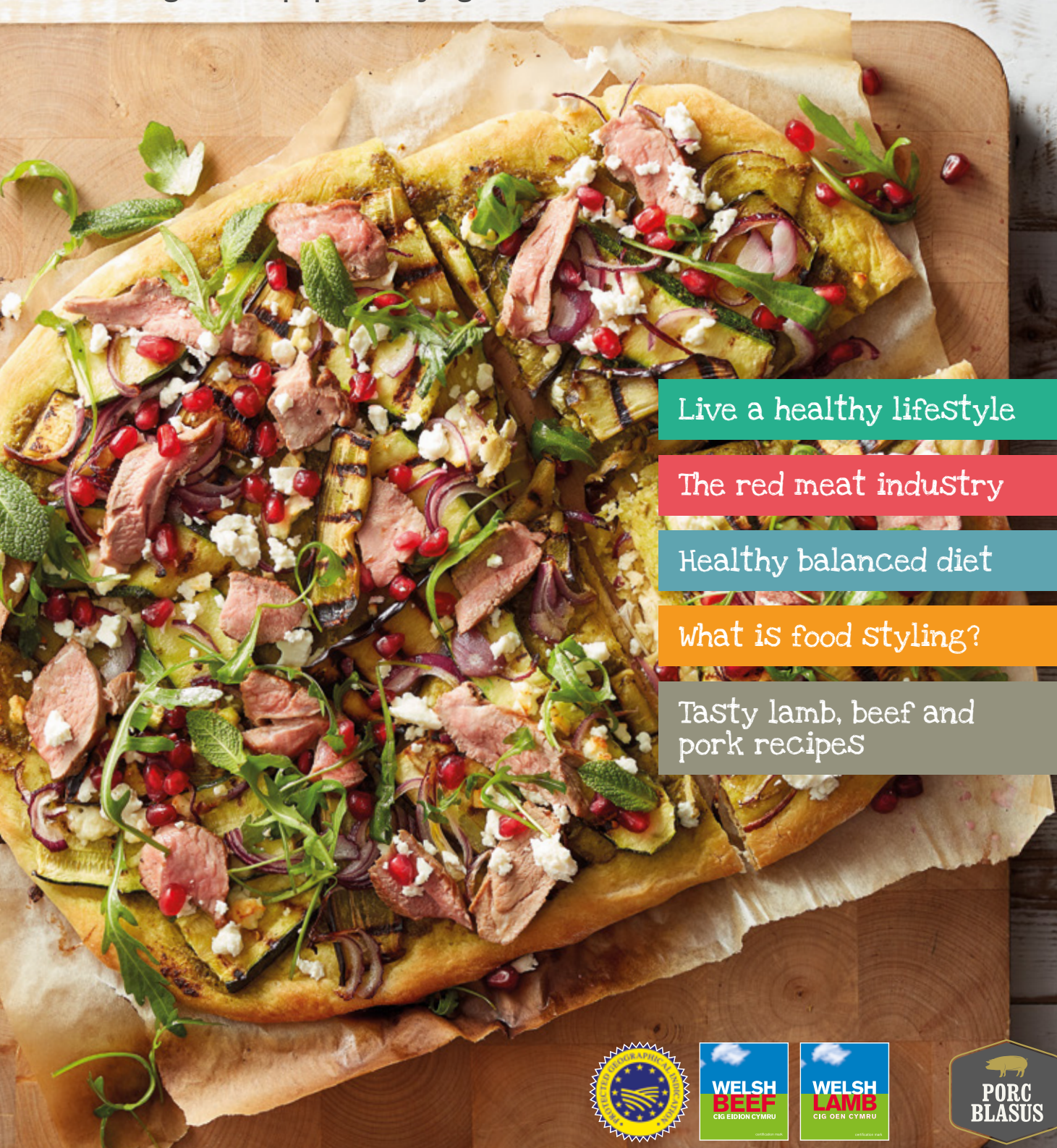


A comprehensive guide to red meat.

A useful guide for pupils studying food related courses



Live a healthy lifestyle

The red meat industry

Healthy balanced diet

What is food styling?

Tasty lamb, beef and pork recipes



We're also online!

Join us online for a food field trip covering topics such as; where our food comes from, the traceability of red meat, sustainable farming, healthy eating and balanced diets, food presentation and styling.

Watch skills videos, download PowerPoint presentations and worksheets, participate in interactive activities and access great recipes that are suitable to prepare and cook in the classroom.

Our user friendly website is both colourful and attractive, and hosts a suite of interactive activities packed with free downloadable resources specifically designed for teachers and pupils.

Visit redmeathub.wales



Provenance



What is meat?



Sustainable farming



Food styling



Recipe ideas



Meat types and cuts



Understanding red meat

“ I’m Lloyd Henry and I’m a food teacher at Ysgol Gyfun Gŵyr with a passion for food and all it encompasses.

Having taught at all key stage levels and previously been in employment in wider roles within the food industry, including working at a variety of hospitality and catering establishments across the world, I feel it’s of the utmost importance that pupils are educated about an array of factors that affect our food.

It is essential they know how to cook and the different factors that affect where their food is sourced. Equally as important is their understanding of the function of ingredients and the important role food has with their health and well-being.

Making pupils aware of their choices and giving them the correct information can only be a positive influence for future generations.

It has been my pleasure to work with Hybu Cig Cymru - Meat Promotion Wales to assist and share my knowledge with the production of this excellent resource. The booklet will be of great assistance to all pupils who study a variety of food themed subjects, be it GCSE, A level or vocational based. It covers a wide range of topics that will cater all needs, and aid all pupils with their studies.

I hope you find it as beneficial as I have, and use the knowledge presented to help you to succeed. ”

Lloyd Henry
Ysgol Gyfun Gŵyr



About the red meat industry



SUPPLY CHAIN

How does red meat get from the field onto our plates?

In Wales, animals are reared on the farm in a healthy, natural environment with plenty of food, fresh water and clean air. Following months of rearing, when the desired weight and level of finish (fat cover) of an animal has been achieved, farmers send or take their animals to market or the abattoir.

The welfare of animals is paramount during the production of red meat. In the UK, animals are protected by government legislation and European Union (EU) regulations to ensure they are treated with care throughout the process. Highly trained staff at the abattoir ensure the process is humane and efficient.

The fresh red meat is prepared into smaller cuts to make it saleable and ready for cooking and eating. It's at this stage it can be bought from food retailers (supermarkets, butchers' shops) or sent to food manufacturers. This first stage of production is called primary processing. Secondary processing is when the processed product is turned into a food product e.g. as part of a ready meal.

When you see PGI Welsh Lamb and PGI Welsh Beef logos on packaging, this means the meat comes from animals that are born and reared in Wales. The animals are tagged and logged from birth so they can be identified as belonging to a specific farm. This is called traceability.

The supply chain is the name used for the different stages the meat goes through to get from the farm to your plate. By eating locally this keeps the supply chain short and the carbon footprint of the meat to a minimum, which helps the environment.

Every abattoir and cutting plant using the Welsh Lamb and Welsh Beef logos must be approved by the red meat authority Hybu Cig Cymru - Meat Promotion Wales (HCC). HCC carries out inspections at every stage of the supply chain. This care and attention to detail produces some of the best and tastiest lamb and beef money can buy; the meat is an excellent source of protein and other essential nutrients.

Where does Welsh Lamb and Welsh Beef come from?

Welsh farmers know that if you look after the environment, the environment will look after you. Centuries of sustainable farming practices have made Wales a respected producer of lamb and beef. These farming practices have remained largely unchanged over the centuries and work with the rhythm of the seasons.

The unique, ancient landscape of Wales is perfect when it comes to sheep and beef farming. The lush, green habitat covers lowland pastures that roll down to the sea, and mountainous uplands rich with hardy, fragrant heathers, all fed by a network of streams and rivers.

It's an ideal environment in which to raise sheep and cattle, with hundreds of acres of rich grass - the main reason why Wales has been linked with livestock farming for generations. As a result of the changing terrain, the Welsh lambing season is long-lasting. The warmer lowlands produce lambs first and the harder uplands produce lambs last. This means you can have tasty Welsh Lamb nearly all year round - but nevertheless, Welsh Lamb is naturally at its most abundant between July and November.

This Welsh way of farming is very different from intensive farming. With high standards of animal husbandry and pasture land management, family-run farms have helped preserve Wales's unique landscape for generations. A perfect balance of nature and

farming exists side by side, protecting our environment. It's one of the reasons Welsh Lamb and Welsh Beef have achieved the sought-after and respected Protected Geographical Indication (PGI) status from the European Commission (EC) as well as DEFRA in the UK.



PROTECTED GEOGRAPHICAL INDICATION (PGI)

What makes Welsh Lamb and Welsh Beef so special?

Let's have a look at some of the different logos you'll see on Welsh Lamb and Welsh Beef packaging and what do they mean.

The European Protected Geographical Indication (PGI) designation, and the new equivalent UK GI designation being phased in from 2021, exist to protect the reputation of regional products from being misused or copied. They also help consumers by giving them information about the specific character of the products, with the schemes linking to the quality, traditions and environment of a specific area.

A particularly important benefit of the PGI and UK GI status is that you know where your food is coming from, which is called 'provenance'.

What does this mean in practice?

Welsh Lamb and Welsh Beef's distinctive qualities have been recognised as having unique characteristics that can only be attributable to Wales, which is the products' geographical origin.

This means that only sheep and cattle born and reared in Wales, and have been tagged, logged and processed in approved abattoirs, can be sold as 'Welsh' and use the Welsh Lamb and Welsh Beef trademarks.

An individual or business does not own a GI. Any producer can make and sell a product under a registered product name if they:

- follow the product's specification
- are verified to do so

Hybu Cig Cymru - Meat Promotion Wales (HCC) acts as the guardian of the GI designations placed on Welsh Lamb and Welsh Beef, and makes sure the supply chain is kept to very high standards.

The Welsh Lamb and Welsh Beef designations not only signify a quality product, but they are the result of farmers' dedication and tireless efforts behind the scenes to support a wider sustainable system. Sustainability plays an important role in the production process and Welsh farmers have embraced agri-environment schemes designed to protect and enhance our cherished environment. Ultimately, the whole supply chain helps maintain local livestock markets, maintaining the local rural economy and supporting local jobs.



Dispelling the myths

Issues such as the impact of red meat on the environment and our health is currently a hot topic for discussion. But it's important to remember that there are huge variations in the environmental impact of different farming systems across the world, with Wales being especially suited for rearing cattle and sheep, while red meat can play an essential part in a healthy and balanced diet.

Working with our natural environment

The guardians of our nation's natural environment



For centuries, our livestock farmers have played a pivotal role in creating and maintaining the spectacularly beautiful rural landscapes that we know and love. Their sustainable management helps create a diverse rural environment rich in wildlife, is visitor-friendly and sustains a network of protected areas carefully managed by responsible grazing.

Many of our most iconic landscapes are not accidents of nature but the result of generations of careful management.

Wales's topography and landscape favours a grassland system of production

80% of its landmass is primarily suited for livestock farming

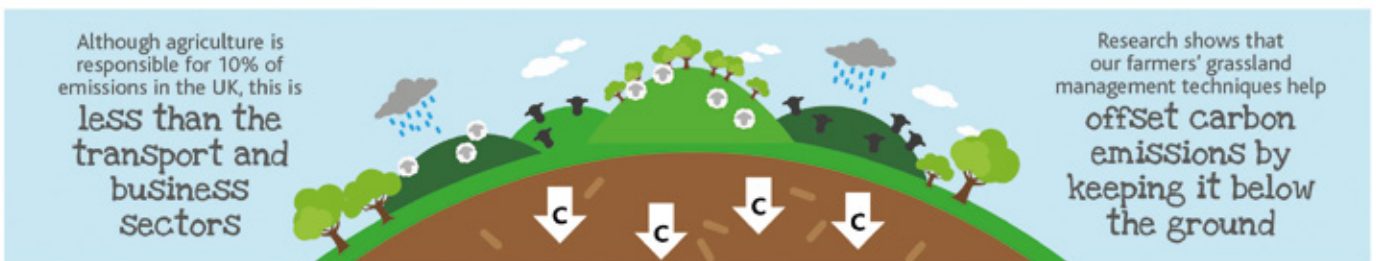
The vast majority of land is unsuitable for growing foods and crops such as...

Landscape + Climatic conditions = One of the world's most sustainable places to produce red meat



Although agriculture is responsible for 10% of emissions in the UK, this is less than the transport and business sectors

Research shows that our farmers' grassland management techniques help offset carbon emissions by keeping it below the ground



The livestock industry is highly efficient and productive...

PGI Welsh Lamb and Welsh Beef are reared on grass and organic heathers.

Their grazing enhance bio-diversity and improves soil health and structure.



Livestock farmers are putting our land to good use by helping feed us the essential vitamins and minerals needed for healthy and happy lives.

By eating locally and sustainably produced food, we're not only supporting the wellbeing of our rural communities but also minimising the environmental impact of importing food from across the globe.



The health benefits of quality red meat

How lean Welsh red meat can be central to a healthy and balanced diet

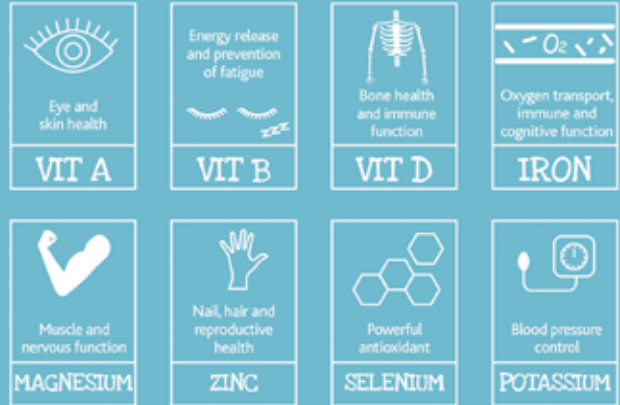
No single food contains all the nutrients we need for good health, so it is important to eat a wide variety of different foods each day. However, due to it being packed with essential vitamins and minerals, a balanced diet with lean red meat at its core can help keep people of all ages healthy and happy.

Raw, fully trimmed and lean red meat contains less fat than you think



Contrary to popular belief, lean red meat can play a positive role in weight loss and weight maintenance programmes, with its higher energy density helping you feel fuller and reducing the need for snacking.

Studies show that red meat provides us with essential nutrients that help boost our health and wellbeing...



Based on the average UK diet

30%
of our protein intake comes from red meat...

...which is vital for our body's growth, maintenance and muscle recovery!



Leading scientists recommend we eat up to



How much is enough?
Around 70-100g per portion

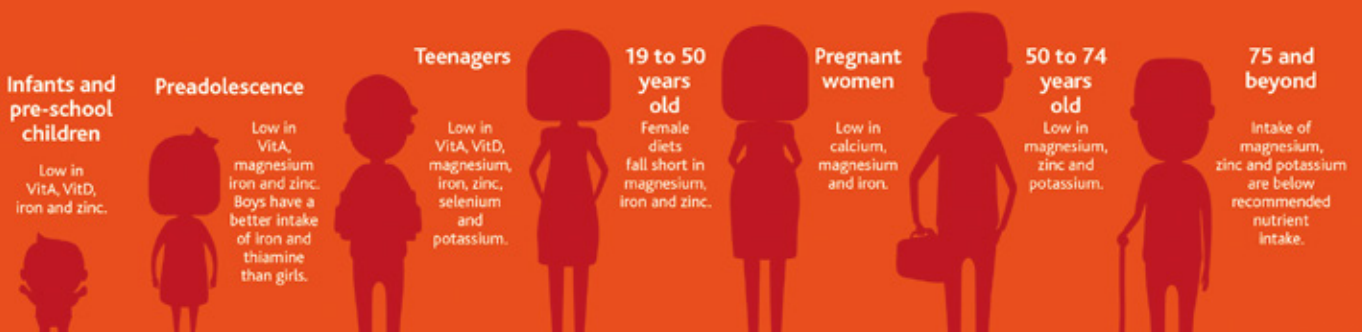
TO ESTIMATE
Use your hand OR a deck of cards

KEEP IT LEAN

- LOOK FOR LOWER FAT & SATURATED FAT CONTENT
- GRILL RATHER THAN FRY
- TRIM THE FAT
- GET RID OF EXTRA MELTED FAT
- AVOID EXTRA OIL

When choosing ingredients and cooking red meat

Lean red meat helps keep people of all ages healthy, with studies showing shortages in...



Making the most of meat in a healthy balanced diet

Different cuts of red meat have different characteristics. Some cuts are naturally leaner (meaning they have less natural fat) than others, and while some are best cooked quickly, others benefit from slow, moist cooking methods.

In terms of eating red meat as part of a healthy and balanced diet, choose leaner cuts, adopt healthier cooking methods and serve with plenty of wholegrains and vegetables. The best way to limit fat content while cooking is to grill, stir fry or barbecue. It is also good practice to avoid adding extra oil during the cooking process.

Learn how to use the hob, grill and oven skilfully and safely.



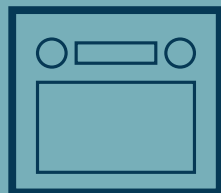
The grill

Quickly cooking or browning red meat. Heat transfer method - radiation and conduction.



The hob

Frying, stir-frying, boiling and simmering red meat. Heat transfer method - conduction and convection.



The oven

Roasting meat in dry, high temperatures, casseroles or pot roasting; this is where a joint of meat is placed on top of vegetables in a pot with a tight-fitting lid. Heat transfer method- radiation and conduction.

When preparing cuts of meat, remember to use a red chopping board for raw meat and wash your hands before and after handling.

Red meat is a complete protein source

It provides all of the essential amino acids that our bodies need. Red meat is a source of high biological value protein. It is also a source of iron and a rich source of zinc and a range of Vitamins in particular B Vitamins.

Red meat can aid the following:

Red blood cells

The body needs iron to make haemoglobin in the blood, as well as myoglobin in our own muscles.

Cell constituents

We need the amino acids provided by meat to construct the proteins that make up our cells, including their membranes and the cell machinery.

Muscles

Our own muscle fibres are built from protein that we can only make if we get the right balance and supply of amino acids in our diet.



Welsh Lamb

Welsh Lamb is available all year round: new season lamb is available from March with supplies at their peak between July and November. The fat should be crisp and white, and the meat lean and fine grained, firm and pinky-reddish brown in colour. Freshly cut surfaces should look lightly moist and the bones a pinkish blue.

» **Best End** You can buy this cut as 'rack of lamb' – a roasting joint made up of six or seven rib bones (ask your butcher to remove the back bone for easier carving). But more often you'll find it prepared as individual lamb cutlets suitable for frying and grilling. Two best end necks facing each other fat side outwards is called a 'guard of honour'.

» **Loin** The loin is usually divided into loin end and chump end and cut into chops for grilling and frying. It can also be boned completely and pan fried or stuffed and rolled to produce a roasting joint or cut into individual 'noisettes'.

» **Rump** The rump section is also called the 'chump' and you can buy it as chump chops or boneless lamb rump steaks. These are very tender and excellent for frying and grilling. You can also use the boneless rump as a mini-roasting joint.

Top tip!

Make sure you choose the correct cooking method for each cut to ensure your lamb is delicious and tender.

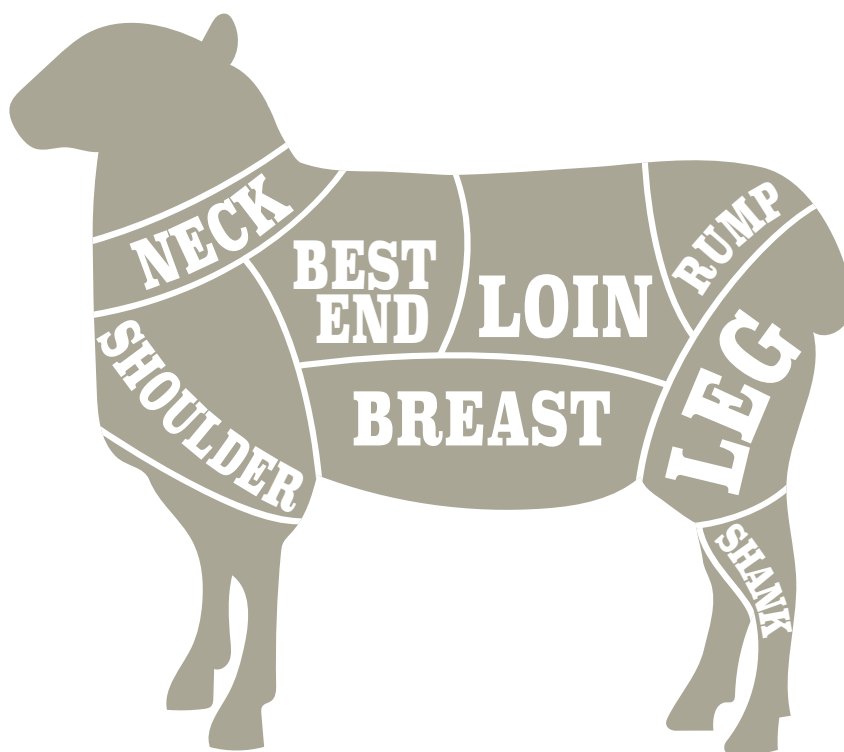
» **Neck** This cheaper cut of meat is often sold as neck rings or chops on the bone, used for stewing, braising, and in traditional dishes like Welsh cawl or Lancashire hot pot. Boneless neck fillets are great for marinating for kebabs, slicing thinly for stir-frys or diced for curries.

» **Shoulder** This is a very succulent, tender slow roasting joint, available either on the bone or more commonly boned and rolled and sometimes stuffed. You can also get it whole or halved into blade and knuckle sections, both of which are ideal for slow roasting or braising. Shoulder can also be cut into chops and steaks suitable for frying, grilling and braising.

» **Breast** This is a relatively cheap piece of lamb and is best used in a stew. Usually, however, the red meat is extracted to make mince.

» **Leg** The leg of lamb is the quintessential roasting joint beloved of Sunday lunchers across the land. You can have it on the bone or boned and rolled. But this versatile cut can also be divided into fillet and shank ends, leg steaks and stir-fry strips.

» **Shank** Lower section of the leg of lamb, suitable for slow, moist cooking methods which results in very tender melt-in-the-mouth meat.



Welsh Beef

Probably the most well-known cut of beef is the steak, which is popular in both eating out locations as well as with home cooks. Steak can come from different parts of the animal, with each one having unique taste and texture attributes (e.g. fillet steak, sirloin steak, rump steak or featherblade). But did you know there are lots of other cuts of beef too, ideally suited for a range of different dishes?

» **Rump** This is an excellent lean and tender cut, normally sold in slices for grilling, frying and barbecuing. Top rump: This is a lean cut of beef suitable for roasting and pot-roasting, or braising whole or in slices.

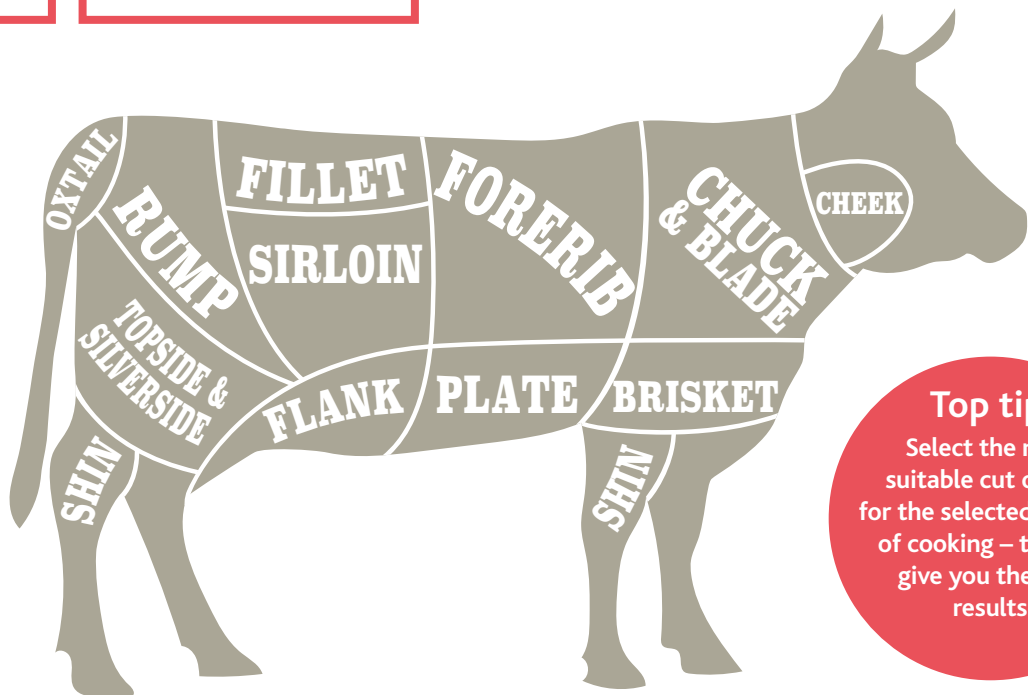
» **Fillet** This most tender of beef cuts is the fillet muscle found on the inner side of the rib bones. It's normally removed in one piece and typically cut into thick slices as fillet steak or kept whole for Beef Wellington.

» **Forerib** This is the traditional cut of roast beef and where you get your rib-eye steaks from. You can buy it either on the bone or boned and rolled.

» **Chuck & Blade** This is a fairly lean cut of high-quality beef removed from the bone and sold as chuck steak and diced chuck. Suitable for braising, stewing and is excellent for pie fillings.

» **Oxtail** Culinary name for the tail of the animal. Robust in flavour and texture. Requires slow, moist cooking methods resulting in very tender meat.

» **Shin** This is usually cut into pieces for mincing or into rings for stewing and braising.



Top tip!
Select the most suitable cut of beef for the selected method of cooking – this will give you the best results.

» **Topside** This is a lean cut of beef with little or no fat that makes an ideal roasting joint. You can buy it with a thin layer of fat wrapped around it to help keep the meat moist while roasting. You can also buy it in slices for quick-frying steak.

» **Silverside** This is a lean cut of beef typically used for roasting and pot-roasting, and is also the cut traditionally used for sliced salt beef.

» **Sirloin** A very tender and succulent cut of beef that you can buy on the bone or boned and rolled to make an easy-carve, top quality roasting joint. You can also buy sirloin steaks suitable for frying, grilling or barbecuing.

» **Flank** Belly area located below the sirloin, therefore, contains a lot of working muscles. Flank steak (Bavette) now popular – great for marinating to tenderise and then cook quickly for medium-rare.

» **Plate** Centre belly part below the ribeye, this is the short plate – short ribs which require slow cooking methods. Skirt steak and hanger steak which suit marinating and then cook quickly for medium-rare.

» **Cheek** Comes from the facial muscle of the animal. A very tough piece of meat but packed with flavour – requires slow cooking methods which results in very tender meat. Much sought-after by chefs.

» **Brisket** Although you can buy this cut on the bone these days, it's usually sold boned and rolled, ready for slow roasting, pot-roasting and often used for pulled beef.

Pork from Wales

Pork is versatile and quick to prepare, making it suitable for any day of the week. Fat is very evenly distributed throughout the pig carcass. Cuts of meat with the most connective tissue (those from the shoulder or belly) generally require longer, moist cooking in liquid at lower temperatures, e.g. stewing or braising. Modern production systems have created an extremely lean meat suitable for health conscious consumers.

» **Cheek** Comes from the facial muscle of the animal. A very tough piece of meat but packed with flavour – requires slow cooking methods which results in very tender meat. Much sought-after by chefs.

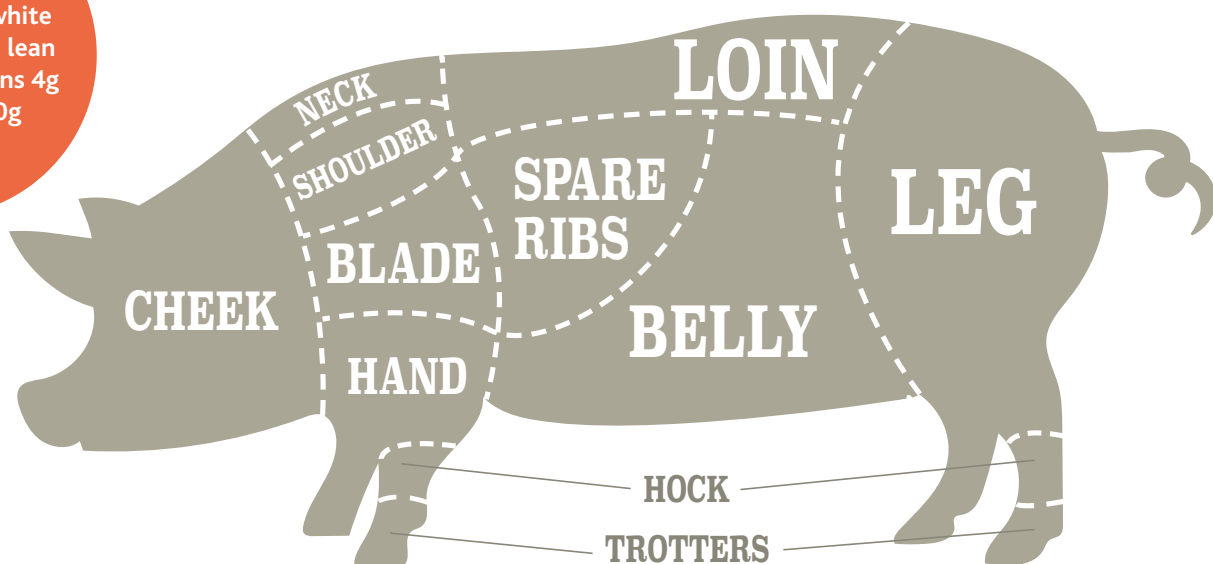
» **Shoulder** This joint produces very tender, succulent meat which is suitable for either roasting or slow cooking. Other cuts from the shoulder include spare ribs, collar steaks and the hock. For a healthy option, it can be diced and used on a kebab.

» **Neck** With a fine marbling of fat, this lesser known cut is succulent and full of flavour. It is ideal for soups and stews, or can be roasted slow and low.

» **Leg** Produces an excellent roasting joint – either on the bone or boned and rolled. A range of steaks and stir-fry strips can be prepared from the different muscles and are ideal for quick cooking.

Top tip!

Fully trimmed (trimming the white fat off the pork) lean pork only contains 4g of fat per 100g of pork.



» **Blade** Thanks to its rich marbling, blade steak is very flavoursome and remains tender throughout cooking. Quickly braise, grill or sauté, but be careful not to overcook.

» **Hock** An inexpensive cut, the hock is ideal for broths, stews and soups. Being a tougher meat, it is best slow-cooked on a low heat.

» **Belly** This is a really tasty cut of pork which is commonly sold in individual slices or as a joint. It's ideal for boning and stuffing, producing an economical family meal. The spare rib sheet is also cut from the belly and as with the other cuts from here, is best suited to slow cooking methods.

» **Loin** This is a very versatile and lean cut of meat. From here we get rib chops, loin steaks, boneless loin joints and T-bone chops. The tenderloin is also found here and is the equivalent cut to the fillet of beef. All cuts from the loin are suitable for quick meals using grilling or frying techniques. As a special joint, you could use the rib roast.

» **Spare ribs** Slightly larger and with more meat than other cuts of ribs, spare ribs are best prepared slow-cooked on a low heat until tender and juicy. Marinades can offer the perfect opportunity to put your stamp on meals, but remember to keep braising the ribs whilst cooking to keep them moist.

What is food styling?

The art of food presentation and styling

Which shepherd's pie would you rather eat?

You may have heard the saying 'we eat with our eyes'? It sounds impossible, doesn't it? But there is a nugget of truth here.

While the flavour and aroma of a dish is important, what we see on the plate and how it is presented to us can make a real difference to its initial appeal. Impossible as it may seem, even the colour of the plate can trigger our appetites in different ways.

Food styling, or how food components are arranged on a plate, is key to a great dish and showcases cooking and creative skills. You may have seen images of appetising food in magazines, online or on the television. It is not the case of putting a dollop of mash here and a splash of gravy there and hoping for the best; these dishes are artfully and meticulously constructed with the aim to make the food look attractive, fresh and mouth-wateringly irresistible. So, is there more to food styling than meets the eye...?



Dress to impress

1. The support

This is the item that the food will be served on e.g. plate, dish, bowl, platter etc. Avoid using patterned or coloured serveware as it is likely to compete with the food for the diner's attention. A general rule of thumb is to follow what the professionals do and use a neutral background such as plain, dark or white plates. Also consider the size of the support; it should be proportional to the amount of food served on it. If the support/plate is too big, the food may look lost on it or appear as a 'mean' portion size; too small and the food may appear too much.



2. The focal point

This is the area or point of the dish that is the most interesting and to where the eye is naturally drawn. This could be the highest element on the dish or the point with the most volume. This area of the dish is often occupied by meat, fish or other protein. The diner must be able to access this point with ease and yet it must not compromise the overall presentation and look of the dish.



3. Colours

As mentioned previously, colours can influence how we perceive food. For example, red represents passion and excitement; green is cooling and calming, while black is elegant. It is best to avoid blue as it suppresses (spoils the appetite) and so you won't see many restaurants serving food on blue plates. It is not just the colour of serveware that impacts the overall effect; the colour of the ingredients within the dish also have a part to play. Using vegetables of varying colours and shapes is important, but remember to arrange them so that they don't hide the other elements of the dish.



5. Decoration and garnish

Finishing touches increase aesthetic (visual) appeal and make the dish look complete and professional. Decoration can make the dish look less bare and garnish can also enhance the flavour of some dishes. Garnishes or decorative techniques should be functional/edible. They should add contrasting colour, texture and overall interest and should always enhance and flavour food.

The final touches

Here are some ideas on how to add the final flourishes to your dish:

- Fresh herbs or dried spices
- Toasted nuts, sesame or pumpkin seeds
- Julienne strips or ribbons of vegetables
- Twists of citrus fruit, shaped or carved vegetables
- Crispy croutons
- Coarsely crushed peppercorns
- Grated citrus zest
- Edible flowers such as nasturtium, elderflower and cornflower or pea shoots
- Edible herb flowers such as chive, garlic and fennel
- Swirled, brushed, painted or piped cream, half fat crème fraîche, jus or compotes

4. Textures

Again, textures play an important role in the appearance and visual appeal of a dish. Contrasting textures that are made by different preparation methods add interest. Firm, soft, silky, rigid; think of how these textures could elevate the dish to another level.



How to go about it

Food presentation and food styling - the tricks of the trade

Perfecting your platter

Simple serveware

Chefs often use large white or neutral coloured plates. If there is a design, e.g. the name or logo of a hotel, this would normally appear on the border.

Get creative

Modern chefs often use alternative ways to present their food such as paper cones for chips, preserving jars for pâté, individual lidded dishes for casseroles, mini saucepans for soups and natural stone or wooden plates. Can you think of innovative ways to serve food that would be functional as well as add interest?

Portion control

Be aware of portion sizes and current healthy eating advice. The smaller the portion, the easier it is to create compact, elegant servings.



The rule of odds

Be mindful of this rule. Having an odd number of elements on a dish is more visually appealing than having an even number. It creates the impression that a piece of food is being framed by the other pieces.

Be colour confident

Use vibrant colours. Liven up your plate with vegetables or sauces in bright, sharp colours, especially if the dish has a dark colour such as a steak or casserole.



It's 'time' to put your dish in order!

If faced with lots of ingredients, the classic way to position food on the plate is to 'clock it'. Place the potatoes, pasta or rice at ten o'clock, meat or fish at six o'clock and the vegetables at two o'clock.



Stack it!

Elevation is another method to achieve the 'wow' factor. You can stack meat, fish, eggs or cheese over starch components such as rice, pasta and couscous in a tight pyramid or cylinder.

Repeat. Repeat. Repeat.

The repetition of ingredients, such as laying three small identical pieces of protein side by side with different garnishes on each one, will add visual interest. Repetition is an easy way of creating a picture.



Keep it clean

Make sure the plate is clean. After going to the trouble to present your food beautifully, make sure you don't serve it on a dirty plate and make sure that any drips have been wiped away.

Tools and equipment

Just like an artist needs a certain paintbrush to create a particular effect/result, the same applies to the tools you need for creating your edible masterpiece. From intricate detail work to setting the scene for your dish, the following tools and equipment are a good start.

Tweezers/small spoon – useful for positioning small, delicate pieces and garnishes.

Plain/fluted biscuit cutter – these are great tools for creating shapes to layer meat, fish and vegetables. The thinner the layers, the more impressive the outcome.

Paintbrush or squeeze bottle – use these to creatively add sauces in an attractive and controlled way.

Melon baller, julienne peeler and apple corer – use these to create attractive garnishes with fruit and vegetables.

Piping bags and nozzles – create attractive decoration and garnishes on sweet and savoury dishes using different sized/shaped nozzles.

Palette knife – to smooth the sides or tops of dishes and ease removal of dishes from moulds or rings.



Setting the scene

Try to include props as part of your overall food presentation, such as flowers, napkins, glassware, cutlery, tablecloths and a menu.

If you are producing a dish or menu based on a theme or culture, include appropriate decorations and cutlery such as Christmas baubles for a festive dish.



Keeping up with the trends!

Keep on top of food presentation and styling trends by reading food magazines, watching cookery programmes and following food blogs.

What is meat?

Meat forms the centrepiece of most traditional cooking; understanding its structure and composition helps you make the most of your cut.

Lean meat is the muscle tissue of animals. It consists of muscle tissue or fibres held together by connective tissue – collagen, elastin and fats.

Muscle cells (the meat) contain water, proteins, minerals, vitamins and the red protein called myoglobin which gives meat its red colour.

Tender cuts of meat, such as sirloin steak, have fine muscle fibres and contain little collagen and therefore suit quick cooking methods such as frying.

Thick muscle fibres tend to have more connective tissue, cuts such as neck and shin, and the meat is tougher, therefore, needs long, moist cooking methods such as casseroles.

Why does meat change colour when cooked?

Browning, or the Maillard reaction, creates flavour and changes the colour of food. Maillard reactions generally only begin to occur above 140°C (285°F). Until the Maillard reaction occurs, meat will have less flavour.

The **Maillard reaction** is a chemical reaction between an amino acid and a reducing sugar, usually requiring the addition of heat. Like caramelization, it is a form of non-enzymatic browning. The reactive carbonyl group of the sugar interacts with the nucleophilic amino group of the amino acid, and interesting but poorly characterized odour and flavour molecules result. This process accelerates in an alkaline environment because the amino groups do not neutralize. This reaction is the basis of the flavouring industry, since the type of amino acid determines the resulting flavour.

Cooking methods that result in the Maillard reaction are: roasting, grilling, baking and frying.

Some key scientific questions to investigate

If I freeze meat, will it destroy the taste and texture?

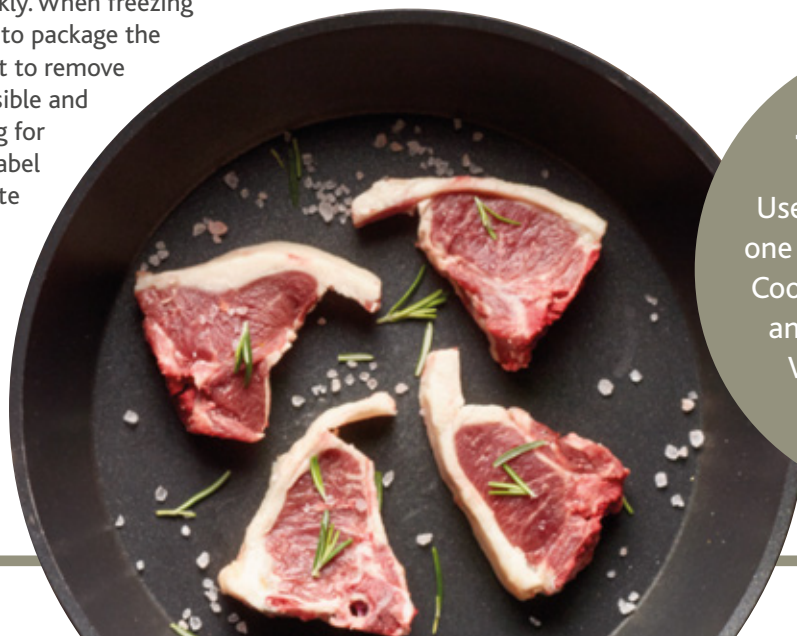
Undeniably convenient, freezers allow us to store food for months, but low-powered home freezers are far less efficient than industrial ones, which "flash freeze" meats very quickly. When freezing at home, it's important to package the meat carefully, sealing it to remove as much oxygen as possible and using suitable packaging for freezing. Always add a label to name the cut and date of freezing.

How can an animal's feed affect the taste and texture of its meat?

Whether cattle are fed on grass or grain, it affects their calorie intake and their lifestyle, and both of these factors influence the type of meat produced.

How can I tenderise meat?

You can tenderise tougher cuts by hitting the meat with a meat hammer. This breaks down the muscle fibres, making it more tender e.g. some of the tougher beef steaks.



Try it yourself!

Use a meat hammer to hit one steak, but not the other. Cook both in the same way and compare the results. Which is more tender when eaten?

Science and cooking

Cooking breaks down (unravels) chemical bonds in proteins making meat more tender, soft and easier to chew. This process is called Protein Denaturation. Long and slow and often moist cooking methods transforms tough connective tissue - collagen into soft and soluble gelatine. The protein in meat denatures when heated to 52°C - 60°C (126°F - 140°F).

The fat of raw meat turns into oil when cooked, carrying flavour and giving a moist feel in the mouth. Each fat cell contains a droplet of oil which bursts open when heated, dissolving flavour molecules.



Setting up your own experiment

Here's a step-by-step guide to the main considerations when planning a successful cookery experiment:

Steps	Instructions
When would you use this test?	You would use this test to find out whether or not people can tell the difference between similar examples of food.
What are you going to use in the comparison?	Remember - the products need to look similar in size, shape and colour so people cannot be swayed to choose what they think is the right answer to your question.
What do you want to find out?	You are trying to find out if the taster can identify a difference in the samples you provide.
How many samples will each person need?	You need three samples; two of these samples are identical and the third has had something changed. It could be an ingredient change, for example.
Give 3 digit codes to the samples.	Three digit codes ensure the taster is not swayed. A,B,C,D, or 1,2,3,4 gives the taster room to guess which samples are which.
Write which sample is associated with each product.	Keep the codes hidden from the tasters, but this is important for the analysis.
Place the samples onto plates.	Place a cube of food onto a coded plate.
How do you lay out the samples?	Serve one of the identical samples, then serve the remaining samples.
Produce a results table and give instructions.	Taste the samples. After each sample, wait, rinse the mouth with water and wait another 30 seconds.
Choose a suitable graph.	Make sure it is relevant and you understand how to explain it.

Keywords to remember:

- o hypothesis
- o sample
- o compare
- o contrast
- o conclusion
- o results

How to analyse the results?

- o Write down your observations and what happened.
- o What were the differences between each sample?
- o Link the test carried out to your research; what should it show?
- o Have you proved or disproved your hypothesis?
- o What other tests could you carry out to check the validity of results?
- o End with relating the investigation to the task.

Remember to take photographic evidence

Quick and simple recipes to try

Here's a selection of easy to follow, colourful and tasty recipes to help you hone and brush up your skills. Packed full of healthy vegetables and lean meat, you can use them to produce a well balanced meal as part of a healthy diet.

They are an ideal way to show off your cooking and practical skills. Use the below key to see which recipes you want to try first.

Remember to carefully think about how you will style your food to serve it, using what you have learnt in the previous pages about how to create a visually appealing dish.

Practical skills demonstrated

- Bread crumbing
- Chopping
- Coating
- Filleting
- Grating
- Layering
- Making a dressing
- Making a sauce
- Marinating
- Mixing
- Peeling
- Rolling
- Shaping
- Skewering
- Slicing
- Spreading
- Sprinkling
- Zesting

Cooking skills demonstrated

- Baking
- Boiling
- Frying
- Simmering
- Stir-frying
- Grilling



Marinating ingredients

Marinades are used to tenderise meat; using acidic ingredients breaks down the fibres in the meat, denaturing the protein therefore making it more tender. Marinades are also used to add flavour and keep the meat moist during cooking. A marinade should include most of the following: salt, oil, an acid ingredient e.g. lemon juice and flavourings such as sugar, herbs, garlic and spices.

Marinade basics

Salt

Fats

Acidic ingredients (optional)

Lemon Juice

Vinegar

Wine

Flavourings

Sugar

Garlic

Herbs and Spices



Pork Jambalaya



Serves: 4

Preparation time: 25 minutes

Cooking time: 1 hour

Jambalaya is a popular Louisiana-origin dish of Spanish, French and West African influence which mainly consists of meat and vegetables mixed with rice. Traditionally, the meat always includes sausage of some sort as in this recipe. It is made in one pan which is great when it comes to the washing up!

● Filleting ● Chopping ● Peeling ● Frying ● Simmering ● Boiling

You will need

Chopping board
Chopping knife
Large lidded saucepan
(or use foil if no lid available)
Wooden spoon

Ingredients

450g lean pork fillet
1 tbsp oil
4 thick spicy sausages
1 onion, sliced
2 garlic cloves, crushed
2 tbsp jerk seasoning
225g long grain rice
Can chopped tomatoes
600ml stock
1 tbsp tomato purée
1 red pepper, deseeded and finely diced
1 yellow pepper, deseeded and finely diced
5 spring onions, finely sliced
1 red chilli, deseeded and chopped (optional)
2 tbsp fresh coriander

Method

- 1 Carefully cut the pork fillet into 1.5cm sized cubes and prepare the vegetables. Take care when chopping the chilli (if using) as the oils from the chilli can irritate or burn, so remember to wear rubber gloves or wash your hands thoroughly after handling.
- 2 In a large saucepan, heat the oil over a medium heat.
- 3 Add the onion and garlic and cook for 5 minutes until softened.
- 4 Add the spicy sausages and turn occasionally to make sure they are browned all over. Remove the sausages from the pan and allow to cool slightly before cutting each one into 3 pieces.
- 5 Add the diced lean pork fillet and cook on all sides until browned (about 8 minutes) then add the jerk seasoning and cook for a further minute.
- 6 Mix in the long grain rice and stir until coated in the spices.
- 7 Pour in the chopped tomatoes, stock, tomato purée, and red and yellow peppers.
- 8 Stir well, cover and simmer for 30 minutes, stirring occasionally (you may need to add extra liquid if it's a bit sticky).
- 9 Uncover for a further 10-15 minutes and leave the sauce to reduce, then add the spring onions, chilli (if using), and the fresh coriander.
- 10 Serve with crusty bread and make it even healthier by serving with extra steamed vegetables.



Spiced Sumac Welsh Lamb Kebabs with Cauliflower Couscous

Serves: 4

Preparation time: 30 minutes

Cooking time: 15 minutes

This is a great dish to serve at a barbecue. The kebabs are grilled so most of the fat will disappear during the cooking process. The jewel-like pomegranate seeds in the 'couscous' not only add a pop of colour but are also good for you. Sumac is a dried red spice traditionally used in Middle Eastern cooking. It has a tangy, sour flavour – a bit like lemon juice – and is readily available in supermarkets.

● Marinating ● Mixing ● Chopping ● Peeling ● Zesting ● Skewering ● Grilling ● Boiling ● Frying

You will need

Large bowl
Spoon
Cling film
Pre-soaked wooden skewers
Barbecue griddle pan (if using)
Small food processor or coarse grater
Chopping board
Chopping knife
Frying pan

Ingredients

800g boneless PGI Welsh Lamb neck,
cut into chunks

For the marinade:

3 tbsp sumac powder
2 tbsp oil
1 lemon, rind
½ lemon, juice
Seasoning

For the couscous:

1 head of cauliflower (thick stalks removed),
pulsed in processor or grated on coarse
grater
Dash of oil
1 or 2 tbsp pomegranate seeds
Handful of mint leaves, chopped
8 dried apricots, diced
6 dates, stoned and chopped
Small bunch of spring onions, sliced
1 lime, rind and juice
Pomegranate molasses to finish

Method

- 1 Mix all the ingredients for the marinade and add the lamb. Leave to marinate for at least 30 minutes.
- 2 Thread the lamb chunks onto pre-soaked wooden skewers. Cook under a hot grill, on a barbecue or in a griddle pan for approximately 10 minutes, turning and basting with the marinade.
- 3 To make the couscous, fry the cauliflower crumbs in hot oil for 5-6 minutes. Cool, then mix with the other ingredients. Serve with the kebabs and drizzle over the pomegranate molasses.



Welsh Lamb Stir-Fry with Ginger and Spring Onions

Serves: 4

Preparation time: 15 minutes

Cooking time: 15 minutes

This colourful dish is packed full of healthy vegetables and lean Welsh Lamb, and perhaps best of all, it's on the table in no time! If you've cooked too much, then it's also perfect for leftovers to eat another day - just make sure you store it in an air-tight container in the fridge and thoroughly reheat it in the microwave before serving.

● Grating ● Slicing ● Peeling ● Chopping ● Coating ● Frying ● Stir frying

You will need

Chopping boards x 2
Chopping knife
Mixing bowl
Spoon
Wok or large frying pan
Wooden spoon

Ingredients

2 lean PGI Welsh Lamb leg or rump steaks
1 tsp cornflour
Pinch of black pepper
3 tbsp reduced salt soy sauce
1 tbsp oil
5cm piece of fresh root ginger, peeled and thinly sliced
3 garlic cloves, peeled and thinly sliced
6 spring onions, finely sliced
1 large carrot, peeled and cut into thin batons or into thin circles
1 pack of sugar snap peas
75g broccoli florets
2 tbsp orange juice
Water (if required)
300g cooked noodles, to serve

Method

- 1 Slice the lamb into very thin slices and coat in the cornflour, add the black pepper and one tablespoon of soy sauce. Cover and leave to stand while you prepare the vegetables.
- 2 Heat the oil in a frying pan, add the lamb and cook over a high heat for approximately 5 minutes until nice and brown. Remove the meat from the pan and set aside.
- 3 To the same pan add the ginger and garlic and stir for a minute (add a dash of oil if required), then add the remaining vegetables, and stir over a high heat for 4 minutes.
- 4 Return the lamb to the pan and stir well. Add the orange juice and remaining soy sauce, add a little water, if required, to the sauce. Add the cooked noodles and stir well. Heat until the noodles are piping hot.



Welsh Beef Katsu

Serves: 4

Preparation time: 15 minutes

Cooking time: 20 minutes

Katsu is a type of curry from Japan. While curries can vary from mild to hot, the sauce in this recipe is on the milder side. Panko breadcrumbs are special Japanese breadcrumbs which are very light and crispy. The crispy breadcrumb coating on the beef and the smooth sauce give a lovely texture and contrast to the dish. Ginger, garlic and onion are often used together as a base for curries as they add an extra depth of flavour.

● Grating ● Chopping ● Peeling ● Making a sauce ● Coating ● Bread crumbing
● Frying ● Boiling ● Simmering

You will need

Chopping board
Chopping knife
Saucepan
Wooden spoon
Frying pan
3 shallow bowls or plates
Blender (optional)

Ingredients

For the marinade:

4 thin cut PGI Welsh Beef sirloin steaks
75g seasoned plain flour
1 large egg, beaten
75g panko breadcrumbs
(or make your own breadcrumbs)
25g golden breadcrumbs
Oil for shallow frying

For the sauce:

1 tsp vegetable oil
1 onion, finely chopped
2.5cm piece fresh root ginger, grated
2 garlic cloves, crushed
1 tbsp medium curry powder
2 tbsp plain flour
250ml chicken stock
1 tbsp soy sauce
1 tbsp honey

Method

- 1 Make the sauce by heating the oil in a pan and fry the onion for a few minutes to soften and start to colour. Add the garlic and ginger and cook for a few minutes.
- 2 Add the curry powder and flour and stir for a minute. Slowly add the stock, stirring all the time to avoid any lumps.
- 3 Add the honey and soy sauce. Boil, and then simmer for approximately 10 minutes. You may need to add more water if it is a bit thick. If you want a smooth sauce, place in a blender.
- 4 Take the steaks out of the fridge 20 minutes prior to cooking.
- 5 Put the flour, egg and breadcrumbs in 3 different shallow bowls or plates.
- 6 Dip the steaks in the flour, then the egg and then in the breadcrumbs, ensuring they are all coated.
- 7 To cook, gently heat the oil in a frying pan and cook the steaks over a low-medium heat until cooked – approximately 4-5 minutes each side. Rest for 5 minutes before slicing.
- 8 Serve with sticky rice and the delicious katsu curry sauce and a nice crisp salad or slaw.



Welsh Lamb, Pesto and Feta Pizza

Serves: 5+

Preparation time: 25 minutes

Cooking time: 20 minutes

Pizzas are often associated with fast food and unhealthy eating due to the amount of cheese added to them. Making your own pizza allows you to make sure that what - and how much - you put on it can be tasty as well as healthy. Follow the step-by-step guide below on how to create a healthy take on a family favourite.

● Rolling ● Shaping ● Spreading ● Making a dressing ● Chopping ● Frying ● Baking

You will need

1 large baking tray
Baking parchment
Rolling pin
Chopping board
Chopping knife
Non-stick griddle pan or frying pan
Tongs
Small bowl
Knife
Spoon
Brush for oil
Garlic press (optional)

Ingredients

225g boneless PGI Welsh Lamb leg steaks
(1 large or 2 small leg steaks)
Prepared fresh ready rolled pizza dough -
enough for 1 pizza
Seasoning
1 tbsp oil
1 aubergine, sliced lengthways
2 courgettes, sliced lengthways
100g reduced fat prepared green pesto
150g feta cheese, crumbled
1 pomegranate, seeds only
Handful of rocket leaves


For the dressing:

1 lemon, zest and juice
50ml extra virgin olive oil
1 garlic clove, crushed or finely chopped

Method

- 1 Heat the oven to 220°C / 200°C fan / Gas 7.
- 2 Line a large baking tray with baking parchment.
- 3 On a floured surface, roll out the dough into a thin rough oval shape and place on the tray. Leave to stand for a few minutes.
- 4 Heat a non-stick griddle or frying pan until hot and brush with oil. Lightly char the courgette and aubergine slices on both sides for a few minutes.
- 5 Spread the pesto over the dough. Top with slices of courgette and aubergine.
- 6 Place the pizza in the oven and cook for 15-20 minutes until the base is crisp.
- 7 While the pizza is in the oven, cook the lamb steak. Drizzle a little oil over the steak on both sides and cook for 4-5 minutes on each side, season and allow to rest for a few minutes, then cut into slices.
- 8 In a small bowl, mix the dressing ingredients together and set aside.
- 9 When the pizza is cooked, top with the feta, pomegranate seeds, rocket leaves and sliced lamb.
- 10 Drizzle with the lemon dressing and serve immediately.

Tip: To save time, we've used 'ready to use' chilled pizza dough or you can make your own dough or use a dough mix, where you just add water and follow the instructions on the pack. We've topped our pizza with sliced cooked lamb leg steak but you could use leftover roast lamb if you prefer.



Welsh Beef Lasagne

Serves: 5+

Preparation time: 25 minutes

Cooking time: 1 hour 5 minutes

Always a popular Italian dish which can be served with a crisp side salad and portion of garlic bread. Using the best lean Welsh minced beef makes this dish superior by far to any ready prepared lasagne.

● Making a sauce ● Grating ● Layering ● Chopping ● Peeling ● Sprinkling ● Frying ● Baking

You will need

Chopping knife
Chopping board
Large frying pan or saucepan
Wooden spoon x 2
Small saucepan
Oven proof dish

Ingredients

450g lean PGI Welsh Beef mince
1 large onion, chopped
2 garlic cloves, crushed
2 celery sticks, finely chopped
2 red peppers, finely chopped
2 carrots, grated
400g tin of chopped tomatoes
2 tbsp tomato purée
150ml beef stock
1 tsp mixed herbs
Seasoning

For the cheese sauce:

50g unsalted butter
50g plain flour
500ml whole milk
1 tsp Dijon mustard
100g mature cheddar cheese, grated
12 lasagne sheets

Method

- 1 Preheat the oven to 200°C / 180°C fan / Gas 6.
- 2 Dry fry the lean minced beef until brown. Add the onion, garlic, celery, and fry until softened. Add the remaining ingredients, stir, and simmer for 20 minutes.
- 3 To make the cheese sauce, melt the butter in a pan, adding the flour and stirring well for about a minute. Slowly add the milk and bring to boil. Add the mustard and taking the pan off the heat, add 75g of the cheese.
- 4 In an ovenproof dish, layer the mince mixture with lasagne sheets, creating 3-4 layers. Top with the cheese sauce, sprinkling the remaining cheese on top.
- 5 Place in the oven on the middle shelf for 45 minutes until the pasta is soft and the cheese is golden brown.



Where can I get more advice?

Hybu Cig Cymru – Meat Promotion Wales is here to help you. If you have any queries about PGI Welsh Lamb, PGI Welsh Beef or Porc Blasus, please contact us through:

01970 625050 info@hybucig.cymru

