

COCO ICE



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AIM: Our group's aimed to make a non-dairy, no - soy, frozen dessert using coconut cream. We saw the need for a unique flavour in this market after looking at current products in popular supermarkets like Pak n' Save, Countdown, Nosh, Farro and New World. We were to target health conscious, lactose intolerant individuals.

PROJECT BRIEF: The brief given to us by Leah Davie (our CREST mentor): Develop a non-dairy and non-soy frozen dessert with less fat and sugar than traditional desserts.

METHOD:
Planning: During our period of planning we researched planning tools in which will help us with the key stages and time we have to develop and plan for our final product. We decided on Log books, Gantt chart and an action plan, to help with the process and keeping organised throughout our trialling/planning and development of our ice cream.
Brief development: Here we identified considerations, produce a need or opportunity, carried out an environmental investigation, developed a conceptual statement, decided on our attribute and started our initial trialling (where we trailed 8 different ice cream flavour, to then determine our final and favourite flavours/flavour)
Processing and trialling: From doing our initial trialling we decided on 5 concepts in which we evaluated them further through PMI charts and PISC charts. To then decided on the most popular and favourite flavour, so we could then develop our final attribute and make our specifications for the ice cream flavour. By doing this we also gained stakeholder feedback at each stage so we can correct and alter our ice cream.
Packaging final product: In this step we decided on the name, logo and packaging we want for our final product, we researched the ingredients and their nutritional information to also go on our final label.

PRODUCT DEVELOPMENT: FOLLOWING OUR INITIAL TRIALLING,
STAKEHOLDER FEEDBACK: We looked at our stakeholder feedback and recipes then tried to decide what dairy free ice cream flavour would have the most success with our stakeholders and possible consumers in our target market. From our previously trialled ice creams, we found that avocado lime and salted caramel coffee coconut were the two favourites in our group and among our stakeholders.
PMI & PISC: We developed a PMI chart looking at the Interesting, Positive and Negative points of each product as well as a product idea screening chart to look at the factors affecting the development of our product in our position. We looked at limiting factors such as equipment, time, processing operations and the skills required to make our product. We then evaluated this information and elected the best suited ice cream for us to further develop.
BRIEF: Following these charts we developed a brief suited to the product, in the brief we described the desired attributes for our product, based on what we had previously learnt about how others prefer their ice cream and what our target market would look for in a product. We also included a brief description on why and how we would complete these attributes.
SPECIFICATIONS: We developed definite specifications that would be what each trial would be assessed against thus giving us a goal to work towards each time we further developed the ice cream. Our specifications included texture, flavour balance, nutrition, cost and colour.
QUALITY CONTROL: We researched the types of products that we would use in the processing of our product, to ensure each aspect was the best it could be. We did this because we believe that in order to have the best possible product we should use the best possible ingredients. We researched the coconut cream, limes and avocados to ensure we knew we were using the best products available to us so that the quality of our ingredients was not an inhibiting factor as we refined our product. This gave us insight on how to pick and work with the best ingredients available.
PRODUCT TRIALLING AND REFINING: We then began trialling our recipe. Each trial we conducted would see a change in one aspect of the recipe, so that we could effectively identify what ingredient, quantity or processing operation was negatively affecting the outcome of our ice cream. This fair testing system was useful in the refining stage of our product development as we were able to productively improve our ice cream while minimizing the number of trials we would have conducted if we were to change numerous things in our recipe per trial; which would have caused unnecessary confusion.

EXPERIMENTS
We trialled our ice cream multiple times, only changing one variable to determine what was affecting the texture/ taste and other specifications of our ice cream. By experimenting like this we were able to improve our ice cream. Some examples of how we experimented include

- Trialling different coconut creams to determine the best in terms of texture and taste.
- Using xanthan gum to thicken and emulsify our ice cream
- Whipping the cream to smoothen and aerate the ice cream
- Using raw organic sugar to improve the creaminess (sugar affects the size of ice crystals when freezing)
- Removing lime rind from recipe to smoothen the texture



PROBLEMS ENCOUNTERED: Throughout trialling and further developing of our product we have come across many barriers and problems that have affected our ice cream, we also decided to make changes based on our specifications. But by gaining stakeholder feedback from each trial we were able to look and decide how we are going to change the ice cream for the next trial.
These problems include:
- Texture was one of the first initial problems we faced with our ice cream; having small coconut cream lumps as the coconut cream being separated between the water particles and the cream particles, by doing this we used the techniques such as **whipping coconut cream, heating coconut cream and using thickeners and gums.**
- Appearance colour not being appealing to stakeholders and not reaching are specified colour on our specifications, we looked for **better quality avocados.**
- Flavour not having an even balance of sweet and tangy from the lime and maple syrup both having times of being overpowering. Also the coconut cream/ milk we were using gave a bitter aftertaste which wasn't appealing for our flavour and stakeholders didn't enjoy this. We changed this by taking out **the lime zest and using a better quality maple syrup.**

INITIAL ATTRIBUTES
We selected vague initial attributes based on our environmental research.

Attribute	Why	How?
Colour: Due to the packaging colour	as that the products are more noticeable and people want to buy it	Physical
Cost: Due to the availability of resources, we have been provided for production from other products	This was a good point that others are not used to the product and will pick it over other products that are more expensive than it	Physical
Quantity: Our product should be a sufficient size	Depending on how many people we want to produce to make our product to the amount of resources we have available to us	Physical
Texture: It has to be smooth on their taste buds, not too thick or too thin, it has to be creamy, not too soft and not too hard	It has to be smooth on their taste buds, not too thick or too thin, it has to be creamy, not too soft and not too hard	Physical
Flavour: The product will be a sweet flavour, but not too sweet, it should be a good balance of sweet and tangy	The flavour needs to be suitable for the product that it is intended for, it should be appealing to the target market	Physical
Packaging: The packaging needs to be a good balance of attractive and functional, it should be easy to use and store, and it should be appealing to the target market	The packaging for the final product needs to be appealing to the target market, it should be easy to use and store, and it should be appealing to the target market	Physical
Healthiness: Due to the healthiness of the product, we should use natural ingredients and avoid artificial additives	It is more healthy and people will be more likely to buy it	Physical
Storage: Our product needs to allow for long shelf life, it should be easy to store and transport	It is more convenient for the consumer to have a product that can be stored for a long time	Physical

SENSORY TESTING:
In order to create a product fit for our standards and specifications we had to carry out several tests to ensure we achieved this. Throughout the process we used several methods of testing that our stakeholders completed for us to evaluate and develop our product as every trial happened.

- We created a stakeholder feedback form used for every trial that approximately 10-12 stakeholders would give feedback on, this way we would be able to receive the feedback we required.
- Another technique we used was having a set of specifications which addressed each sensory term related to our product therefore we would be able to achieve a product that is appealing to consumers in all aspects.

CONSTRAINTS
While developing our product it was inevitable that we would face obstacles that affected the ease developing our product and therefore its outcome. These limiting factors meant we needed to find alternative ways to produce and improve our ice cream. Working in a Year 12 Food technology environment created most of the restraining factors as the materials usually necessary to successfully create a product were not available to us. Examples include:

- **Money:** Through fees and donations we were assigned a certain budget per person / group that we could work within throughout the year, this budget had to cover the cost of ingredients, packaging, meeting with other companies and any new equipment our product would require.
- **Equipment Availability:** Due to working within the school we had a lot of existing equipment that the school supplied. Though this also meant that there was a lack in speciality equipment such as the ice cream machine that existed was very old.
- **Knowledge & Skills:** Our group's only experience within school is very limited to just level 1 food and nutrition as well as the help we had from our teacher and mentor who was experienced in food chemicals and technology, therefore luckily we were able to consult them when we didn't get something.

Nutritional Information

Serving size: 53 g (100 mL)

	Avg Quantity Per Serving	Avg Quantity per 100G
Energy	449 g	847 g
	108 Cal	203 Cal
Protein, total	0.7 g	1.4 g
-gluten	0 mg	0 mg
Fat, total	4.7 g	8.8 g
-saturated	2.8 g	5.2 g
Carbohydrate	15.4 g	29.0 g
-sugars	12.9 g	24.3 g
Sodium	15 mg	29 mg

CONCLUSION
Our brief outlined the necessity to create a dairy free, non-soy ice cream. Upon further research into the market and after trialling various recipes and flavours we were able to identify a gap for a uniquely flavoured, creamy ice cream made from coconut cream. From our developed specifications, we worked towards a nutritious, smooth-textured, creamy, avocado lime ice cream with well-balanced flavours and an appetising colour. Judging our product now, we believe that we have achieved this. We have faced major problems with the flavour (the aftertaste of each ice cream due to the coconut cream) and with the texture (from the unemulsified Ceres Organic) of our ice cream. However we were able to overcome both these problems to develop a well-rounded ice cream that fits all specifications extremely well. Because of this we believe that we have been able to fully fulfil the outlined requirements of our brief. Reflecting on our research into the need and opportunity for our product in the dairy free ice cream market we think it would be successful if introduced into supermarkets and dairies.



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