

# SANCTA MARIA COLLEGE



# ACES CREST REPORT

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# Sancta Maria College CREST Project

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- Mentors: Sam Harper & Katie Hatton – Bluebird Foods
- Teacher: Beth McCrystal



As a group we decided to call ourselves the A.C.E.S. team – this acronym arose during our first brainstorm and discussion of our project.

Our initial brief was to develop a new “Breakfast Cookie” for Bluebird Foods targeting busy people who would like a meal replacement. This included taking responsibility for product and packaging, product development based on concept and market research and identifying key health or nutritional claims that would be associated with the product.

Discussion and initial research showed that there isn’t anything on the market in this product range. Many people don’t have time for breakfast so need something that is quick and easy to consume. This product could be for those with little time in the morning – they could eat it with a coffee on the way to work, or sports people who exercise in the mornings and don’t have time to make breakfast before leaving for school or work.

## Choosing a Brief

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Gay Watson from Futureintech introduced Katie Hatton and Sam Harper from Bluebird to our class in February. Katie and Sam were from Bluebird Foods and they became our mentors. Katie and Sam gave us a choice of four project briefs and from these we chose our project

### **Bluebird Foods**

#### **Introduction**

Bluebird Foods Ltd (BFL) started back in 1947 over 50 years ago and is a genuine kiwi icon. BFL supplies the New Zealand market with a range of classic household snacks, many of which are favourites for Kiwi’s young and old.

BFL is part of the Pepsi Co Group and as such has a raft of global experience in producing top quality snacks for all occasions.

BFL operates from a site in Wiri, Auckland (since 1988) and runs 10 production lines, one of which being the Muesli Line. Consistently improving the range of bar products from a quality, health credential and cost perspective is imperative in meeting changing consumer demands.

## Brand Information

The Muesli Production Line is responsible for some of New Zealand's favourite food icons; Flemings, Snacker, Naked and recently launched Quaker.



## The Project

- **Brief No 1**

To develop a new 'Breakfast Cookie' for Bluebird Foods which targets busy people who would like a meal replacement. You will be responsible for the concept development – product and packaging, product development based on concept and market research and identifying key health or nutritional claims that would be associated with this product.

- **Brief No 2**

To develop a new 'Multigrain Bar' for Bluebird Foods that targets 'The Baby Boomers' (approx. 40+ yrs) who would like a tasty snack. You will be responsible for the concept development – product and packaging, product development based on concept and market research and identifying key health or nutritional claims that would be associated with this product.

- **Brief No 3**

To develop a new 'Sweet Dipping Snack' for Bluebird Foods which targets children who want a tasty, convenient and fun lunch-box snack. You will be responsible for the concept development – product and packaging, product development based on concept and market research and identifying key health or nutritional claims that would be associated with this product.

- **Brief No 4**

To develop a new 'Popcorn Bar' for Bluebird Foods which targets people who want a tasty, convenient snack – suitable for children or adults. You will be responsible for the concept development – product and packaging, product development based on concept and market research and identifying key health or nutritional claims that would be associated with this product.

## **Support**

Bluebird will provide you with support for this project via meetings and communication when required. Sam Harper & Katie Hatton from Bluebird R & D will both be available to provide support throughout the course of your project.

## **Key Objectives**

- Complete consumer and market research to identify primary target market for such a product
- Complete concept testing on primary target market for both product and packaging
- Ensure product meets relevant nutritional criteria as outlined below:
  - o Good Source of Wholegrain
  - o Minimum 2.5g of Fibre per 40g Serve
  - o Stretch Objective – Meets Bluebird’s GNC
  - o Any other key nutritional requirements highlighted within the consumer research
- Complete product development in order to meet requirements of primary target market both for the product and packaging.

## **Other Considerations**

- Product costing – consideration throughout development of product and packaging costs and how this relates to proposed selling price in market
- Processing – consideration of how this product would be manufactured on a larger scale, taking into account equipment, food safety risks, health and safety risks etc
- Breakfast Nutritional Requirements – research into what a typical NZ breakfast provides the primary target market in regards to energy, fibre, fat etc

**We were given four briefs from Bluebird – as a group we took one brief each and researched existing products. With the help of our mentor we discussed the pros and cons of each and then decided on the idea of developing a breakfast cookie. There isn’t anything on the market in this product range. Many people don’t have time for breakfast so need something that is quick and easy to consume. This product could be for those with little time in the morning – they could eat it with a coffee on the way to work, or sports people who exercise in the mornings could also enjoy this product.**

**We also felt that we could develop this product in further detail than any of the others and there were not many cookies of the breakfast type selling in any supermarkets.**

# Breakfast

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We first had to learn as much as we could about breakfast. Beginning with what it means: Breakfast - Literally means "breaking the fast"—of the night, as it is the first meal after sleeping.

Throughout most of our childhood and life, we have been constantly told that breakfast is the most important meal of the day. Eating first thing in the morning gets the body's metabolism going, replenishes your glucose levels which are very low because you generally been asleep without a meal for 6 – 10 hours. Skipping breakfast forces your body to work overtime as our bodies need to find stored carbohydrates or chemically turn proteins and fats into glucose.

So what should be included in your breakfast?

Breakfast should include protein and plenty of fibre; the combination will help satisfy your hunger and will keep you feeling full until lunch time. You should also be snacking throughout the day to keep your metabolism up. You can find proteins from low-fat meat, eggs, nuts or dairy products. High-fibre foods include fruits, vegetables and whole grains which can be a great way to start the day. Having a balanced breakfast is a very important aspect of this meal. So if possible, try to include foods that have carbohydrates, proteins, high fibre foods, whole grains, fruits, vegetables and of course your calcium from the milk.

Calcium-Dairy products are our main source of calcium, an essential nutrient for bone development and maintenance.

Fibre- Dietary fibre is essential for good health and is naturally found in cereals, grains, legumes, fruit and vegetables. Increasing fibre in our diet is important for digestive health and reduces the energy density of foods, helping to maintain a healthy weight.

Protein-Vegetable sources of protein, such as beans, nuts, and whole grains, are excellent choices for sources of protein. The best animal protein choices are fish poultry and red meats. Make sure not to eat so much of these as they also contain fats.

Fruit and vegetables- apples, bananas, oranges, mandarins, pineapples, carrots, tomato, water melon, mango, lettuce, cabbage, spinach etc. These are all great and help to minimise risks of heart disease and to keep yourself healthy and nutrition.

**From the information we found above, it would be great if we put important nutrients such as calcium, fibre, protein and carbohydrates in our cookie. In saying this, we also need to make sure that we control the amount of fat in the cookie. This might become a problem as we will need to ensure that the cookie also tastes good. I think it'll be hard to keep the fat down without affecting the taste.**

# Breakfast Cookie Research

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In New Zealand Breakfast cookies are not a very popular product. In fact, very rarely would you be able to find a breakfast cookie product in a retail food-shopping store. This is why when we were given our three briefs from Katie and Sam we decided to choose a breakfast cookie as we saw a potential opening in the food industry for a healthy, energy boosting, easy to eat cookie that had all the nutritious foods you would have in your normal breakfast. As a group we have researched different recipes that we think may be a good starting block for us to trial, some of these recipe ideas were:

- Oatmeal – Raisin Breakfast Cookie.
- Breakfast Monster Cookie – included dried fruits, oatmeal, chocolate chips and honey.
- Banana Oatmeal Breakfast Cookie.
- Healthy Breakfast Cookie – included bran flakes, cinnamon, honey, unsweetened apple.
- Vegan Breakfast Balls.

As we researched these products we found that two main ingredients were in this recipes and they were; oatmeal and a fruit of our choice. We also found a vegetarian recipe, of Vegan Breakfast Balls. This is a vegetarian option that as a group we have not really considered, but I think we should strongly consider a vegetarian option as our chosen product.



As you see from the pictures above, the main ingredients food companies' overseas use when they create their own breakfast cookie is a nut or oats and fruit. This information could be vital to us as it may lead to us creating our own recipe rather than developing a former recipe. An alternative option could be using a berry in our recipe, a strawberry, blackberry or raspberry.

# Ethical Practice when doing Research

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## **Asking permission**

People who become involved in research or other projects must be volunteers. People are volunteers when they feel free to choose whether to take part, know all the details about what their involvement will mean and give their consent. Asking for consent must take place before the research/project begins. This consent requirement applies to members of a student's family and other students in the class as well as people more widely.

## **Safety**

People who become involved in research or other projects must be safe at all times. Involvement must not cause harm. There are several different kinds of harm. Examples are physical and emotional harm; taking a risk that may result in harm; not listening carefully so that misunderstanding or confusion may arise; and deceiving or misleading.

## **Privacy**

People have aspects of their lives that they do not wish to share openly with others or even share at all. Some people may share more willingly than others. Students engaging in research and other projects must respect people's privacy and how much they are willing to tell. They must keep information confidential by storing it securely, not talking about it with others, and by presenting it in ways that hide the identities of the people who gave it to them. Data may be used only for the purposes that the participants consented to and is to be destroyed once the research/project is finished with.

## **Honesty**

Honesty is important at all times. Students must be honest when they explain to participants how they will collect and use data. They must also be truthful and accurate when they write up the research or project.

## **Reporting back**

Participants have an interest in the research and other projects in which they become involved that extends to the outcomes of their involvement. It is important for students to report back to participants about what has been achieved in the research or other project. Sometimes it may be appropriate to give participants a copy of the completed assignment. At other times, reporting may be limited to acknowledgement, thanks, and a few words about the main findings.

### **Responsibilities and Getting ready**

*As a group we need to be very organised and have a plan prior to the tasting session. A clear set of instructions is required so that the participants know exactly what to do and how to respond. We are limited to lunchtimes ( max 40 mins) so will need to invite a range of people to taste the products. All response forms will have numbers identifying the cookie batch and keep the person's responses and identity confidential. All response sheets will include a warning relating to allergies and the use of nuts.*

*All participants will have the option of responding and we will clearly explain the purpose of the testing and what we hope to gain from their responses.*

*All written data (response forms) will be kept in a cupboard in our teacher's office. We will be taking photographs of the tasting – we will need to check back with people to gain permission if we decide to use their photos in our report or poster. At the end of our project we could publish our report and poster on our school web site, by doing this all participants will have access to our findings.*

**Ethics is important in this project as it will keep people safe.**

**When doing our trials we must be clear in stating what is in the product as some people may have different allergies, being clear will ensure that nobody has any type of reactions and gets hurt, especially as we are using nuts.**

**We must make sure the participants are willing and doing the trial on their own accord.**

**We must make sure our trials are fair tests and our testers are being honest. This will ensure that our final product is what is wanted and needed in the market which will help in the sale of the product.**



# Planning

*This is an example of our overall planning- this gave us an overview of the time available and tasks required to succeed*

## March 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Group meeting – define roles for each person for each brief	2 Recieve detailed brief's Discussed briefs, write <b>survey</b>	3	4 Pro's and cons – all brief's	5
6	7 Katie visit – decide on brief Project approval application	8	9 <b>Research</b> Initial recipe trial Vanilla apple muffin	10 Develop survey, test and conduct survey	11 Second recipe trial	12
13	14	15 Analyse survey, write up results	16 <b>recipe trial</b>	17 look at NCEA A.S. begin documenting portfolio info	18	19
20	21 Redefine aim, need / opportunity <b>research products</b>	22	23 NCEA portfolio	24 <b>Further survey???</b> Katie to visit	25 research existing products	26
27	28	29	30	31		

# Planning

*This is an example of our weekly planning- planning helped us to allocate tasks and share responsibilities in developing the*

*product*

Definition – Planning is used to develop, review, and revise on-going development work and planning to pre-empt anticipated problems and/or overcome actual problems and/or maximise opportunities.

## Planning – key tasks

<b>Week</b> 4	<b>Aims:</b> To complete graph and spread sheet analysis. To retrieve information from Sam regarding the spread sheets. Distinguish ethics for taste testing Design an ergonomically taste testing questionnaire. Complete a practical order form.					
<b>Possible Constraints:</b> Student interruptions, lack of effort, incompleteness of homework, technical problems						
<b>Goals:</b> to get back on track with log book/folios and to finish spread sheets and graphs.						
	Description of action	Time frame	Resources required	Possible Costs	Key anticipated issues	Key anticipated outcomes
<b>Alex</b>	Devise an agronomical taste testing questionnaire. Update log book Update tech folio Update year calendar	4 hrs school 2 hrs HW	Computers. Practical order form	nil	Computers might be in use. Technical problems. Away from class.	Completion of questionnaire. Log book update and tech folio update. Updated year calendar.
<b>Chelsea</b>	Complete graphs and spread sheet analysis of survey Update tech folio Update log book Put in an order form for recipe	4 hrs school 2 hrs HW	Computers. Recipes Practical order form	nil	Computers might be in use. Away from class.	Completion of spread sheets, tech folio and log book and graphs.
<b>Elliott</b>	Complete graphs and spread sheet analysis of survey Update log book Put in an order form for a recipe. Summary of recent trailed recipes.	4 hrs school 2 hrs HW	Computers. Recipes Practical order form	nil	Computers might be in use. Away from class. Technical problems	Completion of tech folio, analysis of survey results graphs. Also update log book.
<b>Summer</b>	Distinguish ethics for taste testing Update tech folio Update log book	4 hrs school 2 hrs HW	Computers- internet. Practical order form	nil	Computers might be in use Technical problems	Completion of ethics for taste testing. Update of log book and folio

# Hedonic Scale

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This is an example of the second template we used to gather information about our product from a taste test. At the top of the page we wrote a waiver to the stakeholders with a warning stating that the cookie samples contained nuts.

## 5-Point Hedonic Scale

Sample number	How much do you like this cookie?					Comments and Rate			
	1	2	3	4	5	Appearance Rate with #	Smell/Odour Rate with #	Taste and after taste Rate with #	Texture Rate with #
1. 273									
2. 924									
3. 618									

**Key1** = Dislike very much   2 = Dislike   3 = neither like nor dislike   4 = Like   5 = Like very much   #=number

This template proved much easier for the tasters to use and fill in. Because we conducted the tasting in lunchtime – (time restrictions of 40 minutes) this format was quicker and also gave us good written feedback from the stakeholders.

# Important Points

Target market	My Client created a target market for me by the brief. I need to consider the nutritional value, taste and convenience when creating my product to meet the needs of my target market. The target market want a product that is tasty so it is appealing especially if the nutrition value of the cookie is high as they would rather choose to eat a cookie that is tasty and has good nutrition other than just a cookie that is tasty and not nutritional. From my brief I know that my target market want convenience so I have to make the cookie and easy to eat meal replacement that is tasty and nutritional to keep the consumer energised until their next meal. Size is important when considering my target market as I need to ensure that the size is just right so that it doesn't put of my consumers from purchasing it. The cookie needs to be the size to fill the consumer to keep them energised but not too big so that there is wastage.	Client Size Cost Nutritional Value Taste
Taste	I need to ensure that the cookie is tasty so it appeals to the consumers as well as having good nutritional value so I meet my brief and specifications identifying what my target want. Also this effects Bluebirds GNC as I need to meet their nutritional guide stated in our brief.	Nutritional Value GNC
Skills	Developing and improving my skills are limited as a result of the equipment we are resourced with. I am able to develop basic kitchen skills as I am able to practice at school and at home baking my product using different methods; however the times at school are limited as we have to share the kitchens with other food tech classes. As we have the restriction of rooming our time is decreased to improve our product therefore are skills cannot be developed at a faster rate.	Equipment Rooming Time
Trends	Research shows that many people are missing breakfast and it is becoming a trend so I am creating the product to reduce the amount of people missing breakfast. It is also becoming a trend that people are choosing to eat healthier so I have to ensure that my product has a high nutritional value to appeal to my target market. It has become a trend that packaging is now bright and colourful to appeal to the consumers and grab attention to the product. There has also become a lot more rules and regulations about what has to be mentioned and what isn't allowed to be mentioned on the package.	Target Market Nutrition Value Packaging
Shelf Life	The shelf life of the product relies heavily on the packaging. The packaging has to be sealed tightly to allow no air to get to the product to reduce mould and fungus growing on the product limiting shelf life. I have to take in account that the ingredients I use may lose taste as the longer it is left on the shelf, also that the ingredients I use may allow the product to limit the shelf life. For example if I use a lot of water based ingredients the more likely mould will grow in a shorter space of time.	Packaging Ingredients Taste
Ingredients	The ingredients impact the taste so I will have to ensure that I use new tasty fresh ingredients so that the product appeals to my target market	Taste Target Market

# Trial Survey Number One

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When we began our first trial recipe of our three breakfast cookies we were looking for results that would help us develop and find our final product. We had three products that we wished to trial. All three of them had individual dominant flavours, and we were hoping as a group they would identify these flavours and choose the product they preferred. In order for this survey to work we created a nine page survey, when once analysed would help our group detect their preferred cookie they liked. Overall we found the survey to be a real success for our first time, we were able to identify a preferred product the stakeholders liked and also we were able to adjust our dominant flavours on our final product due to stakeholder comments and feedback.

# Trial Survey Number Two

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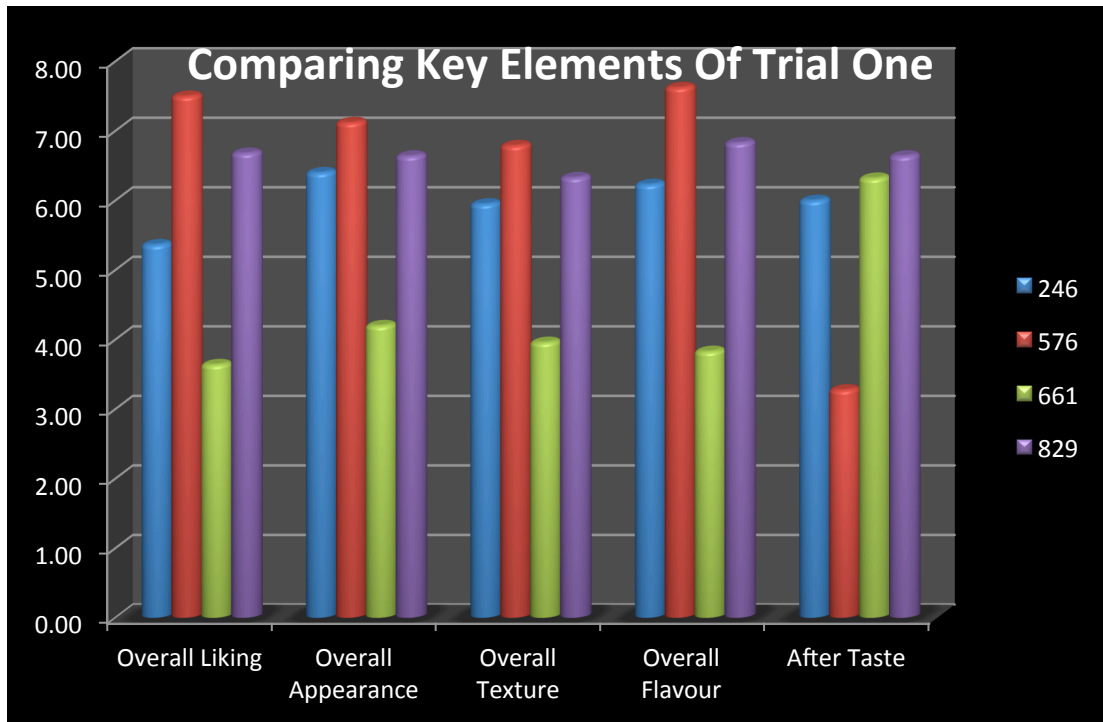


Our Second Trial we found to be of more success than our first trial, this may be due to our group having more experience therefore we worked better as a group knowing our roles we needed to perform in order for our trial to be of success. In this second trial we thought we had three better products for stakeholders to try because we had listened and analysed the results from the first survey and made suitable adjustments. Once our trial was completed, Katie and Sam visited us once again and helped us graph our results from our trial so we could make further improvements to our product based on the stakeholder feedback.

# Graphing our Results

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Once we had completed our survey and trials of our three Breakfast Cookie we then have to analyse each individual survey and then once we have calculated percentages then we must graph our results like the following one below.



We found these graphs to be very helpful as the graphs did not require any description however by looking at our graphs we were able to establish clear favourites amongst the stakeholders and we could also see the most favourite cookie in all of the different categories broken down to help us improve our cookie that would become our final product.

## Sugar and fat – too high?

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When we first started creating our breakfast cookie concepts we struggled to combine our ingredients so that we had a dry hard cookie that would have a long shelf life, numerous trials we had done previously were not up to our specifications and came out soggy and wet, like on the pictures above, this would either be due to a result of too much butter or using frozen ingredients such as frozen berries, that when baked produced a lot of water making the cookie very soggy and giving it a very short life, so we decided to adapt these changes and use dried ingredients as a substitute.



# Weighing our Products

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In order to achieve a product that met the Bluebird Specification of a 40g serve, we had to weigh our ingredients before and after baking our product. These results would tell us the amount of water that was lost during baking and as we had numerous products that we baked we were able to calculate an average on the amount of water lost in each product in order for us to predict how much we would lose once we made our final product. This experiment was a good success and fair as we had decent results in every cookie we tested.

# Our Recipe

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## Recipe 1

285g butter	2 t baking soda	
6 Tbsp. golden syrup	4 t boiling water	½ c chopped apricots
2c rolled oats	1 c sultanas	2 c flour
1 c sunflower seeds	2 c coconut	1 c raw sugar

1. Preheat oven to 160 degrees Celsius.
2. Melt butter and golden syrup. Add baking soda and boiling water.
3. Add all other ingredients, mix well.
4. Roll into balls, flatten and place on a baking tray. Bake approx. 30 minutes.

## Version 2

Rolled oats	1 c	96g
Self-raising flour	1 c	147g
Coconut	1 c	76g
Apricots	¼ c	53g
Walnuts	¼ c	25g
Orange juice	¼ c	62.5
Yoghurt	¼ c	76
Almonds	¼ c	26g
Sesame seeds	¼ c	31g
Golden syrup	3 T	84g
Margarine	90g	90g

## Version 3

Rolled oats	189.16g
Self-raising flour	185.37g
Coconut	23.22g
Apricots	75.66
Walnuts	31.53g
Treacle	82.27g
Brown sugar	60.53g
Almonds	32.79g
Cinnamon	3.78g
Golden syrup	105.93g
Margarine	138.71
Salt	

Three slightly different versions –

## Version 4

## Version 5

## Version 6

Dried apricots	75g	Dried apricots	38g	Dried apricots	38g
SR flour	196g	SR flour	98g	SR flour	98g
Rolled Oats	188g	Rolled Oats	94g	Rolled Oats	94g
Walnuts	31g	Walnuts	31g	Wheat bran	15g
Water	56	Water	20	Water	20
Treacle	87g	Treacle	43.5g	Treacle	43.5g
Almonds	32g	Almonds	32g	Almonds	32g
Golden syrup	111g	Golden syrup	55.5g	Golden syrup	55.5g
Vanilla essence	6g	Vanilla essence	3g	Vanilla essence	3g
Margarine	138g	Margarine	69g	Margarine	69g
Brown sugar	66g	Brown sugar	33g	Brown sugar	33g
Cinnamon	6g	Cinnamon	1t	Cinnamon	2t
Salt	5g	Salt	½ t	Salt	5.7g

### Version 6 – final recipe

Dried apricots	38g	Plus • Biscuit flavour • Lecithin • Glycerine • Invert syrup
SR flour	98g	
Rolled Oats	94g	
Wheat bran	15g	
Water	20	
Treacle	43.5g	
Almonds	32g	
Golden syrup	55.5g	
Vanilla essence	3g	
Margarine	69g	
Brown sugar	33g	
Cinnamon	2t	

We made a bulk batch, divided one in half with slight modifications to every batch. Baking times for each batch were also slightly different. This helped us to work out optimum cooking against colour of the baked product and moisture loss. From this test we took the best product/recipe to the bluebird lab to make a prototype.

At Bluebird we baked two batches of our prototype. To improve the overall flavour, reduce the sugar but at the same time improve the binding properties, Sam advised us to add lecithin, glycerine and invert syrup.

# Stakeholder Feedback

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“Appears healthy and filling.”

“Has a very strong apricot flavour.”  
“I really like the big chunks of apricot in the cookie.”

“Delicious sweet taste.”  
“I could really use a product like this in the morning.”

“This biscuit had a weird after taste”  
“I didn’t like the walnuts. To me they seemed to overpower all the flavours.”

“It kept me full for several hours, which was really beneficial.”  
“I like the almond taste it has.”  
“The texture and flavour is really good.”

“All In all it was a great biscuit.”

# Methods / Techniques / Changes

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During the analysis of our first initial cookie recipe, we found that the cookie had a very high sugar and fat content and because of this, it did not meet the Bluebird GNC. We had to make several changes to this recipe to insure that it matched with Bluebird's requirements and gave the same nutritional value as a standard breakfast and meet our specifications.

Our first recipe, we found to contain a lot of butter which made the mixture very 'wet'. In order to fix this we made three different batches of the recipe and tried three different substitutes.

In batch number one we changed the 174g of butter to 56g of oil. In this batch the cookie mixture was less 'wet' but once taste tested and tasted we found that the flavour had been tainted by the flavour of the oil, which had over powered the rest of the ingredients giving of an unpleasant oily taste. We also tried a second batch using 'rice bran' oil as the flavour of rice bran oil is less strong. This still wasn't the perfect result we were after because of the oily after taste.

Some stake holder feedback we got back was that the cookie "left a bad after taste" and wasn't liked by the majority who tried it. Because of the negative feedback we decided that this substitute would not work for us.

In batch number two we replaced the butter with margarine to reduce the fat content. Although it reduced the taste a bit it still tasted "very nice". From here on, we only used margarine, as seen in our final product. It made a massive difference taste wise and nutritional wise. Majority of the people who taste tested it said that they enjoyed it very much and preferred this batch to the first batch.

In batch number three we replaced the butter with both oil and margarine (half of each). This trial in the taste testing came up second best to batch number two as the flavour of this batch was again over powered/tainted by the taste of oil.

We found the best trial of these batches was batch number two, which contained the full amount of margarine. Due to the feedback from the trials, we decided that margarine would be a suitable substitute as it is a healthier alternate to butter. This was the first modification in our recipe.

Modifications included:

- Replacing some of the white flour with wheat bran and wholemeal flour as it increased the wholegrain component,
- Toasted rolled oats instead of ordinary rolled oats – toasted oats look bigger
- Coconut was removed to help reduce the saturated fat content.
- Walnuts removed
- Adding glycerol and invert syrup

Water loss test: we measured the amount of water loss by weighing the mixture before cooking, after cooking and two days after cooking. Water content affects shelf life and bacterial growth. As our product is baked this becomes a sterilisation process which kills bacteria that may be present in raw ingredients. However, when exposed to the air after cooking bacteria is reintroduced to the product, hence we rely on low water content (ph. below 0.65) to help inhibit bacterial growth.

**For both of the oil substitute recipes we held an unofficial taste test and asked a range of people to try the cookie to see if they shared the same opinion. They all had the same comments. We decided from this to research more substitutes we could use in place of oil. We came up with honey, margarine, orange juice and yoghurt. We had to be aware that the large amount of butter was being used in the original recipe to hold all the ingredients together so we had to think of ingredients that would be able to hold the mixture as well as lowering fat content and came up with the above ingredients. We also had to take into account that if we lowered the amount of nuts and seeds used in the original recipe the less binding ingredients we would need, effectively lowering fat content. We decided to make 3 different cookies, each with slightly different ingredients and gave these to Sam to test in the lab. The most popular batch became our final product.**

# Food Safety

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New Zealand has a well-deserved reputation for a safe food supply. Two organisations share the primary responsibility for protecting consumers:

New Zealand Food Safety Authority. NZFSA

Food Standards Australia and New Zealand. FSANZ

FSANZ (formerly the Australia New Zealand Food Standards Authority — ANZFA) develops food standards (primarily composition and labelling) for food sold in New Zealand and Australia.

The result of the joint arrangement is a joint Australia New Zealand Food Standards Code that replaces both the New Zealand Food Regulations made under the New Zealand Food Act 1981 and the Australian Food Standards Code. The joint Food Standards Code is law that applies in Australia and in New Zealand.

Food safety.govt.nz

**When our crest team finalises our product we must ensure that it is in accordance to FSANZ for it to be legally manufacture and sold in NZ and AUS shops. This will also help us to stay on the nutritional track as it will help keep the cookie as healthy as possible.**

NZFSA- New Zealand Food Standard Authority

“If you make bread and bread products for sale, you must comply with the Food Act. You can do this by meeting the Food Hygiene Regulations 1974”.

Food safety.govt.nz

**This is a legal act that must be done if our product gets accepted by Bluebird. If the product does not meet the standards, Bluebird could be fined and we will have to modify the cookie to suit the standards. This will cost money, therefore affecting the selling price as it would need to make up the money it has lost during production.**

# The New Zealand Heart Foundation Tick

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The New Zealand Heart Foundation Tick is placed on products that indicate to the stakeholders that their product is healthy, nutritious and has all the vital positive nutrients in the body. The Heart Tick aims to help everyday people without a chronic health condition make healthier food choices quickly and easily. According to The Heart Foundation, “research shows that 93% of main grocery shoppers have heard of the Tick, and that nearly two-thirds (58%) would buy a product with the Tick over a similar product without it.”

In general, foods that carry the Heart Foundation Tick are lower in saturated fat, Trans fat and salt than comparable foods. Some are also higher in fibre and lower in kilojoules. The Heart Foundation Tick is used to indicate they are a healthier choice.

The Tick nutrition standards aim to:

- Decrease potentially harmful nutrients - saturated fat, trans fat, sodium
- Increase positive nutrients - dietary fibre and calcium
- Limit energy (kilojoules) in many categories

Reasons why the heart foundation came around is because over recent years New Zealanders have been struggling with heart problems and due to this tick it enables people to see what food is good on your heart, and meets the requirements of the heart foundation tick.

## General Heart Statistics

- Cardiovascular disease (heart, stroke and blood vessel disease) is still the leading cause of death in New Zealand, accounting for 40% of deaths annually.
- Every 90 minutes a New Zealander dies from coronary heart disease (16 deaths a day).
- Many of these deaths are premature and preventable due to the foods they are eating.
- Obesity is a risk factor for a number of diseases including coronary heart disease, stroke, diabetes, high blood pressure, osteoarthritis and some cancers.
- Approximately one in two New Zealanders are obese or overweight.

**As we continued to develop our breakfast cookie we found to be reducing the amount of fats and oils in our cookie, this is when we realised we could possibly have a chance of creating a breakfast cookie that meets the requirements for the tick. We spoke with our mentor Sam and went over our ingredients in our cookie and how much we have of each. Sam then went to the Heart Foundation to see whether our cookie met these requirements, he then came back to us and said that if we reduced our cookie size to 33g then we would be able to say that we have met the heart foundation tick, this was a real achievement for us as we could see that our product was already really healthy.**



# Food Labelling

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## What needs to be on a food label?

Almost every food requires a label. In New Zealand every label must be in English (*other languages may be used in addition to English as long as they do not contradict the information on the label*)

Key features of a food label include:

- The name of the food – *this is to identify it*
- The lot/batch identification – *this helps if the food is recalled*
- The name & address of the supplier - *in case more information about the product is required*
- Warning or advisory statements/declarations - *to identify ingredients that may react with some people e.g. quinine, caffeine, aspartame, unpasteurised egg and milk products, milk, eggs, gluten, nuts, soy beans.*
- Ingredients list – *in descending order of weight including food additives e.g. preservatives, flavours, colours (identified by additive name or class number)*
- Date marking – *used on food with a shelf life of less than two years e.g. use by or best before dates*
- Directions for use and storage – *how product should be stored to stop it spoiling*
- Nutrition Information – *The panel must list the amount of energy, protein, total fat, saturated fat, carbohydrate, sugar, and sodium in the product.*
- Percentage labelling - *labels must display the proportion of characterising ingredients in a product. E.g., strawberries are a characterising ingredient of strawberry yoghurt*
- Net weight or volume
- Legibility: all information required by the code must be displayed prominently, legibly, and in English.

<http://www.foodsmart.govt.nz/whats-in-our-food/food-labelling/understanding-food-labels/>

Food packaging or labelling is vital for the success for our product. A lot of the customers rely on first impressions. Therefore, we would need to design a package in which would attract the customer immediately which needs to stand out from the rest of the products. Along with appearance, the legal requirements also need to be stated. A part of this is the nutritional panel. In saying this, our product looks to be healthier than most of the existing products out there. We should therefore make this clear to customers. We also need to make sure that our packaging will last on the shelf. so putting the package vertically or landscape it will still have the same appearance. We researched food labelling as a key factor in the making of our product as we needed to create a food label for our product so we could put it on our packaging. As a group we found this challenging as we all had different ideas of what we wanted our food label to look like, so in order for this to work out we had to bring all our ideas together so we could create our food label worthy enough to be put on our packaging. We allocated certain areas of the food labelling around the group so we all had background knowledge of what had to be on the labelling.

# Nutrition Information Panel

## What is a Nutrition Information Panel?

The Nutrition Information Panel (NIP) gives you nutrition information about the food product. The NIP must contain nutrient information about seven key nutrient components – energy, protein, fat, saturated fat, carbohydrates, sugars, and sodium.

This can help you compare products across these seven nutrient components and make healthy food choices. These quantities are shown per serving and per 100 grams (g) or millilitres (mL). The quantities for these nutrients are expressed as an average value, except for fats which can be expressed as maximum or minimum values.

<b>A.</b>  <b>Nutrition Information Panel</b>  Minimum requirements	<b>NUTRITION INFORMATION</b> Servings per package: Serving size: mL			
		Average Quantity per Serving	% Daily Intake* per Serving	Average Quantity per 100 mL
	Energy	kJ	%	kJ
	Protein	g	%	g
	Fat, total	g	%	g
	- saturated	g	%	g
	Carbohydrate	g	%	g
	- sugars	g	%	g
	Sodium	mg	%	mg
	*Percentage Daily Intakes are based on an average adult diet of 8700kJ. Your daily intakes may be higher or lower depending on your energy needs.			

## Nutrition claims

In addition to the seven key nutrients, where a claim has been made about specific nutrients (usually vitamins or minerals) or biologically active substances (such as phytoestrogens) the levels of these must also be declared on the NIP. E.g. if there is a claim about the calcium content of a food, the NIP must also show the average level of calcium present.

Some nutrients degrade over time. To ensure that the average level is still present at the end of the shelf life of the product, the level added at time of manufacture may be higher than the stated average. The higher levels of nutrients are not harmful and they ensure you get at least what is stated on the label until the product reaches the end of its shelf life.

<http://www.foodsmart.govt.nz/whats-in-our-food/food-labelling/>

# Comparison of Products

One Square Meal - Apricot				Mother Earth Baked Oaty Slices - Anzac				Traditionally tasti Baked Wholegrain Oat Bar- Apricot& Dark Chocolate			
	Average Quantity per serving	% Daily Intake per serving *	Average Quantity per 100g		Average Quantity per serving	% Daily Intake per serving *	Average Quantity per 100g		Average Quantity per serving	% Daily Intake per serving *	Average Quantity per 100g
<b>Energy</b>	2900kJ	33%	1660kJ	<b>Energy</b>	720kJ		1800kJ	<b>Energy</b>	536kJ		1790kJ
<b>Protein</b>	16.7g	33%	9.5g	<b>Protein</b>	2.7g		6.7g	<b>Protein</b>	1.7g		5.7g
<b>Fat, total</b>	23.3g	33%	13.3g	<b>Fat, total</b>	8.9g		22.2g	<b>Fat, total</b>	4.6g		15.2g
<b>- saturated</b>	8.0g	33%	4.6g	<b>- saturated</b>	5.4g		13.5g	<b>- saturated</b>	1.2g		4.0g
<b>Carbohydrate</b>	90.2g	33%	511.5g	<b>Carbohydrate</b>	19.5g		48.8g	<b>Carbohydrate</b>	17.9g		59.7g
<b>- sugars</b>	30.0g	33%	17.1g	<b>- sugars</b>	9.6g		23.9g	<b>- sugars</b>	9.7g		32.2g
<b>Dietary Fibre</b>	10.0g	33%	5.7g	<b>Dietary Fibre</b>	1.8g		4.5g	<b>Dietary Fibre</b>	2.2g		7.2g
<b>Sodium</b>	511mg	22%	292mg	<b>Sodium</b>	76mg		190mg	<b>Sodium</b>	112mg		373mg
	82.5g Bars				40g Bars				30g Bars		

We did a comparison with the existing products on the market to see if our product could compete. The products we tested ours against were One Square Meal-apricot, Mother Earth Baked Oat Slices- Anzac, and Traditionally Tasti Baked Wholegrain Oat Bar- apricot. Comparing our cookie to the Tasti bar we found that our cookie has 1.8g more protein per 100g, 2.5g less saturated fat and 235mg less sodium per serve. Comparing to the Mother Earth bar we have 12g less Saturated fat per 100g and 52mg less per 100g. Comparing to the One Square Meal we have 3.1g less Saturated fat per 100g and 154mg less Sodium per 100g. Overall our highlights for our cookie are the values outlined in yellow.

## Nutrition Information

Servings per package : 6. Average serving size: One Cookie (33g)

	Average Quantity per serving	% Daily Intake per serving *	Average Quantity per 100g
<b>Energy</b>	<b>590kJ</b>	<b>8%</b>	<b>1790kJ</b>
<b>Protein</b>	2.5g	6%	7.5g
<b>Fat, total</b>	5.7g	10%	17.4g
<b>- saturated</b>	<b>0.5g</b>	<b>3%</b>	<b>1.5g</b>
<b>Carbohydrate</b>	19.4g	8%	58.8g
<b>- sugars</b>	8.8g	12%	26.7g
<b>Dietary Fibre</b>	<b>1.5g</b>	<b>6%</b>	<b>4.4g</b>
<b>Sodium</b>	<b>46mg</b>	<b>2%</b>	<b>138mg</b>

- Our product has no partially hydrogenated fat, or trans-fat.
- Our product has more than 1.5g of fibre per serve which means that we can claim a good source of fibre.
- Our product also contains 25% of wholegrains so we can claim for this on our product which may make it more appealing to customers.

We feel that our product stands a good chance of being successful should we apply for the Heart Tick. We researched online for the criteria needed in a product (see attached PDF) and we also talked to our mentor Sam. The reasons why we believe that we would be successful is because we have less than 600KJ of energy per serve, less than 2g of Saturated Fat per serve, less than 250mg of Sodium per serve, and more than 1g of Fibre per serve.

In further developments of our product we would seriously consider applying for the heart tick because we believe our product meets all the desirable criteria.

# Food Packaging

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**Food packaging** is [packaging](#) for [food](#). It requires protection, tampering resistance, and special physical, chemical, or biological needs. It also shows the product that is labeled to show any [nutrition](#) information on the food being consumed.

- **Physical protection** - The food enclosed in the package may require protection from, among other things, shock, vibration, compression, temperature, etc.
- **Barrier protection** - A barrier from oxygen, water vapor, dust, etc., is often required. Permeation is a critical factor in design. Some packages contain desiccants or Oxygen absorbers to help extend shelf life. Modified atmospheres or controlled atmospheres are also maintained in some food packages. Keeping the contents clean, fresh, and safe for the intended shelf life is a primary function.

**The New Zealand Food Safety Authority says that for packaging the company must comply with 9 general requirements:**

## **Legibility**

The required information on labels must be easy to read and in English. The information must be in noticeable type which is separate from the background. Retailers or manufacturers may choose to present the required information in other languages too. In that case, the information in any other languages must not be different to the information presented in English.

## **Labels must tell the truth**

Information on the label should be clear and accurate. It is illegal to include misleading information on the label.

## **Date marking**

Date markings help buyers work out when the food they have purchased needs to be eaten by. Foods with a shelf life of less than two years must have a date mark. Food with a shelf life of more than two years may use either a date mark or a lot code. Foods that must be consumed before a certain date because of health or safety reasons need a 'use by' date. Food cannot be sold after this date. Foods that decrease in quality after a certain time and remain safe to eat can be labeled with a 'best before' date. Foods may be sold after the best before date.

## **Name or description of the food**

It is important that customers know what they are about to buy. The name of the food must accurately describe the food, and must not be misleading.

## **Name and address of the business**

People need to know who to contact if something goes wrong. The address shown must be a physical location from which the supplier is operating. The supplier may be the manufacturer, importer, vendor or packer of the food. A post box or other type of postal address is not enough but can be used in addition to the physical address. It can, for example, be the street address of the processing site, head office or importing business.

### **Warning and advisory statements**

Warning statements are required if ingredients, such as caffeine, unpasteurised milk and egg products if they have been used in the product. These warning statements need to have specific words, and the height of the words must be 3 mm or more.

Certain foods, ingredients or components can cause severe adverse reactions in some people. Cereals with gluten, shellfish, eggs, fish, milk, peanuts, soybeans, tree nuts, sesame seeds and added sulphites are some commonly known sources of allergens. Even if these are present in negligible amounts in the food they must be declared. These are usually declared in the ingredients list.

### **Ingredients list**

Listing the Ingredients helps consumers get a better idea of what is in the food. This is particularly important for people on special diets. All ingredients must be listed from greatest amount to smallest by ingoing weight, including added water.

### **Percentage labeling**

Percentages of the characterizing ingredients must be included in the ingredients list. This helps consumers compare similar products and make informed choices. Some examples of characterizing ingredients are fruit in jam, apple in apple pie, milk fat in ice cream, cocoa solids in chocolate.

### **Nutrition information panel**

Most packaged foods require a Nutrition Information Panel. It tells consumers the amount of a nutrient the food supplies to their diet and allows them to compare between foods. Typically the nutrition information panel includes information on the levels of energy (kilojoules), protein, total fat, saturated fat, carbohydrate, sugars and sodium, as well as any other nutrient that relates to a claim on the label.

### **Use and storage directions**

If specific storage conditions are required in order for a product to keep until the date mark, these must be on the label. For example, chocolate biscuits might be labelled “store unopened in a cool dry place, away from direct sunlight”. Directions for safe use must also be given. For example, raw bamboo shoots and raw sweet cassava must be labelled with a statement indicating the required cooking instructions to make these foods safe to eat.

**We had to consider all of these general requirements before we looked at our packaging. We had to make sure that we met the requirements of the New Zealand Food Safety Authority in order for our packaging to be passed, completing all these requirements were hard as we had to work well as a team and also use our mentor Sam with any questions we might have when drawing up or labelling.**

# Final Evaluation

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We produced our final cookie at Bluebird with Sam. We took this batch of cookies back to school so we could have a final taste test and get stakeholder feedback. Everyone was enthusiastic about our product. Some of the feedback we got was:

- “The texture and flavour is really good.”
- “I could really use a product like this in the morning.”
- “It kept me full for several hours, which was really beneficial.”

It all had to start from somewhere though. For us, our major first step was the planning. Our planning calendar was good for organisation if we had all stuck to it. Unfortunately, we had many interruptions such as sickness, injury and sporting tournament week. We had to change and alter our calendar so that we could get the tasks done on time. All these factors forced us to have to stay after school and during lunch times to make up for the lost time. The packaging, poster and final report were the work that took the longest time.

After the planning, we knew it will be a great idea to explore and do some research on the existing products. There wasn't much out there and this was the main drive point leading us into choosing to develop a breakfast cookie.

What are the things we would have done differently?

I think that if we organised our time better we would have had more time to think about our concept. Also, it would have saved us time as we wouldn't have to stay in after school or during lunchtime. I think that our organisation starts off with planning. So next time, we definitely will put more effort and time into the preparation of the brief. Another strategy that we should have used is to type documents up rather than taking them down on paper then losing it. This would have been helpful as we would just be able to collate the pages at the end of the day. Also, for taking down notes, information and ideas, we think that we should have used our log books to more effect. Yes, we did use them, but in all fairness, we could have and should have used them much more.

Also if we had the chance to do this again then I feel that we could have got some more information and further developed our background research on all of our given briefs so that we had a better decision and more clearer decision to make at the start of our project. I feel as a group we could have gathered a lot more information on the briefs and this would have made our planning a lot easier and more efficient.



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Sancta Maria College	Beth McCrystal

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