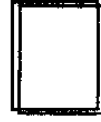


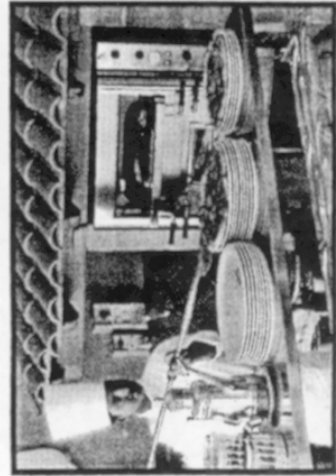
GCSE in Manufacturing (Double Award).

**Unit 2: Manufactured Products
Food**



Proposed marks for Unit 2 - Food

		Location of evidence		Allocated mark			
a1 describe a simple manufacturing process, using ICT as appropriate.	0 1 2 3	a2 produce a production plan that identifies the manufacturing processes and quality control.	4 5 6	a3 evaluate their production plan in relation to manufacturing processes and quality control.	7 8 9	A manufacturing process is described on page 1. A basic production plan relevant to the project is outlined on page 2 along with quality control checks that could be carried out. Pages 3, 4 and 5 cover production planning, quality control and production methods but these are general aspects and not totally directed specifically to the project.	5
b1 describe the importance of accurate production planning and of meeting the product specification.	0 1 2 3	b2 identify in their production plan the schedule for manufacture and allocate roles to team members.	4 5	b3 evaluate their production plan in terms of how the schedule of manufacture could be improved and why particular roles were allocated to particular team members.	6 7	Planning the manufacture of products is identified on page 3 but this work is very general and should be developed in more depth relevant to the product. Roles in the stages of manufacturing are identified and allocated to team members (page 6). A Gantt chart to show the stages of making and ways of improving the production plan are given on page 7	5
c1 identify key control points during manufacture and describe the importance of health and safety.	0 1 2 3 4	c2 use quality control tests and carry out work with due regard to health and safety, including reference to appropriate safety systems.	5 6 7	c3 explain and justify how the production planning and scheduling could be improved to encompass total quality management and appropriate safety systems.	8 9	A basic list of key control points along with health and safety issues are given on pages 8 and 9. Page 9 the comments are more direct to the product produced. Quality control checks are carried out on page 10 how the production plan can be improved is also suggested but only at a basic level. more detail could have been included.	7
d1 describe the features of good teamwork in the manufacture of a product.	0 1 2 3 4 5	d2 identify effective teamwork for different aspects of manufacture, identify key roles during the preparation of materials, components, equipment and machinery in the manufacture of their product	6 7 8	d3 explain methods of improving the production of their product by more effective use of the manufacturing team and through improvements that could be made as a result of buying in ingredients or components.	9 10	Page 13 organises the team and shows the key roles that they are to undertake page 14 outlines features that make a good team. Methods of improving the production are identified on page 15, the buying in of components to make improvements is also considered.	9
e1 describe how they produced their product using appropriate tools and equipment.	0 1 2 3 4 5 6 7	e2 explain why the tools and equipment used were appropriate to the task and identify any changes they have made to their production plan.	8 9 10 11	e3 evaluate their product in terms of the tools, equipment and processes they have used and comment on how these would be modified in "real world" manufacturing.	12 13 14 15	A plan of making and time plan are given on pages 16 and 17. Tools, equipment and a report on problems encountered are also shown on page 17. The product is evaluated from others point of view on page 18 and from the candidates on page 19. How the pizza would be made in bulk in an industrial situation is described in a basic form on page 20, but more direct comparisons to the product and manufacturing it in industry should be made.	10
		Total mark		Total mark			36

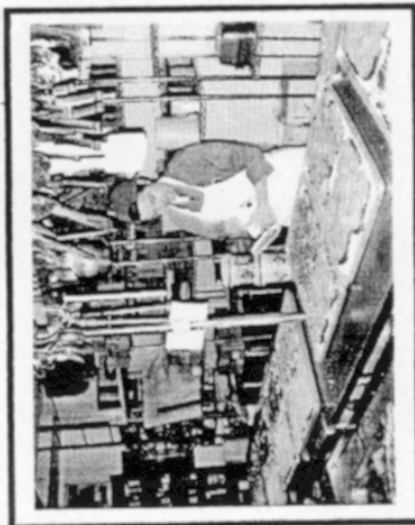


Manufacturing a pizza.

A variety of images can be seen of the stages that take place when manufacturing a pizza.

Preparation of the base, and topping can be seen. Also shown are workers in appropriate clothing to make sure that they conform to Health and Safety regulations.

The quantity of products produced is greater than in the school environment due to the size of ovens used.



PRODUCTION PLANNING

Making a pizza

Buy in ingredients for pizza topping and base.

Prepare ingredients for pizza base.

Make dough and roll out base.

Cut base to required shape.

Prepare ingredients for pizza topping.

Cut and chop items to suitable sizes.

Store items in containers so that they can be used as required.

Apply tomato puree to base.

Put topping onto base.

Cover topping with cheese.

Cook pizza.

Apply packaging.

Freeze

Specification for pizza

- The pizza must use a base of cheese and tomato.
- The pizza should make use of a topping that would appeal to a wide range of customers.
- The pizzas produced should be a uniform and standard shape.
- The product should be cooked ready for consumption when heated.
- The product should be suitable for eating by a single person or be used at parties.

Quality control on production.

Check hygiene standards are upheld throughout manufacturing - correct protective clothing, worker hygiene, storage and use of ingredients.

Check ingredients bought in.

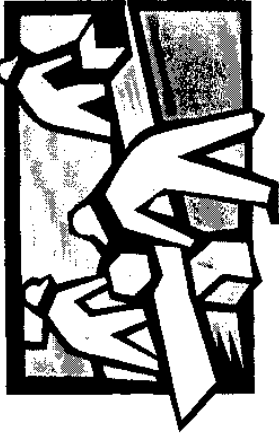
Weigh ingredients into equal quantities to ensure that similar quantities are placed on each pizza. Including cheese and topping.

Check shape and depth of pizza to ensure repeated product quality.

Check that product is cooked thoroughly not just surface and edges.

Taste pizza to ensure quality of product.

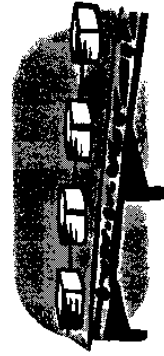
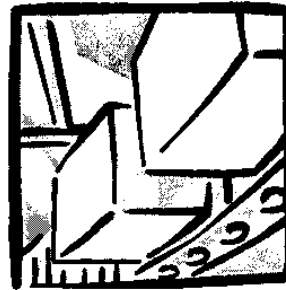
Check that packaging is suitable and sealed.



PLANNING THE MANUFACTURE OF FOOD PRODUCTS.

The following stages for planning the manufacture of food products can be applied to commercial production as well as the school food area.

- Separate the production process into main areas.
- Organise each area into a logical order of events and set up a production line.
- Identify each stage of the production line clearly. Making sure that each stage leads directly into the next one.
- Identify hygiene and safety issues, and use HACCP procedures to reduce risks.
- Identify standard components or materials that need to be bought in from outside suppliers.
- Design the production line, identify the various manufacturing processes and where and when different ingredients or components need to be introduced.
- Decide how the workforce and workspace should be organised for maximum efficiency.
- Decide how and when quality control systems should be applied.
- Review the design of the product to see how the quality could be improved and how costs might be reduced.

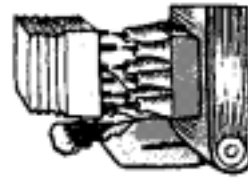


Process control during manufacturing

In order to manufacture products consistently, safely and efficiently, process control is used to monitor a number of subsystems.

Process control works by monitoring a part of a production system for example:

- Sensing the critical parts of a process, e.g. the temperature of chocolate flowing through a pipe.
- Displaying and recording the data collected by a sensory instrument, e.g. a chart showing the temperature of chocolate over a length of time
- Taking a decision: if the sensors detect that a specific part of the process is not within tolerance levels, a signal is sent to make a change. This is known as continuous monitoring, e.g. that if the temperature drops too low, the chocolate in the pipe may start to solidify and stop flowing.
- Making a change to correct the faulty part of the process e.g. to increase the temperature of the chocolate in the pipe, a thermostat switches on a heater.



Checks to be carried out.

Metal detection, counting, visual inspection, and vision systems

Metal detection. Monitoring for the presence of metal may happen throughout the production process. The product, either in its natural or packaged state, passes through a detector. If metal is present, then a signal is sent to a kick-out device to remove the contaminated product.

Counting the number of packages or products. As they are produced, the products break a light beam. When the specified number are counted they are either packaged or transferred to another conveyor.

Visual inspection. Some monitoring may be too complex, time intensive or costly to automate. On some processes people check certain attributes of a product or its packaging, e.g. sorting vegetable pieces. This process is not as efficient as automatic sensing by vision systems.

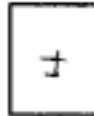
Vision systems. These systems observe shapes and colours and report back on them. Examples of these are checking that a pizza has the specified number of pepperoni slices on top, that adhesive labels are correctly placed on food packets or identifying discoloured peas on a production line.

Composition, pH and Moisture

Product composition. It is possible to monitor the solids content of a variety of liquid products, e.g. fruit juices, milks and syrups by measuring their refractive index. This is important when determining a products composition or in the control of blending. This method may also be used to monitor product viscosity. E.g., the thickness of jam.

pH. Acidity or alkalinity can be difficult to monitor in an ongoing process, so the pH of products may be tested during off-line quality control checks.

Moisture Controlling moisture can be problematic depending on the food type being monitored. Various methods are available. However some do take some time to produce results. Therefore this type of control is usually used off-line, with changes being made to batches of products at a later time



Weight, Flow and Temperature

Weight: the weights of an individual item, mix, package, or mixture of products can be monitored and controlled. This is important, especially in formulation stages, as specified amounts of ingredients are needed to make a product with the correct physical or sensory characteristics.

Checkweighers are special scales that are used usually when a product is finished. If the product is either under or over weight, a signal is sent and a kick-out device removes the product from the line.

Flow: in order to keep production at a steady rate, it may be important to monitor and control the flow rate of ingredients. The method used to measure the flow of a liquid depends greatly upon its composition. For example, some systems would not be suitable for fluids containing lumps, such as vegetable soup, as they would prevent the flow gauge from operating.

Temperature is a critical measurement for many food products, especially those that need to be sterilized or cooked, or cooled within a pre-determined time, e.g., cook-chill meals.

Different methods are used to control temperature in a variety of manufacturing processes. Having the temperature too low may allow food poisoning organisms to survive and result in illness. Having temperature too high (or even too low) can affect the organoleptic qualities of a product. For example in the canning process the temperature is critical, as it needs to be high enough to destroy harmful organisms and spores.

TYPES OF PRODUCTION.

The method of production used will depend large on the food product, and the scale of production required.

Batch production makes products in specific quantities. These may be made in one production run or in batches to be repeated at certain times. Sandwiches are produced in batches. Different fillings or types of bread can be used for each batch.

A batch can range from a dozen products to a hundred thousand or more. Bread is a high-demand food that is made in batches on a daily basis.

In a batch production manufacturing system, each piece of equipment may be used to make several different products. This means that the machinery used must be far more versatile than that used in mass production. In the manufacturing of biscuits for example, biscuits with different flavours may be manufactured on the same production line after strict cleaning routines have been carried out.

Jobbing production is also known as custom manufacturing. This system of manufacturing normally produces one product at a time, to a single customer's individual specification. A hand-decorated wedding cake would be an example of this. Highly skilled workers and general purpose equipment are used.

Problem-solving and trouble-shooting are necessary in the jobbing shop environment because each product presents new challenges. Products that are customer designed are very expensive, when compared to other food products manufactured by using different production systems.

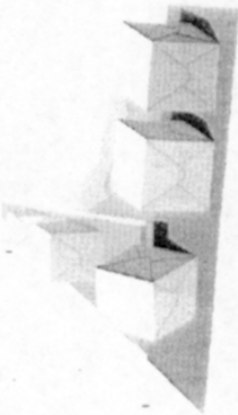
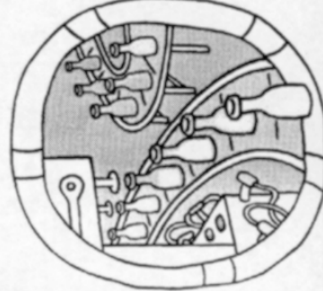
Process or continuous production is where the plant or factory may run twenty-four hours a day, for weeks or months on end, stopping only for cleaning, maintenance or when breakdowns occur. This type of production is not used to produce a defined quantity of a product, but aims instead to produce maximum volume every day. The output from the plant is normally expressed in weight or volume of goods.

Continuous flow production may also be used for food products such as frozen peas that have a short season. During the harvesting and freezing period the plant will run continually. Once the peas reach the end of their season, the plant may be used for another type of vegetable.

In mass production large quantities of products are manufactured or processed, such as pasta shapes.

Often mass production in the food industry will involve the use of specialized equipment that may be used for a number of different products. For example, the frozen food plant the equipment may be used to freeze a number of different vegetable or fruits. Similarly, pasta machines may be changed to make different shapes, by changing the cross section of the die.

The variety of the product manufactured is kept to a minimum where possible, to minimise any changes necessary to the tooling, which will take time and therefore cost money.



QUALITY COUNTS.

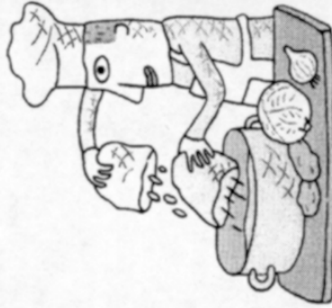
Manufacturers make regular and frequent checks to make sure that a product meets its specification. The product specification is only one part of a whole system set up to make sure that products are of a uniform quality and safety, and pose no risk to consumers.

Quality assurance is the continual monitoring of quality during all stages of the manufacturing process, from the inspection of raw materials through to checking the final product. A quality assurance scheme aims to detect unacceptable products at an early stage.

HACCP. An example of a quality assurance system used to control food safety is the internationally known HACCP system (Hazard Analysis Critical Control Point). HACCP is a systematic process used to assess where hazards might occur at any stage of the process and to put controls in place to make sure that the risk of their occurring is minimized.

The Food Safety (General Food Hygiene) Regulations 1995 require all food businesses covered by these regulations to adopt risk management procedures based upon the principles of HACCP. The correct applications of these principles assists in ensuring the health of consumers, and will help food businesses meet the highest standards, such as ISO9000 or BSS750. Risk management aims to prevent faults arising, where the traditional end product testing systems merely detects defective products.

Quality Control testing is a part of a quality assurance system. It is a system of inspecting and testing food products to check whether they are acceptable. This testing is usually performed after the product has been made. It checks that the product meets the required standard and rejects any that are not acceptable, rather than preventing unacceptable products being made in the first place. In principle, this type of system may lead to the rejection of large quantities of sub-standard food products that cannot be sold.



TEAM A	
Name	Strengths
Alison	Alison is good at making things with Food she especially enjoys practical work. She is neat and tidy and never misses a day at school.
Chris	Chris enjoys practical work and has a part time job at a Fast Food outlet that makes Pizzas. He is reliable and has a good attendance record at school.
Nadjele	Nadjele is good with computer work and likes making things but she doesn't like written tasks.
Katie	Katie's favourite lesson is Food she enjoys written and practical work and has represented the school at the International Cooking competition where she was runner up in the local heat.

Team roles
In production of pizzas

Order protective film/
packaging.
Nadjele and Katie.

List the ingredients to
buy for the pizzas.
Alison and Chris.

Prepare toppings for
pizza.
Nadjele and Katie

Prepare ingredients
for pizza bases.
Alison and Chris.

Put toppings onto
Pizzas.
Katie

Put tomato puree and
cheese onto pizzas.
Nadjele

Make dough and roll
out base.
Alison and Chris

Put pizzas in oven.
Nadjele

Note throughout the
whole process
quality checks will
be carried out.

Tidy up work area.
All

6

KEY FEATURES IN MAKING THE PIZZAS.

- Ordering ingredients.
- Preparation of topping.
- Preparation of base.
- Making base for pizza.
- Applying topping.

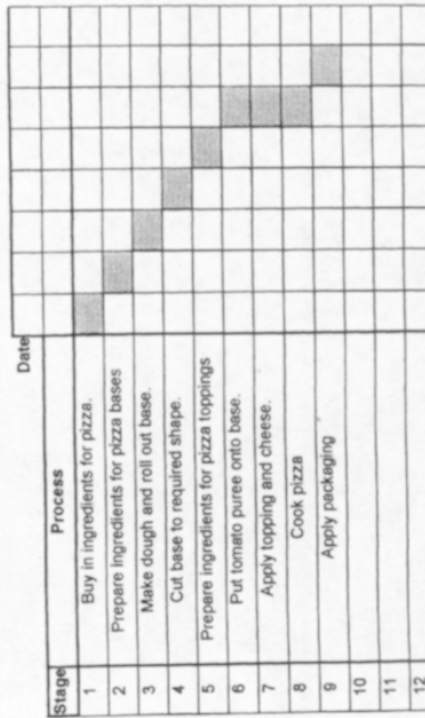
ROLES OF THE TEAM MEMBERS.

The team members were allocated their tasks in manufacturing the pizzas according to their interests in the practical area. They were also put together to work as a team or on some occasions to work with partners. When they were given someone to work with this was based upon who they were friends with.

IMPROVING THE PRODUCTION PLAN.

The plan for producing the pizzas is quite good in that it has been divided up into two main areas one to prepare the base of the pizza and the other to produce and apply the topping. However as the group is small in numbers it may be better if roles could be arranged that everyone is multi skilled so that if one of the team was absent or if their work rate was not up to schedule then others could step in to help with or carry out the task fully.

GANTT CHART TO SHOW STAGES IN MAKING THE PIZZA



Health and Safety Issues

The food Safety Regulations 1995 were introduced to make food hygiene rules standard across the European Union. They concentrate on identifying and controlling food safety risks at each stage of producing and selling food. Local Authorities employ Environmental Health Officers to enforce the regulations. Food businesses are expected to make sure that -

- food is supplied or sold in a hygienic way.
- food safety standards are identified.
- critical stages in the production process are identified.
- safety controls are maintained and reviewed.

Poor food hygiene can lead to outbreaks of food poisoning which can cause serious illness. Poor hygiene can also result in wastage of contaminated food, infestation by pests, time away from work because of illness, loss of customers as well as possible legal action.

Personal protection

When working with food personal cleanliness is important the worker should have clean hands with short nails and no nail polish. Any cuts should be covered with waterproof dressings. Jewellery such as watches and rings should be removed. Clean clothes should be worn maybe a work coat or apron. Hair should be covered with long hair being tied back and a net, cap or hat worn. Sensible shoes should also be worn.



Food Hygiene

Food Preparation

When preparing food at the work surface it is important that raw food and cooked food are kept away from each other to prevent contamination. Separate knives and chopping boards should be used with these items.

Kitchen Equipment

All items should be clean prior to use to avoid germs being passed onto the items being made. The equipment to be used should be checked for damage prior to use.

Work surfaces

Prior to carrying out any process all work tops should be clean and tidy, in order to minimise the risk of any germs getting onto the product when making commences.

The work area should always be kept as clean as possible and at the end of each task items should be washed in hot water, dried and carefully stored away.

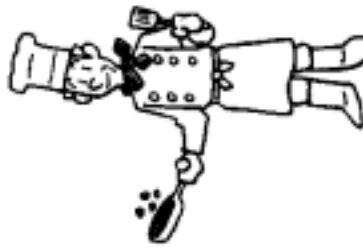
Food items that are produced should be carefully stored in containers or packaged they may be frozen for future use but whatever is decided it should be in line with food regulations. In doing so it will minimise any risk to the consumer.



Quality Assurance of Pizzas

Stages for checking during manufacturing -

- Check the quality of raw materials to be used.
- Process control checks -
 - depth of base of the pizza are all same thickness?
 - are all the ingredients the same size?
 - quantity of topping is the mixture and amounts correct and not all cheese or tomato?
 - is the pizza cooked correctly - topping and base.
- Foreign body checks - are there any unwanted items on pizzas?
- Weighing final item
- Microbiological testing of a sample of the pizza.



Health and Safety Issues.

Food Preparation

- Opening packets and tins with ingredients in - take care not to cut yourself - wear protective clothing - hat and apron
- Using sharp knives - keep fingers away from blade cutting edge.
- Make sure that all work surfaces have been wiped down.
- Keep work area tidy put away unwanted items - avoiding breakages and dropping or spilling items due to cluttered work area.



Cooking



- When handling hot items take care not to burn yourself - use oven gloves to move items.
- Watch out for splashes or hot rings on the cooker when heating items - wear an apron, hat and use oven gloves when necessary.
- Wipe up any spillages and clean area after use.
- Take care when using cutters to divide up pizza.
- Be careful check temperatures before putting hands in liquids especially water when washing.



Completed product

Avoid sharp corners and small loose parts especially if you are using packaging or wrapping the pizza with protective film as serrated cutting edges can cut you easily.

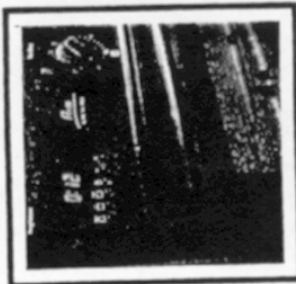
Quality checks carried out in making the pizza



Checking the correct thickness of base



Checking the correct mixture of ingredients on the topping.



Setting the correct oven temperature and timer



Checking that the base has been cooked sufficiently.

Improving the production system.

The way that the schedule for manufacture is set up will prove to be an efficient and reliable system. This is even more reliable now that the team are being multi trained in order to carry out all processes in order to cover for other members. However in order to make sure that all pizzas are as similar to each other as possible it may be beneficial if each topping ingredient is weighed and stored in a container. When the base is ready to have the topping added the container can just be emptied into the required position.

Health and Safety issues.
Checking safety systems available in the school food area

Health and Safety check sheet.		
Item	Location	Condition
Aprons		
Hair nets/ Hats		
Oven gloves		
Rubber gloves (blue)*		
Water Supply		
Power cut off switch		
Fire Alarm		
Emergency Exit		
First Aid Equipment		
Ventilation Windows		
Ventilation Extractors		
Lighting Electric		
Light switches		
Electric sockets		

*First aid items and gloves are normally coloured blue as they can easily be seen and will not be confused with food as no natural food items are this colour.

Overcome problems as they arise.

CORRECTIVE ACTION REQUEST		Number: 1
Request raised by	To:	
Department:	Dept. or Supplier:	
Date:	Copies to: Manufacturing Manager Quality Assurance Manager Others:	
Signature:		
What is wrong (e.g. give details of parts, batch details, not working to procedures etc.)		
The base of the pizza is not the required shape.		

CORRECTIVE ACTION REPLY	
From:	To:
The problem is: One of two possible problems: Too much liquid is present in the mixture and it will not hold its shape. or The oven temperature is too low and the ingredients are melting and running rather than setting.	
Immediate action to correct is: Check mixture. Check temperature setting on the oven.	
Signature	Date
Action to prevent this happening again: Carry out careful checks of mixture and setting of oven temperature prior to manufacturing.	
Signature	Date

CORRECTIVE ACTION	
Completed <input type="checkbox"/>	Date
Not Completed <input type="checkbox"/>	
Signature	Date
WHEN COMPLETED SEND THIS FORM TO QUALITY ASSURANCE DEPARTMENT	
QA DEPARTMENT ONLY	
CHECK FOR EFFECTIVENESS	By:
Yes <input type="checkbox"/>	
No <input type="checkbox"/>	
Comments:	
Check setting of all ovens as mixture is satisfactory.	
Signature	Date

11

Overcome problems as they arise.

CORRECTIVE ACTION REQUEST		Number: 2
Request raised by	To:	
Department:	Dept. or Supplier:	
Date:	Copies to: Manufacturing Manager Quality Assurance Manager Others:	
Signature:		
What is wrong (e.g. give details of parts, batch details, not working to procedures etc.)		
The topping of the pizza is burnt but the base is not cooked.		

CORRECTIVE ACTION REPLY	
From:	To:
The problem is: One of two possible problems may exist: The pizza has been placed too high in the oven. or The oven temperature is too high.	
Immediate action to correct is: Check that the pizza is positioned on the middle shelf in the oven. Check temperature setting on the oven it should be at 200 degrees.	
Signature	Date
Action to prevent this happening again: Carry out careful checks of position of the pizza in the oven and setting of oven at 200 degrees.	
Signature	Date

CORRECTIVE ACTION		Completed <input type="checkbox"/>	Date
		Not Completed <input type="checkbox"/>	
Signature		Date	
WHEN COMPLETED SEND THIS FORM TO QUALITY ASSURANCE DEPARTMENT			
QA DEPARTMENT ONLY			
CHECK FOR EFFECTIVENESS		Yes <input type="checkbox"/>	By: <input type="checkbox"/>
		No <input type="checkbox"/>	
Comments:			
Check placing of pizza in oven and keep temperature constant at 200 degrees.			
Signature		Date	

12

Teamwork

What do I think is important in a good team ?

A good team needs to communicate with each other. They need to share ideas with each other and not be offended when others don't agree with or do not like their ideas. The individual members need to be reliable and be good timekeepers, they should attend school regularly.

When carrying out tasks they should always try to produce their best. They should support each other and if one member is having a problem with a particular task or process then other members should support that person showing them ways to carry out the task or helping them with it. If one member of the team is behind with their work schedule and another is up to date it may be better if they pool their resources and work together to get everyone back on schedule and allow the work to progress as planned.

Review of Group

Key - A = Excellent F = Poor

NAME	Attendance	Punctuality	Contribution	STRENGTHS	WEAKNESSES
Alison	A	A	A	Alison has worked well throughout the project she is good at ordering and organising the team.	She wants to do all the jobs and wants Everyone to do it her way.
Chris	A	A	C	Is good with preparing the ingredients and making the pizza bases.	Tends to be a little slow and others are waiting for tasks to be completed.
Nadjele	C	A	C	Is good at making food items.	Missed quite a few sessions and others had to cover and carry out her work.
<p>How does team communicate and overcome problems as they arise?</p> <p>The use of forms to highlight problems. When a problem is identified a corrective action request is completed and tests are carried out and recommendations made to ensure quality is maintained.</p>					
<p>How does team carry out quality control tasks?</p> <p>Control points have been identified at various stages throughout the manufacturing process. Also the team have been organised to work in pairs with opposite groups checking each others work.</p>					

IMPROVING THE PRODUCTION SYSTEM

Organisation of the team.

It would be a far more efficient team if all members of the team were trained to carry out each others tasks. This would lead to a multi skilled workforce. Such a team would be able to cover for each other in times of absence from school or they would be able to assist team members if they got behind with their work schedule.

Buying in prepared components and parts.

To increase the efficiency of the product and to increase the amount of items that can be made in a set time it would be beneficial to buy in items that have already been prepared. For example if pizza bases were bought in the quality of these items could be guaranteed as the company producing them would be making them to set instructions e.g. diameter and thickness.

Individual topping items could also be bought in. Such items would already be prepared ready to go straight onto the pizza base. By bringing in these items ready prepared the company could guarantee that the individual fillings were all cut to similar sizes. As said earlier the production line would be speeded up as all workers would have to do would be to pick up fillings and place the correct quantity onto each base.

Improving the product.

The product can be improved by looking at alternative topping that could be added to the pizza. These items could be sold as separate items in sachets that could be added as required. The type of ingredients used for the base could be reviewed in order to produce different types of bases such as deep pan and thin base.

COSTING

ITEM	QUANTITY	PRICE
BASE		
Strong plain flour	250g	18p
Sugar	5g	2p
Yeast	10g	5p
Warm water	150 ml	1p
Salt	2.5g	2p
TOPPING		
Tomato sauce	20g	10p
Mushrooms	50g	18p
Pineapple	50g	10p
Ham	50g	45p
Onion	small	5p
Mozzarella cheese	30g	60p
Cheddar cheese	60g	30p
Cost		1.78p
Total cost		£2.04p

BUYING IN ITEMS

ITEM	QUANTITY	PRICE	PRICE per Pizza
Pizza base	each	.99p	1
Tomato Sauce	500g	£2.25	20g
Cheese Mozzarella	2.5 Kg	£6.00	30g
Cheese Cheddar	2.5 Kg	£4.00	60g
Topping - Ham	1 Kg	£2.66	50g
Topping - Pineapple	3 Kg	£1.50	50g
Topping - Onion	5 Kg	£5.00	20g
Topping - Mushroom.	1 Kg	£1.30	50g
Total cost		£1.50	

It can be seen from the costing sheet above that the cost drops substantially for the pizza when the items are bought in bulk and then used in the identified quantities shown for individual pizzas. Even though the cost of buying the pizza bases increases when they are bought in pre made from making them individually the reduction in cost for buying the ingredients in large quantities offsets this increase and the end result is pizzas that cost at least 50p less than when they are made as a one off item.

PLAN of MAKING THE PIZZA

TASK	SUB TASK	HEALTH & SAFETY ISSUES
Preparation of bases	Mix ingredients Roll to thickness. Cut to required shape.	General - personal cleanliness and hygiene. Use of clean protective clothing - aprons and hair cover. Use of clean benches and equipment.
Topping preparation	Peel and chop onion. Drain and chop pineapple. Wash and slice mushrooms. Cut up ham. Grate cheeses.	Care with cutter - sharp edge. Care with sharp knives, don't clutter bench/work area. Use different chopping boards and equipment for meat and vegetables.
Assembly of pizza	Spread tomato puree onto base. Add onion, pineapple and mushrooms. Add ham. Sprinkle cheese.	Take care with sharp surface on grater.
Cooking	Heat oven to required temperature. Place pizza in oven. remove and pack/serve.	Hot oven and baking tray - use gloves at all times.

TIME PLAN

TIME	WORK TO BE CARRIED OUT	EQUIPMENT, PROCESSES.	REPORT (changes, problems etc.)
9.00	<p>Collect equipment Set oven Gas 7 Electric 220 degrees C Check that all required foods are available Open tins and drain Grease baking tray.</p>	<p>Cutter Cooks knife Chopping board Vegetable knife Baking tray Oil for greasing Tablespoon Fish slice</p>	<p>Ham and cheese to be kept in fridge at 5 degrees C max. until required. Pineapple to be drained to remove juice/syrup. Onion to be peeled and finely chopped.</p>
9.10	<p>Cut circles from pizza base using stone cutter. Place base onto lightly greased baking tray.</p>	<p>Grater knife Pastry brush Sieve Bowl</p>	<p>Check evenly spread and close to the edge - if too close to the edge tomato may burn when cooking.</p>
9.15	<p>Spread one tablespoon of tomato sauce/puree onto the base.</p>		
9.20	<p>Remove remaining ingredients from fridge cut ham into small pieces chop onion slice mushrooms cut up pineapple grate cheeses</p>		
9.30	<p>Assemble topping onto pizza - onion, followed by ham and then pineapple. Mix cheeses together then add to pizza.</p>		<p>Cheese used last as this will melt and help to stop the ham, onion, mushroom and pineapple drying out.</p>
9.40	<p>Place into pre heated oven to cook for 10 to 15 minutes until base is crisp and cheeses have melted and started to turn golden brown.</p>		<p>Base should be crisp and cheese melted over the rest of the ingredients - indicated by it just turning golden brown.</p>
9.45	<p>Clear away and wash up dishes.</p>		
9.55	<p>Remove pizza from oven. Remove from tray using a fish slice. Serve or pack for sale</p>		

TASTE PANEL

NAME	Dislike very much.	Dislike	Like	Like very much	Flavour	Texture	Smell	Appearance
James			*		A little too much pepper used.	Crunchy	Strong smell of Cheese.	Very colourful.
Sue		*			Wont try don't like, mushrooms.	Crusty, pineapple very juicy.	Strong, appetising.	Slightly overcooked
Brian			*		Very nice I love the combination of ham	A little dry to eat.	Nice smell.	Seem OK. Lots of ingredients can be seen.
Kate				*	I like the bitter taste of the mushroom and the sweet juicy pineapples.	Crunchy base and nice squashy topping.	Lovely aroma.	Like the colours yellow, pink and grey.
Diane			*		Lovely very tasty. I like the extra pepper taste.	A little dry on the edges, crunchy.	Strong smell makes me feel hungry.	Very nice, nice shape and colour of ingredients.

I asked 5 members of my class to taste the pizzas that the group had produced. Overall the results of the taste panel were very good with only one person not liking the product, and the other four liking them, one person liked them very much. The person who didn't like the pizza was not a lover of mushrooms and this put her off the pizza

EVALUATION OF MANUFACTURED PRODUCT

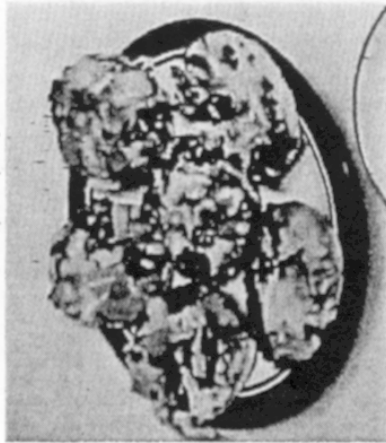
I am very happy with the way that the product turned out. I think that the pizzas compare favourably with other products available in shops. There are many changes that can be made to the product in order to bring this up to a level of existing pizza outlets. However the product is not aimed at pizza takeaways. The market that is targeted is the party or celebration event or maybe people living on their own or the meals for one. In order to compare favourably with other products it may be beneficial for a variety of bases to be made available. The product that was produced consisted of a thin base, where as deep pan and filled edges could also be developed. The shape of the base could also be altered pizza squares or wedges could be manufactured in a similar way. The toppings that are applied to the pizza could be changed so that a variety of popular pizzas are produced. A survey could be carried out to see what the market demand is and a range of alternatives could be made available. A basic margarita pizza could be produced immediately to support the pizzas in this project. By manufacturing the margarita and introducing it to the market people can add their own toppings to the basic tomato and cheese base therefore making their own favourite snack.

Tools and equipment.

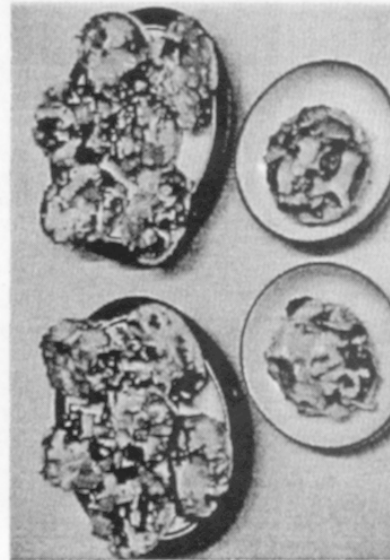
When we made the pizzas the preparation of ingredients was the most important part of the project especially measuring out equal amounts of ingredients. This was especially true for the toppings as we did not want some pizzas to have a unequal amounts of mushrooms on them and similarly with the ham and pineapples etc. The size of the pieces used was also checked so that they were not too big and did not look out of place on party sized pizzas.

No real special equipment was used apart from the general equipment that we always use in food lessons. A variety of sharp knives and cutting boards were used for preparation with care been taken to wash carefully before using on different ingredients to avoid contamination. A lot of different storage bowls were used so that each different ingredient for the topping could be kept separate. A grater was used for the cheese preparation although in future to save a lot of time it may be quicker to buy in ready grated cheese.

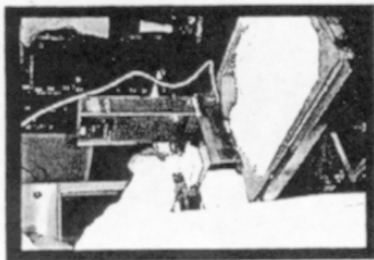
Final project - Party Pizzas



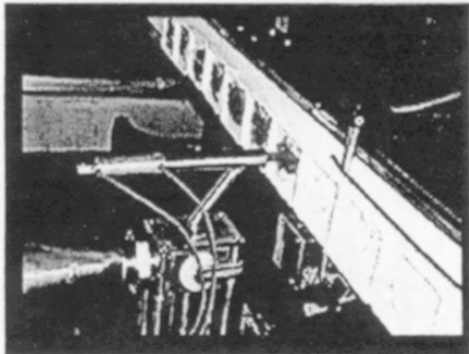
A batch of party pizzas.



**MANUFACTURING THE PIZZA
IN BULK IN INDUSTRY**

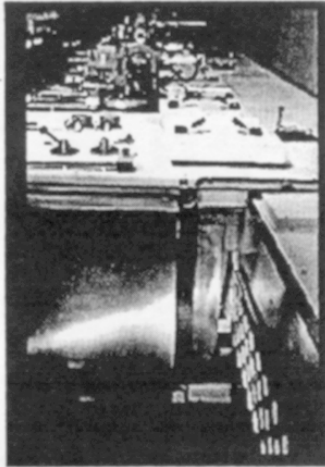


Ingredients are mixed in bulk and checked



Measured quantities of toppings being added to food product.

A batch of food products going into preheated oven



The pizzas when produced in bulk will be subjected to many checks to ensure that the quality of each product is guaranteed.

The mixture for the base will be produced in great volume using large containers. It will then be measured in equal amounts onto large trays. The topping will be added and then the pizza and will be passed through preheated ovens on a moving roller until it is cooked. On leaving the oven the product will be tested for taste.

The product will then be allowed to cool under controlled conditions. Once at the required temperature it will be heat sealed and placed in a box ready for sale.

The product could also be fast frozen for the home freezer market.