

GCSE in Manufacturing (Double Award)

**Unit 1: Designing Products for Manufacture
Food**



Proposed marks for Unit 1 - Food

			Allocated mark	Location of evidence
a1 produce a design specification from a gross design brief. 0 1 2 3	a2 produce a detailed design specification using customer feedback and associated information. 4 5 6	a3 justify the final design specification by explaining how customer feedback and associated information were used. 7 8 9	7	Page 1 sets out a customer design brief and specification. Further information is gathered relevant to the project on pages 2, 3 and 4. The information gathered is reported back to the customer and a revised, although basic, specification is given on page 5.
b1 use their design specification to produce ideas for a design solution. 0 1 2 3	b2 explain the use of their design specifications in developing ideas for their final design solution. 4 5	b3 fully justify their choice of a final design solution from a range of ideas. 6 7	6	Pages 6 to 10 include a range of annotated sketches to show the development of ideas for all aspects of the bar and packaging. The final choice of idea could have been justified more fully and reference to specification made.
c1 identify health and safety issues that may arise in making their product. 0 1 2 3 4	c2 identify the quality control procedures that would be used in each stage of making their product. 5 6 7	c3 evaluate quality control, quality assurance and total quality management applied to making their product. 8 9	6	Health and safety issues and quality control procedures are talked about in general terms on pages 11 to 13. Page 12 shows the stages of production involved in making the breakfast bar and appropriate quality control checks to be carried out when making the bar are identified.
d1 use diagrams, sketches and other appropriate methods to present their design solution to the customer. 0 1 2 3 4 5	d2 use diagrams, sketches and other appropriate methods, including modelling, to explain their design solution to the customer. 6 7 8	d3 use diagrams, sketches, working drawings and other appropriate methods, including modelling, to justify their design solution to the customer. 9 10	8	The final bar has been drawn and packaging suggested on page 14, brief annotation is included. The product has been modelled and ingredients identified on page 15 a brief justification for the selection of ingredients is also given.
e1 identify the manufacturing processes that would be used to produce their product in quantity. 0 1 2 3 4 5 6 7	e2 identify the stages and associated quality assurances that will be used to manufacture their product. 8 9 10 11	e3 evaluate and justify the stages and associated quality assurances they will be use in the manufacture of their product with particular reference to "real world" situations. 12 13 14 15	9	The manufacturing processes that would be used to manufacture the bar are named on page 16 but not gone into on any great depth. Quality assurance and production key points are identified on page 16. Methods to produce the breakfast bar are identified on pages 16 and 17. However would the processes identified be the correct method to create the breakfast bars?
Total mark			36	

CUSTOMER DESIGN BRIEF

It is a well known fact that breakfast is the most important meal of the day. However many business people and children who would rather spend extra time in bed don't make time to have breakfast.

A well known cereal manufacturer would like to develop a range of breakfast bars that would encourage people to eat something at breakfast time. The idea of the cereal bars is that despite people saying that they are rushed for time and can't make anything to sit down and eat in the home they could use these cereal bars as they can be treated like any other confectionery bar and can be eaten while on the move.

Experts have stated that the British diet contained too much sugar, fat and not enough fibre. By eating the bars the customer will be provided with a low sugar product that will have a high fibre content which will give the customers diet a balanced start to the day.

SPECIFICATION

- The design of the breakfast bar should make sure that healthy eating is considered.
- The product should have a positive contribution towards the customers daily balanced diet.
- It should be low in sugar content.
- The bar should be high in fibre content.
- It could make use of fruits or nuts in its mixture.
- The breakfast bar should be different to other bars already available on the market.
- Packaging used should protect and advertise the product.
- The bars should be a suitable size to be carried in your pocket or bag.
- The bar should have enough about it that customers will feel that they have eaten a product and not be looking for another food straight away.

What bars are already available on the market and what do potential customers think of them?

Product - Fruit Nuts & Raisins	Image of Packaging	Taste	Comments
Person 1	***	***	Like nut & raisin taste.
Person 2	***	*****	Enjoyed the taste.
Person 3	*****	*	Nuts got me off.
Person 4	***	***	OK but prefer others.
Person 5	****	***	Quite a nice taste.

Key ***** = Excellent, ** = Do not like at all



Product - K time	Image of Packaging	Taste	Comments
Person 1	***	***	OK but a little dry.
Person 2	****	**	Not keen on fruit sweet.
Person 3	***	*****	My favourite bar.
Person 4	***	***	Alright but prefer others.
Person 5	***	**	Rather dry to eat.

Key ***** = Excellent, ** = Do not like at all



Product - Alpen Fruit and Nut	Image of Packaging	Taste	Comments
Person 1	****	***	I like the nut taste.
Person 2	****	****	Crisp but chewy also.
Person 3	***	*	Don't like nuts.
Person 4	****	****	Liked the taste.
Person 5	****	***	Nice and fruity taste.

Key ***** = Excellent, ** = Do not like at all



Product - Blackberry Cereal Bar	Image of Packaging	Taste	Comments
Person 1	**	****	Quite nice.
Person 2	*	****	Nice and fruity.
Person 3	*	*****	Definitely one of best.
Person 4	*	****	Like the taste a lot.
Person 5	**	**	OK but a little sweet.

Key ***** = Excellent, ** = Do not like at all

Product - Alpen Strawberry & Yogurt	Image of Packaging	Taste	Comments
Person 1	****	*	Don't like the yogurt.
Person 2	****	*****	Nice fibred flavour.
Person 3	***	****	Liked the fruit taste.
Person 4	****	*	Too sweet for me.
Person 5	****	****	Nice, I will buy another.

Key ***** = Excellent, ** = Do not like at all

After looking at five cereal bars that are available on the market today I found that the majority of people asked liked the bars that were sampled. The main problem for one person was that they did not like nuts and therefore the bars containing this ingredient scored low. The most popular bar was the blueberry cereal bar as the majority of people asked rated it at four stars or better only one person gave it a less than four stars rating. However the packaging used to contain the bar scored very low due to it being rather square and the colour scheme was rather dull. The packaging used to hold the Alpen bars was given the highest rating with three stars being the lowest award and all others being four stars. The Alpen fruit and nut bar was the second most popular cereal bar only person three scored it low due to their disliking of nuts.

Disassembly of the existing bars



CONTENTS

Alpen fruit and nut bar, weight 28 g.

Ingredients - glucose syrup, wheat, raisins, rice, oats, apple juice concentrate, sugar, mixed chopped nuts (hazelnuts and almonds).

Nutrition information -

100g provides: energy 1661kJ/394kcal, protein 6.5g, carbohydrate 71.2g, fat 9.2g.

Frusli raisin and hazelnut bar, weight 33.3g.

Ingredients - Californian raisins, rolled oats, flour, roast hazelnuts, glucose syrup, blended rapeseed and palm oil, raw cane sugar, honey and rice flour.

Nutrition information -

100g provides: energy 1789kJ/426kcal, protein 6.3g, carbohydrate 61.2g, fat 17.2g.

Alpen strawberry with yoghurt bar, weight 29 g.

Ingredients - glucose syrup, wheat, rice, oats, dried apple pieces, freeze dried strawberry, strawberry juice concentrate, sugar, yoghurt powder.

Nutrition information -

100g provides: energy 1792kJ/425kcal, protein 5.6g, carbohydrate 73.5g, fat 12.1g.

Traditional cereal bar, Weight 23g.

Ingredients - oat flakes, wheat flakes, honey, glucose syrup, dried cherry pieces, dried apricot pieces, coconut, raisins.

Nutrition information -

100g provides: energy 1639kJ/417kcal, protein 6.5g, carbohydrate 63.8g, fat 9.8g.



Survey to find out what people require from a breakfast cereal bar

1. How many people live in your house?

- 1
2
3
4
5
More than 5

How many people live in your house?

- 1
 2
 3
 4
 5
 5+

How many people eat breakfast?

- Everyday
 Most days
 On holiday
 Sometimes
 Never

2. How many people in your house eat breakfast?

- Everyday
Weekends
On holiday
Sometimes
Never

What is the reason that people don't eat breakfast?

- Lack of time
 Don't like cereal
 Other
 Don't like cooked breakfast

Have you ever eaten a cereal bar?

- Yes
 No

3. What is the reason people don't eat breakfast everyday?

- Lack of time
Don't like cooked breakfast
Don't like cereals
Other

4. Have you ever eaten a cereal bar?

- Yes
No

5. What did you think of the bar?

- Too crunchy
Took too long to eat
Didn't like the taste
Other

What did you think about the cereal bar?

- Too crunchy
 Took too long to eat
 Didn't like the taste
 Other

Would you consider eating a cereal bar for your breakfast?

- Yes
 No
 Sometimes

6. Would you consider eating a cereal bar for your breakfast?

- Yes
No
Sometimes

7. Which of the following ingredients would you like a cereal bar to contain?

- Bran flakes
Rice Crispies
Dried Fruit
Nuts
Other

What would you like the cereal bar to contain?

- Bran flakes
 Rice Crispies
 Dried fruit
 Other
 Nuts

8. Would you prefer it if any of the following coatings were added to the cereal bar?

- Chocolate
Caramel
Other
No coating

Would you prefer it if any of the following coatings were added to the bar?

- Chocolate
 Caramel
 No coating
 Other

Feedback to customer regarding findings from initial research.

After carrying out initial research I have found a wide range of responses to my questions in the survey and to peoples views about products that are available already on the market.

I suppose that I should have expected such responses as everyone is different in many ways. Not just from what they like to eat but also as to how much time they have on a morning to eat a breakfast. I also found that the majority of people have more time on a weekend to prepare eat something first thing in a morning. A similar response was given for holiday time.

More than half the people surveyed had not eaten a cereal bar before. Of those who had eaten a bar the opinion was that they took too long to eat and tended to be rather crunchie. Whether being crunchie was a bad or a good point I will need to explore further.

The majority of people who hadn't tried cereal bars before said that they were willing to consider using them in the future breakfast.

Bran flakes, rice crispies and dried fruit were the most popular main ingredients suggested to be used when making a breakfast bar. Such ingredients would fit in well with a persons health diet as these are all high fibre products and contain no fat or sugar. For some people bars that contained nuts were a problem. This was seen when people were asked to try out samples of five existing breakfast bars. One person in particular did not like nuts and the products that contained these items scored low from that person. Therefore the use of nuts in the bars should be carefully considered. I don't think that they should be totally abandoned but some products should be produced without nuts included in order for them to appeal to the full market place.

Chocolate and caramel scored highly when people were asked which covering they would like on the bars however this would not help the healthy living bias of the product as these coatings would contain a high sugar content. However it appeared from the survey that people were quite happy to eat the bars without a coating.

Packaging used to hold the product was also considered and it was found that people liked packages that were neatly presented and colourful. This is an important point as this may be one way to attract the customer to a new product after that the taste will keep them coming back for more.

REVISED SPECIFICATION

KEY POINTS TO CONSIDER WHEN DESIGNING THE BREAKFAST BAR

Bars have a high fibre content.

Bars have a low fat and sugar content.

Bars could include nuts but alternative bars without nuts should be available.

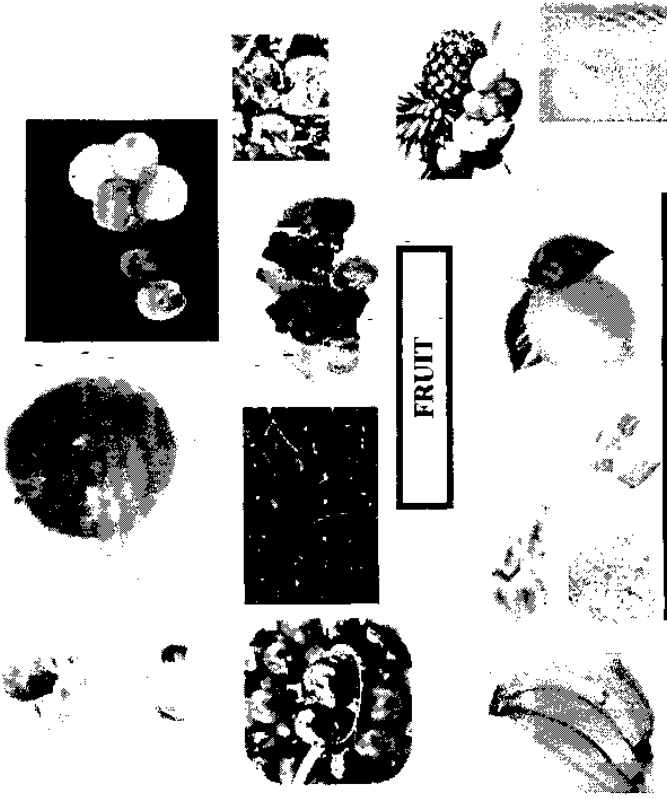
Bars should be of a suitable size to be eaten as breakfast substitute and able to fit in a bag or pocket.

Bars should be protected so that they will not easily break or crumble.

Packaging should attract customers.

Bars should be different from those already available on the market.

What ingredients could go into the breakfast bar?



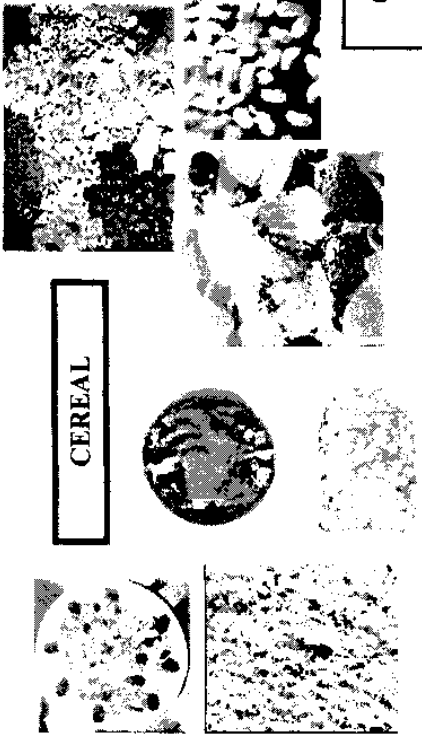
FRUIT

Fruit is a very popular ingredient in existing cereal bars and many different types of fruit can be included. The pieces of fruit used will be dried fruits so that they will last when made into bars. The combinations of fruits or fruits with nuts are endless. Fruits that can be used - apple, cherry, pineapple, banana, orange, lemon, apricot, raspberry and strawberry.



NUTS

There are many types of nut and cereal that can be used on the cereal bar. These can either be used individually or as mixtures. The main problem with nuts is that some people have a reaction to them so this will have to be carefully considered.
Nuts - mixed, brazil, coconut, hazelnut, almond, peanut, cashew, walnut.
Cereals - cornflakes, bran flakes, rice crispies, puffed wheat, bran and oats.



CEREAL

SHAPE OF THE BAR

What shape can the bar be?
 Most cereal bars available in the shops are based on a rectangular shape.

rectangle shaped bar similar to those already available.

easily moulded to shape.

possibility of wing basic rectangle shape but rounding ends

Alternative shape but may be difficult to pack. Could be sold in pairs.

Why has bar to be a one piece bar? Could be available as two chunks or slices. Although these smaller shapes may break or crumble easily.

Corners may crumble.

slight change from basic block shape and curved top may make this bar have more appeal.

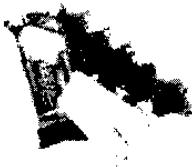
Quite easy to firm and remove from a mould.

Cylinder shape is quite different from bars available but may difficult to pack!

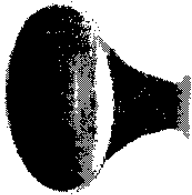
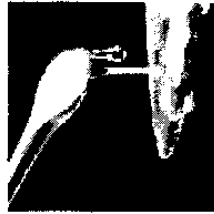
This is a different shape from most break fast bars. Could be difficult to firm and keep shape. May be awkward to hold.

Other items that could go into the breakfast bar

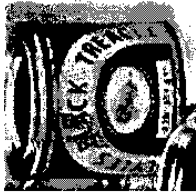
As well as the cereals, fruits and nuts that can be used to make up the breakfast bar biscuit can also be used. Biscuit could be used in a number of forms from wafer to large sections the length of the bar or to small pieces or even crushed biscuit. The flavour of the pieces used can also vary according to individual tastes or to compliment the other ingredients used.



How could the ingredients used to make the bar be kept together?



The individual ingredients that are used to make up the bar will have to be kept together so that when the bar is taken out of its wrapper it does not drop to pieces. The method used for binding the together will have to be carefully considered as it will have to compliment the ingredients and add to the overall taste.

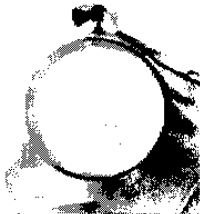


If required what coatings could be used on the bars?

Coatings could be placed on one end or one side of the bar, however if it is enrobed the whole of the bar will be covered.

Any extra coatings to the breakfast bar will need considered according to how the bar is to be promoted. As if it is going to be a healthy bar then chocolate may need to be avoided although carob could be used for vegetarians as a substitute for chocolate. Chocolate if selected could be used in a variety of forms - milk, dark or white.

Caramel or thick yoghurt could also be considered. The method used to apply the topping could also be altered as the bar could be dipped into the topping or it could be piped onto the surface.



Yoghurt

White chocolate



The following items may be used and some of them could be used in a combination.



Syrup, treacle, chocolate, sugar, margarine, chocolate, caramel and marshmallow.

PROTECTING AND PACKING THE

single piece of protection card placed under the bar before wrapping.



will add to strength and with not increase price too much.



this tray could be used as a pair with one tray at top and the other below.

plastic formed trays used to hold the bar.

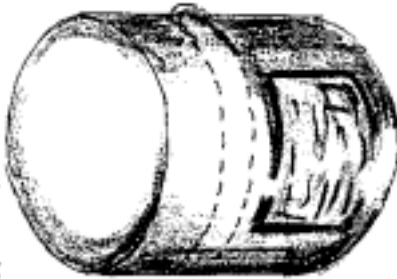


handles on this tray allow it to be easily slid from package.

the trays could be made from a see through plastic or be coloured to add to the overall presentation.

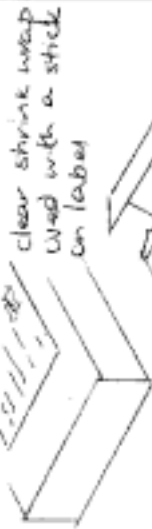
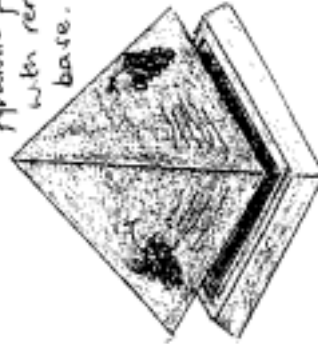
BREAKFAST BAR

card may be a suitable material in a lot of cases however it will need to have surface protection to avoid greasy stains.

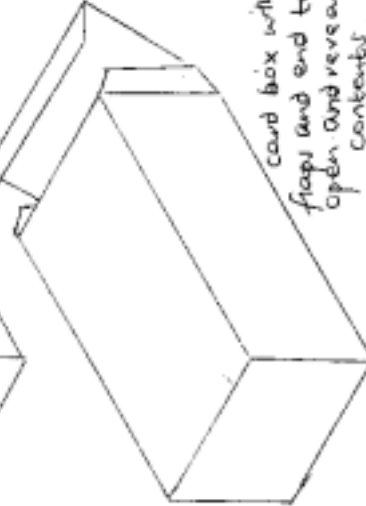


cylindrical shape with tear strip near to the top.

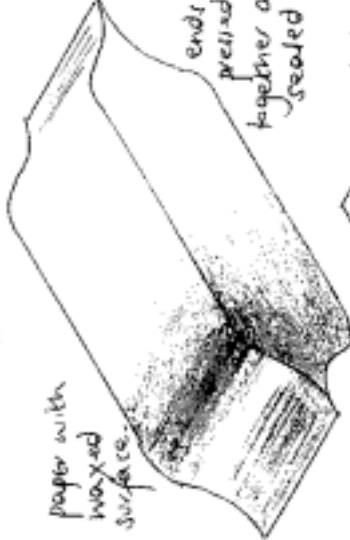
pyramid package with removable base.



clear shrink wrap used with a stick on label

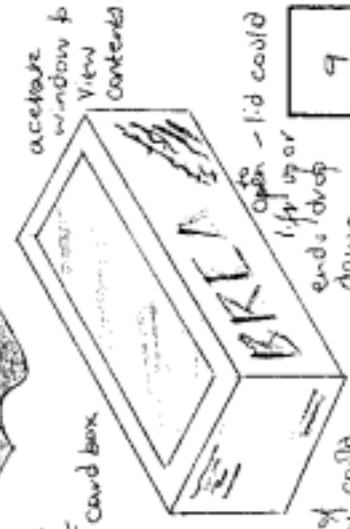


card box with flaps and end to open and reveal contents



paper with waxed surface.

ends pressed together and sealed



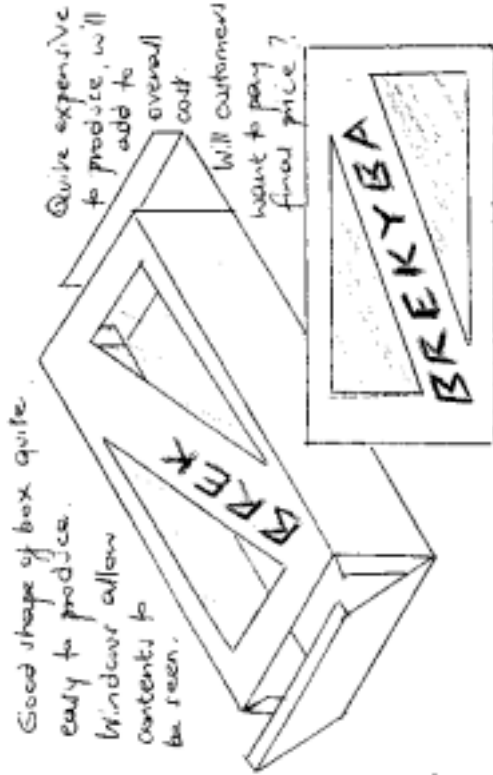
acetate window to view contents

card box

acetate window - lid could lift up or ends drop down.

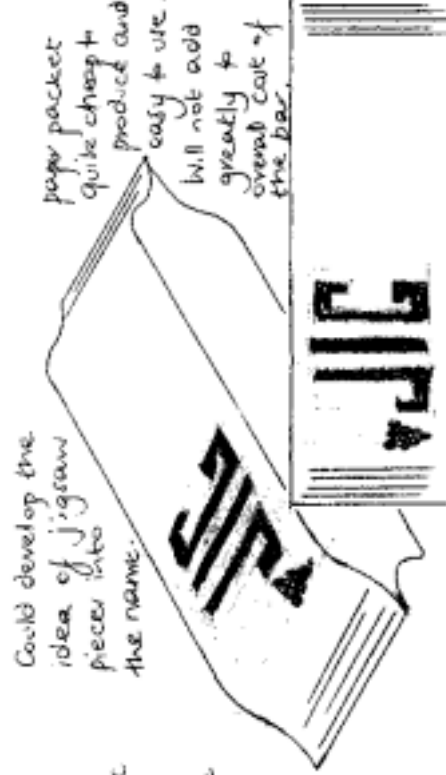
shape of window could vary

9



Good shape of box quite easy to produce. Windows allow contents to be seen.

Quite expensive to produce, will add to overall cost. Will customers want to pay final price?



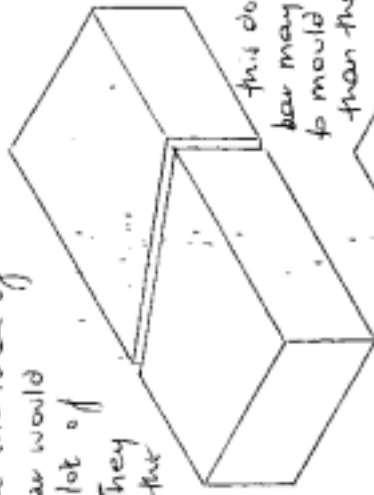
Could develop the idea of jigsaw pieces into the name.

paper packet quite cheap to produce and easy to use. Will not add greatly to overall cost of the bar.

JIGSAW WANT MORE
JIGSAW WANT MORE
JIGSAW

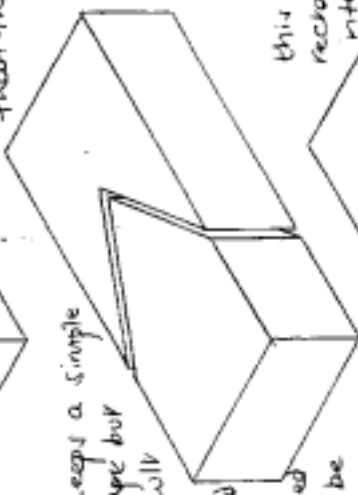
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I think that the idea of a double bar would appeal to a lot of customers. They could share the bar or save part to eat later.

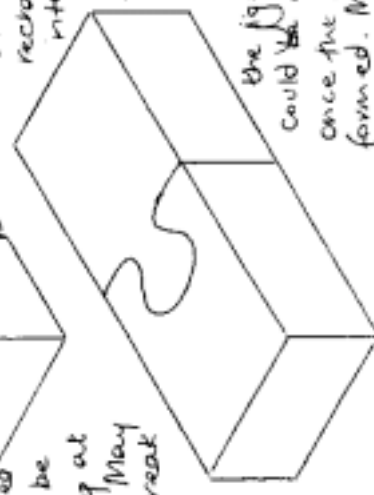


this double bar may be easier to mould and form than the others shown.

this shape keeps a simple overall shape but may be difficult to produce. This will depend upon the ingredients used as points will be difficult to keep at the corners. May be liable to break and crumble at key points.



this shape is a basic rectangle but the interest centred around how the two pieces go together.



the jigsaw idea could be stamped out once the bar has been formed. May cause initial problems but could be a style worth developing.

Health and Safety issues that must be observed when making the product.

In order for the product to reach the customer in a state that is safe to eat care must be taken at each stage in the manufacturing process that safety rules are observed.

The Food Safety Act 1990 and The Health and Safety at Work Act 1974 are two pieces of legislation which must be observed.

Premises, staff and equipment must be kept clean.

Food must be handled and stored safely. It must also be prepared in safe surroundings to reduce the risk of serious illness. Poor food hygiene can lead to outbreaks of food poisoning which can result in serious illness. With some groups of the population particularly vulnerable especially the young and elderly.

Poor hygiene practices can result in the waste of contaminated food, infestation by pests, absence from work because of illness, loss of customers, reduced profits and the threat of possible legal action.

People handling food should -

- Have good personal hygiene.
- Use separate wash basins for hand washing and for washing food items.
- Wear protective clothing - to cover clothes, hats for hair, gloves (depending upon the task).
- Report any illness.

Work area should -

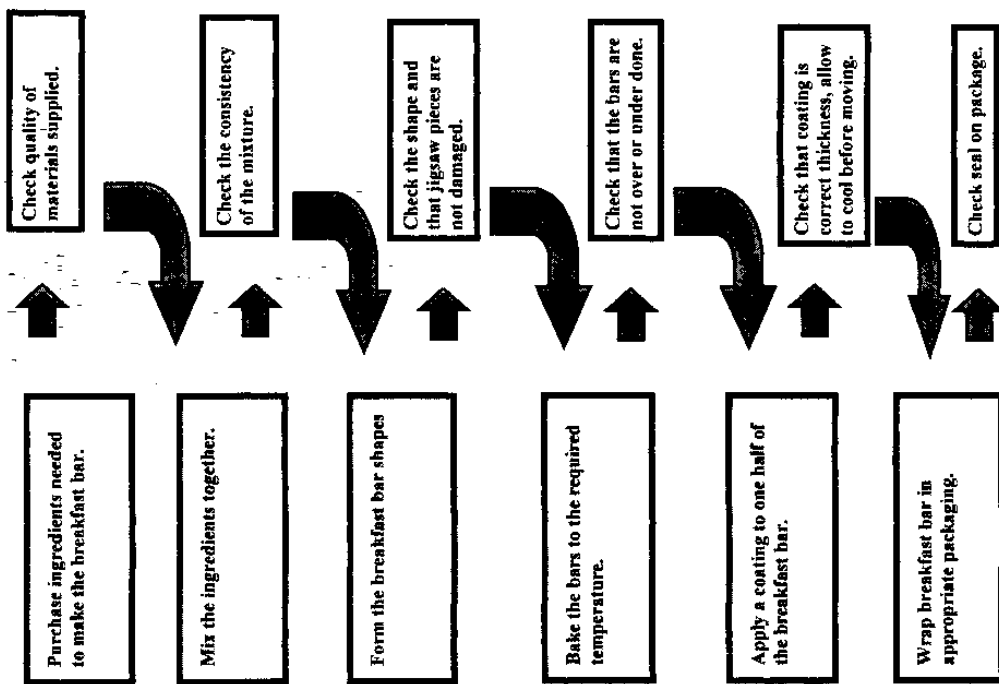
- Be clean.
- No broken or damaged equipment should be used.
- Work surfaces should be kept clean and regularly wiped down using clean cloths.
- Be well ventilated, well lit.
- Clear of all waste, rubbish should be regularly removed from the area.
- Equipment should be stored in a covered state.
- Different chopping boards, knives and bowls should be used for raw and cooked food.
- Make use of pest control by using fly screens on windows, ultra violet light insect traps and food covers.

Food storage:

- Rotate stock and use oldest first.
- Discard any product that is past its sell by date.
- Store food at the required temperature.
- Regularly check the temperature of units to cook food and units to store food.



Production plan to show the making of the Breakfast Cereal bar and quality control procedures that will be carried out to ensure that the final product is of a first class standard and meets the needs of the identified customer specification.



Customers expect that the food that they buy is safe to eat, however food poisoning can easily happen if the correct precautions have not been followed. It is essential that food is stored, prepared, cooked and served properly. The manufacturer needs to assess the risk of the item being produced becoming a hazard to customers health. Every food product has its own particular danger points. Manufacturers need to be able to assess and anticipate problems if they are going to avoid wasting ingredients, production time and money. There is no way that a manufacturer wants to receive complaints from customers or visits from local health authority inspectors, therefore care at every level of production is vital in order for safe products to be produced.

Risk assessment

Involves thinking about what could happen and then taking steps to prevent it.

Risk assessment methods ensure that food operations are designed to be safe and any potential hazard is taken into considered.

Hazards

Anything that can cause a problem to the customer is classed as a hazard. These could be biological, physical or chemical.

Hazards can happen at any stage of the food production process. They could happen during the harvesting of raw ingredients, the production of ingredients or when the items are being transported to the processing plant. After these stages hazards could then occur during the mixing, processing and storage of the product. Or after it is manufactured during the distribution to the retail outlets and on to the customer.

Hazard Analysis and Critical Control Point (HACCP)

In the food industry this is the method used for risk assessment. It identifies points where hazards may occur and which are critical to the customer. It also makes sure that tests are carried out at critical points and sets out action to be taken if not within safe limits.

Application of HACCP

Staff should be trained to carry out HACCP checks on a variety of aspects and when a check is carried out it should be recorded so that if there was a problem reference could be made to the log book.

- all work areas should be kept clean and hygienic.
- temperature probes should be wiped before and after use.
- pest control measures should be followed.
- cooking times should be accurate.
- rotation of stock.
- use of metal detectors at all times.

Total Quality Management

Quality guaranteed.

In order to produce a product that the customer wants and is happy with it is important that procedures are put in place to ensure that the item meets the requirements specified. By meeting the customers specification and meeting deadlines set a confidence is built up between the manufacturer and the client. This will hopefully result in more orders being placed with the manufacturer and will help develop a successful business.

A variety of stages have been identified in the production of the breakfast bar and checks have been set up to be carried out in order to maintain standards set.

Testing will not only be a visual check but tests can also be carried out in controlled situations within the establishment.

Inspections can take place by workers trained to carry out a variety of checks. Or in the school situation students working on different tasks can be asked to check the work of others and comment on their findings.

With Total Quality Management it is important that the last item produced is up to the same standard as the first manufactured.

Potential hazards or risks can be eliminated or reduced to an acceptable level if the correct quality control measures are taken and procedures put in place. Such checks should take place at a variety of critical control points during the manufacturing stages.

CRITICAL CONTROL POINTS.

SAFETY

Hygiene of temperature probes - must be wiped with alcohol before and after use. Ingredients used must be covered at all times. Raw materials, components and finished products must be stored and covered off the floor level.

QUALITY CHECK POINTS

Ingredients should be weighed as identified on the production sheet. In order to ensure that all products produced are a similar weight and ingredients are identical in each.

Bake quality must be checked for each run in order to ensure that standards are matched for colour and baking. Avoid under or over baking.

Check the mixture consistency for each batch. If under mixed continue until desired consistency is reached.

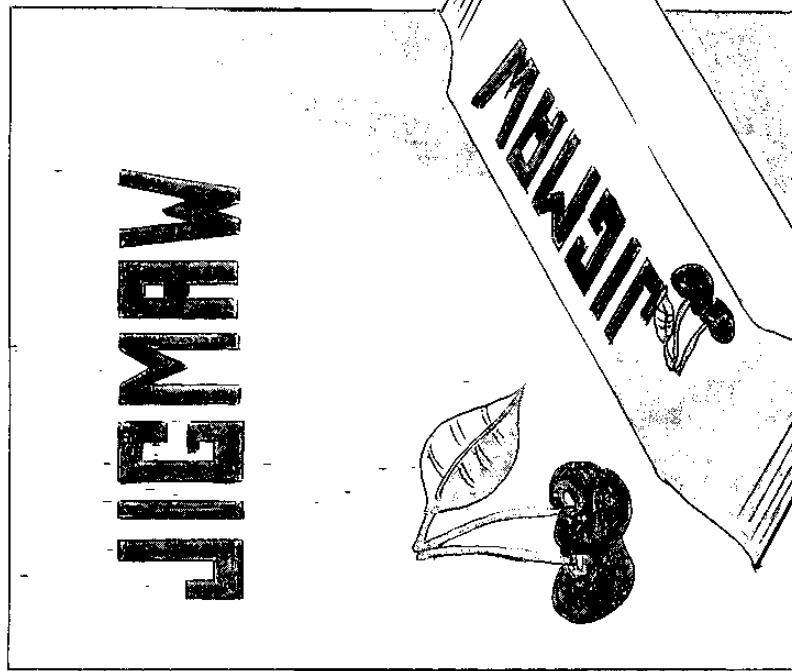
Final product should be checked that specification has been observed and quality maintained. Product could be weighed, lab tested, tasted.

Packaging should be checked to see that product has been correctly sealed.

GENERAL

Food contamination. Every employee must be trained in basic food hygiene. Rules associated with personal protection must be used.

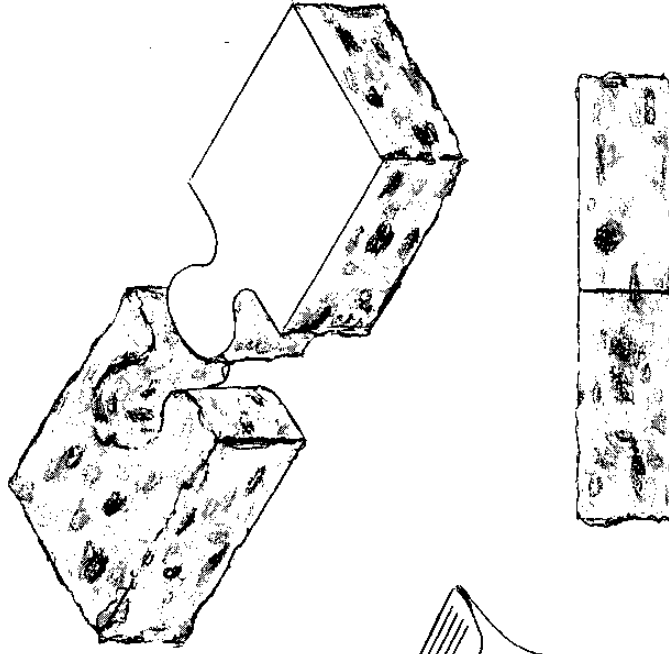
Chill temperature should be checked regularly possibly every hour to see that it is at 0 - 5 degrees C.



COLOURS USED ON THE DISPLAY WILL REFLECT THE MAIN INGREDIENT OF THE JEMAW BAR.

DEVELOPING FINAL SHAPE AND PACKAGING.

The final product will make use of the name JEMAW which has arrived from the shape of the bar. Hopefully the novel and new shape will attract first time buyers. The taste will keep them coming back for more!



The bars will have standard ingredients but a main ingredient or combination will be added to them in order to allow a range of products to be manufactured. The JEMAW shown features the main ingredient of CHERRIES.

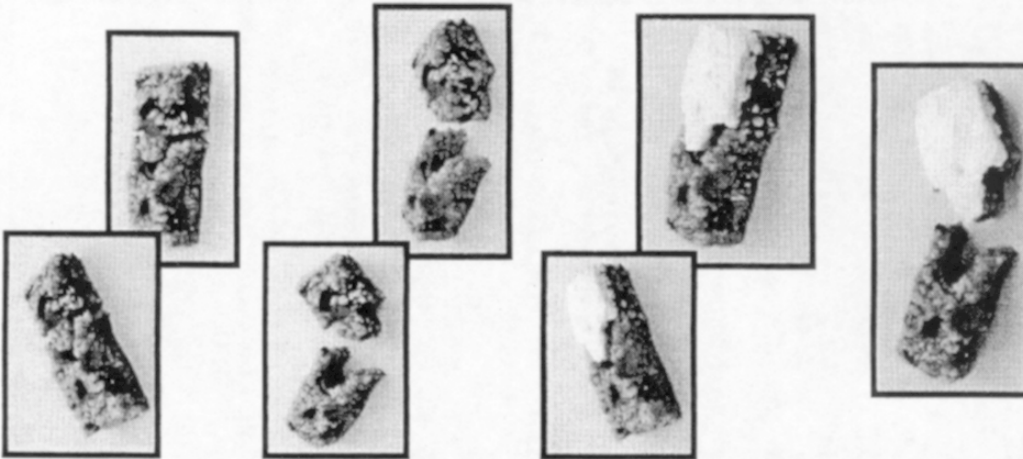
INGREDIENTS TO BE USED IN THE FINAL PRODUCT

As the product is to be a high fibre breakfast bar I have decided to use ingredients that have a high fibre content and are low in fat. I have also decided that as the bar is going to be made in two pieces it would be a good commercial move to have a slight contrast between the bars. I would therefore like to produce one of the bars with a coating and the other half without. However I need to carefully select the correct type of coating as the favourites from the survey were chocolate and caramel. As both of these coatings are high in sugar content I think that it may be better to use a yoghurt based coating on the bar.

Ingredients used:

- Crisp rice
- Oat flakes
- Wheat flakes
- Raisins
- Cherries
- Yoghurt
- Glucose syrup.

Note in this product I have not included any variety of nuts but these may be considered in future product development.



Modelling final product.

The photographs alongside show the bar that I would like to put into full scale production. I modelled the breakfast bar as a prototype so that I could see what it would look and taste like.

I modelled the bar without a topping and then with the topping applied. I think that it may be possible to develop this idea so that one side can have a covering on the top as seen in the photographs and the other side could be coated on the base as a contrast.

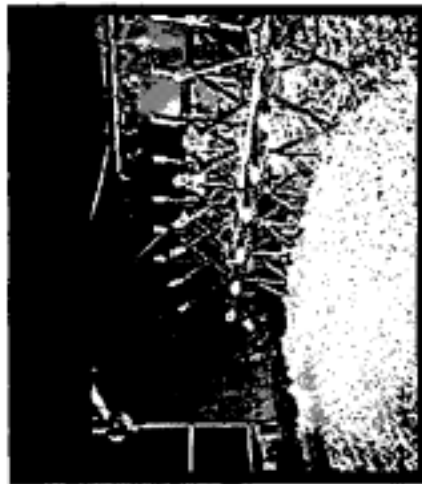
I think that this would be a good idea to put forward as not only is the shape a different idea but as it is available in a variety of fillings I think that it could prove to be a success. The extra change of having a coating on top of one piece and under the other will also attract customers.

Industrial processes that could be considered when producing my Breakfast bar in quantity.

MANUFACTURING PROCESSES

Used to manufacture the Breakfast bar in quantity.

- RAW MATERIAL SUPPLY
- RAW MATERIAL INSPECTION
- CHOPPING
- INGREDIENT MIXING
- BAR FORMATION/SHAPING
- BAKING
- COATING
- COOLING
- FLOW WRAPPING
- HAND LOADING INTO BOXES
- DISTRIBUTION



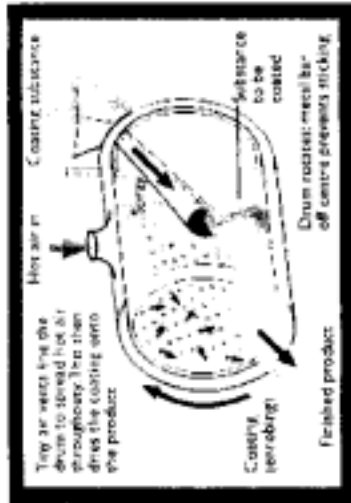
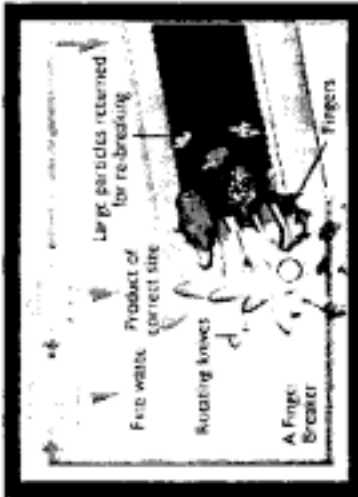
Making the breakfast bars from a variety of materials.

The ingredients are placed into a hopper and are the mixed to the required consistency using rotating paddles.

In the production of "cluster" style breakfast cereals the cereal is first baked into one large slab. The next stage, using the finger breaker, breaks the large slab into small pieces. Rotating knives are used for this process. The fine waste is then removed by one sieve and a second sieve then separates all the clusters that are within the correct tolerances. The larger pieces being recycled to the breaker.

The pieces can then be coated with another item to produce the required finish this process is known as enrobing. Sweetened breakfast bars can be coated with sugar and honey to provide their characteristic flavour and texture. Enrobing can be carried out using a drum enrober where syrup is sprayed onto the dry cereal or in an enclosed machine. Air vents in the machine help the coating to dry more quickly.

Enrobing can also take place at the end of the process, when then end of the breakfast bar may be dipped in the required substance.



Quality Control measures that would be carried out when Manufacturing the product in quantity in an Industry.

A variety of checks would be carried out to ensure that the product meets the identified customer specification.

The checks will begin from the earliest stages by checking the ingredients when they arrive to the manufacturing site.

The ingredients will need to be carefully weighed before being added to the mixture.

The mixture will need to be checked that it is at the correct consistency.

The bars will have to be checked that they are moulded or shaped to the required style and size.

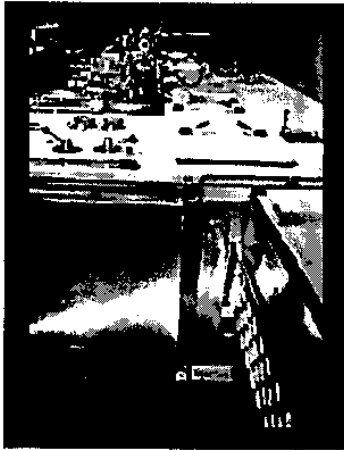
They will have to be checked that they have been cooked for the required time and that they are not under done or over cooked.

Lab tests will be carried out to ensure the product meets requirements and standards set.

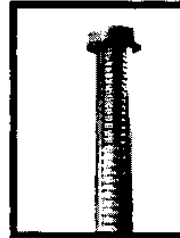
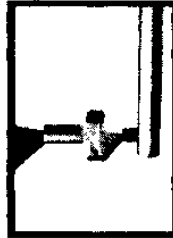
Packaging will be sampled to ensure that the bars are sealed satisfactorily ready for distribution.

TYPES OF PRODUCTION

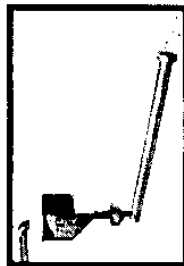
The Breakfast bars will be produced in a batch production manufacturing system. This system of production manufactures items in specific quantities. When the bars are produced each piece of manufacturing machinery will be used to make several similar products or different flavoured products. As the mixture and ingredients will need to be changed for the different items produced strict cleaning routines will have to be carried out.



When the Breakfast bars have been assembled and cut to the required shape they then need to be baked. This is carried out by placing them on a moving conveyor belt which passes through a heater set at the correct temperature.



The ingredients are fed into the hopper. They pass through the hopper onto a screw thread that as it turns the ingredients are forced along the designed tube. Eventually the contents reach the end of the screw and are forced out through a shaped die. As they pass through the die the ingredients are pressed to the required shape.



The Breakfast bars could be produced using an extrusion process. The stages that this system goes through are shown alongside.

