

CORK BUTTER MUSEUM

Science Lesson Full Activity Sheets Answers



The Science of Butter



Lesson Four		
Science	Strand:	<ul style="list-style-type: none"> Materials.
	Strand Unit:	<ul style="list-style-type: none"> Materials and change. Properties and characteristics of materials.
	Scientific Skills:	<ul style="list-style-type: none"> Questioning, observing, predicting, investigating and experimenting. Recording and communicating.

<p>What will I learn?</p>	<ul style="list-style-type: none"> The procedure for making butter before the development of modern technology. The role of modern technology in producing butter. The processes involved in butter production: Separation, Pasteurisation, Churning, Washing, Draining, Working, Packaging and Storage. Experiment: Compare the growth of bacteria on raw milk and pasteurised milk. Experiment: Can you mix water and oil together? The characteristics of various types of butter: Blended, Clarified, Whipped and Whey butter.
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The Butter Museum Dictionary!

Match the word with the correct meaning. Use your dictionary to help you. There is one answer done for you. Match up the rest!



Technology	Wooden spade shaped tools that were used to work and shape butter by hand.
Butter spades or paddles	A field of knowledge having to do with the practical applications of science and industry or the inventions and methods of solving problems that are produced through research in these areas.
Bacteria	To divide something from another, as found in the separation of cream and skim milk.
Raw milk	Having parts very close together with little space between. Dense objects are usually heavy.
Globules	Bacteria are microscopic living organisms, usually one-celled, that can be found everywhere. They can be dangerous, such as when they cause infection, or beneficial, as in the process of fermentation (part of the wine-making process).
Separation	Foods that provide a place for bacteria to live, grow and thrive are described as High risk foods.
Dense	To heat for a certain length of time. Food and drinks are pasteurised in order to kill most of the harmful bacteria. Continuous pasteurisation is the most common kind of pasteurisation used today in dairy factories.
Centrifugal Milk-Cream Separator	Plural of Globule; A very small drop, ball, or round shape.
High risk foods	To removing any live microorganisms. This method makes sure that no harmful germs can cause spoiling and disease.
Sterilisation	Milk in its purest state. This milk that has not been treated or changed in any way.
Pasteurisation	The first machine that allowed milk and cream to be separated.
Holding tank	A chamber that holds the separated skim milk before it is pasteurised.

Nutrient agar	The small solid bits or grains of butter. These begin to form towards the end of the churning process, as the butter separates from the buttermilk.
Petri dishes	The liquid left over after the butter has been formed into a solid block. Buttermilk is commonly used in baking.
Agitated	A jelly-like substance that comes from sea algae . Agar is mainly used for growing bacteria or thickening food.
Buttermilk	Plural of petri dish; A shallow, round, transparent glass or plastic dish with an overlapping cover, used for growing bacteria and other microorganisms.
Emulsion	To cause to move in a quick, tumbling motion or with force; shake.
Beaters	A machine used to wrap blocks of butter before selling them.
Butter working	Past machines that were used to drain the buttermilk from the butter and to create the ideal butter texture.
Butter workers	Small paddles that beat the cream during the Continuous churning process.
Butter granules	A mixture consisting of drops or globules of one liquid suspended in another liquid that does not mix well with the first.
Vegetable parchment	A thin metal packaging used to protect food from spoiling.
Foil wrapping	Grease proof packaging used to protect food from spoiling.
Branding iron	A metal plate that stamps a container to show what product it is and where it comes from. Branding irons were used to mark firkins of butter.
Packing machine	Stamps used to print the butter-maker's brand on to the butter.
Butter prints	The forming of the butter into the desired spreadable texture using paddles or butter workers.
List of Butter churns	Continuous churning and Traditional Batch churning, Rocker churns, Dash churns, Wooden Barrel churns and Glass Jar churns.



Activity

Can you find some of the new words in the word search?

F H O L D I N G T A N K I S H
 Y B E A T E R S Q Q B K E Y E
 Y P E T R I D I S H A L O X N
 A F D E T A T I G A U W S H I
 T A I R E T C A B N E H E U H
 Z B R U M Z U O A M W Z P C C
 N O I T A S I R U E T S A P A
 E O E E Q A G L K I E M R I M
 S W V V M R S H I L G E A N G
 N V I Q E I C K D Q S K T Q N
 E M J T O B X D S G T C I X I
 D O T N E N A I O K G I O G K
 S U P Z E P S S T W G Z N E C
 B Z I B H F N K L I M W A R A
 A N O I T A S I L I R E T S P

PADDLE
BACTERIA
RAWMILK
SEPARATION
DENSE
STERILISATION
PASTEURISATION
HOLDINGTANK
PETRIDISH
AGITATED
EMULSION
BEATERS
BUTTERGRANULES
PACKINGMACHINE





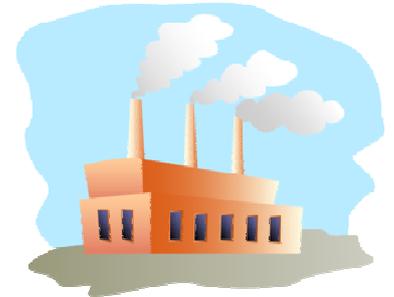
In the not so distant past, the people who lived outside the city often owned a plot of land and a cow. It was therefore not unusual for these people to make their own butter. This butter was very different from the kind we eat today. It was made by hand, without the help of modern **technology** and often with little knowledge of the science behind



butter-making. Unlike the butter we eat today, it was made with cream, water, a little salt and using the very simplest of equipment, such as butter churns and **butter spades** or **paddles**. The butter we eat today is no longer made in this way.



Over the years, new butter-making technology, such as butter-making equipment and machines have been developed. At the same time, more scientists are making discoveries on butter-making. Both technology and science have worked together to improve butter-making methods, discover new recipes and safety methods and learn more about the process of butter-making.



The butter-making equipment and machines are used in factories, where a lot of butter is made nowadays. At the factory, each machine has a special purpose. There are machines used to separate the cream from the milk quickly. Others kill off harmful **bacteria** by increasing temperature and rapidly cooling it. Some machines churn the cream into butter, removing the liquid from the solid butter.



The ability to use these machines and equipment in factories greatly helps the butter businesses. Here, butter can be more quickly, cheaply and with little waste. Many other foods are produced in factories today because of how easy it is to do so.



Activity



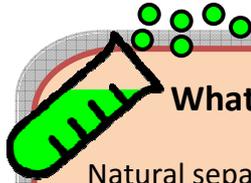
Did you know that there are some disadvantages to factory produced food? It can be healthier to buy farm-made food, or even to grow your own!

List 2 advantages and disadvantages to factory and non-factory produced food. Here's some help!

Factory Made		Farm Made	
<p>Faster.</p> <p>More employees.</p> <p>More money made.</p> <p>Advantages</p>	<p>Pollution to air.</p> <p>Additives to foods.</p> <p>Animals don't live as long.</p> <p>Disadvantages</p>	<p>Tastes better.</p> <p>More natural.</p> <p>Animals treated better.</p> <p>Advantages</p>	<p>Made in smaller amounts.</p> <p>Harder work.</p> <p>Pollution to rivers/lakes.</p> <p>Disadvantages</p>

Butter Stage: Separation

Separation is one of the first stages of butter production, after the collecting of the **raw milk** from the cow. It is necessary to separate cream from milk because both foods have different uses. For example, think about all the things you use milk for but not cream and the other way around too.



What is happening?

Natural separation occurs when the smaller and lighter (less **dense**) fat **globules** rise to the top of the liquid. This is similar to the way in which ice floats to the top of a glass.

Natural Separation

In old times, as part of the butter-making process, milk had to wait for at least one full day before it could be used. This time was needed to allow the cream to separate naturally from the milk. The risk of the cream spoiling was always high, especially in hot weather. Once it had separated, it could then be skimmed off by hand and used for butter-making.



The Centrifugal Separator

The **Centrifugal Milk-Cream Separator** was an important invention made by Gustav de Laval in the late 19th century. This machine separated the cream from the milk in a matter of minutes!

A handle was turned, which caused a disk to spin inside the separator. The denser skim milk was pushed to the outside of the machine and the less dense cream flowed to the centre of the machine. These both poured out separate pipes, to be collected as skim milk and cream.

In this way, the butter was able to be produced more quickly and easily and more importantly, the butter was fresher. As dairy products are sensitive in nature, they tend to go off quickly. This discovery drastically reduced the risk of spoiling during separation.

1	Raw milk is poured into this chamber.
2	Separated skim milk flows out this pipe.
3	Separated cream flows out this pipe.
4	Container is placed under pipes to collect the separated liquids.
5	Disk spins inside to separate the cream and skim milk.
6	Handle is turned to cause the disks to spin.

Modern day Separator

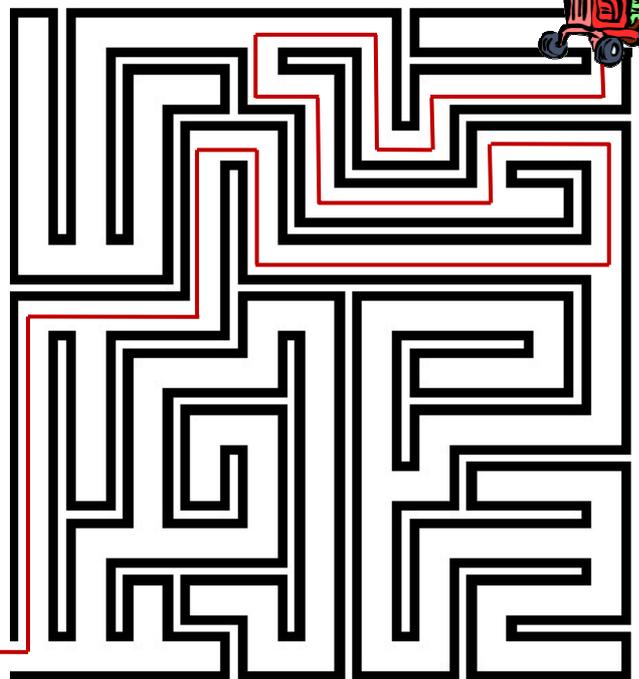
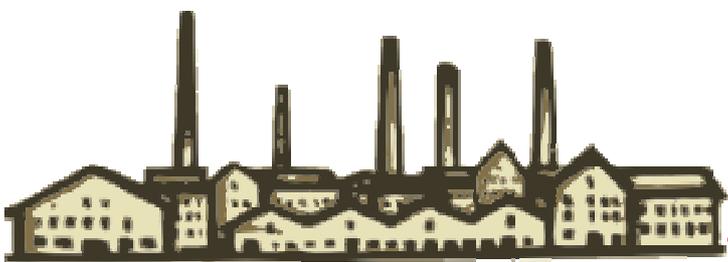
The modern day separator works in the same way as the Centrifugal Separator. The main differences between the machines include:

- The modern separator is much larger. As a result, more raw milk can be separated.
- Larger amounts of milk are continuously separated, as more milk is added to the tank in the modern separator. In the Centrifugal Separator only one batch at a time can be separated.
- The modern separator uses many disks to separate the milk, instead of the one disk used in the Centrifugal Separator. Separation is much quicker now.
- The modern separator is a much more complicated machine. It is built to have other functions apart from separation. This can include controlling the temperature and the amount of fat in the milk.
- The modern separator is automatic, whereas the Centrifugal Separator was turned by hand. For this reason, separation is much faster today.



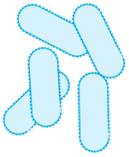
Activity

Can you help the farmer find his way to the factory, so he can separate his milk?



Food Safety and Butter-making

Dairy products are described as '**High risk foods**'. This means they can spoil far more quickly than most foods and this makes them dangerous to eat after a certain time. This is because there is a large amount of bacteria that exist in all dairy products.

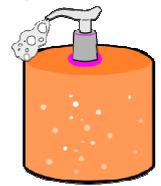


Lots of bacteria live in raw milk and these can grow and change, becoming more harmful if the milk is left in its raw state or left out in the open for too long. This bacteria cause the milk and other dairy products to spoil.

Thankfully, our butter nowadays is much safer to eat, thanks to better food safety. There are various ways of protecting food from spoiling. One of the most important



ways to do so is keeping clean during food handling at all times, as well as refrigerating the food when you can. As you know, processes like modern day separation improve food safety.



There are other processes too, such as **pasteurisation** that was developed especially to cut down and even kill harmful bacteria.



Activity

All foods have bacteria living in them, which makes the food spoil eventually. Certain foods, like dairy products have a lot more bacteria, which causes them to spoil more quickly than others.



(a) Can you think of 4 other High risk foods?

(b) Think about how you can be safe around these foods?

Chicken
Eggs
Cooked pasta
Pork

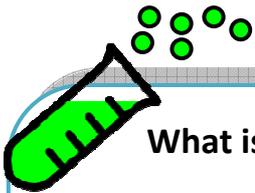
Store in the fridge.
Put in air tight containers.
Pay attention to the best before/expiry dates.
Wash surfaces/hands after handling foods.

Butter Stage: Pasteurisation

Pasteurisation is an important process that helps keep dairy products fresh. The cream itself can be pasteurised after it has been separated from the milk. Afterwards, the pasteurised cream can be made into butter. Milk and cream are pasteurised separately but both use the same equipment, as well as similar temperatures and heating times throughout the pasteurisation process.



Pasteurised dairy products are much safer to eat than raw dairy products. These have the ability to be stored for longer without spoiling. This is an advantage for dairy products that must travel greater distances to be sold. Pasteurising dairy products also helps reduce the spreading of certain diseases that are found in raw milk.



What is Pasteurisation?

Pasteurisation is the process of heating a liquid or a food to very high temperature in order to kill harmful bacteria. This process makes the food much safer to eat.

This process does not reduce the quality of the food. Unlike **sterilisation**, there are still some friendly bacteria left in the food.

Continuous Pasteurisation

The most common method of pasteurisation used today is **Continuous pasteurisation**. In Continuous pasteurisation, the milk or cream is taken from a tank, called the **holding tank**. From here, it is pumped into the Continuous pasteurisation machine. The liquid constantly flows through a series of metal plates. These plates heat up the liquid to a certain temperature, keeping it at this temperature for at least 15 seconds. It then flows through the cooling area. The cooled milk is then pumped out with the rest of the pasteurised milk.





Activity

Try this experiment! Compare the growth of bacteria on raw milk and pasteurised milk.

Ingredients:

- A few drops of raw milk (from your local farm).
- A few drops of pasteurised milk (from the shop).
- ½ cup of hot water.
- 1 teaspoon of **nutrient agar**.
- 2 droppers.
- 2 new **petri dishes**.
- 1 small saucepan.
- A kitchen hob.
- 1 permanent marker.



What is nutrient agar?

Agar comes from certain species of red algae or seaweed. It is a perfect substance for growing bacteria.

Preparation: *The teacher must supervise the students during this stage. OR: This can be completed by the teacher beforehand.

Mix 1 teaspoon of nutrient agar and ½ cup of hot water in the saucepan. Stir together and bring the mixture to the boil on the hob. After 1 minute, the agar should have dissolved. Allow the mixture to cool for 3-5 minutes. Take the petri dishes and fill these with the mixture. Open the lid and allow the mixture to harden for 1 hour.



Method:

Use the dropper to suck up some raw milk. Squeeze out 2-3 droplets into one of the agar dishes. Repeat the same process with a new dropper and the pasteurised milk. Squeeze into the other petri dish. Label the petri dish lids with a marker, saying raw milk or pasteurised milk. Close the lids and leave the petri dishes on a warm window sill for a week.

Conclusion: Observe the changes in texture and colour as bacteria begins to grow. Compare the changes in each petri dish.

Which agar dish begins changing first? The raw or unpasteurised milk.

Butter Stage: Churning

Churning is the main stage of butter production. In modern times, this occurs after the cream has been pasteurised. At this point the cream begins to form the texture and colour that we recognise as butter. Also, the liquid part of the cream separates from solid butter into **buttermilk**.

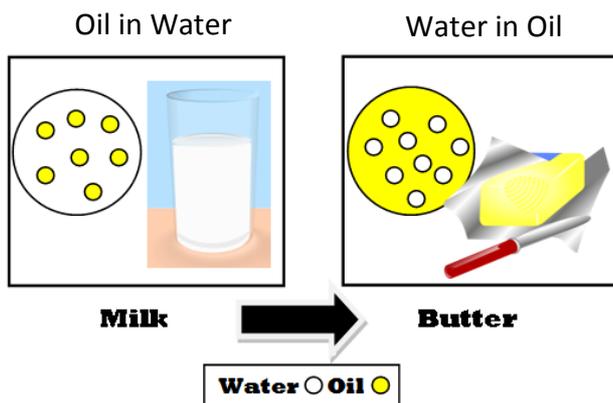
Churning Methods of the Past

In the past, churning involved whipping the cream by hand. The cream was stirred, or beaten until the butter formed. Normally, butter was produced in a butter churn. The cream was stirred quickly, or '**agitated**' using a stick or paddle. The cream thickened as it was stirred and eventually separated into butter and buttermilk (which was the remaining liquid). Nowadays machines are used to speed up this process.

Temperature before Churning

The cream is kept at a low temperature before the churning process. This helps to improve the texture of the finished butter. In the past, people used spring water to lower the temperature of the cream. Nowadays refrigeration and cooling machines are used.

From Milk to Butter



What is happening?

Cream is an **emulsion**. An emulsion exists when tiny droplets of one type of a liquid float around in another type of liquid but do not mix with together. In cream, tiny globules of fat or oil are floating in the liquid. The process of churning forces the fat globules to stick together. The more it is churned, the more fat collects. Eventually these globules form a chunk of butter.

As you can see, the characteristics of the emulsion changes when the milk is turned into butter. Milk is a watery solution with tiny globules of fat or oil floating in the liquid. Once it has been changed into butter, it becomes an oily or fatty solid with tiny globules of water that float in it.



Activity



Try this experiment! Can you mix water and oil together?

Ingredients

- 2 tablespoons of cooking oil.
- 1 small bottle of water with lid.
- Spoon or whisk for mixing.



Method:

Pour 2 tablespoons of oil into a small bottle of water. Notice that the oil stays separate from the water, forming a layer at the top. Try shaking, stirring or whisking the mixture together to see if the water and oil blend into one solution.

Conclusion:

Do the oil and water mix together?

The oil and water stay separate.

What type of emulsion do you think it is?

This is an oil- in water emulsion.

Which is denser- the water or the oil? Explain why.

The water is denser because it doesn't float on top, unlike the oil.

The History of Butter Churns

Over the long history of butter-making, many butter churns have been invented. Over the years, people have experimented with many different shapes. There have been simple wooden frames, to long and narrow containers, rotating barrels, to small bell jars. There have been different methods of agitating the cream too. The cream has been shaken, beat, plunged, stomped and swished, to name but a few techniques!

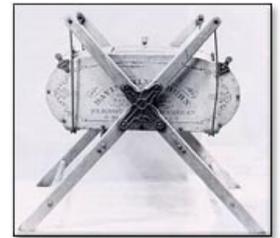
As people have become more advanced they have left behind simple materials like wood for better, stronger materials, such as glass and metal. Butter churns have changed from containers that were turned by hand, to automatic machines that do the work for you!



Early Butter Churns

Rocker churns

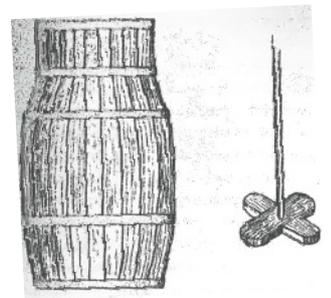
This was one of the earliest types of churn. It was made with animal skins and other simple materials. The cream was often simply shaken until the butter formed.



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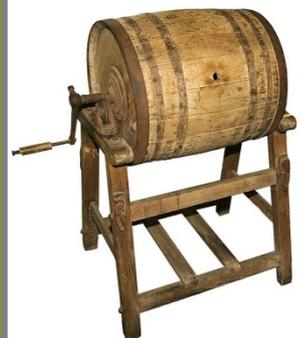
Dash churns

The Dash churn was used on farms for centuries. This was made up of a tall, thin stone or wooden tub with a cover. The cream was agitated by hand using a wooden plunger.



Wooden Barrel churns

This churn looked like a small barrel that rested on top of a wooden cradle. A handle was turned, causing the barrel to flip over and back, as a wooden stomper agitated the cream inside. There a small window on the side, so the butter-maker could check on the butter without opening the lid.

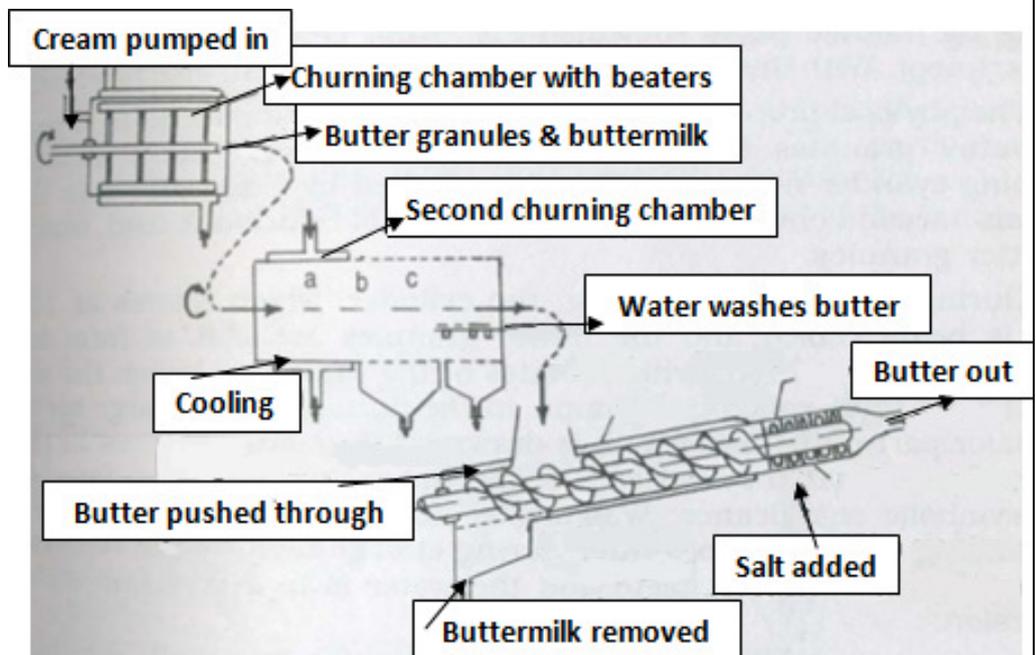


Glass Jar churns

Glass jar churns were one of the last churns to be used at home. These had glass bodies, with a metal lid and paddles that attached to the lid. The earlier models worked by turning the handle, which would cause the paddles to agitate the cream. The latest model had an electric motor, which made the process much faster.



Most modern day churning happens in the factory. The churns are barrel-shaped containers that rotate to agitate the cream, until the tiny fat globules push together to form butter. The buttermilk is then drained and the butter is washed with sterilised water.



Continuous Churning

Continuous churning is the most common type of churning used today. New cream is constantly pumped into the machine to produce a continuous supply of butter.

The cream is fed into a churning chamber. Inside this area, small paddles called **beaters** are used to beat the cream. This causes the cream to change into butter much more quickly than normal.

The butter granules and the buttermilk are moved into the draining section. Here, the butter grains are washed several times with cold water and pushed through a narrow channel to remove any buttermilk left behind. The butter is blasted until it is broken down into smaller grains. Afterwards, salt can be added.

Next, the butter enters another chamber. Inside, the air is sucked out using a pump. Afterwards, in the mixing section, the butter passes through several disks and wheels to create the correct buttery texture. At the same time, water is injected into the butter.

The finished butter is pumped out as one long ribbon. From here, it goes straight into the packaging machine, where it is individually packaged.

Traditional Batch Churning

Traditional Batch churning is an older method of churning and is still used today. The butter is produced in one large tank or batch.

The cream is fed into a churning chamber. The churn begins to rotate, agitating the cream and forming **butter granules**. The buttermilk is drained from the chamber and rinsed afterwards using cold water. The remaining butter is washed. Salt is then added. The butter granules are worked to make a solid, firm block of butter. It is then removed from the churn for packaging.



Butter Stage: Working & Draining

Today our churning machines are so advanced that they have two functions. They churn the cream into butter and they work the butter until it has the perfect buttery texture. In the past, we were not so lucky! Following the churning process there was another necessary stage in butter-making. This was known as **butter working**.



Why work the butter?

The purpose of butter working was to drain the buttermilk, to evenly mix the salt through the butter and to create the ideal buttery, spreadable texture.

It was especially important to remove the buttermilk. If left in the butter, the moisture in the buttermilk caused the butter to spoil more quickly than normal. Also, removing the buttermilk made the butter more solid in form.

Butter spades

Butter spades or **paddles** were used to work smaller amounts of butter by hand. These worked the butter in a way that was very similar to butter workers. Butter spades were wooden and spade shaped. The flat grooved surface helped any buttermilk to run off the block of butter, while the butter was being worked.

The block of butter was squeezed with the spades to remove any liquids. The butter was turned around and the process was repeated again. This continued until the butter block became solid and smooth in texture.

Salt was then added at this stage. The spades were then used to mix the salt through the butter and to finally shape the butter into a perfectly square block.

Butter workers

Butter workers were large wooden structures with a tray and rollers attached. These were used to work large amounts of butter.

The butter was placed in the tray of the butter worker. Pressure was applied to the large rollers. This forced any liquids out of the butter and smoothed the butter out. The tray was slightly tilted, which allowed the liquid buttermilk to run off and gather at the bottom. Salt was also added during this process and the constant rolling of the rollers helped to spread it evenly through the butter.



Butter Stage: Packing and Storage

Butter packaging has changed a lot over the years. In the early days, the containers used to pack butter, were very practical and were only made to protect the butter from spoiling. These were also made to hold a lot of butter. As time went on, butter was sold in smaller amounts and in packaging that began to display the name of the butter-maker who had produced the butter.



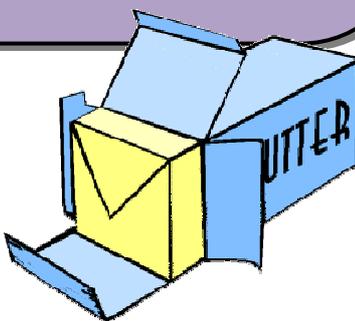
Today the packaging advertises certain butter brands. The method of packing has changed too. In the past, butter was packing by hand. Nowadays, automatic machines do all the work!

Vegetable parchment

Although firkins were excellent containers for storing butter, there were some problems that came from using them. The taste and smell from the wood could be passed on to the butter.

After years of people complaining, a solution was finally made. The inside of the firkin was lined with sheets of **vegetable parchment**. This made the butter taste far better, as there were no other added tastes or smells getting into the butter.

What's more, the parchment was used as a second layer to help preserve the butter better still. Parchment was useful because it did not weaken, even when wet or greasy. As a result, the butter stayed protected in its wrapper.



The Firkin

The old method of packaging butter was by firkin. Firkins were wooden barrels made to store large amounts of foods, like butter for long periods of time. Firkins were in use before refrigeration had been invented. They were very important for preserving the food that was stored inside, especially while it was being transported over long distances.

To preserve the butter, a small hole was made at the top of the firkin and this was filled with salt water. Not only did the salt preserve the butter but it also pushed out any air that was left behind in the firkin. The reason why the air needed to be pushed out was because if left behind, it would eventually spoil the butter.

The beginning of Modern Packaging

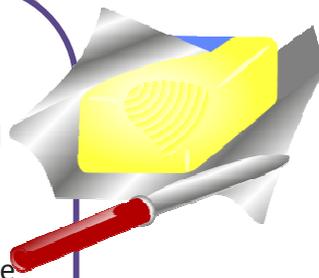
As time went by, firkins stopped being used for packaging butter and vegetable parchment took over. One of the reasons for this was because people started buying smaller amounts of butter instead of entire firkins. Butter businesses noticed this and started to use vegetable parchment as a way of packaging the smaller blocks of butter.

In many countries in the world, the parchment wrapping is still used to pack and sell butter in.

Irish Packaging

In Ireland, we mostly use the foil and paper wrapping. **Foil wrapping** has many of the same advantages as vegetable parchment. Like the vegetable parchment, the outside foil layer protects the butter from air that would normally cause the butter to spoil. It also helps keep out other flavours and tastes from other foods that are around the butter.

The shiny or reflective surface helps prevent spoiling from the light. The inner paper layer is an extra layer of protection.



1. **Air-tight container.**

2. **Tinfoil or cling-film.**

3. **Dark shelf or fridge.**



Activity

Wrappers are used to protect food by keeping out air, light and other food flavours. Name three other ways to protect our food?

Branding over the years

In the past, before a firkin was sold overseas, a **branding iron** was used to stamp the name of the place from which the butter had come from. This helped to tell the difference between the various butters on sale. Therefore, people could more easily recognise their favourite butter and buy it again!



Another way of branding the butter involved the stamping of the block of butter after churning with **butter prints**. This marked the butter in the same way.

Today, branding works in a similar way. Butter companies, such as Kerrygold print their name on to the foil package let the customer know which butter brand they are buying and to compete with other companies.



Machine packing Today

The packing machine has replaced the old method of hand packing the butter into firkins or individual wrapping.

Today, after the churning process, the butter is pumped out as one long ribbon into the **packing machine**. The machine divides the ribbon of butter into smaller blocks and places each block into an open foil packet.

The machine has a set of metal arms that it uses to fold up all the sides of the packet. The closed packet of butter is then pushed out of the machine to be packaged in a box and delivered to your local shop!





Activity



Follow the teacher's instructions to make butter in the old way. Take notes as you follow the procedure for making the butter?

Aim:	Make your own butter using the old fashioned method.
Materials required:	<ul style="list-style-type: none"> • 1 large carton of cream • 100ml of cold water with ice • A few pinches of salt • A few slices of bread • 2 large jugs • 1 large jar with lid- pasta or curry jar • 2 strong flat wide wooden stirrers • 1 chopping board • 1 deep baking tray • 1 sieve • 1 butter knife • 1 sheet of tinfoil • 1 small pointy tool.
Step One: Preparation	Take the cream out of the fridge. Leave it out for 1 hour, until it is at room temperature.
Step Two: Churning	Pour about half the cream into the jar. Screw on the lid. Notice that the cream is very runny. Begin shaking the cream. Shaking the cream will agitate it in the same way as churning. Continue shaking it for about 15 minutes. During that time you can pass the jar around from person to person. You will notice that the cream starts to change.
Step Three: Observation	Observe the cream changing. It will change from runny, to frothy, to soft whipped cream, to heavy whipped cream, to slooshy. Pause every few minutes to check to see what stage the cream is at. Once you hear the slooshy stage, stop. Notice that you now have a large lump of butter in the jar. The pale yellow liquid around it is called buttermilk.
Step Four: Washing	Pour a little of the cold water into the jar. Use the wooden stirrers to prevent any ice falling in. Now shake or swish the jar. Empty any of the remaining liquid into the spare jug. Repeat this process 4-5 times or until the liquid runs clear.

**Step Five:
Draining**

Lay out the baking tray and place the chopping board on top at an angle. This helps drain any remaining liquid from the butter. Scoop out the block of butter. Take out the wooden stirrers. Press them gently to the sides of the butter to squeeze out the water. Turn the butter around and squeeze again. Dip the stirrers into the cold water. This is to prevent the butter from melting during this stage. Continue squeezing and dipping the stirrers in the water until the butter has a more solid form.

**Step Six:
Working and
Shaping**

Now use the stirrers to gently shape the butter into a perfect square. At the same time sprinkle a little salt over the butter. Press the butter slightly from both sides with the stirrers. Turn the butter carefully around and then upside down and do the same. Continue doing this until you are happy with the shape. The salt is mixed evenly through the butter in this way. Be careful not to over-work the butter, as it will start to melt!

**Step Seven:
Branding**

Take out the pointy tool and use it to draw your own brand on the butter! Brands are used to tell the difference between various types of butter.

**Step: Eight
Tasting**

Take out a few slices of bread and spread your own homemade butter onto it. Delicious!

**Step Nine:
Packaging and
Storage**

Wrap the remaining butter carefully in tinfoil to store in the fridge. It will last for about 1-2 weeks.

Conclusion:

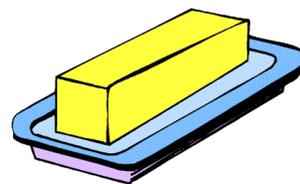
You have successfully made your own butter using the old fashioned method. You have followed all the various stages; churning, washing, draining, working and shaping, branding and packaging and storage. Your butter should look very yellow in appearance, be slightly salty to taste and be formed into a perfect firm square block.

**Activity****Draw some pictures of your favourite butter stage.**

A large, empty rounded rectangular box with a blue border, intended for drawing.

Butter Types

Now that you have made your own butter, think about all the other types of butter out there! There are many varieties of butter that you can buy nowadays. From spreads and blended butters, to clarified butter, to whey butter, to the good old fashioned churned butter. These are among some of the many different types of butter that we can buy today.



Blended butter or butter spreads are produced by mixing real butter with liquid oil, like canola. This spread tastes like real butter but can be spread straight away after being refrigerated. An example of this variety is margarine.

Clarified butter is formed when the liquid and the milk solid are removed from regular butter. Removing these allows for the butter to remain unspoiled at room temperature for longer than other butters. An example of this variety is **ghee**.

Whipped butter is created to produce a lighter and more spreadable butter. The whipping process introduces air into the butter that changes the texture of the butter. This variety can often be found in restaurants for spreading on bread rolls.

Whey butter is made using the separated whey from cheese-making. This butter has a much stronger flavour than regular churned butter because of the salty cheese-like flavour it has. This variety can often be found at health stores and farmers' markets.

There are many more types of butter too, such as low-fat butter or butter that has been sweetened or without any added salt. In other butters, extra flavours have been introduced, such as garlic and sometimes friendly bacteria can even be added to give it a taste almost like yoghurt.



Activity

Ask the teacher to bring in a couple of types of butter to compare.

Can you describe the different butters? Which butters had:

- 1. A strong in taste or smell: Whey butter tastes strong and spoiled butter tastes even stronger!**
- 2. A more yellow colour: Pure Irish butter, like Kerrygold is very yellow in colour.**
- 3. A smoother texture: Spreads, like flora are smooth. They are specially made to be spreadable.**
- 4. A lower fat content: Most spreads or blended butters have a low fat variety. Pure butter does not.**
- 5. Added flavours: Garlic butter is the most common type. Others include, chilli and four cheese.**



What have I learned?

Record four new facts that you didn't know before!



Fact 1:

A blue tray containing three yellow butter sticks on the left and a large yellow rectangular box on the right for writing. The box is labeled "Fact 1:".

Fact 2:

A blue tray containing three yellow butter sticks on the left and a large yellow rectangular box on the right for writing. The box is labeled "Fact 2:".

Fact 3:

A blue tray containing three yellow butter sticks on the left and a large yellow rectangular box on the right for writing. The box is labeled "Fact 3:".

Fact 4:

A blue tray containing three yellow butter sticks on the left and a large yellow rectangular box on the right for writing. The box is labeled "Fact 4:".