EDEXCEL

GCE Design and Technology:
Food Technology (AS)

EXEMPLAR MATERIAL 2

UNIT: 6FT01

AS GCE Design and Technology:
Food Technology

Section A:

Product Investigation

Section A: Product Investigation

Performance Analysis

Aim: To analyse an existing product and write a technical specification.
Task: The product I have decided to select for analysing is 'Beef Cannelloni' from ASDA's Italian range of refrigerated ready prepared meals. I chose this particular product as it contains lots of ingredients that can be examined and justified. Also, I felt this was a good product to look at due to its similar relation with another productthat's already present on this type of market, 'Beef Lasagne'. I will compare the 'Beef Cannelloni' to a similar product that's available on the range of ready prepared meals from a different store to evaluate the quality of components in

The outer sleeve is made from paperboard. This type of material is fairly cheap and also is easy to print on.

The products name is clearly printed in large and bold font on the packaging. This is so the product is easy to find on the shelf. This product has used white font on a green background as a way to emphasise and make the name stand out. It also links in with the colour scheme of red, white and green which are often associated with Italy (flag) .

The Asda's ITALIEN logo is positioned on different areas of the packaging of the product. It is there to ensure the consumer knows where they are getting the meal from, and allows them to remember where its from if they were impressed by the product so they may choose to purchase other similar products from this brand. It is used as a promotional method.

Displaying a large picture on the front and the back of the packaging helps to promote the product. It is eye-catching therefore attracts the consumers attention to the meal. It allows them to see what the product looks like before they purchase it.

To the left is a series of simply cooking instructions. It gives clear and easy instructions for the consumer, telling them how to heat the meal in the oven and also how to heat the meal in a microwave. (Including times and temps etc).

The label holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion.

The large box at the top left of this image is the products ingredients list. Every single ingredient that has been put into the product has to, by law be listed on this.
There are often a variety of 'other' boxes like the ones below this. Some of the ones on here give consumers allergy advice, further nutritional information and how to best dispose of the packaging. For example this says that the paperboard sleeve is recyclable.

This shows the overall weight of the product. This is one of the mandatory law requirements. Weights often have and 'e' positioned next to them. This simply means that the weight is an average. This product doesn't have this symbol therefore the consumer can be sure it is precise.

Storage instructions are also provided on the packaging. This states where the product should be stored and also gives the consumer a 'useolby' date. This should never be exceeded!
The product packaging has a barcode on it. This is important so the product can be scanned to pay.

Technical Specification:

Form.	The packaging for the beef cannelloni is a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent film. The film seals the product to prevent it becoming contaminated and deteriorating. It is made transparent simply for the fact that it allows the consumers to see what they are buying. The container is covered by a laminated paperboard sleeve. This type of material is fairly cheap and also is easy to print on. The label holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion.
Function.	The purpose of the product is to provide a substantially portioned main meal, that is quick and easy to be re-heat at a time that suits the consumer; the beef cannelloni meets this function by requiring no further preparation other than heating (which is a fairly quick process in itself). The product contains both macro and some micro nutrients which are essential for a healthy and balanced diet.
User requirements.	The beef cannelloni product is aimed mainly at those who have little free time or those who have very few cooking skills. It is aimed at this group of people as the meal is already prepared and requires no further preparation, other than that of heating and serving. It is ideal for young professionals or individuals that are looking for a quick and convenient meal that requires little effort. The product is approximately 25% of an adults recommended daily calorie intake.
Performance requirements.	The beef cannelloni is a high quality, ready prepared product, therefore holds no need for further preparation other than that of serving. The product can be served cold however will be most desirable after being heated. It can be heated quickly in the microwave for approximately 7 minutes of it can be oven baked for 30 minutes (oven baking will create a more appetising golden brown colouring on the top). Before being used, the product should be kept in a chilled cabinet at a temperature of between 0°c and 5°c. It is a meal that is suitable to be frozen and should be done so at a temperature of –18°c: freezing it will extend the products used– by date.
Material and component/ ingredients requirements	Minced beef composed in total 38% of the product, within this 33% of it being pure minced beef, therefore adding a substantial amount of protein and iron to the product. It holds a tender texture that contrasts well with the soft pasta, as do the colours of each of the component parts. Cornflour and starch is used to thicken the béchamel sauce through the process of gelatinisation. The cornflour helps to reduce the risk of retrogradation and synerisis when the sauce is cooled. The milk and cheese add calcium to the meal and make up the béchamel sauce giving it a creamy texture and appearance. The cheese also adds a dominant flavour. Acidity regulator helps to balance out the acidity intensity and level in the product. Salt acts as an enhancer, bringing out the flavours of all the other ingredients. See page 3 for more detail.
Scale of production.	This product will have been manufactured by mass production. Mass production is a method used in the food industry to make high quality products that are sold regularly in large numbers. The process is continuously running, and is constructed from very specialised equipment that is expensive to install and repair or replace if the production line breaks down. This process will involve the use of CAM (computer aided manufacture) - this will speed up the process, enabling large amounts to be produced in a shorter period of time.
Cost.	The total cost of the Beef Cannelloni is £2.49. This is more expensive than a lot of other ready-made meals on the market however it is a fairly decent price for a high quality product like this. The total cost of the cannelloni is inexpensive when you take in to consideration things like the expenses for the ingredients and the packaging. Also things like staff wages, utilities, the cost of transport when getting the product from the factory to the retailers. Advertisements, labelling, design costs, the net profit and the current price of VAT are all elements that help determine the price of a product.

Section A: Product Investigation

Specification	Product A - Beef Cannelloni (Asda's 'ITALIAN' range)	Product B - Spinach and Ricotta Cannelloni (WeightWatchers)
Form.	The packaging for the beef cannelloni is a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent film. The film seals the product to prevent it becoming contaminated and deteriorating. It is made transparent simply for the fact that it allows the consumers to see what they are buying. The container is covered by a laminated paperboard sleeve. This type of material is used as it is water proof (after being laminated) and is fairly cheap and also is easy to print on. The label holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion.	The packaging for the spinach and ricotta cannelloni is the same as the packaging for the beef cannelloni; a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent film. The container is covered by a laminated paperboard sleeve. The label on this product also holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion.
Function.	The purpose of the product is to provide a substantially portioned main meal, that is quick and easy to be re-heat at a time that suits the consumer; the beef cannelloni meets this function by requiring no further preparation other than heating (which is a fairly quick process in itself). The product contains both macro and some micro nutrients which are essential for a healthy and balanced diet.	The purpose of the product is to provide a substantially portioned main meal, that is quick and easy to be re-heat at a time that suits the consumer; the product meets this function by requiring no further preparation other than heating (which is a fairly quick process in itself). The product contains both macro and some micro nutrients which are essential for a healthy and balanced diet. It is also low in fat and calories which make it even healthier for a consumer.
User requirements.	The beef cannelloni product is aimed mainly at those who have little free time or those who have very few cooking skills. It is aimed at this group of people as the meal is already prepared and requires no further preparation, other than that of heating and serving. It is ideal for young professionals or individuals that are looking for a quick and convenient meal that requires little effort. The product is approximately 25% of an adults recommended daily calorie intake.	The product is aimed mainly at those who are on a low fat and low calorie diet, often who are following a weightwatchers scheme. It may also be for those who have little free time or those who have very few cooking skills.
Performance requirements.	The beef cannelloni is a high quality, ready prepared product, therefore holds no need for further preparation other than that of serving. The product can be served cold however will be most desirable after being heated. It can be heated quickly in the microwave for approximately 7 minutes of it can be oven baked for 30 minutes (oven baking will create a more appetising golden brown colouring on the top). Before being used, the product should be kept in a chilled cabinet at a temperature of between 0°c and 5°c. It is a meal that is suitable to be frozen and should be done so at a temperature of –18°c: freezing it will extend the products used– by date.	The spinach and ricotta cannelloni is a high quality, ready prepared product, therefore holds no need for further preparation other than that of serving. The product can be served cold however will be most desirable after being heated. It can be heated quickly in the microwave for approximately 7 minutes of it can be oven baked for 30 minutes (oven baking will create a more appetising golden brown colouring on the top). Before being used, the product should be kept in a chilled cabinet at a temperature of between 0°c and 5°c. It is a meal that is suitable to be frozen and should be done so at a temperature of –18°c: freezing it will extend the products used– by date.
Material and component/ ingredients requirements (Weight Order).	Minced beef composed in total 38% of the product, within this 33% of it being pure minced beef, therefore adding a substantial amount of protein and iron to the product. It holds a tender texture that contrasts well with the soft pasta, as do the colours of each of the component parts. Cornflour and starch is used to thicken the béchamel sauce through the process of gelatinisation. The cornflour helps to reduce the risk of retrogradation and synerisis when the sauce is cooled. The milk and cheese add calcium to the meal and make up the béchamel sauce giving it a creamy texture and appearance. The cheese also adds a dominant flavour. Acidity regulator helps to balance out the acidity intensity and level in the product. Salt acts as an enhancer, bringing out the flavours of all the other ingredients. See page 3 for more detail.	The water in the product will add moisture. The cannelloni form the structure of the product, allowing the sauce to be rolled inside it. The ricotta whey cheese, and the cheddar cheese will add flavour to the dish and the full fat significantly increase the fat content. The durum wheat semolina contains a high gluten content which helps to form the structure and elasticity of the lasagne rolls. The spinach is on of the main ingredients for the filling of the cannelloni, adding flavour and a thick texture to the dish. Corn flour is used to thicken the cheese sauce through the process of gelatinisation. Eggs are added to allow coagulation to take place, giving the pasta more structure, colour and flavour. Vegetable oil will form and emulsion in the sauce, keeping it stable and preventing it from separating out. Lemon juice adds flavour to the product and also acid. Tomatoes and Tomato puree are added to create a dominant flavour, and also help to thicken the sauce, giving it texture and colour. Skimmed Milk is simply the liquid base for the sauce. Onions add a strong flavour and contrasting crunchy texture to the dish. Single cream is added to flavour to the dish and also add a smooth texture that enriches the dish. It may also be used to thicken the sauce. Sugar is added to neutralise the acidity of the tomatoes and the lemon juice.Mature cheddar cheese - Adds flavour and colour because of the browning process, adds the nutritional value of protein and calcium. Garlic puree is added to simply create more flavour. Emulsifier e452 allows the oil and the vinegar to combine together, forming an emulsion that is stable and wont separate out.Vegetable concentrate: Carrot ,Celeriac, Lettuce, Beetroot – These adds a healthy ingredients that gives lots of flavour and also forms the concentrate for the filling. Dijon mustard: Mustard flour – bulks and thicken the sauce given it flavour and colour. Spirit vinegar is a component that will help to form a stable emulsion in the sauce. Spices, herbs and seasoning i.e. turmeric, salt, parsley are added to enhance and improve flavours.
Scale of production.	This product will have been manufactured by mass production. Mass production is a method used in the food industry to make high quality products that are sold regularly in large numbers. The process is continuously running, and is constructed from very specialised equipment that is expensive to install and repair or replace if the production line breaks down. This process will involve the use of CAM (computer aided manufacture) - this will speed up the process, enabling large amounts to be produced in a shorter period of time.	This product will have been manufactured by mass production. Mass production is a method used in the food industry to make high quality products that are sold regularly in large numbers. The process is continuously running, and is constructed from very specialised equipment that is expensive to install and repair or replace if the production line breaks down. This process will involve the use of CAM (computer aided manufacture) - this will speed up the process, enabling large amounts to be produced in a shorter period of time.
Cost.	The total cost of the Beef Cannelloni is £2.49. This is more expensive than a lot of other ready-made meals on the market however it is a fairly decent price for a high quality product like this. The total cost of the cannelloni is inexpensive when you take in to consideration things like the expenses for the ingredients and the packaging. Also things like staff wages, utilities, the cost of transport when getting the product from the factory to the retailers. Advertisements, labelling, design costs, the net profit and the current price of VAT are all elements that help determine the price of a product.	The total cost of the Spinach and Ricotta Cannelloni is £3.49. This is more expensive than the beef cannelloni, however is still a fairly decent price for a high quality product like this. The total cost of the cannelloni is inexpensive when you take in to consideration things like the expenses for the ingredients and the packaging. Also things like staff wages, utilities, the cost of transport when getting the product from the factory to the retailers. Advertisements, labelling (especially with a branded product like this, design costs, the net profit and the current price of VAT are all elements that help determine the price of a product.

Section A: Product Investigation

Comparison To An Existing Product.

Photographic Evidence:


Product A - Uncooked


Product A - Cooked


Product B - Uncooked


Product B - Cooked

To make the comparisons of the two meals fair, I heated both products in the oven which gave both a more golden brown, crispy top which looked more appetising and appealing for the testers. Product A was the beef cannelloni that was £2.49 from Asda's 'ITALIEN' range. Product B was a spinach and ricotta cannelloni that was £3.49 from a 'WeightWatchers'. As you can see, I took pictures of both products firstly uncooked, then cooked. This allowed me to analyse and compare the two side by side in terms of their similarities and differences.

The scanned images to the left show the packaging for both Product A (top) and Product B (bottom). Both products were contained in the same packaging: a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent film. The film seals the product to prevent it becoming contaminated and deteriorating. It is made transparent simply for the fact that it allows the consumers to see what they are buying. The container is covered by a laminated paperboard sleeve. This type of material is used as it is fairly cheap and also is easy to print on. The label holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion.

Sensory Analysis Testing:

Product	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
A	4	4	4	4	**16**	4	3	3	4	**14**	3	3	4	4	**14**	4	4	4	3	**15**	**59**
B	4	4	4	4	**16**	3	3	4	4	**14**	2	3	2	2	**9**	3	3	3	3	**12**	**51**

From testing the products using sensory analysis, it makes it visible to see which areas of each the tasters enjoyed and which areas they thought let the product down. From the table above it is clear to see that Product A (the beef cannelloni) was the tasters overall favourite meal, scoring a total of 59 out of a possible 80 marks in the testing, whereas product B (the spinach and ricotta cannelloni) scored just 51. The scores were pretty even between both when it came to the appearance and texture, it was in fact the overall taste that let Product B down scoring just 9 out of a possible 20 marks which is just under 50%. I think the meal scored so low on this characteristic as it was very 'bland and flavourless', which is likely to be due to it being low in fat as it is a 'weightwatchers' product. Both products held a fairly attractive finish after being heated and lightly baked in the oven. They had a light golden colouring with a crisp top that made the meal look more appetising than those that are heated in a microwave. The aromas of both products weren't very strong, however the tasters decided that Product A's was more dominant and pleasant.

The sensory profile to the left shows the results of testing both the products. Making the results into a star profile like this makes it clear to see the tasters opinions on each meal side by side, making comparisons easy. Product A is coded in the darker purple colour and Product B is coded in the lighter pink colour. Looking at the results in this sensory profile it backs up my idea that Product A was the tasters favourite, linking it to the sensory characteristics and attributes it held.

Detailed Comparison.

Sensory Characteristics:

Appearance - The appearance of both products were fairly similar. Looking at the products in their packaging before heating them through the two meals looked identical. It was only when heated and lightly oven baked that they changed and developed their own characteristics. Product A held a light golden brown colouring when it came out of the oven, looking appetising and appealing to the tasters. It was however a surprise to find that the cannelloni was no longer in rolls but was more in layers like a lasagne. This was deceptive before cutting the product.

Texture - The textures in each ready meal weren't great, both scoring 14 out of 20 in the sensory analysis testing. The beef cannelloni had a wider variety of textures as the tenderised meet and the crunchy onions contrasted well with the smooth and creamy béchamel sauce and also the soft pasta. Product B didn't really hold a range of textures so could be improved by adding more ingredients that would benefit and contrast, e.g. onions or peppers.

Taste - The taste of Product A was much preferred to the taste of Product B. It was a lot more rich and flavoursome whereas Product B appeared very bland and plain.

Aroma - Both meals held a similar aroma as they were on the whole very similar products. Product A was however described as more dominant and pleasant in comparison to Product B.

Cost:

There was quite a big difference between the two prices of the meals, even though they were similar products. Product A, which was the beef cannelloni from Asda's 'ITALIEN' range cost £2.49. Product B, the spinach and ricotta cannelloni from the 'WeightWatchers' range was £1 more expensive, costing a total of £3.49. These are fairly decent prices for high quality product like this. The total cost of the products are inexpensive when you take in to consideration things like the expenses for the ingredients and the packaging. Also things like staff wages, utilities, the cost of transport when getting the product from the factory to the retailers. Advertisements, labelling, design costs, the net profit and the current price of VAT are all elements that help determine the price of a product. Product B was more expensive as it was a branded named product that is seen to be of better quality and standard for the consumer group it is aimed at (those on a low calorie intake diet).

Packaging:

The packaging for each was extremely similar in terms of the materials used. Both products were packaged in rigid rectangular, thermoplastic (PET) containers that were sealed by transparent films. The advantage of using a thermoplastic (PET) container is that it is suitable to be heated in the microwave or oven, with the ability to stand the heat and not melt. It is made rigid to help hold the shape and form of the product, reducing the risk of it becoming damaged. A disadvantage of using this type of material for a packaging container is the fact that it is not recyclable. The cellophane film on each seals the products to prevent them becoming contaminated and deteriorating. The advantage of making the film transparent is simply the fact that it allows the consumers to see what they are buying. The container is covered by a laminated paperboard sleeve. This type of material is used as it is fairly cheap and also is easy to print on. The label on each is different in terms of the choice of fonts used however, both hold all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion. Another advantage of using paperboard as part of a product packaging is that is recyclable.

Nutritional Information:

When comparing the nutritional information of each product I needed to take into account each of the products weight. Both weighed 400g so that was the first similarity between the two. After looking at the weight, I moved on to look at the total calorie count in each product. Product A (beef cannelloni) had 457kcals, whereas Product B had just 282kcals. This would be reassuring for a consumer following a low calorie diet with a 'weightwatchers' scheme as it shows their products are that much lower in calories than other readymade meals on the market. Looking more into the macronutrients in each product, the saturated fat in the weightwatchers meal was 3.6g in total. The amount of saturated fat in Product A was almost four times more than that of Product B, reaching a total of 12.9g - that was 65% of the product which scored red on the FSA traffic light system. The protein level in Product A was a lot higher than in Product B. This will be down to the beef content in the meat cannelloni as apposed to the vegetarian and low calorie substitutes in Product B. The weightwatchers meal (Product B) contains a higher level of carbohydrates than Product A. This is good for this type of product as this particular macronutrient has a good satiety value, giving and keeping the feeling of fullness (therefore will prevent people following the low calorie weightwatchers diet from wanting to eat more and more). Carbohydrates should not be eaten in excess, however on an occasion like this where there is a very low calorie count in the product there shouldn't be any real concerns when eating it.

Overall Conclusion:

Overall, from analysing and comparing the two products in detail using both sensory testing and experimental work, it has become apparent that the beef cannelloni was the tasters favourite. This is mainly due to the better flavouring and other good sensory characteristics the product held. Product B (the weightwatchers spinach and ricotta cannelloni) was in general much better for you than Product A. It held a lower calorie count and on the whole gave you a more balanced meal to go towards your daily balanced diet.

Section A: Product Investigation

Ingredients and Components.

Photographs of Product Appraisal.

Left, is a picture showing the beef cannelloni in its packaging before being cooked. The picture on the right hand side shows the product after being cooked in a conventional oven for 30 minutes as the cooking guidelines state. As you can see I used a food probe to ensure the product was at a temperature above 72°.

The series of photographs above show how I disassembled all the main component parts of the ready prepared meal in order to see the percentage composition of each . From left to right the images show first the Chianti bolognaise mince sauce, then the lasagne pasta, then the béchamel sauce. The photograph on the far right shows the sensory testing set up I used for the tasters to sample the product first as a whole, then deconstructed as each of the components separately, focusing particularly on the organaleptic qualities.

Nutritional Analysis:

Nutritional information is not a mandatory requirement on food packaging. The beef cannelloni product held this information in two formats of display, making it easy for consumers to look at and analyse if they chose to. From personally looking at the information, it came to my attention that the product was very high in fat (34%), and that of saturated fat (65%), scoring red in the FSA traffic light nutritional labelling system. Fat of any type should be at a minimum level in the diet, especially saturated fat as it relates to health problems such as the blocking of arteries which may lead to coronary heart disease. In total, the meal holds 457 calories, this is fairly good considering it is designed as a main meal and is only approximately 25% of a females daily recommendation and around 20% of a males recommended daily intake. The cannelloni contains 6.3g of protein. This is a substantial amount for one meal, with the majority of this macronutrient originating from the beef which is a red meat. The product is also high in carbohydrates, reaching a total of 9.8g. This is okay if this amount is not consumed in every meal of the person's diet. Carbohydrates are essential as they store large amounts of energy that is slowly released throughout the day. However, if there is an excess amount of carbohydrates taken in, the body starts to turn and store it as fat, resulting in the person becoming overweight. The sugar levels are fairly low (7%), scoring green in the FSA traffic lights system.

To the left is the FSA traffic light system for the beef cannelloni that was found on the front of the packaging. Below shows general nutritional information that was found on the back of the packaging, relating to the products typical values.

Alternative Ingredients:

The beef cannelloni is not suitable for people with certain dietary needs. Firstly, the meal contains beef therefore is not suitable for vegetarians. An alternative protein like quorn could be used to replace this. This would maintain the quality, quantity and protein in the dish but would mean it would be available to sell to a bigger market group range making more money for the manufacturers. If the product was to be suitable for people with coeliacs disease, the flour based pasta would have to be changed, using gluten free flour to replace it. People with lactose intolerances may also be at risk when eating this product in its original state. The milk and cheese for the béchamel sauce would have to be replaced by soya milk or other ingredients that are lactose free. All these alternative ingredients are available to buy at most supermarkets, therefore should not cause a problem if the product was to be changed to suit better suit these group of people with special dietary needs.

Functionality Ingredients/ Organaleptic Qualities:

- **Minced Beef -** This is one of the bulk ingredients in the ready prepared meal. The minced beef filling composed in total 38% of the product, within this 33% of it being pure minced beef, therefore adding a substantial amount of HBV protein and iron to the product. It holds a tender texture that contrasts well with the soft pasta, as do the colours of each of the component parts.
- **Cornflour -** The main function of cornflour is simply to thicken a sauce, in this case the béchamel sauce. An advantage of this ingredient is that it is very easy to gelatinise due to its high amylase content. Another advantage is that it has the ability to keep a sauce thick, even when cooled. The disadvantage of using cornflour is the process of retrogradation easily and often takes place, producing synerisis that is very noticeable and un-attractive on a product surface.
- **Milk/Cheese**—Both the milk and the cheese are used as bulk ingredients in the béchamel sauce. They help to add calcium to the product, increasing its nutritional value. The milk gives the sauce a smooth and creamy texture that is aesthetically pleasing for a consumer. The cheese adds a dominant flavour and also a brighter colouring to the sauce that the consumers will find more eye-catching and appetising.
- **Acidity regulator -** The function of using an acidity regulator is to simply bring down or raise the acid intensity to a safe and pleasant level.
- **Salt -** The main function of salt in a product like this is to enhance and bring out the flavours of all the other ingredients included. It improves the overall taste of a product by doing this. This is an ingredient that must not be used in excess as it is commonly known to give a person high cholesterol.
- **Starch -** The main function of starch is its ability to perform well in the process of gelatinisation. Gelatinisation takes place in order to thicken a sauce. When the mixture is first heated, the starch granules start to swell and take up around 25% of their own body weight in water. Once the mixture reaches a temperature of 60°c, the granules can take up between 3 and 10 times their original body weight in water. The final stage of gelatinisation is where the starch granules have taken in around 20 times their body weight in water and eventually burst. This is what causes the sauce to thicken.
- **Durum wheat -** This is another bulk ingredient, used in the lasagne pasta. It has a high content of proteins (glutenin and gliadin) that form gluten when mixed with water and in this case egg. The gluten develops and forms a strong network, allowing the ingredients to combine and form the pasta.
- **Egg -** Eggs are used to bind all the dry ingredients together. When heated the eggs coagulate, another thickening process to make the pasta combine and form shape. The protein in the egg yolk, lecithin acts as an emulsifier, ensuring the mixture stays stable and doesn't separate out. The egg adds a more golden colouring to the pasta, making it look more attractive and appealing to the consumer.
- **Oil -** The oil is used as an alternative fat. Its main function in this readymade meal would be to extend the products shelf-life as it acts as a preservative. The oil may have also been added as another binding agent, bringing and holding all the dry ingredients together.

Environmental issues related to the Packaging and the Ingredients:

During the manufacturing and distribution of this product there are numerous environmental concerns which need to be taken into consideration and in some cases altered. One way this product could become more environmentally friendly is ensuring all the ingredients are bought locally; if the ingredients are from other countries this will mean they need transporting which is fairly expensive in itself. As well as the costs that are tied into transport there is also the idea of pollution that needs to be thought about, which is already and increasing problem for the world's environment. Another way to reduce environmental impacts when making this product would be to look into the packaging that is used. It is best to use packaging that has been made from sustainable forest (i.e. for the paperboard sleeve) as this means the packaging does not damage the environment as such as it is made from renewable sources. The packaging for the beef cannelloni is a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent film. The advantage of using a thermoplastic (PET) container is that it is suitable to be heated in the microwave or oven, with the ability to stand the heat and not melt. It is made rigid to help hold the shape and form of the product, reducing the risk of it becoming damaged. A disadvantage of using this type of material for a packaging container is the fact that it is not recyclable. The cellophane film seals the product to prevent it becoming contaminated and deteriorating. The advantage of making the film transparent is simply the fact that it allows the consumers to see what they are buying. The container is covered by a laminated paperboard sleeve. This type of material is used as it is fairly cheap and also is easy to print on. The label holds all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It also includes a selection of other types of information that may be of interest or help to the consumer i.e. a serving suggestion. Another advantage of using paperboard as part of a product packaging is that is recyclable. The disadvantages of using paperboard are that it isn't very strong as a material therefore may be easily torn or damaged and also the fact that it is not entirely water resistant.

Section A: Product Investigation - Manufacture

Production Method:

My chosen product, Beef Cannelloni will have been mass produced. Mass production is a method used in the food industry to make high quality products that are sold regularly in large numbers. The process is continuously running, and is constructed from very specialised equipment that is expensive to install and repair or replace if the production line breaks down. This type of process is controlled by computers. The main advantages of using CAM (computer aided manufacture) are it requires very few staff with little skill in regards to cooking, therefore making the process cheaper in respects to wages that need to be paid. The tasks carried out by the computers make the conditions safer for the staff, and more hygienic in terms of the risks that are associated with handling food.

Raw Materials:

The majority of the ingredients will bought in bulk as this can be cost effective for the manufacturers.

- **Minced beef -** This would be bought in bulk as a standard component. The beef meat will be already minced and browned, making the preparation for the product quicker and easier for the production line. The meat adds a good source of protein and iron to the meal.
- **Fresh egg pasta -** This would also be bought in bulk as a standard component to create the cannelloni. The pasta will be already cooked, again speeding up the preparation time for the product. The pasta adds a good source of carbohydrates to the meal.
- **Chianti red wine bolognaise -** This sauce will be bought in bulk as a ready made standard component. It will need to be mixed with large machinery down the production line to ensure it evenly covers all of the mince.
- **Béchamel sauce -** The béchamel sauce is another component part that will be bought into the factory. The thick and viscous sauce will have already gone through the process of gelatinisation, therefore will require no more preparation other than that of layering it into the meal.
- **Cheese -** The cheese will also be bought into the factory, however will be grated by CAM further down the production line. This will make it easy to cook and combine in with the béchamel sauce giving it more flavour.
- **Onions -** When the onions arrive, they will first need to be graded in terms of quality (poor quality ones will not be used and will be thrown away). When they have been graded, the onions will be washed using a vertical water spray method. They will then be sized reduced, using rotary cutting knives. Using machinery like this ensures evenness of the chopped onion sizes and also makes the process safer for the factory staff.

Production Process:

On arrival at the factory, all of the ingredients will be visually checked - the packaging will be assessed and use-by dates will be checked. Any ingredients with damaged or tampered packaging or short/expired shelf lives will be returned to the suppliers. Temperature checks will also be made on arrival, ensuring frozen goods are at a temperature of –18°c, chilled goods are at a temperature between 0°c and 5°c, and ingredients that need to be kept in dry conditions are at an ambient temperature around 20°c. The vegetables will first be graded, sorted, cleaned and sized reduced, ready for being used in the cannelloni. The first stage along the production line will be the pasta being cut into equally sized sheets. This will take place on a conveyor belt that is regulated by CAM. Meanwhile, on another line, the vegetables (i.e. onions etc) will be being cleaned by spray cleaning, ensuring they are not contaminated by any dirt. They will then be moved down on conveyor belts to be sized reduced by the rotary cutting knives. The ready browned mince will be on another line, in a large industrial mixer, along with the Chianti red wine bolognaise sauce. The z-blades will be already turning, ensuring even spreading and enrobing of the sauce. When the vegetables have been cleaned and sized reduced, they too will be added to the main filling sauce in the mixer. The pasta sheets will be removed from the conveyor belts and will be positioned ready to be filled and rolled. Firstly a layer of the béchamel sauce will be generously brushed across the pasta by a CAM machine. This will be followed by a specific amount of the mince filling being added on top. The products will then be sent down a different line on a conveyor belt to be rolled by specialised CAM machines. Once the product has been assembled, the cannelloni's are ready for packaging. They do not need to be cooked as the majority of the component parts have already had heat treatment. If they did need to be cooked, the products would be positioned on large trays that would be sent through a tunnel oven. The tunnel oven would be at 200°c and would be on a constant medium speed which would allow the meals to cook slowly and evenly. The packaging for the assembled product will be a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent cellophane film. The idea of the container being thermoplastic allows the product to be heated in the microwave or oven without melting. The air tight film that seals the product prevents it becoming contaminated and is made transparent so consumers can see what they are buying. The product is positioned in the containers then stamp sealed by CAM. A paperboard sleeve is then inserted around the product, containing all of the mandatory information about the product as a label. Prior to distribution, the products will be kept in chilled cabinets at a temperature between 0°c and 5°c. When distributed, they will be transported in refrigerated lorries (0°c to 5°c) to the supermarkets where they will be stored in the same conditions, ready to be purchased by consumers.

Comparison with Production Process:

Through recipe engineering, this production line could be adapted and altered to produce a completely different end product, using the machinery and equipment that already stood in the factory. By using an alternative HBV protein like chicken, fish or quorn, or an alternative carbohydrate source like potatoes or rice, this product could be used to create another production line for the manufacturer. The beef in the cannelloni could be replaced by a meat substitute like quorn, keeping its HBV protein but allowing the product to become suitable for a wider range of consumer groups (in this case vegetarians). That is one example of altering the product within itself. Larger adaptations could be made to create completely new products, for example changing the HBV protein to diced chicken, the carbohydrate source to rice and changing the flavour of the bought in sauce (standard component) could make the product become a ready made curry meal. Keeping the idea of the mince, lamb could be used as the HBV protein, potatoes could replace the pasta as the carbohydrate source and gravy could replace the sauce, making the product a cottage pie. The basic production line would still be the same, but the process stages within this may differ slightly. This would have great beneficial results for the manufacturers, creating and opening up different product lines that could target different consumer groups.

Alternative Production Method:

The beef cannelloni meal is suitable to be produced by mass production when large amounts of the product are needed on high demand. This product would however also be suitable to be produced by batch production. Batch production is slightly different to mass production as it is making the product on a smaller scale, for example making it for a school canteen kitchen or large restaurant kitchen. It would be used to make large pans of the product that would be assembled, cooked and sold all on the same day. Doing all this on the same day would mean the ingredients would not necessarily need to be refrigerated or stored for any longer, therefore would free up storage space and would ensure that stock rotation was taking place efficiently. To make this product by batch production, some standard components would be used to save time and to ensure the product was of a high quality. Standard components that would be used for the beef cannelloni would be: Pre-minced beef, pre-made chianti red wine bolognaise sauce, pre-made/gelatinised béchamel sauce and fresh egg pasta sheets.

The basic method for making the beef cannelloni would be similar to that of mass production , however, each process would be done manually by staff or small electrical equipment rather than large computerised machines. The process is likely to be:

- Grade, sort, peel, wash and size reduce the onions (by chopping), done manually by staff, or with a food processor.
- Place in a large pan with the pre-minced beef. Sauté until meat + onions have browned.
- Add pre-made chianti red wine sauce. Stir and simmer for 10 minutes.
- Place fresh egg pasta sheets on clean, floured surface and brush with milk.
- Apply a generous layer of béchamel sauce. Cover with grated cheese.
- Cover béchamel sauce with the minced beef in chianti sauce.
- Assemble product, rolling them into separate portions - important to ensure each portion size is the same - measure using cooking vessels.
- Allow products to cool. Once cool, cover and chill in a refrigerator at 0 to 5°c.
- When needed, re-heat. Put back into large vats heating the products until they reach 74°c - (this will help to prevent food poisoning).
- Once temperature is above 74°c, serve.

Using this method to manufacture the product allows the process to be easily adapted to produce different end products. This style of production makes it likely that the final cost per each portion would be more expensive to make, however this could be counteracted by making the price at which the products are sold also higher.

Environmental Considerations during Manufacture:

The packaging for the beef cannelloni is a rigid rectangular, thermoplastic (PET) container that is sealed with a transparent cellophane film. During the manufacturing and distribution of this product there are numerous environmental concerns which need to be taken into consideration and in some cases altered. When planning the packaging that will be used to contain the product, the manufacturers need to think about the materials they use. The paperboard sleeve that acts as a label for the cannelloni is actually the only part of this packaging that is recyclable. The thermoplastic container is practical for the product however would be better if it was designed and made by a material that was also recyclable. One way this product could become more environmentally friendly is ensuring all the ingredients are bought locally and are farm assured wherever possible; if the ingredients are from other countries this will mean they need transporting which is fairly expensive in itself. As well as the costs that are tied into transport, there is also the idea of pollution that needs to be thought about, which is already and increasing problem for the world's environment. Another way to reduce environmental impacts when making this product would be again to look into the packaging that is used. It is best to use packaging that has been made from sustainable forests (i.e. for the paperboard sleeve) that can be recycled as this means the packaging does not damage the environment as much as it is made from renewable resources.

Section A: Product Investigation - Quality

The term quality is defined as 'a degree of excellence or character'. In the food industry, food manufacturers use this expression a lot as it is an important factor when designing, making and selling a product. 'Quality assurance' is one sector that manufacturers particularly focus on, using it as a way to describe and guarantee the overall standard of a product, whereas 'quality control' is the actual checks or restraints that are carried out to ensure the 'guaranteed' standards are met, as well as meeting the design specification and the manufacturing specification.

Quality Checks During the Manufacture:

- Ingredients and standard components bought in from a reliable supplier and delivered to the factory, preferably sourcing from farm assured producers wherever possible.
- On arrival at the factory, all of the ingredients will be visually checked - the packaging will be assessed and use-by dates will be checked. Any ingredients with damaged or tampered packaging or short/expired shelf lives will be returned to the suppliers.
- Temperature checks will also be made on arrival, ensuring frozen goods are at a temperature of –18°c, chilled goods are at a temperature between 0°c and 5°c, and ingredients that need to be kept in dry conditions are at an ambient temperature around 20°c.
- Composition of product - minced beef, fresh egg pasta sheets, size of vegetables, chianti red wine bolognaise, béchamel sauce.
- The standard of the product must meet all the high quality level expectations, ranging from the physical form, to the organolpetic attributes (i.e. the appearance, aroma, texture, taste etc), through to the microbiological standards.
- The viscosity of the sauces need to be checked, ensuring they are of the desired texture and thickness, this can be done by sensory analysis testing (taste, texture etc), or by using colour/number coded viscosity charts - it is essential that the sauces are palatable for the consumers.
- The overall weight of each product will be checked and connected up to computers. This will ensure all recordings are precise, accurate, and reliable which will therefore ensure the products have equal weights.
- Regular quality checks will be carried out to ensure the high standard expectations for the products organolpetic qualities are met. The product must be high quality in terms of its texture, taste, appearance and aroma - this checking process will be carried out by highly trained personnel staff.
- The colour of all the component parts will be checked against tolerance charts, for example the meat sauce, the fresh egg pasta sheets and the béchamel sauce.
- The products flavour of each component part and the meal as a whole will all be tested through a process of sensory analysis testing. Fair testing methods will need to be taken into consideration, for example separate individual tasting booths, correct lighting and temperature conditions, random labelling and sampling, and an available cup of water to cleanse the palate between each tasting etc.
- The standard and quality of the packaging will checked again but in more detail this time. Checks will be focused on the information that is on the label, ensuring all the required mandatory information is clearly visible and present (e.g. ingredients lists) . At the end of the production line the packaging of random products will be checked to ensure these high standards are met.
- Date and traceability coding will be checked. This allows any problems to be identified at the source, meaning in the event of a problem arising, it can be sorted and corrected quickly and efficiently.
- During the storage of all the ingredients regular temperature and time checks will need to be carried out. This will help to keep possible hazards under control. They will include computerised temperature control, checking that frozen goods are at a temperature of –18°c, chilled goods are at a temperature between 0°c and 5°c, and ingredients that need to be kept in dry conditions are at an ambient temperature around 20°c. This is also a process that is carried out throughout the distribution of the products.
- Chemical quality control checks are carried out to ensure safe use of preservatives and additives in the product.
- Physical quality checks are carried out to ensure no contamination or tampering has occurred within the product - these could include visual checks or things like metal detectors or microbiological screening.
- Tolerances would ensure consistent standards in terms of colour, sizes and overall weights of the final products. For the final weight of the product, a tolerance of +/- 10g should be suitable and acceptable.

All these quality control checks will need to be carried out in order to ensure high standards of consistency for the final beef cannelloni product. The quality control checks that are carried out help to minimise as far as possible any risks that are associated with the production, distribution and storage of the product, therefore making it as safe as possible for the consumer.

Quality Assurance System:

HACCP is one type of a formal quality assurance scheme that could be used in the production of the beef cannelloni. HACCP stands for Hazard Analysis and Critical Control Point and is a system that is used to help food companies identify possible threats to food safety. The main ideologies of HACCP are that certain hazards are identified at early stages so that they can be quickly controlled, therefore making the product as safe as it can be for the consumer. Risks to the consumer can be when the food is biologically, chemically or physically contaminated. An example of a biological hazard would be growth of pathogenic bacteria on high risk ingredients, for example salmonella in the eggs. Chemical contamination could be where equipment hasn't been washed and rinsed thoroughly enough so there is still cleaning chemicals on the equipment that have been wiped onto the food during use. A physical hazard is where an unwanted object is in the food, ranging from a human hair to a piece of metal or glass. The table below shows each stage of the production process for the beef cannelloni, along with possible hazards that may arise, linked with a suitable HACCP control that can be taken to ensure the food remains as safe as it can be for the consumer.

Production Process	HACCP Hazards	HACCP controls
• Ingredients arrive at the factory. • Storage of ingredients in dry stores(20°c)/ chilled cabinets (between 0°c and 5°c).	• Out of date ingredients • Damaged packaging • Growth of pathogenic bacteria	• Visual check on quality of all ingredients. • Check use-by dates. • Return ingredients with damaged/ tampered packaging or ingredients with short/expired shelf lives.
• CAM: Ingredients weighed as specification. • Placed in preparation area.	• Chemical/physical contamination from equipment/handling by staff. • Growth of pathogenic bacteria on high risk ingredients like the meat.	• Use electronic/digital scales. Scales checked frequently by production staff to ensure accurate weighing (working properly). • Ensure all equipment is washed/rinsed thoroughly. • Preparation area kept out of the danger zone temperatures (5°c to 63°c).
• CAM: Vegetables graded, sorted, cleaned (wet, spray washing), and sized reduced by rotary cutting knives. Blanched to prevent enzymic activity (browning).	• Biological contamination on vegetables. • Chemical/physical contamination from equipment/handling by staff.	• Ensure all equipment is first disinfected with water at temperature of at least 82°c. Ensure washed/rinsed thoroughly. • Train all staff in food handling procedures - tie hair back, no jewellery, clean apron, blue plasters to cover cuts etc.
• CAM: Pasta sheets cut into equally sized rectangles as specification.	• Chemical contamination from equipment.	• Ensure all equipment is first disinfected with water at temperature of at least 82°c. Ensure washed/rinsed thoroughly.
• CAM: Mince and Chianti sauce in large z-blade mixer.	• Chemical/physical contamination from equipment/handling by staff.	• Ensure all equipment is first disinfected with water at temperature at least 82°c. Ensure washed/rinsed thoroughly. • Train all staff in food handling situations - tie hair back, no jewellery, clean apron, blue plasters.
• CAM: Add vegetables to mince filling in large mixer.	• Physical contamination from handling by staff.	• Train all staff in food handling situations - tie hair back, no jewellery, clean apron, blue plasters covering cuts etc.
• CAM: Assemble product - layer of béchamel sauce covers pasta sheet. Covered in grated cheese. Topped with mince filling. Rolled and sealed into cannelloni's.	• Chemical/physical contamination from equipment/handling by staff.	• Ensure all equipment is first disinfected with water at temperature of at least 82°c. Ensure washed/rinsed thoroughly. • Train all staff in food handling situations - tie hair back, no jewellery, clean apron, blue plasters.
• CAM: Package product	• Chemical/physical contamination from equipment/handling by staff/ machinery.	• Visual check of packaging. • Send packaging through metal detectors.
• Final finished product stored and distributed in refrigerated areas, (between 0°c and 5°c).	• Damaged packaging • Growth of pathogenic bacteria	• Visually check packaging to ensure its not been damaged/tampered with. • Ensure fridges are between 0°c and 5°c - regular checks on temperatures.

AS GCE Design and Technology:
Food Technology

Section B:

Product Design

Section B: Product Design

Aim: To examine the design brief and begin process of thoughts.

Design Brief:
Gastropub food is a relatively new concept and continuous to increase its market share when eating out. A major food retailer has developed a range of 'Gastropub' ready meals that have been a huge success. The company wishes to extend its existing range.

Design a 'Gastropub' main course or dessert product aimed at the adult market to complement the existing range of products.

Design criteria:

- Sold as an individual serving (200-450g)
- Suitable to be reheated and eaten warm
- Appeal to the adult market
- Be served with or include a sauce
- Include fruit or vegetables
- Contain no more than 800 kcal per serving
- Have an attractive and well finished appearance.

A **gastropub** (or "gastro pub") is a British term for a public house which specializes in high-quality food a step above the more basic "pub grub."

Analysis/Initial Thoughts:
After looking at and examining the design brief I have decided to visit a couple of the local supermarkets for example Marks & Spencer's, in order to look at some existing products that relate to the 'Gastropub' theme and also to aid me to get more ideas and understanding. By doing this I will be able to see where there is a 'gap' in the market and also be able to see where I can develop some existing products further, making them original and interesting. Below are a series of photos I took of the exiting products on the shelves of Marks & Spencer's, relating to the idea of Gastropub.





Section B: Design Sketches

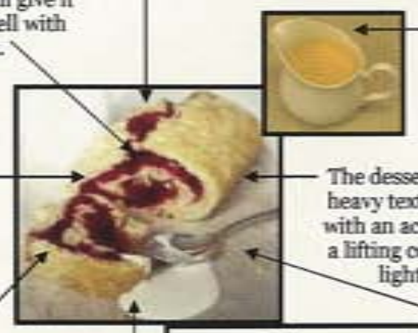
Aim: To generate 4 deign ideas for sweet products, meeting the design criteria as closely as possible.

Jam Roly Poly Served With Custard:

Rich raspberry jam spread evenly across the sponge to create an equal swirl throughout the dessert. It will act as a sweetener in the dessert and will give it a deep red colouration that will contrast well with the pale colouring of the suet pastry.

The raspberry jam contains vitamin C which adds a small element of nutritional value to the dessert product.

Homemade custard will accompany the jam roly poly to keep up the traditionalism of the 'family favourite' dessert. This could be modified to be served with fresh cream or different flavours of homemade ice-cream depending on what is most popular.



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The product will hold a variety of different flavours, ranging from the sweet raspberry jam, to the rich suet pastry, right through to the intense flavouring of the homemade vanilla custard. Providing a range of flavours makes the dessert more enjoyable to eat, enticing you for another bite.

The dessert will have a very dense and heavy texture, therefore will work well with an accompaniment as it will act as a lifting component, making it slightly lighter and more enjoyable.

The jam roly poly can be cooked in two ways; one way is to steam the product ensuring the dense and moist desired texture is successful. The other way is to bake it in the oven. This will still hold a good texture and will also give the product a light golden brown colouring that will look appealing to a consumer.

This product has a lot of scope for developments which would make it a more original dessert. I could experiment with ingredients like the fat and the flour or modify ingredients like the jam and the accompaniment.

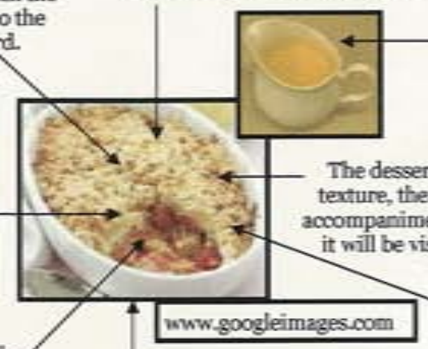
The products sensory characteristics will all be dynamic and to a high quality standard. The dessert product will look professional, holding a tidy and well finished appearance that will appeal to an adult market.

Apple And Rhubarb Crumble Served With Custard:

The dessert will include a range of textures incorporated that contrast yet compliment each other well. For example the soft fruit with the light and 'crunchy' crumble, through to the thick and viscous homemade custard.

The apple and rhubarb add nutritional value to the dessert, especially vitamin C and fibre.

Homemade custard will accompany the crumble to keep up the traditionalism of the dessert. This could be modified to be served with clotted cream, crème fraiche or different flavours of homemade ice-cream depending on what is discovered to be the most popular.



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The product will hold a variety of different flavours, ranging from the slightly bitter apple and rhubarb centre, to the sweet crumble on top, right through to the intense flavouring of the homemade vanilla custard. Providing a range of flavours makes the dessert more enjoyable and interesting to eat.

The dessert will have a fairly standard texture, therefore will work well with an accompaniment like homemade custard, as it will be viscous and moist, coating the product nicely .

The fruit filling will be stewed along with the sugar to develop the flavour and the desired soft texture. The flour and the fat will be rubbed into a fine mixture in order to form the light crumble topping. The product will then be baked in the oven at a low temperature until an appealing golden brown colour is present.

This product has a lot of scope for developments which would make it a more original dessert. I could experiment with ingredients like the fat, the flour and the sugar or modify ingredients like the fruit or change the accompaniment.

The products sensory characteristics will all be dynamic and to a high quality standard. The dessert product will look professional, holding a tidy and well finished appearance that will appeal to an adult market.

Sticky Toffee and Ginger Pudding :

The sweet sticky sauce is drizzled across the top of the pudding to make it look more appetising and appealing to consumers.

Throughout the product there will be a variety of different textures and distinctive flavours.

The high quality ingredients used will ensure a high quality final product. The sticky toffee puddings will be served as manageable individual portions, therefore meeting another point of the design specification.

There is no traditional accompaniment with sticky toffee pudding other than the sticky toffee sauce. I could make this dessert more original by serving it with homemade custard or fresh cream, or even a homemade ice-cream. I would have to experiment with flavours, seeing which was the most popular with tasters.

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Nutrition per serving: 557 kcal, protein 5.1g, carbohydrate 69.6g, fat 30.7 g, saturated fat 18g, fibre 1.7g, salt 0.29 g. As you can see from the information above this dessert is not a healthy option, therefore not suitable for someone on a low calorie diet. Things could be developed and modified to make the product into a healthier option. For example, ingredients that have higher nutritional values could be added, i.e. a fruit like dates that are high in iron and potassium, also vitamin A and vitamin B. This would work well with the texture of the product and as hoped, add a more healthy twist to the pudding. Healthier options are becoming more and more popular so this would be an interesting experiment to alter the dessert with.

This product is suitable for vegetarians, therefore will be seen to appeal to a bigger consumer group as there is no restrictions for consumption.

This dessert product could be developed and modified in different ways to make it more original and unique. Ingredients like dried fruits or nuts could be added to form different textures and even contrasting colours that will make the product more eye-catching.

The products sensory characteristics will all be dynamic and to a high quality standard. The dessert product will look professional, holding a tidy and well finished appearance that will appeal to an adult market.

Chocolate Fondant Served With Caramel Sauce And Strawberries:

Nutrition per serving (just the fondants) : 581 kcal, protein 9g, carbohydrate 52g, fat 40 g, saturated fat 21g, fibre 0g, salt 0.55 g.

As you can see from the information above this dessert is not a healthy option, therefore not suitable for someone on a low calorie diet. Things could be developed and modified to make the product into a healthier option.

The dessert could come with fresh succulent strawberries, adding a refreshing finish to the dish. This vivid red colouring will contrast well with the dark chocolaty brown colour, making it look eye-catching and appetising.

The strawberries contain potassium and vitamin C which add a small element of nutritional value to the rich dessert product.

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A caramel sauce will accompany the fondants. This could be modified or additional accompaniments could be severed with it. For example clotted or fresh cream, homemade vanilla custard or different flavours of homemade ice-cream could be added depending on what is discovered to be the most popular.

The products sensory characteristics will all be dynamic and to a high quality standard. The dessert product will look professional, holding a tidy and well finished appearance that will appeal to an adult market.

This product doesn't have huge scope for developments, however meets the design specification very closely in every other way, showing me it could be a great success.

The chocolate fondants will hold a very rich and dominant chocolaty taste. They have a variety of textures ranging from with a melt-in-the-mouth centre to a more spongy outer shell, through to a soft creamy accompaniment that is served with it. It is made with high quality ingredients ensuring a high quality finished product. This decadent dessert is simply irresistible.

The dessert will have a very dense and heavy texture and flavour, therefore will work well with an accompaniment as it will act as a lifting component, making it slightly lighter and more enjoyable.

Section B: Design Sketches

Aim: To generate 4 deign ideas for savoury products, meeting the design criteria as closely as possible.

Beef Steak Stroganoff Served With Long Grain Rice:

The product holds a variety of different flavours and textures. The tender beef will contrast well with the soft, long grain rice. The two colours of the component parts also contrast yet compliment each other well, ranging from the rich brown of the sauce to the pale white of the rice. The meal looks visually striking and holds a neat and tidy finish. The rice has many flavourings within itself. As you can see from the picture, it has a combination of vegetables like peas and flavourings like different herbs. This gives the meal more colour and flavour but also adds to the overall aroma that would be given off during cooking and serving.

The dimensions of the meal will be approximately 150mm x 150 mm. This is a substantially sized portion for a main evening meal.

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This meal will fit perfectly on a 'gastropub' menu. It is a traditional meal that could be fairly limited in terms of developments. The beef could be replaced by chicken, which is still a HBV protein, or it could be replaced by a meat substitute like quorn, which would then make the product suitable for vegetarians. The sauce could also be modified, making it a more creamy tomato flavour rather than having the dominant meat sauce flavouring.

A leaf of parsley is positioned on top of the meal. This gives it an overall professional and well finished appearance that looks neat and tidy on the serving plate. The parsley adds another vivid colour that contrasts, which would attract the consumers attention and appetite.

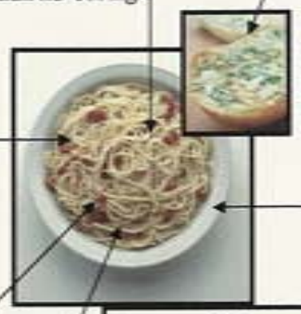
This product holds a fairly good nutritional value. The beef is classed as a HBV protein which is essential for good body structure and movement and also the production of antibodies. The long grain rice in the meal adds a count for carbohydrates. Carbohydrates store large amounts of energy that are slowly released throughout the day. With a mixture of macronutrients like this, the product would be suitable for those looking for a balanced evening meal that holds a high satiety value (the feeling of fullness).

Spaghetti Carbonara Served With Garlic Bread:

The main bulk of the dish will be made up from egg and spinach flavoured spaghetti pasta. It will hold a soft and smooth texture that will be compliment by the creamy sauce that enrobes it. It offers the dish a contrast of colours (white and green) and helps to create a basic Italian flavouring.

The spaghetti dish will be accompanied by a portion of garlic bread. This again adds on the idea of the dish being Italian based and also adds another dominant flavour to go with the meal. The bread could be modified and developed in many different ways; I could change the shape and size of it and could also make the addition of ingredients like onions and tomatoes to make it taste and look completely different, almost like a serving of broshetta.

The pasta will be enrobed by a cream and garlic sauce. This will give an overall moist texture and will also enhance an Italian flavouring. The dish will include tender chunks of cured bacon to give the dish more flavour, a varied texture and another colour to contrast the pale pasta and sauce. The dish looks attractive and has a very dominant yet pleasant garlic aroma.



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The dish will have the approximate dimensions of 150mm x 150mm. This is a substantially sized portion for an evening meal.

Finely chopped and sprinkled fresh oregano could be added to the product. This will give the dish a well finished and professional appearance that will look appetising and appealing to a consumer. Mixed with the garlic cream sauce and the pasta, this will endow the dish flavour with an authentic Italian taste.

The meal at present would not be suitable for vegetarians as it contains bacon. It would also not suit those with religious diets like Muslims . To make this dish available to a bigger range of consumer groups I could eliminate the meat and replace it with something like a mushroom and pea combination. This would make it suitable and would allow it to still keep the same great taste.

Chicken Korma Served With Pilau Rice And Naan Bread:

The sensory characteristics of this product would be very pleasing for a consumer. The diced chicken will be marinated in a marinade in order to create a stronger flavour and more desired tender texture. The green peppers act as a great contrast to this adding more colour to the meal, as does the soft and pale coloured naan bread and the pilau rice that will accompany the dish. There will be a variety of textures included, ranging from the crispness of the peppers, to the tenderness of the chicken, to the creamy korma sauce, all which will compliment yet contrast each other, making it interesting to eat. The korma sauce itself will have a very vibrant yellowy, orange colouring that immediately draws the consumers eye to the dish. This would be a very aesthetically pleasing meal.

The total dimensions of the curry will be approximately 150mm x 150mm. The naan bread will be 150mm x 100m x 15 mm.

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The dish could be served with a portion of naan bread as an accompaniment. They are often made into the shape of a tear drop as this is the traditional way to serve it with an Indian meal. The bread will be unleavened, meaning it will not rise during cooking.

The naan bread will have a light and fluffy texture that will hold air even though it is unleavened. After griddling the bread, it will have a shiny golden brown colouring that will look attractive and appealing to the consumer.

The naan bread could be modified and developed in many different ways. A variety of flavours could be experimented with, ranging from plain, to garlic and coriander, through to sweet peshwari. Traditional ingredients for curries could be added to the bread to give it more texture for example sultanas or nuts.

The curry dish itself has lots of scope for developments and modifications. I could experiment with different spices and sauces making it 'hotter' if the consumers would prefer this. I could also experiment with the meat I used, changing the chicken to other traditional meats like beef, lamb or prawns.

The dish will hold certain aspects that will add to a good nutritional value, for example, the HBV protein in the chicken and the carbohydrates in the bread and the rice.
As a main meal dish, the curry provides a different culture of food towards a traditional 'gastropub' menu.

Garlic Chicken Calzone:

The calzone will hold dynamic flavours and textures and will also meet high standard expectations for its final appearance. There will be a variety of textures included in the centre filling of the calzone, ranging from the crispness of the peppers, to the tenderness of the chicken, through to the smooth garlic and tomato sauce that enrobes the ingredients. This will all contrast yet compliment the soft and fluffy bread dough base that will encase the filling. The product will have a dominant tomato and garlic flavouring which is a traditional Italian combination. The product looks visually striking with a range of vivid colours.

A small dish of sour cream will accompany the calzone. This is an optional component to the meal however is a common addition to a rich pizza based product like this. It adds a contrasting colour that looks eye-catching against the striking red of the tomato filling.

The centre filling of the calzone could be modified and developed in many different ways. Garlic chicken is just one common option that can be created to form a combination of a calzone filling. I could develop this by creating different flavours of chicken for example a chicken tikka flavoured filling. This would create a vivid orange colouring that would be visually striking towards a consumer. Ingredients like chopped peppers could be added to create more textures.

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This Italian dish is another product that will add a different culture of food to a traditional 'gastropub' menu.

This product will not be suitable for vegetarians as it contains chicken. An alternative HBV protein could replace this for example a quorn substitute of chicken, making it more appealing to this audience group with special dietary needs.

The calzone shape is a development of a pizza already. I could still however experiment with a variety of other shapes, like the traditional circle, or a rectangular or square pizza.
The bread dough base is a component that is very open to be developed in many ways. The addition of ingredients such as herbs, cheese (as a stuffed crust or extra) or onions would all work well, enhancing the flavour and adding a wider range of textures and colours, making the product more interesting and unique.

Evaluating Design Ideas

Aim: To analyse all of my design ideas, relating them to the design criteria in order to choose which 4 dishes I am going to take forward to the development stage.

I filled out the table below in order to help me choose which design ideas I should take forward to the making and developing stage in this project. I have related it to the design criteria to ensure I chose the dishes that met the specification in the closest way, therefore being the most successful. Each design is marked out of 5 in terms of meeting the criteria, (5 being easy to reach completion, 1 being difficult) the totals have then been calculated to make it visible which products appear to be the best; the 4 dishes with the highest overall marks will be the ones I take to the next stage.

Design Criteria	Design Idea 1: Beef Steak Stroganoff	Design Idea 2: Spaghetti Carbonara	Design Idea 3: Chicken Korma	Design Idea 4: Garlic Chicken Calzone	Design Idea 5: Jam Roly Poly	Design Idea 6: Sticky Toffee Pudding	Design Idea 7: Chocolate Fondants	Design Idea 8: Traditional Apple & Rhubarb Crumble
Sold as an individual serving (200-450g)	3	4	5	4	5	5	5	4
Suitable to be reheated and eaten warm	4	4	5	4	4	3	3	5
Appeal to the adult market	5	4	5	5	5	4	4	4
Be served with or include a sauce	5	5	5	4	5	5	5	5
Include fruit or vegetables	4	3	4	4	3	3	4	5
Contain no more than 800 kcal per serving	5	5	5	5	5	5	5	4
Have an attractive and well finished appearance.	3	4	5	4	4	4	5	3
Total Scores	**29/35**	**29/35**	**34/35**	**30/35**	**31/35**	**29/35**	**31/35**	**30/35**




After analysing all of my design ideas I have decided on 4 dishes that I am going to take forward to the making and developing stage in this project. Each of the 8 dishes scored well in the specification table (left), I have therefore chosen the ones that meet the specification in the closest way and the ones I feel offer a wider scope for development. When choosing the dishes, as well as relating them to the criteria I also considered the difficulty involved in making the different ideas as I want my products to offer a challenge to me, enabling me to display a rang of cooking techniques and skills. I took the two highest scoring savoury dishes and the two highest scoring sweet dishes in order to receive a range of final products. The dishes I have chosen to take forward are listed below.

Chicken Korma served with Pilau Rice and Naan Bread:

The chicken korma was the highest scoring dish in the criteria table, meeting the needs highly of each specification point, therefore being a product I will definitely be taking forward on to the next stage. As a main meal dish, the curry provides a different culture of food to a traditional 'gastropub' menu which is a good and interesting factor for this project. This Indian dish will be dynamic in terms of flavour, texture and appearance. The diced chicken will be marinated in a marinade in order to create a stronger flavour and more desired tender texture. The korma sauce itself will have a very vibrant yellowy, orange colouring that immediately draws the consumers eye to the dish. The green peppers act as a great contrast to this adding more colour to the meal, as does the pale coloured naan bread and the pilau rice that will accompany the dish. There will be a variety of textures included, ranging from the crispness of the peppers, to the tenderness of the chicken, to the creamy korma sauce, all which will compliment yet contrast each other, making it interesting to eat. The dish will hold certain aspects that will add to a good nutritional value, for example, the protein in the chicken and the carbohydrates in the bread and the rice. A wide range of sauces and flavours could be added or changed throughout the different components of the dish, making it open and good for developments.

Jam Roly Poly served with Homemade Custard:

This dessert product scored a pleasing 31/35 in the criteria rating table. The product holds great scope for development as it is a very traditional dessert with simple ingredients that could be complimented well with the addition of other ingredients. The homemade custard is a skilful component to make and could be seen as a challenge, needing exactly the right consistency and viscosity to impress and meet the tasters expectations. The final finish should be attractive and appealing, including a variation of contrasting colours and textures. The flavour of the jam roly poly should be rich and sweet due to the smooth fruit filling that contrasts well with the dense and moist pastry that surrounds it. This dessert is an traditional 'family favourite' that could be very popular both as an original or as a newly developed unique product on a 'gastropub' menu.

Garlic Chicken Calzone:

This Italian dish is another product that will add a different culture of food to a traditional 'gastropub' menu. It will have dynamic flavours and textures and will also meet high standard expectations for its final appearance. There will be a variety of textures included in the centre filling of the calzone, ranging from the crispness of the peppers, to the tenderness of the chicken, through to the smooth garlic and tomato sauce that binds the ingredients into a paste-like substance. The base is a component that is very open to be developed in many ways. The addition of ingredients such as herbs, cheese (as a stuffed crust or extra) or onions would all work well, enhancing the flavour, making it more interesting and unique. The centre of the calzone could also be developed in many different ways to compliment the base that encases the filling, for example, the meat could be taken out, making the product a vegetarian option in order to appeal and suit to a wider range of consumers. Different ingredients could be used in addition or as substitutions as another development to make the dish more unique.

Chocolate Fondants:

The chocolate fondants is the other dessert I will be taking forward to the next stage in this project. It scored 31/35 in the criteria table, therefore shows me it suits the specification well and could be a really successful product. It is another dish that is open to developments, for example, changing the chocolate used, varying it from dark to milk to white. I could also make ice-cream to serve along side it, developing the different flavours that are available as originals. Additional ingredients could also be added to change the desserts textures, flavours, tastes and even aromas. For example, assorted chocolate chips would be ideal to add colour and a different, harder contrasting texture; zests of citrus fruits like lemons or limes could be added to give a tangy taste, a more vibrant colour appeal and even a thin crisp of texture. The original fondants hold a variety of contrasting textures alone, ranging from the soft 'airy' sponge with the melt-in-the-mouth 'gooey' centre. A single fruit like a raspberry or a fanned strawberry could be added to produce a crisp and fresh texture and also as a finishing touch. Doing this will allow the product to meet another point on the design specification.

I have decided not to take the following dishes on to the making and developing process; beef stroganoff, spaghetti carbonara, sticky toffee pudding or the traditional apple and rhubarb crumble. I feel they do not meet the design criteria as well as the other 4 ideas do. I also feel they lack scope for development as their recipe's are already well developed or the level of skill is too simple and not challenging enough for me to display my cooking techniques and abilities; I therefore feel they do not hold as much potential to be successful and original like the others.

Generating Ideas: Prototype 1 - Jam Roly Poly

Evaluating Design Ideas

Name of product: Jam Roly Poly served with Homemade Custard

This photograph shows the application of the fruit filling, raspberry jam. I layered the jam too thickly this time which caused problems when rolling the pastry to form the products expected structure.

This is a picture showing the jam roly poly being steamed to cook it. Steaming the dessert helps to keep the moist, dense pastry that is expected.

This photo shows the portion of homemade custard that accompanied the jam roly poly as a sauce.

This picture shows the final appearance of the jam roly poly. The mint leaf is positioned as a finishing garnish, contrasting well with the colours of the product. I was on the whole very pleased with my final dessert product.

Description of the Product :

A traditional family favourite, served with the very best homemade custard, simply delicious.

Function of Ingredients:

Jam Roly Poly:

Self-raising flour - Bulk ingredient in which forms the main structure of the pudding. It is the raising agent, therefore aerates the mixture to increase volume.

Salt - This ingredients helps to sharpen and enhance the flavours of other ingredients in the dish, such as the sweet raspberry jam.

Caster sugar - Simply sweetens the mixture for a more likeable and developed flavour. Finer crystals to achieve desired texture.

Suet - Keeps the pastry moist due to the fat content. This also gives the dessert a nice golden brown colouring when its cooked. Suet is high in saturated fat.

Milk - Helps to bind all the dry ingredients together. On heating/cooking produces steam which acts as another raising agent. Another ingredient that adds an element of moisture to the pastry.

Jam - Raspberry flavoured, seedless jam, acts as the main flavouring. The jam is another ingredient that helps moisten the pastry and make the overall flavour become very sweet.

Homemade Custard:

Milk - This forms the main structure of the custard, adding bulk and volume to the mixture. It also adds a nutritional value of calcium and protein into the custard.

Eggs yolks - Adds tenderness and provides a consistent flavour and texture, also providing the pale yellow colour of the custard. When heated the eggs coagulate, a thickening process to make the custard be brought to the desired viscosity.

Vanilla pod - Gives the pure, distinctive vanilla flavouring to the custard. Can also add colour as it leaves dark speckles which contrasted well with the pale yellow base of the custard.

Caster sugar - Simply sweetens the product, also helps to aid a brighter colour to the custard.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
XXY	3	4	4	3	14	5	5	4	5	19	4	4	4	5	17	4	4	4	4	16	66

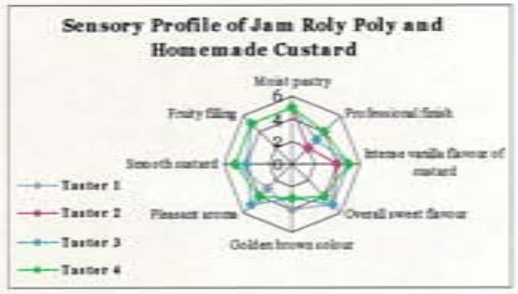
Feedback from the tasting panel:

From testing the product using sensory analysis, it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could do with improvement.

The jam roly poly and custard scored an overall total of 66 out of a possible 80 marks. This shows me the product worked well and was successful, however, as always there is still room for improvements.

The overall appearance scored a total 14 out of a possible 20 marks. This score was not as high as I initially hoped. I found it difficult to roll the dessert neatly as I had put a layer of jam that was too thick on the pastry base.

The final outcome was therefore not as tidy and professional as it should have been. To make this better I would take my time more, spreading a thinner layer of jam across the pastry, then ensuring all the rolls were tight and equal, therefore making the swirls of jam and pastry even throughout the dessert. The custard looked very appetising and complimented the dessert dish very well. The colour could do with being enhanced to make it stand out more, however this is a common problem with homemade custard.



The texture scored very highly in the rating table, marginally missing out on full marks (19 / 20). It was the most popular characteristic with the dessert. The tasters all agreed that the moistness of the pastry was 'perfect, you could see it was before you even tasted it.' The combination of the moist, more firm pastry of the jam roly poly contrasted well with the smooth and thick viscosity of the custard.

The taste of the jam roly poly scored 17 out of a possible 20 marks in the sensory analysis testing. It had an intense raspberry flavour due to the thick layer of jam I applied. This sweet and rich flavour of the jam contrasted well with the pastry and simple vanilla flavouring of the custard. All the components contrasted, yet complimented each other well, toning down flavours that would be too powerful on their own.

The aroma was the aspect that scored the least marks in the rating table completed by the tasters, however it still scored quite well, managing to pick up a total of 16 out of a possible 20 marks. The aroma of the jam roly poly was not that strong and powerful, therefore was hard to give a near-top mark. The custard on the other hand, had a very distinct and dominant vanilla aroma which was described as smelling 'delicious', gaining the majority of the sensory points.

Scope for development:

The jam roly poly has quite a few potential areas for development. If I made this dish again I could:

- Develop a savoury dish to accompany the dessert (i.e.. a main course to have before this dessert).
- Add extra ingredients such as nuts or chocolate chips to the pastry to make it more unique.
- Change the flavour of the jam used in the centre (e.g.. to strawberry or bramble).
- Experiment by making my own jam and flavours.
- Experiment and alter the original vanilla flavour of the custard to something more unique and different.
- Investigate the use of different fats in the pastry, yet retain the desired texture.

Positive aspects of the product:	Negative aspects of the product:	Meeting the design criteria:	Target group opinions:
• The overall sensory analysis testing scored well. • The pastry was moist and spongy. • The thick and smooth viscosity of the homemade custard met the tasters expectations. • The 3 component flavours and textures were all distinctive; the dense pastry, the sweet fruity jam, and the smooth, vanilla flavoured custard. • Looked fairly professional with finishing garnish. • Jam roly poly is a traditional dessert, which could be developed in many ways to create uniqueness.	• The final product did not turn out exactly as I had hoped. The layer of jam was too thick, therefore made the rolling of the pastry messy; because it was difficult to role, the layered swirls of the jam and the pastry were not equal. . If I was going to make this again I would apply a thinner layer of jam so this problem couldn't occur. • The very top of the jam roly poly had split, allowing the excess jam to bubble out while it was being steamed. Although this could not be seen when the dessert was cut into pieces you could see it when the product was left whole.	The jam roly poly met the design criteria in the following ways: • It was served as an individual portion. • The dessert is expected to be served and eaten warm. • The product appealed to and suited the adult market. • The jam roly poly was served with a homemade custard. • Seedless raspberry jam was used for the filling, therefore the product can be seen to include a fruit. • One individual portion contained no more than 800Kcal. • The jam roly poly had a fairly attractive appearance, however improvements could be made to make it look more professional and well finished.	The design criteria states that the target group for all my product ideas is an adult market, I therefore must ensure each one suits and appeals to them. For the jam roly poly the target group agreed that the best aspect of the dessert was its textures (which can be related to in the sensory analysis rating table). They were impressed with the moisture the pastry held and how smooth and thick the homemade custard was - 'perfect'. An element they felt needed attention and could do with improvement was the overall appearance of the product. I have discussed ways I could change how I did certain stages in the making process in order to create a more professional and well finished final jam roly poly.

Generating Ideas: Prototype 2 - Chocolate Fondants

Evaluating Design Ideas:

Name of product: Chocolate Fondants

I used ramekin dishes to cook the fondants. Before putting the fondant mixture in, I coated the sides with a light brush of butter and cocoa powder to ensure the fondants did not stick and were easily removed once cooked.

This picture shows the melted dark chocolate which is the key ingredient for the desserts colour. In the bowl next to it I am sieving the flour in order to create more air when its added to the beaten eggs.

In this picture you can see the increased volume of the eggs. During the process of them being vigorously beaten.

This picture shows the final outcome of my fondants. I was very pleased with the professional appearance that was tidy and well finished.

Description of the Product : A high quality, chocolate based dessert which is served with a drizzle of caramel sauce and a succulent, fanned strawberry. Guaranteed to melt-in-your-mouth, enticing you to have another bite.

Function of Ingredients:

Fondants:

Good-quality dark chocolate - The chocolate gives the dark brown colour and the distinctive rich, chocolaty flavour.

Butter – This ingredient helps to extend the products shelf-life. It holds tiny air bubbles that are produced from mixing, aiding a soft and 'airy' texture. The butter also adds colour and enhances the overall flavour of the fondants.

Golden caster sugar – Generally sweetens the fondants, giving them a more pleasant taste.

Eggs and egg yolk – When vigorously whisked, the eggs hold air bubbles giving the mixture volume and bulk, also used as an element to add more colour. A setting agent through the process of coagulation.

Plain flour – Another ingredient that adds bulk to the mixture, forming the main structure of the fondants. When sieved, it adds more air that again, when combined with all the other ingredients, lightens the texture allowing it to form a loose cake batter that is needed.

Caramel Sauce:

Caster sugar - When heated, the process of caramelisation takes place. This gives the golden brown colour of the sauce and obviously gives the extreme sweet taste.

Double cream - This adds a creamy, thick texture to the sauce, making it manageable in terms of pouring into a dish or into a piping container to then be decoratively added as a finishing touch on the dessert and product.

Butter - An ingredient that adds to the of the sauce, it also adding to the flavour, making it rich and appetising.

Additional items:

Fanned strawberry - This gives the product an appetising professional appearance, making the overall product stand out with contrasting colours and decorative finishes. It also means the product relates to the design criteria (including a fruit).

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
XXY	5	5	4	5	19	4	5	5	4	18	5	5	4	4	18	4	4	4	5	17	72

Feedback from the tasting panel:

From testing the product using sensory analysis it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could do with improvement.

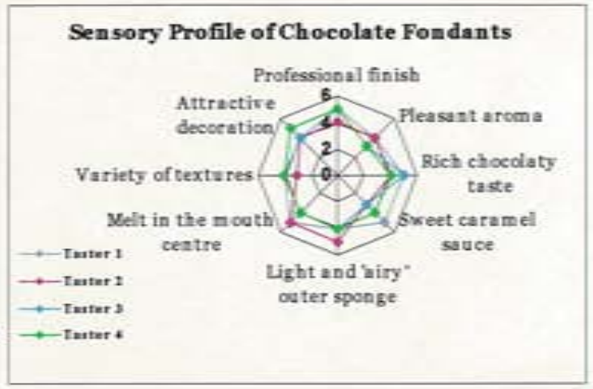
The chocolate fondants scored an overall total of 72 out of a possible 80 marks. This shows me the product worked well and was very successful, however, as always there is still room for improvements.

The appearance of the fondants scored very highly in the rating table, losing just one mark in total (19 / 20). This is due to the overall professional presentation that was 'tidy' and 'well finished'. It is noticeable that the tasters thought this was the products best aspect , therefore I do not think it needs concentrated effort and work in order to improve it if I were to take and develop the dessert further.

The texture scored a pleasing 18 out of a possible 20 marks. The 'gooey' inside, melted in the mouth, contrasting well with the light and airy outer sponge layer of the fondants and the fresh, crispness of the decorative strawberry on the side. The variety of textures this dessert has to offer increased the panels opinions as it was 'interesting' and 'different' to other standard dessert products.

The sensory analysis for the taste also scored very highly in the rating table. It lost only 2 marks, arguably due to the fact that it was extremely rich, something many people would love. The fondants held a luxurious chocolaty taste which is ideal for those with a sweet tooth!

The aroma was the factor that scored the lowest in the sensory analysis testing, receiving 17 out of a possible 20 marks. This was not a disappointing score as the tasters all agreed that the aroma was simply not strong enough, the smell that was given off was very pleasant but it just wasn't as powerful as some other dessert dishes.



Scope for Development:

The chocolate fondant desserts hold great potential and scope for development. Below are a few of my ideas as to how I could develop the fondants if I were to make them again.

- The good quality dark chocolate could be substituted for good quality milk or white chocolate, giving the dessert a completely different appearance and flavour. A combination of these chocolates could be used to again change the appearance and flavour of the dessert. For example, a milk chocolate outer shell, with the 'gooey' melt-in-the-mouth centre consisting of swirled white and dark mixture.
- Additional ingredients could be added to change the desserts textures, flavours, tastes and even aromas. For example, assorted chocolate chips would be ideal to added colour, a different, harder texture; zests of citrus fruits like lemons or limes could be added to give a tangy taste, a more vibrant colour appeal and even a thin crisp of texture.
- All different flavours of homemade ice-cream could be added as a side dish to accompany the fondants. The creamy textures and flavour would contrast yet compliment the rich chocolaty dessert.

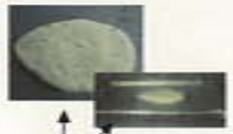
Positive aspects of the product:	Negative aspects of the product:	Meeting the design criteria:	Target group opinions:
• The fondant had a variety of contrasting textures ranging from the soft 'airy' sponge with the melt-in-the-mouth 'gooey' centre, to the crisp and fresh succulent strawberry that was added as a finishing touch to the product. • I was pleased with the fondants as they had an overall professional appearance that was very tidy and well finished. • The product turned out how I expected and wanted, therefore was a success, scoring well in the sensory analysis with the tasters.	• Due to being left, the centre of the fondants cooked in their own heat, making them dry up and turn to a simple cake mixture like the outer shell. This took away the element of the 'gooey', melt-in-the-mouth centre, limiting the expected varied textures. • Following the point above, the fondants were best eaten straight after being made and cooked. This could cause a problem as it meant they couldn't be kept; it would also make re-heating difficult as the centres may have already dried up , therefore would not be classed as fondants anymore.	The fondants met the design criteria in the following ways: • They were served as individual portions. • They are expected to be served and eaten warm. • They appealed to and suited the adult market. • The fondant was served with a caramel sauce. • A strawberry was added as a finish, therefore the product can be seen to include a fruit. • One individual fondant contained no more than 800Kcal. • They had an overall professional appearance that was very tidy and well finished.	The design criteria states that the target group for all my product ideas is an adult market, I therefore must ensure each one suits and appeals to them. With the fondants the tasters were impressed with the variety of different textures ranging from the soft 'airy' sponge with the melt-in-the-mouth 'gooey' centre, to the crisp and fresh succulent strawberry, all in which are expected with a product like this. They said the rich flavour worked well with the size of the portion as it wasn't too much, or too little. They were extremely impressed with the final look of the product as it had an overall professional appearance that was 'tidy' and 'well finished'.

Generating Ideas: Prototype 3 - Chicken Korma

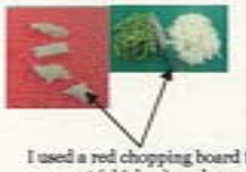
Evaluating Design Ideas

Name of product: Chicken Korma served with Pilau Rice and Naan Bread.

Annotated photographs:



These pictures show the naan bread at 2 of the stages during the making process. Firstly I kneaded the dough mixture for 5 minutes to develop the gluten content. I then shaped the dough into a tear drop, a traditional shape with Indian naan breads. After I was happy with the shape of the dough, I left it to prove for 20 minutes in order to create and expand on the dough's elasticity.



I used a red chopping board for the meat (chicken) and a green chopping board for the veg. This would help prevent cross

This picture shows the chicken being marinated in a marinade and the korma paste. This formed a stronger flavour and a more desired tender texture.

These pictures show my final product. It was very successful and scored well in the sensory analysis testing. The dish included dynamic flavours, textures and aromas and had a pleasing final professional finish.

Description of the Product: Traditional, Indian style chicken korma. Tender chunks of chicken, covered in a thick creamy korma sauce. (Mildly Spicy).

Function of Ingredients:

Korma Dish:

Chicken - Provides the main bulk of the dish, creating good nutritional value (including all 8 of the essential amino acids needed in the diet) adding protein and iron to the dish.

Onion /Green peppers - This helps add to the flavour of the dish, also creating a contrasting texture to the tender chicken and creamy korma sauce. I chose green peppers specifically to contrast the vibrant yellowy colour of the korma sauce. As well as adding colour, the peppers also add a crunchy texture that contrasts yet compliments the other textures in the dish.

Marinade - This is the acid that helps to break down the tissue in the chicken, giving it a stronger flavour and a more desired tender texture.

Korma paste - I bought this in as a standard component to ensure the right balance of flavour and spice in the product. I added grated almonds to the paste in order to create a stronger flavour and another varied texture.

Pilau rice - This is a traditional accompaniment with chicken curry. The rice adds flavour and texture, complimenting the dish itself well.

Naan Bread:

Strong plain flour - Adds gluten which is a protein; when mixed with the water forms an elastic stretchy dough is formed. Kneading the dough stretches the gluten allowing it to hold carbon dioxide bubbles produced by the yeast. During cooking the gluten coagulates, forming the structure of the bread.

Fresh yeast/Sugar - This is the raising agent in the naan bread. This aids the fermentation process of the yeast.

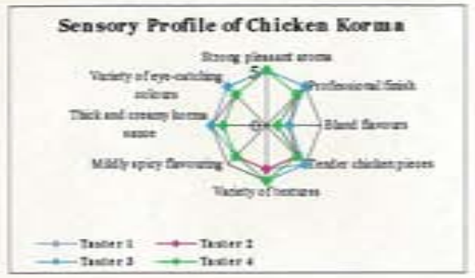
Salt - Helps to strengthen the gluten and control the action of the yeast. It also enhances and develops the flavours of other ingredients in the dough.

Water - Provides warm conditions for yeast fermentation. Adds moisture and binds the dry ingredients together.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
XXY	5	5	4	5	19	4	5	4	4	17	5	5	4	4	18	5	5	3	4	17	71

Feedback from the tasting panel:



From testing the product using sensory analysis, it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could do with improvement. The chicken korma scored a very pleasing overall total of 71 out of a possible 80 marks. This shows me the product worked well and was successful, however, as always there is still room for improvements.

The overall appearance scored a total 19 out of a possible 20 marks. This was the tasters favourite characteristic of the product. The final product looked very professional, holding a variation of vibrant and eye-catching colours. The bright yellow korma sauce contrasted well with the green of the peppers and the pale colouring of the chicken.

Throughout the dish, there was a range of different textures, which made it interesting and dynamic. The chicken reached its desired tender texture after being marinated which also enhanced its flavour. The green peppers contrasted well with the thick and creamy korma sauce. The naan bread was light and 'airy', which lightened the whole dish, taming the viscosity of the sauce itself.

The taste also scored very well in the sensory analysis testing, scoring a total of 18 out of a possible 20 marks. The standard component, korma paste helped to gain the right balance of flavour and spice in the product. I added grated almonds to the paste in order to create a stronger flavour and another varied texture. The naan bread held flavours of its own, being fairly bland but at the same time complimenting the rich sauce.

The aroma was another high scorer in the testing, picking up the same amount of marks as the texture (17/20). It was very strong and distinctive, smelling of spices even though the flavouring was not that powerful. It smelt 'gorgeous'.

In conclusion, each factor scored very well in the sensory analysis testing, losing just 9 marks all together from a possible total of 80 marks. The tasters all agreed the product was a success and would be happy to try developed versions of this traditional Indian dish.

Scope for development:

This product has a lot of scope and is open to developments throughout all of the dish.

Naan Bread:

- Add additional ingredients to change the sensory characteristics. For example, herbs, chives, coconut to make a peshwari style naan.

Meat:

- I could develop the meat to use different kinds of chicken that are available, for example tandoori which will add a stronger flavour and a more vibrant reddish colour. I could substitute the chicken to something less common like beef or prawn to make the dish different and more unique. I could remove the meat all together, creating a vegetarian option that will be open to and suit a wider range of consumers.

Sauce:

- I could change the sauce from korma to something like tikka massala or madras to change the flavour completely, even altering the texture, aroma and appearance.

Target group opinions:

The design criteria states that the target group for all my product ideas is an adult market, I therefore must ensure each one suits and appeals to them. The tasters said they liked the way the dynamic flavours and textures contrasted yet complimented each other. The aroma was 'mouth watering' and the appearance looked very appealing and professional. The meal offers a fairly good nutritional value with lots of protein and fibre included. The dish certainly fits the idea of the 'gastropub' and adds an interesting change of culture to the menu. 'This product could be a great success'.

Positive aspects of the product:	Negative aspects of the product:	Meeting the design criteria:
• The dish scored very well in the sensory analysis testing (71/80). • The chicken held a tender texture and a strong flavour as expected after being marinated. • The dish held dynamic flavours and textures ranging from the tender chicken, to crisp and fresh green peppers, through to the rich and creamy korma sauce. • The overall appearance was very impressive, holding a lot of contrasting colours. The green peppers and the green finishing garnish stood out from the yellowy colouring of the korma paste which made the dish eye catching and appealing. • The dish looked professional, very tidy and well finished.	• The paste was extremely thick due to the contents coagulating, I therefore had to keep adding milk and more cream which disguised some of the spices in the dish. • The product is ideal served straight after cooking when its piping hot; On re-heating, the rice holds the risk of contracting food poisoning. It must be heated to a required temperature to ensure the risk of this is reduced.	The chicken korma met the design criteria in the following ways: • It was served as an individual portion, in separate dishes. • The meal is expected to be served and eaten hot. • The product appealed to and suited the adult market. • The chicken was suspended in the korma flavoured sauce. • I used green peppers and onions in order to meet the vegetable requirement point • One individual portion contained no more than 800Kcal. • The chicken korma had a very attractive and eye-catching appearance which looked professional, tidy and well finished.

Generating Ideas: Prototype 4 - Chicken Calzone

Evaluating Design Ideas

Name of product: Garlic Chicken Calzone.

Annotated photographs

Firstly I kneaded the dough mixture for 5 minutes to develop the gluten content. I then rolled and shaped the dough into an oval type shape. After I was happy with the shape of the dough, I left it to prove for 20 minutes in order to create and expand on the dough's elasticity.

This shows the centre of the filling before I folded the dough into the traditional calzone shaping. You can see the vibrant and contrasting colours of the centre filling that appealed well to the tasters.

This is the calzone as it came out the oven (whole). It holds a light golden brown colouring that is expected of the product.

This shows my final product as I presented it to the tasters. It looks appealing and appetising, holding a variety of colours and a well finished appearance.

Description of the Product : Traditional Italian calzone, filled with chicken and smothered in a garlic based tomato filling. 'Magnifico'.

Function of Ingredients:

Pizza base:

Strong plain flour - Adds gluten which is a protein; when mixed with the water forms an elastic stretchy dough. Kneading the dough stretches the gluten allowing it to hold carbon dioxide bubbles produced by the yeast. During cooking the gluten coagulates, forming the structure of the pizza base.

Fresh yeast - The yeast is used as the main raising agent.

Sugar - This aids the fermentation process of the yeast.

Salt - Helps to strengthen the gluten and controls the action of the yeast. It also enhances and develops the flavours of other ingredients in the dough.

Water - Provides warm conditions for yeast fermentation. Adds moisture and binds the dry ingredients together.

Centre Filling:

Chicken - Provides the main bulk of the filling, creating good nutritional value (including all 8 of the essential amino acids needed in the diet) adding protein and iron to the dish.

Onion - This helps add to the flavour of the dish, creating a contrasting texture to the tender chicken.

Green peppers - I chose green peppers specifically to contrast the vibrant red colour of the tomato filling. As well as adding colour, the peppers also add a crunchy texture that contrasts yet compliments the other textures in the dish.

Garlic - Gives the centre filling of the calzone a very powerful, dynamic and distinctive flavour. One of the main Focus and dominant flavours that is included in the product.

Tinned tomatoes and Tomato puree - This gives the filling the vibrant and eye catching red colouring. It works alongside the fresh, crushed garlic complimenting and coating the chicken, giving the product moisture, more bulk and a refreshing 'tomatoey' flavouring.

Sensory Analysis:

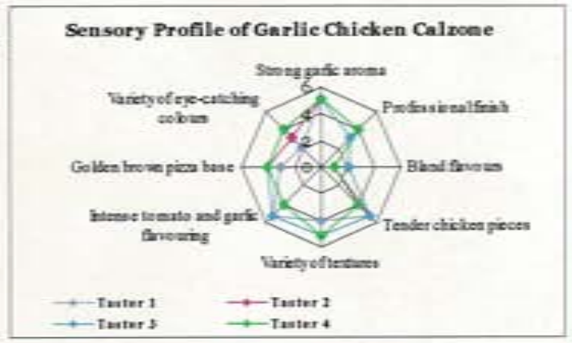
Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
XXY	3	4	4	3	14	4	4	4	5	17	4	4	4	4	16	4	5	5	5	18	66

Feedback from the tasting panel:

From testing the product using sensory analysis, it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could do with improvement.

The garlic chicken calzone also scored an overall total of 66 out of a possible 80 marks. This shows me the product worked well and was successful, however, as always there is still room for improvements.

The overall appearance scored a total 14 out of a possible 20 marks. This score was not as high as I initially hoped. The final product was made as one big calzone, rather than an individual sized one; I therefore had to cut it in order to meet this point on the specification, making it look less professional and tidy as would be expected. To make this better I would make the calzones in to individual sized portions and products, suitable to be packed, delivered and sold singly and on their own, without the need of being divided into equal pieces, therefore meeting the design criteria more closely. The product did hold a lot of eye catching colours that appealed to the tasters making it look appetising and interesting.



The texture scored very highly in the rating table, picking up a total of 17 out of a possible 20 marks. The tasters all agreed that the variation included and available made the dish interesting and very enjoyable to eat. The chicken was lovely and tender, which contrasted well with the hard crunch of the green peppers and the soft, doughy pizza base. The smooth texture of the tomato sauce filling contrasted yet complimented the other component elements incorporated.

The taste of the calzone scored 16 out of a possible 20 marks in the sensory analysis testing. It had an intense tomato and garlic flavouring due to sauce that moistened and filled the inside which suited the tasters palates sufficiently. This strong flavour of the centre contrasted well with the more plain and bland tasting bread base. All the components contrasted, yet complimented each other well, toning down flavours that would be too powerful on their own.

The aroma was the tasters favourite characteristic of the calzone. It had a distinctive and dominant garlic smell, tempting them to eat more than one bite. It matched the expected flavour of the product, linking the tasters sensory testing factors together successfully. 'It smelt absolutely delicious'.

Scope for development:

This product has a lot of scope and is open to developments if I were to take it to the next stage.

- I could experiment with the flour I use, trying different sorts in order to receive the best outcome, for example, strong plain flour, wholemeal, granary, plain white, self raising etc.
- I could add or substitute certain ingredients in the filling and in the bread base. For example I could eliminate the chicken, adding more vegetables like baby-sweetcorn and mange tout making it suitable for vegetarians.
- Rather than making the product into a calzone I could experiment with different shapes and sizes making it more unique and original to other existing Italian pizza based products.

Positive aspects of the product:	Negative aspects of the product:	Meeting the design criteria:	Target group opinions:
• The product scored well in the sensory analysis testing (66/80). • There was a variety of colours, textures and flavours throughout the dish ranging from the vibrant red tomato based filling, to the bright green crunchy peppers, through to the golden brown soft pizza case. • The chicken was tender and nicely flavoured, holding a strong garlic taste that complimented it well. • The overall appearance was very eye-catching, looking professional and 'tidy'. The aroma was 'simply delicious'.	• Due to being left, the outer base of the dough absorbed the steam and condensation making it become 'soggy' and less appetising. If I made this product again I would wait until the product was fully cooled before wrapping it, therefore preventing this problem but still allowing an element of re-heating to take place if required. • Some consumers may think the garlic was too 'overpowering', this therefore would not suit everybody's palates. I could alter or change this ingredient in order to appeal to more possible consumers.	The calzone met the design criteria in the following ways: • After being cut, the calzone was an individual portion. • The product is expected to be served and eaten hot. • The Italian dish appealed to and suited the adult market. • The chicken was covered in the tomato and garlic sauce. • I used green peppers and onions in order to meet the vegetable requirement point. • One individual portion contained no more than 800Kcal. • The chicken calzone had a very attractive and eye-catching appearance which looked professional, and well finished.	The design criteria states that the target group for all my product ideas is an adult market, I therefore must ensure each one suits and appeals to them. The tasters enjoyed the distinctive and dominant garlic element of the product. 'It didn't just give a dynamic flavour, but also a powerful and extremely pleasant aroma.' The variety of textures was a bonus, and made the calzone interesting to eat.' Suggestions of a vegetarian option were made in order to suit a wider range of possible consumers; this would be easy to do and could be very effective. The product overall was liked by all of the tasters, receiving positive sensory results and comments.

Section B: Product Design

Aim: To select a design idea and decide on possible developments.

Developing and Communicating Design Proposals.

Name of product: Jam Roly Poly.

Photographic Evidence

This photograph shows the application of the fruit filling, raspberry jam which could be a possible development at this stage of the project. I layered the jam too thickly when I first made the roly poly which caused problems when rolling the pastry at a later stage in the making process.

Homemade custard will accompany the jam roly poly to keep up the traditionalism of the 'family favourite' dessert. This could be developed into different flavours or modified with the addition of ingredients to alter the flavour, texture, appearance and even the aroma of the final dessert product.

The products sensory characteristics will all be dynamic and to a high quality standard. The texture will be very dense, working well the soft homemade ice-cream accompaniment. The jam roly poly will look professional, holding a tidy and well finished appearance that as a dessert will appeal to an adult market.

Reasons for Selecting the Idea:

After evaluating my 4 prototypes, I have chosen to take forward and develop my jam roly poly product. In the sensory analysis testing it was not the most popular dish, scoring a total of just 66 out of a possible 80 marks, in comparison to my highest scoring dish, the chocolate fondants, which managed to gain a total 72 out of a possible 80 marks. This has set me a challenge, making me want to improve the final sensory scores of the dessert, in order for it to become more unique and original. Jam roly poly is a very popular, 'family favourite' option on a gastropub menu; I want to keep this idea of popularity, but make a new, more exclusive product that could be added to this type of traditional dessert menu, appealing to a range of possible consumer target groups.

Possible Developments:

Jam roly poly is a traditional dessert product which is open to and holds lots of scope for developments. Below is a list of possible ways I could develop the dessert dish:

- **Pastry** - Within the pastry I could modify and develop a range of things that would make the product completely different, holding dynamic sensory characteristics and a more unique element to the final dessert product . I could experiment with the type of fat used and also the type of flour I use. There are a variety of different fats available, for example, butter, margarine, lard, low fat spread and suet, all which could be experimented and tested with in order to gain the most popular and most successful one to take forward and use in my more original final product. The different types of flour I could use would be ranging from plain flour, to wholemeal, granary or even gluten free which would allow the product to be consumed by a wider range of target groups and people, holding little limitations as for who can and can't eat the product. Ingredients could be added to modify the sensory characteristics, for example adding nuts will create a crunchy texture, adding cocoa will alter the overall colouring and flavouring of the product.
- **Filling** - The main development for the filling would be for me to make my own jam as initially I bought it in as a standard component. I could experiment with different fruits, for example strawberries, raspberries, blackcurrants and cherries, all holding and altering the desserts rich, fruity flavouring. I could completely transform the flavour of the dessert, making it more citrus like, making a lemon, lime or orange curd to replace the traditional jam filling. I could even use a chocolate paste-like spread to eliminate the idea of traditionalism, making a whole new unique product for a gastropub menu.
- **Accompaniment** - The traditional accompaniment with jam roly poly is custard. I could modify the custard by adding different flavourings or ingredients, for example, making chocolate flavoured custard and adding chocolate chips to link with the chocolate filling and outer pastry. I could completely change the accompaniment, serving the dessert with homemade ice-cream instead. I could make a variety of types and flavours such as a creamy vanilla ice cream, or a tangy lemon sorbet. I could make one single flavoured ice-cream, making modifications within this one batch, adding ingredients to link to other components of the product. For example, diced strawberries could be mixed in to go with the strawberry jam, or grated lemon zest to link with the citrus filling.

Development 1 - Testing the Flour in the Pastry.

Aim: To experiment and test the flour within suet pastry in order to find out which is most popular and most successful.

Annotated Photographs:

These two images show the 3 different flours I experimented with, plain white, wholemeal and granary. I kept each one clearly labelled throughout the making process to ensure no confusion was made.

This picture shows how I rolled each sample into an exact size and thickness in order to keep the sensory testing fair.

This is how I cooked each sample of the pastry. I steamed each one for a total of 15 minutes. I kept the cooking time of each sample the same to ensure the experiment was a fair test and would give true, fair results.

I positioned each sample on a white plate in the tasting booth, ready for the sensory analysis. The lighting was the same for each tasting, as was the temperature, size and shape of the 3 product samples to ensure the whole experiment was fairly displayed and tested upon. The samples were randomly labelled, allowing the tasters to give true opinions, avoiding any circumstances of a 'placebo effect'. Each taster was provided with a pen and sensory testing table to make the scoring easy to do and the results easy to be processed. They were also given a glass of water to clean their palate between each tasting.

Ingredients:

Sample A (YYX) – 40g plain white flour, 15g vegetable suet, 10ml cold water, 0.5g salt.
Sample B (XXZ) – 40g granary flour, 15g vegetable suet, 10ml cold water, 0.5g salt.
Sample C (XYX) – 40g wholemeal flour, 15g vegetable suet, 10ml cold water, 0.5g salt.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
YYX	4	4	5	5	18	4	5	5	5	19	4	4	5	5	18	3	3	2	3	11	66
XXZ	4	4	4	4	16	2	5	4	4	15	4	4	4	4	16	2	3	3	3	11	58
XYX	3	3	4	4	14	3	4	5	4	16	4	4	3	4	15	3	3	2	3	11	56

From testing each sample using sensory analysis, it made it visible to see which type of flour the tasters preferred in terms of the basic sensory characteristics. The plain white flour was the most popular with the tasters scoring a total of 66 out of a possible 80 marks. The wholemeal flour was the least popular, gaining only 56 marks out of the possible 80, therefore straight away being eliminated as the flour I would use in the final making stage. The plain white flour scored well for appearance, texture and taste and was said to be 'fairly similar' to the original, white self-raising flour. With very little difference between each, I have decided to carry on using the self raising flour when making my final high quality dessert product as I feel it generally works better, allowing the style of suet pastry to be maintained at its best.

How the changes affected the product:

- **Plain White (YYX)** - There was very little differences between this flour and the self-raising flour that I originally used. It kept a similar pale colouring, holding the desired and expected dense texture of the pastry.
- **Granary (XXZ)** - The granary flour altered the appearance completely, giving a darker colouration than the more common 'golden brown' for a pastry jam roly poly.
- **Wholemeal (XYX)** - This also made drastic change to the overall appearance of the sample. It again held a dark brown colouration, along with the visibility of the seeds. The seeds added a contrasting texture to the soft, dense suet pastry and also a fibrous nutritional value.

Conclusion:

From experimenting with the different flours within the suet pastry, it enabled me to discover which was most popular and successful with the products target audience group. Overall, the white plain flour was the most popular, scoring a total of 66 out of a possible 80 marks in the sensory analysis testing. However I have decided to take forward the flour I originally used (white self-raising) as I feel it generally worked better in relation to the texture and pale colouration that is expected of this traditional English dessert.

The next development will be based around experimenting with the fat used within the suet pastry. Again, doing this will enable me to discover the most popular and most successful that I will then take forward and use in my final, high quality gastropub dessert.

Section B: Product Design

Development 2 - Testing the Fat in the Pastry.

Aim: To experiment and test the fat within suet pastry in order to find out which is most popular and most successful.

Annotated Photographs:

I used 40g of self-raising flour, 15g of butter, 10 ml of cold water and a pinch of salt for my first experimental sample. When all the ingredients were combined I kneaded the dough for 5 minutes to develop the gluten.

This picture shows how I rolled each sample into an exact size and thickness in order to keep the sensory testing fair.

Here are the 3 different samples containing different fats. I experimented with, butter, marg and low fat spread. I kept each one clearly labelled throughout the making process to ensure no confusion was made.

This is how I cooked each sample of the pastry. I steamed each one for a total of 15 minutes. I kept the cooking time of each sample the same to ensure the experiment was a fair test and would give true, fair results.

This shows sample YYX. It held a very dense texture that was popular with the tasters in the sensory testing. It also held a pale colouration and fairly pleasant aroma.

Ingredients:

Sample A (YYX) – 40g self-raising flour, 15g butter, 10ml cold water, 0.5g salt.
Sample B (XXZ) – 40g self-raising flour, 15g margarine, 10ml cold water, 0.5g salt.
Sample C (XYX) – 40g self-raising flour, 15g low fat spread (flora), 10ml cold water, 0.5g salt.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
YYX	4	4	5	5	18	4	5	4	5	18	4	4	4	5	17	3	2	2	3	10	63
XXZ	4	4	4	4	16	4	5	4	4	17	4	4	4	4	16	2	2	3	3	10	59
XYX	3	4	5	5	17	3	4	5	4	16	4	4	3	4	15	3	3	2	2	10	58

From testing each sample using sensory analysis, it made it visible to see which type of fat the tasters preferred in terms of the basic sensory characteristics. The butter was the most popular with the tasters scoring a total of 63 out of a possible 80 marks. The low fat spread was the least popular, gaining only 58 marks out of the possible 80, therefore straight away being eliminated as the fat I would use in the final making stage. The butter scored well for appearance, texture and taste, maintaining the light colouration, dense texture and fairly bland pastry flavour. From these results I have decided to take forward the butter, but combine it with a half measure of vegetable suet in order to receive the desired and common properties of a 'suet pastry' that would be used when making jam roly poly.

How the changes affected the product:

- **Butter (YYX)** - There was no real difference within this and the original fat used. It maintained an attractive golden brown colouring and held a moist texture which is expected in this particular sort of pastry.
- **Margarine (XXZ)** - Held a good texture and taste, however lost its vivid colour when the sample was steamed.
- **Low fat spread (XYX)** - This lowered the overall saturated fat content in the pastry, which is a good quality needed for someone who is trying to lower their fat intake. The texture and appearance appeared the same as the other samples, the only thing that lacked was a distinctive rich flavour that occurred in the other 2 pastry samples.

Conclusion:

From experimenting with the different fats within the suet pastry, it enabled me to discover which was most popular and successful with the products target audience group. Overall, the butter was the most popular, scoring a total of 63out of a possible 80 marks in the sensory analysis testing. I have decided to use a combination of fats in my final product. I will use 38g of butter and 38g of vegetable suet in order to maintain the desired and expected moist texture of the suet pastry.

The next development will be based around making my own filling, experimenting with the different flavours of fruit jam. Again, doing this will enable me to discover the most popular and most successful that I will then take forward and use in my final, high quality gastropub dessert.

Development 3 - Making the Filling.

Aim: To make and test possible flavours and styles of fruit fillings in order to find out which is most popular and most successful.

Annotated Photographs:

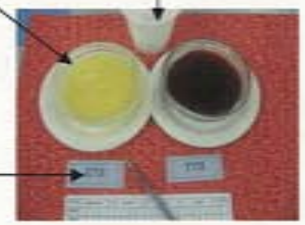
I first melted the margarine in a bowl over a pan of boiling water. I then added the finely grated rind, the squeezed lemon juice and the sugar into the bowl. I beat the eggs and added them, stirring the mixture constantly until the mixture was thick enough to coat the back of the spoon.

This picture shows the strawberry jam just before the stage where the mixture vigorously boils. It held a bright, vibrant red colour, along with a variety of textures ranging from the smooth jam to the small seeds that were spread evenly throughout.

Each sample was presented in the same dishes to ensure no influences were made on the tasters opinions. The portion samples were the same size again to ensure no visual effects of the equipment influenced their decisions.

I provide each of the tasters with a sensory analysis testing chart to ensure results could be recorded easily and accurately.

I provided each taster with a cup of water that they could use to clean their palate between each tasting. Doing this will ensue each flavour is its own, eliminating any flavours of the previous sample to remain on the tasting palate.



Ingredients:

Sample A (XYX) – 50g butter, 200g sugar, 3 eggs, 2 lemons.
Sample B (YYX) – 50g butter, 200g sugar, 100g strawberries.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				To-tal	Aroma				To-tal	Total
XYX	4	5	5	5	19	4	5	4	5	18	5	5	4	5	19	4	4	4	4	16	72
YYX	5	5	5	5	20	4	5	4	4	17	4	5	4	4	18	3	3	4	4	14	69

From testing each sample using sensory analysis, it made it visible to see which type of fruit filling the tasters preferred. The lemon curd was the most popular with the tasters scoring a pleasing total of 72 out of a possible 80 marks. The strawberry jam also scored well, gaining 69 out of a possible 80 marks, proving not to be 'disliked' by any of the tasters. The vivid colour of the lemon curd gained almost full marks in the appearance section of the testing. It held good textures that contrasted each other well, i.e. the smooth curd with the finely grated rind. The taste was very dominant, with a distinctive citrus flavouring that would work well with the pastry, completely altering the common fruity jam filling of the traditional English dessert.

How the changes affected the product:

- **Lemon Curd (XYX)** - The main thing the lemon curd altered was the flavour of the roly poly. It has a distinctive citrusy flavour that brought a whole new tasting factor to the 'family favourite' dessert. It held a vibrant yellow colouring that stood out and complimented the eye-catching appearance well.
- **Strawberry jam (YYX)** - This filling was similar to the raspberry jam I used on the product when I initially made it. It held good colouring and texture, but did not alter the sensory characteristics from the original jam used (raspberry) to an extent that would be worth while.

Conclusion:

From making and experimenting with the different fruit jams, it enabled me to discover which was most popular and successful, with the products target audience group. Overall, the lemon curd was the most popular, scoring a total of 72 out of a possible 80 marks in the sensory analysis testing. I will be taking this forward into the making stage, altering the sensory characteristics of the jam roly poly completely, making it a more unique and interesting, appealing as something 'different' for my adult target audience.

The next development will be based around modifications of a custard based vanilla ice cream that will be served as an accompaniment with the desert. Again, doing this will enable me to discover the most popular and most successful that I will then take forward and use in my final, high quality gastropub dessert.

Section B: Product Design

Development 4 - The Accompaniment.

Aim: To experiment and test with additional ingredients to the vanilla flavoured ice-cream accompaniment.

Annotated Photographs:

This picture shows the custard mixture I made before I added the cream and vanilla essence. It had a very creamy texture which is expected of this smooth type of home-made ice cream.

I poured the mixture into the bowl with the paddle running. I allowed the mixture to freeze until the desired consistency was achieved, this took approximately 20 minutes.

This was a task I carried out to test the viscosity of the ice-cream. It should be thick and smooth which is what the chart in the picture above shows.

I positioned each sample on a white plate in the tasting booth, ready for the sensory analysis. The lighting was the same for each tasting, as was the temperature, size and shape of the 3 samples to ensure the whole experiment was fairly displayed and tested upon. The samples were randomly labelled, allowing the tasters to give true opinions, avoiding any circumstances of a 'placebo effect'. Each taster was provided with a pen and sensory testing table to make the scoring easy to do and the results easy to be processed. They were also given a glass of water to clean their palate between each tasting.

Ingredients:

Custard based vanilla ice-cream - 3 egg yolks, 75g caster sugar, 225ml semi-skimmed milked, 225ml double cream, 2.5ml vanilla essence.

Sample A (YXZ) – Orange zest.

Sample B (YYX) – 25g Chopped strawberry.

Sample C (XXZ) - Lemon zest.

Sensory Analysis:

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
YXZ	5	5	4	5	18	4	3	4	4	15	4	5	4	4	17	3	3	4	3	13	63
YYX	4	5	5	4	18	5	5	4	4	18	5	5	5	4	19	3	3	4	3	13	68
XXZ	5	4	5	5	18	4	4	4	5	17	4	4	5	5	18	4	4	5	5	18	71
XYX	4	4	5	4	17	5	5	5	5	20	4	5	4	4	19	4	4	4	3	15	71

From testing each sample using sensory analysis, it made it visible to see which type of fat the tasters preferred in terms of the basic sensory characteristics. The addition of the lemon zest and the plain vanilla ice cream were the most popular with the tasters scoring a total of 71 out of a possible 80 marks. The addition of the orange zest was the least popular, gaining only 62 marks out of the possible 80, therefore straight away being eliminated as the modification I would use in the final making stage. Although it was a tie between the scores of XXZ and XYX I have decided to take XXZ (the addition of the lemon zest) forward as I feel it will compliment the new lemon curd fruit filling, adding to the citrus idea in my dessert product.

How the changes affected the product:

- **Orange (YXZ) -** The addition of this added a bright colour that contrasted well with the pale colouration of the ice-cream. It was not popular as tasters felt the gratings were too big which spoilt the smooth creamy texture.
- **Strawberry (YYX) -** The strawberries again added colour and a crunchy texture that contrasted well.
- **Lemon (XXZ) -**This added colour and texture, complimenting the changed lemon citrus filling well.
- **Plain vanilla (XYX) -** The overall difference in this was the fact I changed the whole accompaniment from custard to ice-cream. A popular decision with the tasters!

Conclusion:

From making and modifying the custard based vanilla ice cream, it enabled me to discover which was the most popular and the most successful addition to the product in relation to the tasters and my targeted audience group. Overall, the addition of the finely grated lemon rind and zest was the most popular, scoring a pleasing total of 71 out of a possible 80 marks in the sensory analysis testing. I will be taking this forward into the making stage, which will compliment the lemon curd filling well, also working towards the idea of altering the sensory characteristics, making the dessert more unique and interesting for my adult target audience.

Method of Making.

Add the first stage of making I Mixed the flour, salt, suet and butter together in a bowl. I used a round bladed knife to stir in about 90ml of cold water to give a soft dough. When I had reached a stage where the dough was easy enough to handle I transferred it to a lightly floured surface, where I then kneaded it for approximately 5 minutes to develop the gluten, making a smooth and elastic dough.

When I had finished kneading the dough, I started making the lemon curd for the fruit filling of the dessert. I first melted the margarine in a bowl over a pan of boiling water. I then added the finely grated rind, the squeezed lemon juice and the sugar into the bowl. I beat the eggs and added them, stirring the mixture constantly until the mixture was thick enough to coat the back of the spoon.

The next stage of the making process was to roll out the dough into a rectangle with the dimensions of approximately 25x20cm. Once I had reached this specified shape, I then started applying a thick layer of the homemade lemon curd on to the dough, leaving a 1cm border that I brushed with milk to help hold the product together when rolled. I rolled the dough tightly to ensure neat and even swirls could be visible.

When I was happy with the shape of the roly poly I wrapped the dessert tightly in tin foil ready for steaming. Wrapping the dessert in foil ensures no water enters the product during the steaming process. If it did, it would alter the appearance and the texture that I desired. I steamed the roly poly for approximately 30 minutes, which left me with a moist, dense pastry that is expected of the traditional English dessert.

While the roly poly was in steaming, I started on the homemade vanilla ice-cream to ensure all the components could be served freshly together when it came to service time. Firstly, I separated the egg yolks and placed them in a glass bowl along with the sugar which were then beaten together. In a saucepan I slowly brought the milk to boiling point, which I then poured onto the beaten egg mixture, beating both components together.

When both mixtures were thoroughly mixed, I returned the mixture to the pan on heat, stirring constantly until the mixture thickened, forming a film over the back of the spoon. I removed the custard from the heat, allowing it to cool. I then stirred in the cream and vanilla essence, shortly pouring the mixture into the bowl with the paddle running. I allowed the mixture to freeze until the desired consistency was achieved.

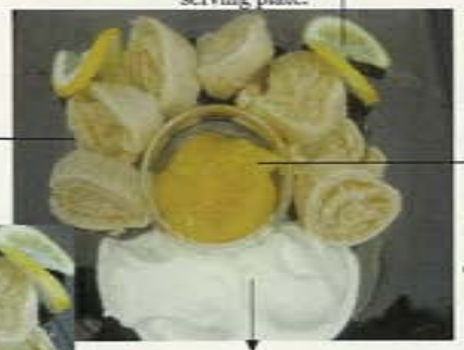
This photo shows my final, high quality dessert product. The presentation is vital in attracting your audience so I had to make sure an overall professional outcome that was very tidy and well finished was present. The texture was very moist and dense like it should be, meeting the tasters high expectations. I ensured the pastry held a pale colouration, that contrasted well with the vivid yellow of the lemon curd. I was very pleased with my final product as it met all the requirements from the design criteria and brought about a unique dessert product for a gastropub menu.

Final Design Solution

Photographs of Final Product:

The dessert held a very dense and heavy texture, therefore worked well with the ice-cream accompaniment as it acted as a lifting component, making it slightly lighter and more enjoyable. The ice-cream was made to a desired viscosity, being smooth and thick, including a variation of textures coming from the modification and addition of grated lemon zest.

I positioned two twisted lemon slices to add to the decoration and the overall professional finish of the product on the serving plate.



The homemade lemon curd completely altered the characteristics of the product. It made it unique and interesting, changing the original and more common fruity flavouring of the jam filling to a more citrus and tangy, dominant lemon tasting dessert product. The colouration was very vibrant and vivid therefore was eye-catching and appealing to the consumers. The dish of lemon curd in the middle of the plate also added to this eye-catching appearance with its bright colour.

The modifications and changes I made to the dessert product all worked well, at the same time still meeting each of the separate points on the product specification and the original design criteria.

The tasters all agreed the final product looked very professional, and well finished. The presentation on the plate was vital in gaining the consumers initial attention and appetite so I arranged the dessert in a way I felt would look the best. The colours on the plate contrasted well, ranging form the pale colouration of the pastry, to the vivid yellow of the curd filling, right through to the pure white of the vanilla ice-cream. The product held an overall neat and tidy appearance that appealed to the desired adult market.

Development Review:

Development 1 - Experimenting with the flour enabled me to see which was the most popular with the tasters. The ones I tested were plain white, granary and wholemeal flour. From testing these different flours it became apparent that the original flour (self raising) was the most popular and successful, therefore I went on to use this in the final product.
Development 2 - When experimenting with the fat, I used butter, margarine and low fat spread to see which gave me the best results. The textures and colours were on the whole fairly similar but the butter appeared to be the most popular within the sensory testing. When making the final product I decided to take this (the most popular) forward but combine it as a half measure with suet to keep up the best results and characteristics of a suet pastry.
Development 3 - The lemon curd was the most popular fruit filling. It brought about unique and 'different' characteristics for the traditional English dessert, i.e. a hint of 'tang' rather than an expected fruity flavouring.
Development 4 - Although all the ice-cream modifications were popular I decided to take forward the accompaniment with the addition of the finely grated lemon zest as I felt it linked and complimented the new citrus lemon filling well.

Sensory Analysis:

From testing the product using sensory analysis, it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could still do with improvements. The steamed lemon roly poly scored a pleasing 75 out of a possible 80 marks, boosting its original score by 9 marks, showing an overall improvement and favourability from the tasters. The texture scored well in the sensory testing, being described as 'perfect'. It held a moist, dense texture that contrasted well the smooth and thick viscosity of the custard based vanilla ice-cream. The taste of the lemon roly poly dessert was 'delicious'. The adaptation of the lemon brought about a whole new flavour to the product, changing its organoleptic qualities completely. It added a hint of tang and slight bitterness to the normally fruity filling which ended up improving the taste overall, complimenting the bland flavouring of the suet pastry. The aroma of the dessert scored better than it did when I originally made the product in the stage of the prototypes. The tasters said it didn't hold a very strong aroma, however the lemon was the most dominant and detectable component, giving off a pleasant and appetising smell. I was pleased with the overall appearance of the lemon roly poly, with it scoring a total of 19 out of a possible 20 marks in the sensory analysis testing. The tasters all agreed it looked professional, holding a tidy and well finished appearance that will appealed to them as an adult market. The presentation on the plate was vital to pick up these good marks so I arranged the dessert in a way I felt would look the best.
In conclusion, from testing the final, developed product, I am very pleased with the scores and improvements that were achieved. From testing the product again it made it visible to see the differences and in the case the preferred changes that I was content with.

Comparison against the Product Specification:

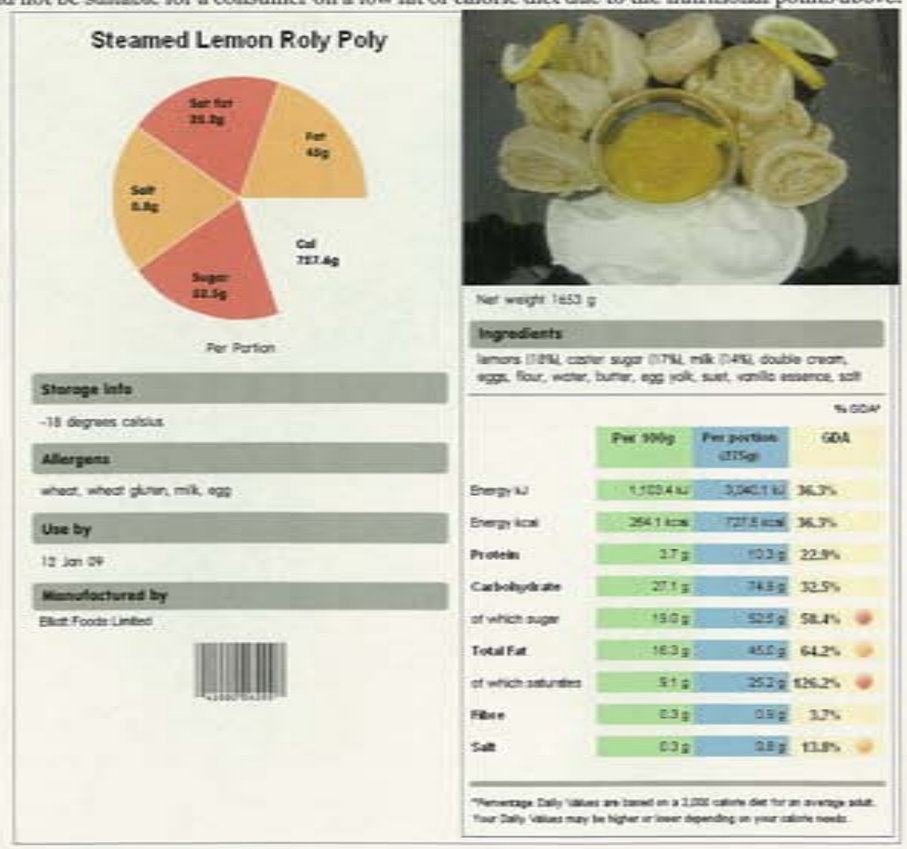
- The dessert was designed to be sold as an individual portion. My product met this requirement as each individual serving weighed on average 275g. This is seen to be a substantially portioned dessert.
- The design criteria states the product must be suitable to be re-heated and eaten warm. The steamed lemon roly poly is easily re-heated, which can be carried out by using a conventional or microwave oven.
- The dessert was designed to appeal to the adult market. It meets this requirement as it is a sophisticated product with different component parts, that would not appeal to the majority of children.
- The lemon roly poly was served with a modified custard based vanilla ice-cream as an accompaniment. This met the specification requirement of including or being served with a sauce. The homemade lemon curd could also be seen as a factor that meets this point on the product criteria.
- The dessert had to include a fruit or vegetable; based on the circumstances of the product being a sweet , I used a fruit (lemons) to meet this requirement.
- The product contained on average 728kcal per 275g portion therefore met the point on the specification that it had to contain no more than 800kcal per serving.
- The design criteria states the product must have an attractive and well finished appearance. My product met this requirement, holding good presentation, looking professional, tidy and appealing for the consumer.

Full List of Ingredients:

Suet Pastry - 175g self raising flour, 1g of salt, 38g vegetable suet, 38g butter, 90ml cold water.
Lemon curd - 50g butter, 200g caster sugar, 3 eggs, 2 lemons.
Custard Based Vanilla Ice Cream - 3 egg yolks, 75g caster sugar, 225ml double cream, 225ml semi-skimmed milk, 2ml vanilla essence.

Nutritional Analysis:

The dessert product held a very high content of sugar, and saturated fats, which scored red in the FSA traffic light nutritional labelling system. Per 275g portion, there was approximately 728kcals which is a fairly high calorific count, however did not exceed the product specification that was set before making the product. The dessert would not be suitable for a consumer on a low fat or calorie diet due to the nutritional points above.



Section B: Product Design

Manufacturing Specification

Name of product: Lemon Roly Poly.
Description of product: A twist on the original jam roly poly, the lemon adds a more refreshing and energising element to product, making it more interesting and unique. Accompanied by homemade vanilla ice-cream to lighten the dense textures, this dessert is bound to entice you for another bite!
Type of product: Steamed lemon roly poly pudding with a homemade ice-cream accompaniment, suitable to be stored in a frozen cabinet (-18°C) at the 'luxury end of a market' e.g. 'Tesco's Finest' range.
Target group: This product is aimed mainly at the adult market.
Number of portions: The roly poly has been modified to be purchased and served into 6 portions.
Special claims: The steamed lemon roly poly product is free from any artificial colours and flavours. The dessert may contain some preservatives as this will help to increase the shelf life of the product after it's been manufactured.

Organoleptic Qualities of the Product:
The lemon roly poly held a variety of different sensory characteristics. The traditional flavouring of the jam in the dessert was replaced by a refreshing and energising layer of home-made lemon curd, making it more interesting and unique. The light golden colouring of the suet pastry contrasted well with the bright, vivid yellow of the lemon curd, which emphasised the even swirls, making them clearly visible. The smooth and viscous ice-cream acted as a lightening agent, lifting the denseness of the pastry, making it more enjoyable and not as 'heavy' to eat. The overall appearance of the product was very neat and tidy. It was well presented on the serving plate which made it look professional and well finished. The lemon roly poly was an original product that was developed and modified to improve its sensory characteristics. It was 'a very aesthetically pleasing' dessert.

Specific dimensions of the products:
Diameter of product: 100mm
Depth of product: 30mm
Diameter of ice-cream: 60mm
Depth of ice-cream: 40mm
Product weight: 150g
Final product tolerances: There will be set tolerances for each ingredient used. These are shown in the ingredients list to the right. These will be a maximum or minimum tolerance (+/-) of 5g depending on the ingredient.


Health and Safety Requirements: Throughout the manufacturing process of preparing, making and packaging, many factors need to be taken into consideration in order to create and most of all maintain a safe working environment. Checks and procedures must be carried out in a strict manor to ensure the product is not contaminated physically, chemically or biologically. They are also there to ensure everything is completed correctly and to the high standards that meet the high expectations. For example visual checks will be carried to ensure the product is not physically contaminated by any foreign bodies. Metal detectors will be put into place and used when packaging the product, which is another way of eliminating the risk of physical contamination. Personal hygiene practices will need to be kept to and followed to a very high standard, including all staff being trained, passing at least their basic hygiene examination, and abiding by the simple rules for example, no jewellery should be worn, hand must be regularly washed, clean aprons and hair nets must be worn, blue plasters should be worn to cover any cuts or wounds.

Storage Instructions: Once purchased, the product should be stored in a frozen cabinet (-18°c). Do not consume the dessert 3 days after purchasing and do not exceed the use by date under any circumstances.

Packaging Details:
The dessert will be packaged in a rigid plastic, air-tight container with a paperboard sleeve on the outside. The rigid plastic will make the mould of the product, keeping it in shape, reducing the risk of it become damaged. The top of the container will be transparent, therefore will allow the consumer to be able to see what they are purchasing. The container will be cheap to produce but has the disadvantage of it not being biodegradable; it can however be recycled which would be seen as an advantage. The paperboard label will be laminated, therefore will be water proof which will reduce the risk of it becoming damaged during delivery or storage. This type of material is used as it is fairly cheap and also is easy to print on. The label will hold all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It will also include a selection of other types of information that may be of interest or help to the consumer i.e. serving suggestions. With the packaging being air-tight, it will help prevent biological contamination in the sense that micro-organism will not be able to deteriorate the product. As well as this, any bacterial growth with be slowed down or stopped as the product will be kept in a frozen cabinet at a temperature of -18°c; these conditions are not ideal, therefore will make the bacteria become dormant and unable to multiply.

Environmental Considerations:

This logo shows that the packaging is recyclable. The plastic container is able to be recycled which reduces the cost of making other packaging materials in the future.

This logo is positioned on packaging in order to try encourage and persuade consumers to dispose of the packaging carefully and responsibly, reducing the amount of litter around.

Ingredients List:

INGREDIENT	QUANTITY	Tolerances	Batch 1	Batch 2	Batch 3	Costing
	4 portions	*Plus/minus*	*100 portions*	*400 portions*	*1000 portion*	4 portions
	Grams	*(+/-)*	**Kilogram**	**Kilogram**	**Kilogram**	£
Roly Poly						
Self raising flour	175	0	4.375	17.5	43.75	£0.09
Salt	2	0	0.05	0.2	0.5	£0.01
Vegetable suet	36	0	0.9	3.6	9	£0.12
Butter	36	0	0.9	3.6	9	£0.18
Water	30	0	0.75	3	7.5	£0.00
Lemon Curd						
Caster sugar	200	0	5	20	50	£0.10
Butter	50	0	1.25	5	12.5	£0.31
Eggs	300	0	7.5	30	75	£0.25
Lemons	300	5	7.5	30	75	£0.04
Ice-Cream						
Egg yolks	75	5	1.875	7.5	18.75	£0.22
Caster sugar	75	0	1.875	7.5	18.75	£0.06
Milk	225	0	5.625	22.5	56.25	£0.15
Double cream	225	0	5.625	22.5	56.25	£0.60
Vanilla essence	3	0	0.075	0.3	0.75	£0.05
Total:						**£2.18**







AS GCE Design and Technology:
Food Technology

Section C:

Product Manufacture

Section C - Product Manufacture

Design Brief:

Design and make a high quality dessert and/or main course aimed at the adult market. The product will be sold from a 'finest/speciality' range in a specialist section of a supermarket.

Design Criteria:

The product/s must be:

- Suitable to serve 2-4 people.
- Packaged as either one product or individual portions.
- Aimed at the adult market.
- Aimed at the luxury end of the market.
- Visually striking and have an aesthetically pleasing finish.
- Inclusive of different textures from component parts.
- Include fruit and/or vegetables.





I have decided to focus this section of my work on dessert products as I feel they best fit the design specification and criteria. I also feel they hold more scope for development and modifications that will benefit in a later stage of creating and making my final, high quality product. The dessert product I have chosen to take forward is an orange chocolate tart. This holds a variety of skills, processes and techniques, making and setting me an interesting challenge to work on. There will also be the advantage that I can experiment further during the manufacturing stages. This product would be suitable to serve more than the listed amount stated in the design criteria, however this could be changed to better suit this point by making an overall smaller product, or even individual portion sized products which would meet the next point on the specification regarding the packaging. The product appeals to the adult market as it holds sophisticated and unique characteristics, making it an interesting and overall enjoyable to eat. The orange chocolate tart is aimed at and would fit nicely in to the luxury end of the market, for example in Asda's 'Extra Special' range. It can be classed as a luxury standard dessert due to the high quality ingredients used and the professional, aesthetically pleasing finished appearance it holds. The contrasting colours in the dessert make it visually striking, ranging from the deep dark brown of the chocolate, to the pale orange custard, right through to the vivid orange on the top. The product is inclusive of a variety of different textures from the different component parts. The pastry casing of the tart will hold a short, crumbly texture that will contrast well with the smooth, and viscous orange custard filling. The final point of the criteria is met as the product has to include a fruit or vegetable. The orange chocolate tart obviously does this, with the 6 oranges that are needed for the making.

Skills, Processes and Techniques Involved in the Making of the Tart:

The orange chocolate tart consists of 3 layers; a pastry casing that is enrobed in a generous layer of dark chocolate, followed by a thick, viscous filling of orange custard, topped off with a caramelised orange salad. The making of the pastry needs skills and patience, ensuring the right consistency and desired crumbly, short-crust texture is achieved. In the filling, the main process that takes place happens within the eggs. On heating (cooking), the protein in the eggs thicken and set the custard. The lecithin acts as an emulsifier, binding and keeping the mixture stable, preventing it separating out whilst making the other component parts of the dessert. The biggest, challenging skill is in the caramelised orange salad. The sugar is heated to a temperature above its boiling point so it goes through the process of caramelisation, leaving a golden brown 'caramel' coloured substance. It is essential at this point that the sugar is not left to burn and is taken off the heat in order to get this desired liquid caramelised sugar. The orange chocolate tart will include a variety of decorative techniques both on the dessert and on the serving plate, making it look more attractive and appealing to a consumer.

Modifications to the Product:

I am not making any major modifications to the original product as that will come later on in the project. I do however intend to work on the decoration, adding zigzags of melted chocolate to the serving plate and possibly across the top of the caramelised orange salad. I will also be adding a small amount of spun sugar. Making this involves great skill in order to get it looking perfect. These modifications will in general make the tart look more professionally

Ingredient	Function
Pastry	
175g butter	The butter is rubbed into the flour, giving a more golden brown colouration to the pastry. It also improves the overall flavour. Fat is added to products in order to extend it's shelf-life. The fat also coat the flour granules giving a short crumb texture.
100g caster sugar	The main function of sugar is to sweeten the base as well as creating a golden brown colour from caramelisation.
250g plain flour	Bulk ingredient, forming the main structure of the pastry base. Plain white flour has a fairly low gluten content therefore allows a desired short crumb texture to be met.
25g ground almonds	Added to create a more flavoursome pastry. Adds texture and a 'nutty' flavouring/aroma.
1 egg, beaten	This ingredient helps to binds all the dry ingredients (i.e. flour, sugar etc) together. The protein in the egg (lecithin) acts as an emulsifier, keeping the mixture stable and not allowing any of it to separate out. When heated, the protein coagulates, aiding the binding of the other ingredients. It also adds a darker, golden brown colouration to the pastry.
Filling	
5 eggs	One of the bulk ingredients of the filling, creating structure and colour when the process of coagulation has taken place on heating. Again acts as an emulsifier.
200g caster sugar	This ingredient is used to simply add sweetness to the product. It is a bulk ingredient for making the filling and when whisked with the other ingredients creates volume and allows a thicker texture to form. The sweetness of the sugar neutralises the acidity from the oranges and lemons, leaving a more pleasant flavouring.
Juice and zest of 4 oranges	The juice is added to create a strong, dominant orange flavouring. The juice and zest add a more vivid orange colouration, as well as the zest adding texture and creating a more citrus smelling aroma, coming from the natural oils.
Juice of 1 lemon	The citric acid in the lemon aids the coagulation of the egg protein The lemon adds a bitter flavouring but is complimented and calmed with the sugar to create a balanced citrus flavour.
142ml double cream	The cream is added to thicken the overall contents of the filling. It adds a pale colouring and a smooth, creamy texture and flavouring.
140g dark chocolate	Adds a dark colouration to the product which contrasts well with the pale pastry and orange custard filling. Adds a dominant flavouring that again contrasts yet compliments with orange, meeting the traditional combination of chocolate and orange.
Caramelised Orange Salad	
2 oranges	Used for decoration on the product. Arranged in a way to make the product look professional, tidy and well finished, adding colour and an eye-catching appearance. Also adds to the main orange flavouring of the tart.
200g caster sugar (+60ml water)	The sugar is heated to a temperature above it's melting point, making it go through the process of caramelisation. A pleasant golden brown colouring, is formed along with a 'toffee like' flavouring. The boiling water is added to thin the caramelised sugar out in order to make it easy to drizzle over the top of the segmented oranges as a finishing touch of decoration.

Section C: Product Manufacture.

Original Product: Orange Chocolate Tart.

Ingredients:

Pastry:
- 175g butter
- 100g caster sugar
- 250g plain flour
- 25g ground almonds
- 1 egg, beaten.

Filling:
- 5 eggs
- 200g caster sugar
- Juice and zest of 4 oranges
- 1 lemon
- 142 ml double cream
- 140g dark chocolate

Topping/Decoration
- 2 oranges
- 200g caster sugar
- 60ml water
- 20g dark chocolate

Method:

1). For the Pastry: Tip the flour, sugar, almonds and butter into a food processor, whizzing until they resemble breadcrumbs. Beat the egg, then add it to the mixture a little at a time, pulsing until the mixture binds together. Tip out the pastry on to a clean, lightly floured surface, then knead it briefly to bring it all together. Roll the pastry out, into a flat rounded shape that will line a 23cm loose-bottomed tart tin (30mm deep), leaving an overhang around the edges. Line the case with baking paper, fill with baking beans then blind-bake at 200°c for 20 minutes until golden. Remove the beans and the paper then continue to cook for a further 10 minutes until the base is also golden brown, then set aside to cool.




2). For the Filling: While the pastry is cooking, make the filling. Whisk together the eggs and sugar well, then whisk in the juices, zest and cream. Scrape into a jug and set aside. Melt the chocolate in a bowl over a pan of simmering water. Once the pastry case is cool, trim off the overhanging edges, then brush generously with the melted chocolate. Chill briefly to set, then repeat and set again. Return the tart case to the oven, then quickly yet carefully pour in the orange custard. Bake at a temperature of 150°c for about 45 to 50 minutes until the custard has just set, then take it out and leave it to cool in the tin.




3). For the Topping/Decoration: To make the orange salad, segment the oranges over a bowl, catching any juice and squeezing out the left over membrane. Put the zest in a pan of cold water, bring to boil, then strain and set aside. Melt the sugar in a saucepan with a splash of water, then bring to the boil. Bubble until caramelisation starts to take place (until you have an amber coloured caramel). Then still on heat, tip in the zest, orange segments and juice. Swirl around for a moment before tipping into a bowl. Turn the tart out on to a serving plate (already decorated with a zigzag of melted chocolate) and drizzle lightly the syrup from the oranges over the top of it. Spoon a segment or two of orange, a bit of zest and a little syrup onto each portion of the tart.
Serve and enjoy your delicious orange chocolate tart dessert.


Development of the Product:

Component Part	Change From Original Product	Effects On Final Product
Pastry	I will modify the pastry by adding cocoa powder and orange zest to it, making it unique and linking to the rest of my product. I will also be changing the size of the pastry cases in to smaller, individual sized portions, which will allow the serving point on the criteria to be better met.	The addition of the cocoa powder will add a chocolaty flavour and a dark brown colouration to the pastry that will work well with the rest of the flavours in the dessert. The orange zest will add a contrasting fleck of vivid colour to the pastry making it more eye-catching, appealing and flavoursome.
Filling	The filling was originally just made from eggs, sugar, oranges, 1 lemon, double cream and dark chocolate. I'm not going to change any of this but I am going to add an additional ingredient - chopped almonds.	The addition of chopped almonds will simply add a harder contrasting texture to the already smooth orange custard. It will also however mean that the tart is not suitable for anyone with a nut allergy.
Topping/Decoration	I originally poured the caramelised orange flavoured salad over the top of the dessert. Instead of doing this, I will arrange some small mandarin segments in a fan shape, drizzle the syrup and melted chocolate over the top, along with finishing it off with a small pile of chopped almonds in the centre and finely grated orange zest sprinkled over the top.	Changing the appearance like this will make the dessert product look even more professional, and well finished. The way things will be arranged will make the dessert look tidier, as will the smaller individual portion sizes. It will add to the colour of the final product and also will again add more variations and ranges of textures.
Accompaniment	Originally, I just served the orange chocolate tart on it's own. I feel the dessert would be improved and to of a better standard if it was served with something else, therefore I have decided to make a homemade custard based vanilla ice-cream to be served alongside it.	Adding an plain vanilla ice-cream accompaniment will make the dessert more enjoyable as it will lighten the heavy textures and flavours. The addition of chocolate chunks and orange zest will mean it all links with the rest of the tart, also adding more colours and textures to the final product.

Comparison to Specification:

The orange chocolate tart matched all of the products specification points. It is suitable to serve 2-4 people, and can be easily packaged as either one product or individual portions. The combination of the chocolate and orange is quite common and traditional, however as a dessert product like this, the tart is quite sophisticated and refined, therefore is aimed and will appeal to an adult market. It is a dessert product of a luxury standard, therefore would sell well at the luxury end of the market in a range such as Asda's 'Extra Special' or Sainsbury's 'Taste the Difference'. Each of the layers in the tart were clearly visible, which again added to the high quality, tidy appearance of the dessert. It is of this luxury standard due to the high quality ingredients used and the professional, tidy and well completed final decoration that was added to make the tart aesthetically pleasing to the consumer. It held a visually striking appearance, for example the vivid colour of the orange on top, which contrasted yet complimented the dark colouration of the chocolate was eye-catching and attention grabbing. The orange chocolate tart was inclusive of a variety of different textures from the different component parts. The pastry casing held a short crumb texture that contrasted well with the smooth, and viscous orange custard filling. The final point of the criteria was met as the final product had to include a fruit or vegetable. The orange chocolate tart obviously does this, with the 6 oranges that are needed for the making.

Section C: Product Manufacture

Manufacturing Specification

Name of product: Orange Chocolate Tart.
Description of product: A rich combination of chocolate and orange, combined together to form a unique and interesting tart. Accompanied by homemade vanilla ice-cream with the addition of chocolate chunks and orange zest this dessert is bound to entice you for another bite!
Type of product: Orange chocolate tart with an ice-cream accompaniment, suitable to be sold in a frozen cabinet (-18°c) at the 'luxury end of a market' e.g. Asda's 'Extra Special Range'.
Target group: This product is aimed and targeted towards an adult market.
Number of portions: The tart has been modified to be purchased and served as an individual portion.
Special claims: The orange chocolate tart product is free from any artificial colours and flavours. It does however contain nuts (ground almonds), therefore will not be suitable for people with nut allergies. The product is classed as suitable for vegetarians as it contains no meat or animal products. The tart may contain some preservatives as this will help to increase the shelf life of the product after it's been manufactured.

Organoleptic Qualities of the Product:
The orange chocolate tart held a variety of different sensory characteristics. The dark colouration of the developed chocolate pastry contrasted well with the pale orange custard centre, which allowed the different layers and component parts to be clearly visible. The traditional flavouring of a chocolate and orange combination was met in this dessert, giving and holding a traditionalist idea that was in fact slightly altered with a variety of modifications that made the product more interesting and unique. The tart was made up of 3 component parts, the short chocolate pastry casing, the smooth and viscous orange custard filling, finalised with the neat and well finished topping. Overall, the orange chocolate tart was full of contrasting flavours, textures and colours, which made it a great success and an overall aesthetically pleasing dessert product.

Specific dimensions of the products:
Diameter of tart: 100mm
Depth of tart: 30mm
Diameter of ice-cream: 60mm
Depth of ice-cream: 40mm
Product weight: 150g
Final product tolerances: There will be set tolerances for each ingredient used. These are shown in the ingredients list to the right. These will be a maximum or minimum tolerance (+/-) of 5g depending on the ingredient.




Health and Safety Requirements: Throughout the manufacturing process of preparing, making and packaging, many factors need to be taken into consideration in order to create and most of all maintain a safe working environment. Checks and procedures must be carried out in a strict manor to ensure the product is not contaminated physically, chemically or biologically. They are also there to ensure everything is completed correctly and to the high standards that meet the high expectations. For example visual checks will be carried to ensure the product is not physically contaminated by any foreign bodies. Metal detectors will be put into place and used when packaging the product, which is another way of eliminating the risk of physical contamination. Personal hygiene practices will need to be kept to and followed to a very high standard, including all staff being trained, passing at least their basic hygiene examination, and abiding by the simple rules for example, no jewellery should be worn, hand must be regularly washed, clean aprons and hair nets must be worn, blue plasters should be worn to cover any cuts or wounds.

Storage Instructions: Once purchased, the product should be stored in a frozen cabinet (-18°c). Do not consume the dessert 3 days after purchasing and do not exceed the use by date under any circumstances.

Production Processes: Refer to the detailed production plan.

Standard Components: The product contained the following ingredients as bought in standard components; mandarin segments for decoration, chopped almonds and chocolate chips created a contrasting texture and also added to the final decoration and. Using these made the production quicker, easier and cheaper to do make.

Packaging Details:
The dessert will be packaged in a rigid plastic, air-tight container with a paperboard sleeve on the outside. The rigid plastic will make the mould of the product, keeping it in shape, reducing the risk of it become damaged. The top of the container will be transparent, therefore will allow the consumer to be able to see what they are purchasing. The container will be cheap to produce but has the disadvantage of it not being biodegradable; it can however be recycled which would be seen as an advantage. The paperboard label will be laminated, therefore will be water proof which will reduce the risk of it becoming damaged during delivery or storage. This type of material is used as it is fairly cheap and also is easy to print on. The label will hold all of the mandatory information (required by law) for example, a list of ingredients, the name of the product, the address of the manufacturers etc. It will also include a selection of other types of information that may be of interest or help to the consumer i.e. serving suggestions. With the packaging being air-tight, it will help prevent biological contamination in the sense that micro-organism will not be able to deteriorate the product. As well as this, any bacterial growth with be slowed down or stopped as the product will be kept in a frozen cabinet at a temperature of -18°c; these conditions are not ideal, therefore will make the bacteria become dormant and unable to multiply.

Environmental Considerations:

This logo shows that the packaging is recyclable. The plastic container is able to be recycled which reduces the cost of making other packaging materials in the future.

This logo is positioned on packaging in order to try encourage and persuade consumers to dispose of the packaging carefully and responsibly, reducing the amount of litter around.

Ingredients List:

INGREDIENT	QUANTITY	Tolerances	Batch 1	Batch 2	Batch 3	Costing
	4 portions	*Plus/minus*	*100 portions*	*400 portions*	*1000 portion*	*4 portions*
	Grams	*(+/-)*	**Kilogram**	**Kilogram**	**Kilogram**	£
TART						
Plain flour	250	0	6.25	25	62.5	£0.20
Caster sugar	300	0	7.5	30	75	£0.24
Eggs	450	0	11.25	45	112.5	£0.96
Butter	175	0	4.375	17.5	43.75	£0.83
Oranges	600	5	15	60	150	£1.80
Lemon	150	5	3.75	15	37.5	£0.72
Dark chocolate	140	0	3.5	14	35	£0.72
Double cream	142	0	3.55	14.2	35.5	£0.38
Almonds	25	0	0.625	2.5	6.25	£0.25
Cocoa	20	0	0.5	2	5	£0.08
ICE - CREAM						
Egg yolks	75	5	1.875	7.5	18.75	£0.22
Caster sugar	75	0	1.875	7.5	18.75	£0.06
Milk	225	0	5.625	22.5	56.25	£0.15
Double cream	225	0	5.625	22.5	56.25	£0.60
Chocolate Chips	50	0	1.25	5	12.5	£0.50
Vanilla essence	3	0	0.075	0.3	0.75	£0.05
TOTAL						**£6.97**

Section C: Product Manufacture

Aim: To produce a detailed production plan for my final product.

Timings	Production Process	Quality Control	Hazards	Control / Monitoring
9:00	⇒ Personal preparation: Jewellery off, hair tied back / in hair nets, clean apron on, wash hands thoroughly, clear blue plasters covering any cuts or wounds, short nails, outdoor clothing not to be brought into test kitchen.		⇒ Bacterial/physical hazard from staff (staphylococcus).	⇒ Hair nets to be worn as this prevents contamination onto food. ⇒ Regular hand washing using anti - bacterial soap or gel prevents bacteria spreading. ⇒ Ensuring outdoor clothing is not brought into test kitchen
9:10	⇒ Preparation of work area: Pre-heat oven, 200°c. ⇒ Thoroughly clean all surfaces with sanitizer. ⇒ Storage of perishable ingredients in refrigerator, between 0°c and 5°c.	⇒ Visual check of packaging. Do not use any ingredients with seals broken or packaging damaged. ⇒ Check the use by dates when purchasing ingredients, do not purchase ingredients with a short shelf life. ⇒ Follow correct procedures for storing chilled foods, ensuring correct temperatures.	⇒ Critical control points– for all ingredients. ⇒ Chemical contamination from cleaning detergents. ⇒ Bacterial hazard - growth of bacteria (e.g. salmonella,).	⇒ Bacteria needs to be kept at a safe level this is done by surfaces and equipment being regularly cleaned with sanitizer. ⇒ Perishable, high risk foods should be stored in a refrigerator and the temperature should be kept between 0 and 5°c. Refrigerator temps should be constantly monitored.
9:15	⇒ Weigh all ingredients for pastry using digital scales - (take into account specified +/- tolerances). ⇒ Return perishable ingredients to chilled cabinet until needed again.	⇒ Use digital scales to ensure accuracy, precision and consistency. ⇒ Regularly check scales to ensure they are correct. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Chemical hazard contamination from equipment used. ⇒ Bacterial hazard contamination– cross contamination between each stage.	⇒ All equipment and surfaces used must be thoroughly cleaned between each stage of using. ⇒ Disinfectant spray should be used and then thoroughly rinsed off, this will avoid chance of chemical contamination.
9:20	⇒ Place the butter, sugar, flour and almonds into a food processor, whizzing until they resemble breadcrumbs. ⇒ Add a little egg at a time, pulsing until the pastry comes together.	⇒ Sieve flour until there are no lumps, sieve again if required. ⇒ Visual check for egg shell in the product. ⇒ Pulse for long enough on constant speed to ensure correct consistency is met. ⇒ Keep high risk foods at correct temperature (between 0°c and 5°c) until needed.	⇒ Bacterial hazard from eggs–check for pathogenic bacteria (salmonella) ⇒ Physical contamination from egg shell	⇒ Regularly carry out visual checks to ensure no contamination in mixture and nothing has broken off into product. ⇒ Thoroughly wash surface where high risk food (egg) has been using disinfectant to avoid any contamination. ⇒ Ensure equipment is regularly checked and cleaned with disinfectant detergents.
9:25	⇒ Tip the pastry out and knead briefly to bring together. ⇒ Shape into a flat and rounded shape, wrap in cling film and chill (between 0°c and 5°c) for 15 mins >> 9:45	⇒ Ensure all ingredients are combined together. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Physical contamination from equipment + staff. ⇒ Chemical hazard form the equipment used.	⇒ Equipment should be regularly checked and disinfected to clean. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.
9:35	⇒ Thoroughly clean all work surfaces with sanitizer. ⇒ Weigh all ingredients for filling using digital scales - (take into account specified +/- tolerances). ⇒ Storage of perishable ingredients in refrigerator, between 0°c and 5°c.	⇒ Use digital scales to ensure accuracy, precision and consistency. ⇒ Regularly check scales to ensure they are correct. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Chemical contamination from cleaning detergents. ⇒ Bacterial hazard, growth of pathogenic bacteria.	⇒ Ensure equipment is regularly checked and cleaned with disinfectant then thoroughly washed and rinsed. ⇒ Regularly check that all equipment is working how it should (accurate scales). ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.
9:40	⇒ Whisk the eggs and sugar well. ⇒ Then whisk in the juices, zest, nuts and cream. ⇒ Scrape into a jug and set aside in chilled cabinet, (between 0°c and 5°c).	⇒ Whisk on constant level and speed to ensure mixture has the correct consistency. ⇒ Ensure electric whisks are on medium speed to ensure consistent mixture. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Chemical contamination from equipment	⇒ Equipment should be regularly checked and disinfected to clean. ⇒ Where raw egg has been– surfaces and equipment should be cleaned thoroughly with disinfectant, this will reduce the risk of pathogenic, food poisoning bacteria spreading (salmonella).
9:45	⇒ Grease the tins with a light brush of butter. ⇒ Turn out the pastry onto a floured surface. ⇒ Roll out to line the tins with a depth of 5mm. ⇒ Line the tins with the pastry leaving an overhang around the edges. ⇒ Line the pastry cases with baking paper, fill with baking beans and bake blind for 20 mins (until golden brown) >> 10:05	⇒ Ensure shaping is correct, use cutters to ensure the sizes of each pastry case are accurate and the same. ⇒ Ensure depth of each pastry case doesn't exceed 5mm. ⇒ Ensure temp of oven is correct - (200°c). ⇒ Visual check: golden brown in colour. ⇒ Timing of the cake should be exact and the product should meet all HACCP requirements.	⇒ Chemical contamination from equipment	⇒ Use cutters to ensure all sizes are the same. ⇒ Ensure equipment is regularly checked for contamination and cleaned with disinfectant/sterilizing fluids. ⇒ Regular checks of oven temperature and times to ensure it remains at the correct.
9:55	⇒ Thoroughly clean all work surfaces with sanitizer. ⇒ Storage of perishable ingredients in refrigerator, between 0°c and 5°c.	⇒ Ensure sanitizer is wiped off again after thoroughly cleaning before next production stage takes place. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Chemical contamination from cleaning detergents. ⇒ Bacterial contamination, growth of bacteria.	⇒ Equipment should be regularly checked and disinfected to clean then thoroughly washed and rinsed. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.

Timings	Production Process	Quality Control	Hazards	Control / Monitoring
10:00	⇒ Remove the beans and baking paper from the pastry cases, then continue to cook for 10 mins until the base is also golden.	⇒ Ensure temperature of oven is correct - (200°c). ⇒ Visual check: golden brown in colour. ⇒ Timing of the cake should be exact and the product should meet all HACCP requirements.	⇒ Chemical contamination from equipment and machinery.	⇒ All equipment used must be thoroughly cleaned between each stage of using. ⇒ Disinfectant spray should be used and then thoroughly rinsed - this will avoid chance of chemical contamination.
10:05	⇒ Melt the chocolate in a bowl over a pan of simmering water.	⇒ Ensure chocolate is fully melted with no lumps in it. This will allow the desired consistency to be met. ⇒ Correct consistency and texture.	⇒ Chemical hazard contamination from equipment used	⇒ All equipment used must be thoroughly cleaned between each stage using disinfectant spray and then thoroughly rinsed - this will avoid chance of contamination ⇒ Regularly check scales to ensure they are correct. ⇒ Visual checks: to ensure no machinery e.g. electric whisk has broken.
10:10	⇒ Remove pastry from oven then set aside to cool >> 10:20. ⇒ Reduce oven temperature to 150°c.	⇒ Visual check: golden brown in colour. ⇒ Ensure temperature of oven is correct - (150°c).	⇒ Chemical hazard from equipment. ⇒ Bacterial hazard from cross contamination.	⇒ Ensure equipment is regularly checked and cleaned with disinfectant. ⇒ Ensure separate crockery is used for different component parts.
10: 15	⇒ Thoroughly clean all work surfaces with sanitizer. ⇒ Storage of perishable ingredients in refrigerator, between 0°c and 5°c.	⇒ Ensure sanitizer is wiped off again after thoroughly cleaning before next production stage takes place. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.	⇒ Chemical contamination from cleaning detergents. ⇒ Bacterial hazard, growth of pathogenic bacteria	⇒ All equipment used must be thoroughly cleaned between each stage of using. ⇒ Disinfectant spray should be used and then thoroughly rinsed - this will avoid chance of chemical contamination.
10:20	⇒ Trim the overhang of the pastry to make the cases look neat and tidy. ⇒ Brush generously with chocolate. ⇒ Chill briefly in a refrigerator to set between 0°c and 5°c. ⇒ Repeat and set again.	⇒ Ensure all edges are trimmed and neatened off. ⇒ Make sure a thick layer of melted chocolate is applied to each pastry case. ⇒ Regular checks on temperatures of fridges, between 0°c and 5° c.	⇒ Chemical contamination from equipment. ⇒ Bacterial hazard, growth of pathogenic bacteria	⇒ All equipment used must be thoroughly cleaned between each stage of using. ⇒ Disinfectant spray should be used and then thoroughly rinsed - this will avoid chance of chemical contamination. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.
10:40	⇒ Return tart cases to oven, then quickly yet carefully pour in the orange custard to the top. ⇒ Bake for 40-45 mins (until the custard has just set) >> 11:20	⇒ Ensure temperature of oven is correct - (150°c). ⇒ Make sure each case has same amount of orange custard in. ⇒ Timing of the cake should be exact and the product should meet all HACCP requirements.	⇒ Physical contamination from equipment + staff. ⇒ Bacterial hazard form the equipment used.	⇒ Equipment should be regularly checked and disinfected to clean. ⇒ Train all staff in food handling situations - tie hair back, no jewellery, clean apron, blue plasters. ⇒ Regular checks on temperatures of fridges, between 0°c and 5°c.
11:20	⇒ Remove from oven then set aside to cool in tin.	⇒ Ensure product is cool before adding any decoration.	⇒ Physical contamination as the tart is left in the open to cool. E.g. open to flies.	⇒ Cover product over in airtight container to ensure no bacteria/pests can contaminate it.
11:20	⇒ Meanwhile, weigh all ingredients for caramelised orange salad using digital scales - (take into account specified +/- tolerances).	⇒ Use digital scales to ensure accuracy, precision and consistency. ⇒ Regularly check scales to ensure they are correct.	⇒ Chemical contamination from equipment.	⇒ Ensure equipment is regularly checked and cleaned with disinfectant. ⇒ Regularly check that all equipment is working how it should (accurate scales).
11:25	⇒ Segment oranges over a bowl, catching any juice and squeezing out the left over membrane. ⇒ Put zest in pan of cold water and bring to boil. Then strain and set aside. ⇒ Melt sugar in a saucepan with a splash of water, bring to boil. ⇒ Bubble until an amber caramel is present. ⇒ Then still on heat, tip in the zest and juice. ⇒ Take off heat tipping mixture into a bowl.	⇒ Visual check: ensure oranges have not deteriorated in quality, not contaminated or damaged. ⇒ Ensure all segments are of similar size and shape. ⇒ Keep temperature of pan the same, ensuring the mixtures are melting and becoming of a desired smooth consistency.	⇒ Pest contamination on oranges e.g. flies. ⇒ Bacterial contamination from soil (clostridium botulinum). ⇒ Chemical contamination from equipment used.	⇒ Visually check each orange and then segment individually, disposing of any contaminated or damaged ones. ⇒ Ensure fruit has been thoroughly washed and rinsed to ensure no dirt/soil remains on the oranges. ⇒ Ensure all equipment is first disinfected with water at temperature at least 82°c. Ensure washed/rinsed thoroughly.
11:35	⇒ Turn out tart onto a serving plate. ⇒ Arrange orange segments using decorative techniques. ⇒ Drizzle caramelized salad over the top of the product. ⇒ Grate zest and sprinkle nuts in a pile. ⇒ Add zigzags of melted chocolate to finish the product, giving it a professional appearance.	⇒ Ensure products decoration looks professional and well finished. It should hold an attractive appearance that will appeal to consumers. ⇒ Decoration should be the same on each product.	⇒ Physical contamination from equipment + staff. ⇒ Chemical hazard from the equipment used.	⇒ Ensure all equipment is first disinfected with water at temperature at least 82°c. Ensure washed/rinsed thoroughly. ⇒ Train all staff in food handling situations - tie hair back, no jewellery, clean apron, blue plasters.

Timings	Production Process	Quality Control	Hazards	Control / Monitoring
11:45	⇒ Weigh all ingredients for ice-cream using digital scales - (take into account specified +/- tolerances).	⇒ Storage conditions of high risk foods - keep in refrigerator between 0°c and 5°c. ⇒ Use electronic scales for accuracy: abide by tolerances.	⇒ Chemical hazard from contamination of equipment.	⇒ Ensure equipment is thoroughly washed. ⇒ Regularly wash surfaces with anti-bacterial spray.
11:50	⇒ Place egg yolks and sugar in a bowl and beat together. ⇒ In a saucepan slowly bring the milk to boiling point.	⇒ Consistency from beating is correct. ⇒ Visual check: no physical contamination. ⇒ Weight check: correct amount of sugar has been added.	⇒ Chemical hazard from equipment not being rinsed thoroughly. ⇒ Bacterial hazard - cross contamination from high risk foods.	⇒ Thoroughly rinse all equipment before use. ⇒ Keep high risked foods in correct storage, e.g. out of the danger zone (5 to 63°c).
11:55	⇒ Pour milk onto egg mixture, beating together. ⇒ Return mixture to pan and stir constantly until the mixture thickens.	⇒ Consistency from beating is correct. ⇒ Visual check: no physical contamination.	⇒ Chemical hazard from equipment not being rinsed thoroughly. ⇒ Bacterial hazard - cross contamination from high risk foods.	⇒ Thoroughly rinse all equipment before use. ⇒ Keep high risked foods in correct storage, e.g. out of the danger zone (5 to 63°c).
12:00	⇒ Remove from heat, set aside and leave mixture to cool.	⇒ Chill mixture until cool, between 0°c and 5°c. ⇒ Visual check: no physical contamination.	⇒ Bacterial contamination from food pests such as flies.	⇒ Cover food with airtight container to avoid bacteria contaminating it.
12:20	⇒ Stir in the cream and vanilla essence. ⇒ Pour the mixture into the ice-cream maker with the paddle already running. Allow to freeze until desired consistency is achieved.	⇒ Visual check: no physical contamination. ⇒ Speed of paddle is correct to form the desired end product.	⇒ Bacterial hazard of contamination from perishable foods. ⇒ Chemical contamination from equipment.	⇒ Keep high risked foods in correct storage, e.g. out of the danger zone (5 to 63°c). ⇒ Thoroughly rinse all equipment before use.
12:30	⇒ Scoop out the ice-cream and serve with product.	⇒ Visual check: no physical contamination. ⇒ Portion of ice-cream abides by stated weight.	⇒ Chemical contamination from equipment.	⇒ Thoroughly rinse all equipment before use.
	⇒ Thoroughly clean all work surfaces with sanitizer/disinfect at 82°c. ⇒ Ensure all equipment used in the production process is thoroughly cleaned.		⇒ Bacterial hazard from equipment.	⇒ Wash all equipment thoroughly in between each process to minimize contamination.

Large Scale Production:
If this product was to be made on a large scale it would be most suitable to be made using batch production. Batch production produces a specified quantity of a product, which can be made on a small or large scale. The product would be assembled, cooked and sold all on the same day. Doing all this on the same day would mean the ingredients would not necessarily need to be refrigerated or stored for any longer, therefore would free up storage space and would ensure that stock rotation was taking place efficiently. I could use batch production for the orange chocolate tart which is a process that could be repeated as many times as required. The main disadvantage of using batch production is when machines break or need to be cleaned or changed - this is called 'down time' as no products can be made which makes this an unproductive time for the manufacturers. Batch production relies on industrial and computerised equipment. This type of machinery is suited to batch production as it needs to be flexible and efficient in terms of the different scales that are produced. For the different component parts, equipment such as computerised scales will be used as this will make weighing of individual ingredients very accurate. It is essential that ingredients are weighed with precision to ensure the best possible outcome is achieved. In batch production large tunnel ovens will be used. These are usually controlled by technical computers that the factory owns. Using computer controlled ovens means temperatures and cooking times can be pre programmed, ensuring the products are all cooked slowly and evenly, ensuring each product receives the same length of time at the same correct temperature. For the pastry large cutters could be used to shape and size the cases. Large ribbon mixers could be used to mix the filling ingredients together, ensuring a thick and viscous texture with a smooth desired consistency. A depositor could be used to fill the cases with the orange custard filling then finished off with the caramelised topping. This will measure an equal amount onto each tart which will ensure consistency and accuracy among all of the products. The depositor, ovens and scales are the most likely to be used in test kitchens, however batch production will also rely on CAD and CAM, which will again ensure a consistent product if its made on a larger scale of production. When the product is assembled and finished it would be packaged and stored in the correct conditions, ready to be dispatched and distributed across supermarket stores. This type of production process will make large quantities of food quickly which can be very beneficial for the manufacturers.Using this method to manufacture the product allows the process to be easily adapted to produce different end products using the same production line machinery which will again be very beneficial for the manufacturers.. This style of production makes it likely that the final cost per each portion would be more expensive to make, however this could be counteracted by making the price at which the products are sold also higher.

The series of photographs above show the different stages of the making process for the orange chocolate tart. The larger images at the bottom of the page show the final product on a serving plate as it would stand ready for the consumer. It holds a professional and well finished appearance that is eye-catching and unique. The vivid and contrasting colours attract the consumers attention, making it look an appealing dessert product that will entice them to take a bite!

Section C: Product Manufacture

Testing

Sensory Analysis Testing:

Product 1 - Orange Chocolate Tart.

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
	3	3	4	3	13	5	4	4	4	17	4	4	4	5	17	4	4	5	4	17	64

Product 2 - Orange Chocolate Tart (Developed)

Sample	Appearance				Total	Texture				Total	Taste				Total	Aroma				Total	Total
	4	5	5	5	19	5	5	4	4	18	5	4	4	5	18	4	5	4	4	17	72

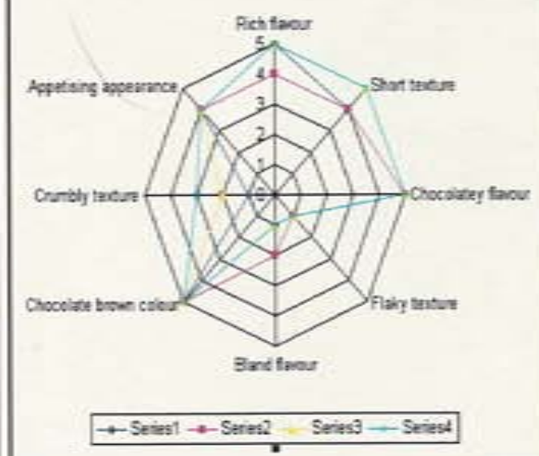
When sensory testing it is important to carry it out in the right way, keeping controls and procedures professional and the same. The sensory testing was carried out before and after developing the dessert product; it was done at these stages so it was made visibly clear the differences and improvements that were achieved from start to finish. The tasters were each in individual tasting booths so that opinions could not influence the decisions made. Each booth was provided with a record sheet that was clear and easy to understand, making it efficient for results to be recorded. The same conditions for each taster were put in place in terms of the amount of light and temperature within the tasting booth. The product was presented in exactly the same way to all the tasters in relation to size and shape and also the colour of the serving plate. The food was coded with 'random labelling' (e.g. XXY) as numbers may appear influential to testers, it also helps to make them unknown to what they were tasting. A drink of water was provided between each sample - this is so that previous flavours don't affect the next product tasted, it is referred to as 'cleansing the palate'.

Sensory Attributes:

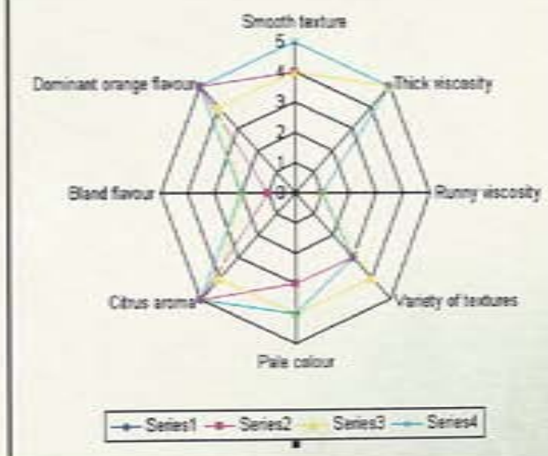
From carrying out sensory analysis testing on the original product it makes it visible to see which areas of the product the tasters enjoyed and which areas they feel could do with improvements. The appearance was the original products weakest point in terms of its sensory characteristics, therefore this was the area I first felt needed the most focus and attention with it scoring just 13 out of a possible 20 marks. I originally poured the caramelised orange flavoured salad over the top of the dessert which was fairly messy and was described as 'a little too rich'. Instead of doing this, to make it appeal more to a wider range of consumers, I arranged some small mandarin segments in a fan shape, drizzled the syrup and melted chocolate over the top, finishing it off with a small pile of chopped almonds in the centre, along with finely grated orange zest sprinkled over the top. These modifications improved the appearance by a very pleasing total of 6 marks which made the dessert product look even more professional, and well finished. The way things were arranged made the dessert look tidier, as did the smaller individual portion sizes which also better suited the design specification (the serving suggestions). When testing the original product, the texture, taste and aroma all scored 17 out of a possible 20 marks. This was a fairly good mark, however all areas obviously still held room for improvements. To increase the scoring for the texture I felt I had to add more variations throughout the dessert that contrasted each other, making the product more interesting and enjoyable to eat. I kept all of the ingredients in the filling the same but made the addition of some finely chopped almonds. The addition of chopped almonds created a harder contrasting texture to the already smooth orange custard. The addition of the almonds could limit my consumer group as the product would then not be suitable for those with nut allergies, however I didn't feel this would affect the overall target group in a way that would impact the sale of the dessert. The modifications I made helped marginally improve the overall scoring of the texture by 1 mark, leaving its final total at 18 out of a possible 20 marks. The taste of the original product was initially described as 'delicious', however with it again scoring 17 out of 20 in the sensory testing I felt I could still improve it in some way. I added more nuts, minimised the amount of caramelised orange salad as this initially wasn't very popular and added more chocolate to the dessert, for example making the pastry chocolate based rather than plain and bland as it appeared in the original product. These small alterations meant the products taste improved by one mark in the sensory testing, scoring a pleasing, final total of 18 out of a possible 20 marks. The aroma scored the same in the sensory testing for both the original and developed product. This was not an issue as tasters all appeared satisfied with the dominant 'citrus smell' that was present in both the original and developed tart. Overall, I managed to improve the original product by a total of 8 marks, leaving the final product with a very pleasing 72 out of a possible 80 marks. I was very pleased with the outcome as it was successful and improved, I do however feel there is still room for improvements to make this high quality product perfect.

Sensory Testing of the Component Parts:

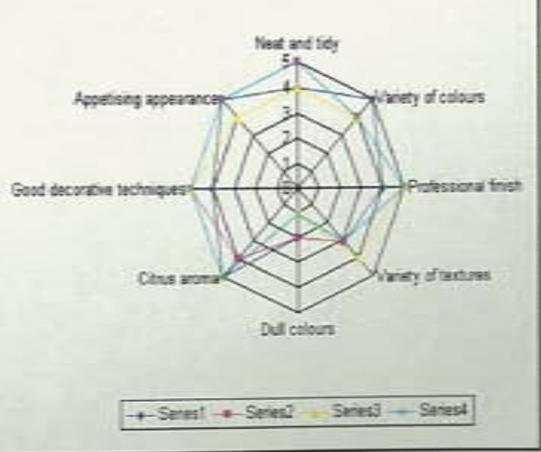
Pastry



Filling



Topping



The diagrams to the left show the tasters responses to each of the sensory characteristics of the 3 component parts of the orange chocolate tart. From looking at the results for the pastry it is clear to see that the tasters were most impressed with the overall texture, with it gaining near enough full marks on the testing due to its 'perfect short texture'. The filling also scored well in the star profile, showing me that the strongest points were the viscosity, aroma and taste, whereas the weakest were the colouration and the smoothness of the filling. This wasn't a bad point as there was supposed to be a variety of textures however if I were to make the product again this is an area I could focus the majority of my development work on. The topping was a component part that scored well in all areas, with little improvements that could be made. Overall, I am pleased with the tasters results from the sensory star profiles. Each component part of the tart in general scored highly where needed and low where appropriate. There are certain areas in which the scores could have improved slightly, for example with the overall appearance of the pastry, but this is something a few small alterations could change, completing the tart and making it appear to be an even more high quality and almost perfect dessert product.

Specification point	How the point is achieved
Suitable to serve 2-4 people.	✓ Originally the tart served more than the suggestion of 2—4 people. I re-sized the dessert into individual tarts therefore better suiting this point as one tart is substaintial (big enough) to serve two people.
Be packaged as either one product or individual portions.	✓ From re-sizing the dessert into smaller, individual portions, it can be packaged more easily. It may also mean that it is cheaper as less material for the packaging will be required.
Be aimed at the adult market.	✓ The product is a very high quality dessert that holds a variety of asthetically pleasing characteristics. The sensory attributes would be appriciated more by the adult market.
Aimed at the luxury end of the market.	✓ This product would be perfect for the sale at the luxury end of the market. All the ingredients used are of a high quality making it suitable to be classed into this category. The tidy and professional finish also helps this.
Visually striking and have an aesthetically pleasing finish.	✓ The tart has a variety of vivid colours, ranging from the bright orange of the decoration, that contrasts well with the dark colouring of the chocolate and pastry. The overall professional appearance of the dessert gives it a very aesthetically pleasing finsh.
Inclusive of different textures from different component parts.	✓ All of the component parts include a variety of different textures, each that contrast yet compliment eachother well. For example, the short, firm pastry constrasts well with the smooth and viscous orange custard filling.
Include fruit and/or vegetables.	✓ One of the main ingredients of the tart is orange. The dessert includes its juice, zest and rind, therefore it can be said this product definitley includes a fruit.

Testing the Quality of the Product:

I tested the quality of the product in many different ways in order to ensure the best outcome was possible. I weighed and checked the weight of all the ingredients and the final product using electronic digital weighing scales. I used these to make sure that the reading was as accurate and precise as it could be, which also ensured that no mistakes were made. Throughout the process of manufacturing the product, I allowed small weight tolerances (+/-) of 5g depending on the ingredient or component part. For example, I gave a 5g (+/-) tolerance for the oranges as each one is unlikely to weigh exactly the same weight as another. This made the testing more fair, therefore allowing me to receive more realistic and accurate results. Before weighing or using any of the ingredients I made visual checks on them all. I looked for any signs of physical, chemical or biological contamination, focusing on the quality to ensure a high standard was maintained. Throughout the preparation of the dessert , I carried out regular checks on the fridges, monitoring the temperatures to ensure they were all at a safe level, for example, checking and making sure the fridge was at a temperature of between 0°c and 5°c, or the freezer cabinet was at at temperature of −18°c. I used small round tart tins for the pastry casings in order to ensure the dimensions were correct and the same for each product. I ensured the overall consistency of all the desserts (including sizes, viscosity, textures etc) were the same by making the components parts in batch, rather than separately for each individual tart. I carried out sensory tests throughout the different stages of the process, allowing me to see where improvements needed to be made

Storage Test:

To ensure the storage I had chosen was correct for the product I decided to carry out a test. I kept a small amount of the product at room temperature which I named sample A. I then placed another sample in a refrigerator at a temperature between 0°c and 5°c which I named sample B. After leaving the two samples for 24 hours I checked them to see if the conditions they were left in had any overall affect on the appearance. Sample A, after 24 hours had slighty deteriorated, looking less fresh therefore losing its high quality, luxury appearance. Sample B on the other hand had no obvious, visible changes as the refidgeorator had presevered the product quite well. After 48 hours, I checked and examined both samples again. Sample A had deteriorated significantly more this time and had started to lose some of its origional shape. Sample B on the other hand was still on the whole looking in good quality condition. I went back to the samples again after 72 hours to see how the time and conditions took effect on each of the samples. After the three days, sample A didn't look very appetising at all. This shows me that this sample hadn't been stored in the right condtions which meant bacteria was able to multiply freely, making the general standard of the product deteriorate quite rapidly. After 72 hours, sample B had also deteriorated, but not anywhere near as much as sample A. This therefore backs up my idea that the dessert product is best stored in a refrigerator at a temperature between 0°c and 5°c. It has also given me a rough idea of a used by date for the dessert product which looking at the results would be approximately 3 days.

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