

Hong Kong Student Science Project Competition 2023

Template of Extended Abstract (Invention Design Proposal)

(Word Limit: 1,600 words, Pages: 3 pages only)

Team Number: SCBC095

Project Title: Chilly Frost Icy (ICY Machine)

Project Type: Invention Design Proposal

To our best knowledge, there are / are no * similar works in the market; (if there are,) related product links are as below:

<https://www.cuisinart.com/shopping/appliances/ice-cream-and-yogurt-makers/ice-30bcp1/>

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

We are here to design an ice-cream and milkshake nutrients calorie detecting machine to cater for their needs.

**Please delete if not applicable. The competition values the originality of works. Students must do enough literature research to ensure that their works are unique and list relevant reference materials before starting research or invention.*

I. Background

- Provide background information as to learn about the audience for whom the project is addressing
- Provide highlights of the **literature review** and/or related technologies or devices, with the support of pertinent and reliable references
- Provide an overview of work, create a point of view as to define the needs and insights of the audience, and mention the **research or technology gap the project is trying to fill**

Our group observed that people nowadays often release their stress from school, work, etc. by consuming sweets. However, this type of stress-relieving method is not convenient and healthy. Moreover, urbanites are often in a laborious situation and lack the opportunity to go out and enjoy food, they are often hungry and neglect the ingredients, nutrition and effects of food on the body. Most people also choose to enjoy different types of milkshakes and ice cream during their leisure time. They need to find a store to buy these desserts and, in the long term, consuming too much sugar also affects our health. It leads to being overweight, heart disease, cancers and diabetes etc. In light of this, we are here to design an ice-cream and milkshake nutrients calorie detecting machine to cater for their needs.

<https://www.fortunebusinessinsights.com/ice-cream-market-104847>

<https://batonrougeclinic.com/is-it-okay-to-eat-ice-cream-every-day/>

II. Objective(s)

- State the **aim(s)** of project

We aim to create a kitchen device that can make both ice cream and milkshakes with ingredients, calories and nutrition detectors. Not only can urbanites enjoy desserts easily and conveniently at home, but also the ingredients of desserts can be detected so that they can be enjoyed while focusing on health.

III. Methodology

- List out and briefly describe the **approaches** that will be used to test the feasibility of the Invention e.g. use of equipment, materials, tests and related experiments
- Explain the selected implementation strategies with the **scientific theory**

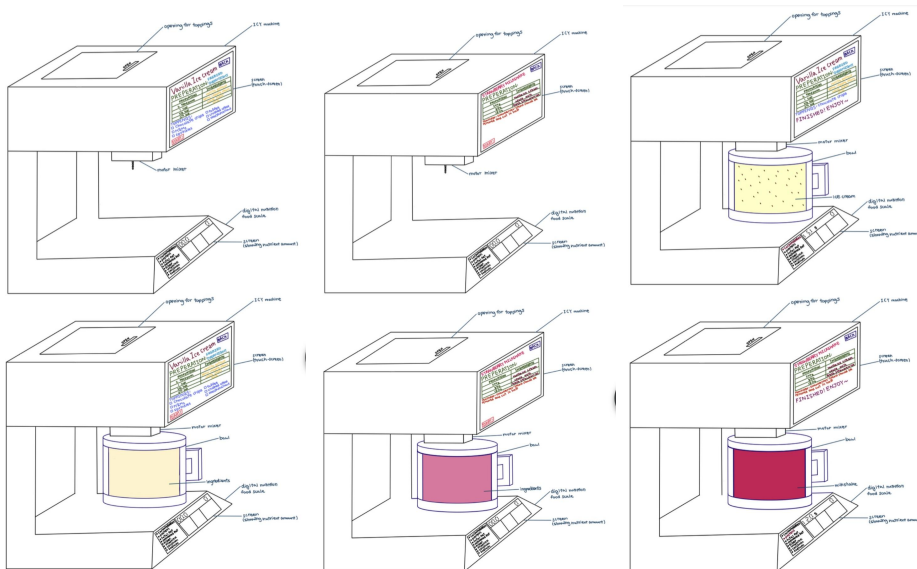
In the design, we have integrated the smart screen and the food pound into one machine. Users can choose the flavor they want to eat, and by clicking on the big screen, the preparation method will be shown quickly, including the ingredients and equipment to be used. For making vanilla ice cream, the user can see clearly on the big screen the ingredients and the quantity needed, such as two teaspoons of vanilla extract, one cup of heavy cream, 3/4 cup of sugar and so on. At the bottom of the screen, the machine is designed with an electric blender that automatically blends the food ingredients into ice cream or milkshake. After some preparation and blending, the finished product is placed on the EatSmart Smart Food Pound. Simply press a button on the ICY machine other than the nutrient you want to measure, and the food pound will automatically generate the amount of nutrients such as carbohydrates, fiber, sodium, fat and vitamin K. It is very convenient and fast. The final measurement results will be displayed in detail on the scale's screen, providing clear

guidance on how to maintain a healthier diet.

IV. Design of Invention

- Describe the **design** and the **principle** of invention (e.g. The ideation of the projects or creative solution as far as applicable)
- Provide sketches or drawings of the invention

In front of the machine, we designed a large screen to show how to make different flavors of ice cream and milkshake. Users can first put the ingredients inside the jar and then stir them to make ice cream or milkshake according to the user's wish and preference. At the same time, the user can add the appropriate ingredients from the top into the ice cream or milkshake. Next, the user can use the smart food pound below to display all the nutrition of the blended food, including calories, fat, and vitamin K. The lids on the bowl and jar containing the food can be easily removed. Finally, the user can pour the ice cream and shakes into a cold glass and enjoy immediately.



V. Application / Market Need

- Explain the area of **application** and **function** of invention

First, ice cream making allows users to try different flavors of ice cream or milkshakes according to their preferences. Besides, the touch screen of the machine will provide healthy recipes, simply follow the instructions and drop the fresh ingredients. Afterwards, the motor mixer will start churning the frozen ingredients in the bowl at different speeds (differs from product to product, eg. churn faster to make milkshake, churn slower to make ice cream). These simple procedures allow users to enjoy low-calorie, healthy and delicious desserts conveniently at any time.

Second, There is an EatSmart Digital Nutrition Food Scale attached at the bottom of the ICY machine. After the machine finished the ice cream, a number will be displayed on the measurement screen showing the amount of calories. After that, by simply pressing the button besides the nutrients that you would like to measure on the ICY machine, the food scale will generate the amount of that food nutrients inside automatically, such as carbs, fiber, Sodium, fats, and Vitamin K at once. The results will be shown on the screen of the scale in a detailed way which clearly guides the user on how to maintain a healthier diet. After the product is done making, mixing and measuring, the bowl on the food scale and the lid on the jar can be easily removed.

- Indicate the market need and **potential impact** of invention

Due to the impact brought by the pandemic in recent years, people often stay at home, and there has been a trend of making homemade food, hoping to eat delicious food even at home. Many people have developed recipes that can be easily done at home, and have received a lot of attention around the world. Undoubtedly, this machine is exactly what people need to help them make food at home. It is extremely easy to use and operate. Simply by following the instructions in recipes shown on the big screen, unique desserts (including ice cream and milkshakes with different flavors) can be made. Moreover, homemade desserts are not limited to ages and are quite suitable for family activities, because it is

rewarding and satisfying to taste the delicious results after making the desserts together.

In addition, people are more health-conscious these days than before, and there is a craze for calculating daily calories intake. Therefore, this machine has a calories and nutrition calculator, which provides accurate and specific data, so that users can know and measure their eating habits more clearly and appropriately. At the same time, you can also enjoy sweets in a healthy way.

- Discuss **limitation** and compare with existing related works (if any)

Although this machine cater people's needs, its market response may not be as enthusiastic as expected. Because it is relatively larger than other kitchen supplies and occupies more space. However, to make ice cream or milkshakes, it is necessary to use a mixer with a certain size, in order to produce a suitable texture, otherwise it will affect the finalised product. Furthermore, the machine will be more expensive than normal ice cream machines, as it includes a smart food scale, which measures nutrition and calories immediately. In light of having more plentiful functions, the cost is relatively higher.

VI. If your team will compete 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)

VII. If your team will compete the Social Innovation Award, please list the target group or social issue the project focuses on, and provide justification for competing for this award. (Word limit: 300 words)

Our target group is people who want to keep a healthy diet.

We observed that people nowadays often release their stress from school, work, etc. by consuming sweets. However, this type of stress-relieving method is not convenient and healthy. Moreover, urbanites are often in a laborious situation and lack the opportunity to go out and enjoy food, they are often hungry and neglect the ingredients, nutrition and effects of food on the body. Most people also choose to enjoy different types of milkshakes and ice cream during their leisure time. They need to find a store to buy these desserts and, in the long term, consuming too much sugar also affects our health. But with this machine, people can decide on their own to place different healthy ingredients, and pay attention to the nutritional value of food, such as reducing unnecessary sugar intake. This encourages great eating habits.

Besides, it is common to see a trend of people calculating their daily calories intake nowadays. They are very cautious of everything they eat as they want to maintain a healthy body and lifestyle. Therefore, with this ice-cream nutrition detecting device, people can freely enjoy low calories and healthy homemade ice cream.

In light of these observations, we are here to design an ice-cream and milkshake nutrients calorie detecting machine to cater for the needs of people who want to keep a healthy diet.

VIII. Conclusion

- Make a conclusion of the design project and the way forward of the invention process

After observing the food trend and researching on how to make ice cream and milkshake at once, and how to measure different nutrients at once, we genuinely hope that people who would like to keep a healthier diet will achieve their final goal and experience the delicacy of dessert simultaneously.