

## Meat consumption

Around the world, the main meat-consuming country is USA (95.4 kg of meat per person per year), followed by Australia (92.5 kg), Argentina (86.3 kg), Israel (81.3 kg), Brazil (75.2 kg), New Zealand (74.8 kg) and the European Union (63.3 kg).

In Spain each person consumed 50kg of meat during 2015 (37% chicken, 29% pork, 15% beef, 4-5% sheep and goat; the rest made up of other species like rabbit or turkey).

## Meat production

Worldwide in 2015 60 million tonnes of beef, 110 million tonnes of pork and almost 90 million tonnes of chicken were produced.

In order to produce such quantities of meat millions of animals are required. In 2015, in the European Union 25 million cows were slaughtered; 4.8 million goats, 250 million pigs, 7 billion chickens and 44 million sheep.

## BEHAVIOUR AND CHARACTERISTICS OF THE ANIMALS USED

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### Cows

The cow (female), or bull (male, *Bos primigenius taurus* / *Bos taurus*), is a mammal from the bovine family.

It is a gregarious species, meaning that it tends to live in herds with hierarchies established through confrontations for dominance. As they are herbivores and a "prey" species, they live in a constant state of alert and fear is a huge stress factor for them, both in their surroundings, noises or nearby unknown animals, or fear of mankind.

They have panoramic vision of about 300° without moving their head, but their monocular vision, meaning, next to the animal, is less sharp and they have difficulty assessing the landscape and depth. Their sense of smell is also very well developed and, like sheep, plays an important role in relationships, as it serves to communicate with each other.

In normal conditions, in other words when they are roaming wild, cows most of their day eating (grazing), including searching for food, moving from place to place, and ruminating (which takes up 5 - 9 hours a day). Grazing is carried out during the day, especially early in the morning and at dusk, although they may also eat at night. Later they spend between 5 and 9 hours resting, although they may be drowsy from 8 hours, they only truly sleep for 4 hours. Altering this pattern provokes behavioural problems.

These animals show a tendency to investigate and familiarise themselves with their environment. However, in confinement these explorations are reduced and their senses end up getting blocked.

Cows may live up to 20 years, although the conditions under which they are subjected in current production systems have reduced longevity by more than half.

These animals have experienced a large number of varieties through artificial reproduction techniques and genetic selection, driven by mankind to maximise their performance and increase production of meat and milk. Thanks to these changes they frequently suffer from heart diseases and problems of mobility, among other things.

One of the most alarming facts is that of the Belgian Blue breed, known as the super beef race, created following an intensive genetic selection, which has a mutation in the myostatin gene, responsible for controlling muscle growth. This causes these animals to grow excessively. Two thirds of the births of the Belgian Blue breed have to be via Caesarean section because the calf is too big to be delivered through the birth canal.

Cows are restricted to pens and have limited mobility, especially dairy cows, which causes them much stress. Many of these animals live in conditions which are insufficient for their needs, such as having dirty or wet legs, and with facilities which are inadequate for resting or moving around. This gives rise to other problems, such as lameness, infections in their hooves or teats.

## Sheep and goats

Sheep or domestic ovine belong to the bovine family and come from three wild species: *Ovis orientalis*, *Ovis musimon* and *Ovis vignei*. From these 3 species nowadays there are over 200 breeds all over the world.

They also have panoramic vision of 300°, although they cannot see clearly until the object is within their angle of vision (of both eyes combined), which is 25-50°. Their difficulty in focussing on close objects quickly explains the problem they have judging depth, which means that in poorly lit areas or in shady places they become frightened and stop dead in their tracks. When this happens their sense of smell also helps them to establish relationships, and thus recognise their mothers and the rest of the group.

In their natural state sheep spend most of their time searching for food and eating, known as grazing, and in order to do that they need to be able to move about. The time of most activity tends to coincide with the hours of most sunlight, however a peak of activity has been detected between 10am and 4pm in the winter, and 6pm in the summer, depending on the temperature and the possibility of finding shade and rest. During this time they usually take breaks in order to rest, which range from 20 minutes up to an hour and a half. When they eat they do so at ground level, so in intensive farming they are given their feed directly onto the ground of the pens or the eating area. When they live on extensive farms and they have the chance to graze, they tend to be quite selective and when discarding foods they use criteria such as the quantity of dry material, the morphology of the plants or presence of other animals.

Sheep are social animals which establish very stable groups and create strong links between members of the flock. They are herbivores and “prey” and when something scares them they come together to make big groups, and even on the farm, they always keep their distance from humans. Nevertheless, this has also converted them into very tough animals that can bear great pain or diseases, so as not to show symptoms of vulnerability to predators.

Goats or kids (*Capra aegagrus hircus*) is a mammal which also belongs to the bovine family and was domesticated around 8,000 B.C. for both its meat and its milk.

Goats are gregarious and are animals which have a reduced body structure, amazing agility and great resilience.

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They feed mainly on leaves, flowers and fruit which they pick from bushes and trees, known as foraging, and in order to feed in this way they often get up on their hind legs. The great attraction they have for eating actually means they can ingest high quantities of food which is toxic for them. They are more inquisitive and less fearful than sheep and they tend to approach a strange presence instead of running away from it.

In the wild they are excellent climbers and can easily get onto roofs, tree branches or high rocky areas. They don't like eating feed from the floor of their pen, or the hay that is often put into their feeding troughs in farms. So, being shut up in a pen, deprived of the chance to jump and explore in search of food may be the cause of great frustration.

## Pigs

The pig (*Sus scrofa domesticus*) was domesticated in 7,000 BC and since then has suffered an excessive genetic modification where the animals with better productive performance (higher daily weight gain, better fertility, etc.) were selected. Even so, the pigs which are bred on farms nowadays retain much of their natural behaviour and have needs and basic instincts which present serious problems of wellbeing, especially in intensive systems.

In natural conditions pigs spend most of their waking hours rooting for food (digging in the dirt with their snout), mainly to feed themselves. To keep cool and protect themselves from the sun, at high temperatures, they need water or puddles to splash in, and if the area is big enough, even to swim. Females nest when its time to give birth, so they look for materials with which to make a bed to lie on and to keep the piglets warm. They are considered the most intelligent animals in the world, even more so than dogs according to experts.

On the farms which do not have nesting material the frequency of stereotypy (repetitive behaviour without any apparent function, which is a sign of a lack of wellbeing and may cause injury to the animal) increases, as does biting the bars of the cage or compulsively activating the drinking trough.

Pigs are social animals and establish strong hierarchies. These hierarchies mean a serious problem when it comes to access to resources such as food or water, as they are the cause of fights or the biting of tails.

## Chicken

Chicken is the name given to young hens, *Gallus domesticus*. This species comes from the red jungle chicken (*Gallus gallus*) and in its natural habitat would spend most of the time searching for food and pecking the floor. They are social and territorial animals that establish hierarchies through which, mainly, access to resources is determined.

Hens' skin is covered in receptors, especially in the areas without feathers (such as the beak, meaning they feel pain when it is cut), so they are highly sensitive to touch and changes in temperature (because they don't have sweat glands). To dissipate the heat they usually hold their feathers erect or raise their wings. In cramped conditions it's very difficult to do this.

Hens are social and territorial animals that establish hierarchies through which access to the main resources is determined. Genetic selection to produce more meat has meant their muscles are developed exceedingly quickly, up to 4 times faster than they did originally. As a result it is common that they have metabolic disorders, heart diseases and reduction of mobility. Due to the location of the diaphragm they have air sacs in the cervical area, chest and abdomen, and the bones in these areas are easily broken.

Living in cramped conditions, and without the necessary space or material to carry out their natural behaviour is a cause of great frustration and serious health problems.

They need periods of rest and darkness, in fact, if they get less than 4 hours of continuous darkness their corneas and retinas may get damaged. However, it is common in chicken production to have artificial light for as much as 23 hours, to stimulate digestion and so that they grow faster.

## PRODUCTION SYSTEMS

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### Beef

This meat is generally obtained from calves that have either been farmed on a grazing system or with artificial feeding (suckler cows).

Many of the calves used in Spain come from other European countries: Poland, France, Germany, Ireland and Italy. Later they are reared mainly in Catalonia and Aragon, where farms have an average of 500-1,000 animals.

The calves used for grazing are usually only with their mothers until 5-7 months of age, until they weigh 180-200 Kg, when they are separated from them and taken to feedlots.

Cows have their first calving at 2-3 years of age and they are exploited in this way 5 or 6 times over a 7 year period. Suckling calves receive artificial lactation and start to eat solids after 2-3 weeks of life. (These calves are usually the offspring of dairy cows.)

Later they are taken to the feedlots in order to fatten up before being slaughtered. The most common feedlot in Spain is made up of a simple bed of straw, some drinking troughs and feeding troughs. There is no unified directive of obligatory compliance for calf feedlots, about the size of the pens or the facilities.

Cattle breeders try to take into account the climatic conditions and market demand mainly when planning the calving. If the calves are born at the beginning of autumn, stay there 7-8 months, are fattened up for 6 months and are slaughtered just before the Christmas period, the time when meat reaches the highest prices.

### Goat meat

On Spanish farms goat farming for meat production is achieved through natural breeding, the practice of artificial insemination is only used for reasons of genetic modification. In order to get the animals to reproduce, the females undergo hormone treatment (vaginal sponges), or the technique of "the male effect" in order to produce in batches and control the timing of the births and productive rhythm, which must be as high as possible.

Goats have 1 birth per year and natural lactation may last for 3-5 weeks, until the kid is 7-12 Kg live weight (suckling), or lactation may be artificial, for 5 weeks achieving kids of 11 to 13 Kg.

Suckling kids usually come from milk production, the males which are not used in this type of farming; although in some farms this may also be established as the principal product, especially in those with a lot of space.

The production of goat meat is usually associated with a more traditional system, with a lot of space, and where the animals feed off grass because they have access to grasslands. There are no farms of goat meat where the animal is confined to a reduced space.

## Mutton

Depending on the type of food, the weight and age at time of slaughter there are several types of lamb meat. The most widely consumed in Spain are the "recental" (lamb younger than 4 months and less than 9 Kg, weaned and fed on natural feeds, offspring of milking sheep). Another common type is the "lechal" (lambs exclusively fed on mother's milk and slaughtered after 35-40 days).

Just like goats, as the reproduction of the animals for meat production essentially comes from natural breeding, the females undergo hormone treatment (vaginal sponges) in order to achieve maximum exploitation.

Sheep tend to have their first lambing at between 10 and 13 months of age, from then on they lamb once per year, or if there is reproductive planning they may lamb 3 times in 2 years, with a 4-5 month resting period. Females are generally lamb 7 times during their lifetime, meaning they remain in the farm for 7-8 years, which is the age of culling (when they are sent away because they are no longer considered "useful" and replaced by other, younger sheep). Gestation lasts about 5 months and lambs are usually weaned after 30 days. Sheep are naturally seasonal poliestric, meaning they are on heat when the days start to get shorter, in autumn, so that the lambing takes place when the days start to get longer, in Spring. In farms this is also controlled and manipulated so as to be able to choose the best date to get the lambs on the market.

## Pork

90% of pork production is carried out following an intensive system, which maximises profitability in all areas.

The females of the breeds used have been selected to have highly efficient indexes of reproduction, so that each sow has 2.2 litters each year, giving 11 live piglets per litter. Sows are used for 2 or 3 years before being slaughtered.

During this time the females are exploited, from the age of 7-8 months, to produce piglets. They are mated with sperm, generally through artificial insemination, until pregnancy is confirmed. They are moved to facilities for expectant mothers, where they live in groups until a week before birth. At which point they are transferred to farrowing crates, individual cages where they have just enough space to lie down and get up, but not enough to turn around. They give birth in these cages, and they are kept there until weaning, usually after 21-28 days. The cages are designed so that mothers don't smother the piglets when they lie down, leaving the babies a wider space around the mother with a warm lamp and space from where they can suckle. However, it doesn't always go as planned and many die under the weight of their own mother. The piglets can access their mother when they want, but the mother has no way of "escaping" them. These restrictions of movement and the feeling of hunger (Their food is restricted) generates stress in the sows, which present stereotypies and even the risk of urinary infections. Once the piglets are weaned, the mothers are inseminated again after only one week, and a new cycle begins.

24-48 hours after their birth piglets are labelled (normally with an ear tag), their tails and tusks are cut off, the males are castrated and they are jabbed with a dose of Iron and vitamins A, D and E, which they need

due to the conditions in which they live. The death rate, due to smothering or weakness in the phase is about 10-15%.

Later, having been separated from their mothers and mixed with other piglets in batches, in pens with a density of 4-5 piglets per m<sup>2</sup>, they tend to suffer a great period of stress, displaying abnormal behaviour, anorexia and fights. They are kept there until they reach 20-25 Kg and mortality is between 3 and 10%.

Once they reach this weight they are transferred to pens where they will live in groups of 10-30 animals. During this period they also suffer situations of anxiety due to the stress, the temperature, the lack of ventilation and density, which may get very high as they grow (about 800 grams per day). When they reach the weight for slaughter, which is usually around 100 Kg and 23-25 weeks of age, they are transported to slaughterhouses.

Some males and females from these batches are selected or in other farms males and females are bred to be used as mothers and fathers, so they are treated differently. The females enter into the cycle of motherhood previously mentioned, and the males are converted into what are known as "boars" and live in a 6 m<sup>2</sup> pen their whole life. They are used for natural breeding or to get close to the sow at the moment of insemination in order to detect which are on heat.

In the systems where the animals have access to open air, such as the system of the Iberian pig, the techniques are much less intensive. Instead they suffer other inconveniences like nose ringing (putting one or two nose rings in their nostrils to stop them from destroying the land when they forage; the ring causes them pain and they do it less) or castration of the females (and not always following the legislation that the surgery should be carried out by a vet, under anaesthetic and analgesic).

Male castration is done to stop them from developing undesired sexual or aggressive conduct, and especially to avoid the sexual smell (from skatole and androsterone) in the final product (the meat). In females the reasons are more aimed at ensuring an increase in weight (when they are on heat they are more active and it could lower) and prevent them being impregnated, for example, by wild boar. From 1st January 2012 castration must be carried out with analgesic and anaesthetic, although even [according to the FVE](#), it appears that this ruling is still not applied in many places. According to a [Declaration in Brussels in 2010](#), as from 2018 this practice must be given up, substituting it for alternative methods such as immunocastration.

[Directive 2008/120/CE of the Committee of 18 of December 2008 relating to the minimum rules for the protection of pigs.](#)

[Royal Decree 1221/2009, 17 of July, by which the basic rules of ordinance of extensive pig farming are established.](#)

## Chicken

Chicken meat comes both from the males and the females of breeds known as "heavy", which have been selected to have a high growth rate and a large quantity of muscular mass in the breast and leg.

First the breeding stock must be bred, these produce eggs, which are incubated in order to get chickens.

In the breeding farms the hens' feeding is restricted until week 18 or 23, when they are taken to the laying sheds, where they stay until 64 weeks of age. They are placed together with males at a ratio of 6-10 males per 100 females. The barn system is used on these farms, with a high level of mechanisation and a space

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equivalent to 4 animals per m<sup>2</sup>. Following this period the chickens used for reproduction are slaughtered. Each female produces 175 eggs for the incubator, from which 148 chicks will hatch and be fattened up.

The chicks are taken to the fattening sheds at one day old, both males and females, and will stay there until the end. This is also a barn system, in which the hours of light and darkness is adjusted to foster growth. During the first week they are only allowed one hour of darkness every 24 hours, during which time their weight increases five-fold. If this is sustained a long time in order to boost rapid growth, the chicks suffer from arthritis, problems of movement and there are sudden deaths. Generally, after a week of age, the periods of darkness are progressively increased until it is time to take them to the slaughterhouse. A few days previous to this the periods of darkness are again reduced.

Using the above system 35- to 42-day-old chickens reach 1.8 - 2.5 Kg of live weight, when it is time to transport them to the slaughterhouse following 10-12 hours starvation.

The animals known as "capons" are males which have been castrated at 6-10 weeks and have been fattened up for 3-9 months until they are 3.5 - 5.5 Kg live weight.

Royal Decree 692/2010, 20 of May which establishes the minimum rules for the handling of chickens destined for meat production.

## Transportation

The ruling on the protection of animals during transportation is [CE n° 1/2005](#), and only applies to the transportation of animals carried out as an economic activity.

A "long journey" is defined as one which lasts more than 8 hours from the time of departure.

This ruling establishes that animals must be offered food, water and rest periods at sufficient intervals and in qualitative and quantitative conditions which are adequate for the species and size. In other words all modes of transport should be built, designed and maintained so that they avoid injury and suffering to the animals, protects them from the weather, ensures cleanliness and disinfection, and offers sufficient space and ventilation, etc. In the case of pigs < 10 Kg, lambs < 20 Kg, calves < 6 months and foals of less than 4 months adequate bedding should be provided, guaranteeing comfort to the animals during transportation. Unfortunately, these rulings are currently systematically violated throughout Europe and a large number of animals are transported in deplorable conditions.

A large part of the problem for animals during transportation is at the time of loading and unloading, for this reason the European legislation establishes a specific prohibition on hitting the animals or using techniques such as electric shock (although it is allowed on adult cows and pigs on their hindquarters for 1 second maximum), spikes and binds. Just as has been reported through several investigations across Europe ([Eurogroup for Animals campaign #StopTheTrucks](#)), these conditions are violated when animals are taken to third countries to be slaughtered and consumed in the place of destination. A problem which is very well known by European governments.

In spite of the ruling animal death rate during transportation to the slaughterhouse is high due to high temperatures, difficult access to water and bad ventilation. Furthermore, animals are frequently injured in this process, either because they slip at the time of loading or unloading, or because something happens during transportation.

## Slaughter

In accordance with the legislation all animals (with exceptions for religious reasons) must be stunned before provoking their death. Stunning is the process through which the animal loses consciousness so that slaughter causes them no pain.

Generally, mechanical methods of stunning, such as a non-penetrative captive bolt pistol, which causes serious brain damage and therefore loss of consciousness are usually used for ruminants and pigs.

In some slaughter houses electric shock methods are used, usually limited to the head, adjusting the voltage and the current for each specific species in order to cause unconsciousness in the animal, whatever the species. Head-torso electrocution in sheep, goats and pigs. With poultry an electrified water bath is used, while the animal hangs upside down. With pigs and poultry gasses are also used (carbon monoxide or CO<sub>2</sub>) inside a chamber.

The operators who carry out these operations must be highly trained in order to ensure that it is done correctly. However, this does not always happen and the animals are often not stunned sufficiently, because they do it in the wrong place, with the wrong intensity or for an insufficient length of time; and the animal is conscious at the time of slaughter.

In all species death is usually caused through bleeding. The slaughterer cuts through the venous plexus in the neck when the animal is hanging upside down so that the blood gushes out and the animal dies. A vet is present in order to assess that the stunning is correctly carried out and to take samples of some of the carcasses, with which they will verify whether or not the meat is fit for human consumption. Nevertheless, as we have pointed out, the stunning methods for the different species is not always effective and many animals end up being slaughtered while still conscious.

It should be added that there are also exceptions to this legislations, like for religious slaughter (Halal and Kosher), which involves the slaughter of animals without stunning. These slaughterings take place in Spain and the whole of Europe, in special areas of conventional slaughterhouses and under specific conditions.

[REG 1099/2009. regarding animal protection at the moment of slaughter.](#)

## Complementary information

[CIWF – Compassion in World Farming.](#)

[FAWEC – Farm Animals Welfare Education Centre.](#)

[AWIN – Animal Welfare Indicators.](#)

[MAPAMA – Ministry of Agriculture and Fisheries, Food and Environment.](#)

[FAO – Food and Agriculture Organization of the United Nations.](#)

[OECD – The Organisation for Economic Co-operation and Development.](#)

[USDA – U. S. Department of Agriculture.](#)

[SITRAN – Integral Animal Traceability System.](#)