong;
- (2) the item embodies local traditional culture and carries significant historical, literary, artistic, scientific, technological or arts and crafts values;
- (3) the item is transmitted from generation to generation and has a dynamic and living nature;
- (4) the item possesses the distinct traits of an ethnic group or a region, or manifests the characteristics of the local living culture as a typical example of that culture; and
- (5) the item exerts significant influence on the community, reinforces community ties and provides communities or groups with a sense of identity and continuity.

Ginger curd milk fulfilled 2,3,4,5→ which is possible and should be listed on the ICH

With ginger milk curd being listed on the ICH, the crowd then would bring more attention to it, and possibly purchase or make more of these. The recipe and story behind ginger curd milk then can be known by many, and this Chinese cultural food can be kept forever and have production of 100% successful. This enhances the value of it to the crowd, and opens up or widens the market of ginger curd milk, making it become a sustainable consumption. (266 words)

VII. Conclusion

- We can make alternates of the original recipe (using ginger, which contains protease), by using ingredients that also contain protease and digestive enzymes, and create fusion recipes, and we found out that kiwi is the best option. By replacing kiwi in the recipe, adding new aspects to it, we can modernize the ginger milk curd into something new.
- We found out that the ratio, temperature of the ingredients is the key that determines whether the curd milk succeeds or not. From several experiments, we discovered the golden ratio of 4:30 (ginger juice to milk).
- Proven with many scientific investigations, the science behind ginger curd milk is complicated but yet simple to make if you know the method and proportions. This can truly show the wisdom and scientific mindset of Chinese people and culture and should be kept and spread forever as it embodies local traditional cultural and scientific values.