

Animal husbandry

Animal husbandry is the branch of [agriculture](#) concerned with [animals](#) that are raised for [meat](#), [fibre](#), [milk](#), or other products. It includes day-to-day care, [selective breeding](#) and the raising of [livestock](#). Husbandry has a long history, starting with the [Neolithic revolution](#) when animals were first [domesticated](#), from around 13,000 BC onwards, predating farming of the [first crops](#). By the time of early civilisations such as [ancient Egypt](#), [cattle](#), [sheep](#), [goats](#) and [pigs](#) were being raised on farms.



Cattle feedlot in [Colorado](#), United States

Major changes took place in the [Columbian exchange](#) when Old World livestock were brought to the New World, and then in the [British Agricultural Revolution](#) of the 18th century, when livestock breeds like the [Dishley Longhorn](#) cattle and [Lincoln Longwool](#) sheep were rapidly improved by agriculturalists such as [Robert Bakewell](#) to yield more meat, milk, and [wool](#). A wide range of other species such as [horse](#), [water buffalo](#), [llama](#), [rabbit](#) and [guinea pig](#) are used as livestock in some parts of the world. [Insect farming](#), as well as [aquaculture](#) of [fish](#), [molluscs](#), and [crustaceans](#), is widespread. Modern animal husbandry relies on [production systems](#) adapted to the type of land available. [Subsistence farming](#) is being superseded by [intensive animal farming](#) in the more developed parts of the world, where for example beef cattle are kept in high density [feedlots](#), and thousands of [chickens](#) may be raised in broiler houses or [batteries](#). On poorer soil such as in uplands, animals are often kept more extensively, and may be allowed to roam widely, foraging for themselves.

Most livestock are [herbivores](#), except for pigs and chickens which are [omnivores](#). [Ruminants](#) like cattle and sheep are adapted to feed on grass; they can forage outdoors, or may be fed entirely or in part on rations richer in energy and protein, such as pelleted cereals. Pigs and poultry cannot digest the [cellulose](#) in forage, and require other high-protein foods.

Etymology

The verb *to husband*, meaning "to manage carefully," derives from an older meaning of [husband](#), which in the 14th century referred to the ownership and care of a household or farm, but today means the "control or judicious use of resources," and in agriculture, the cultivation of plants or animals.^[1] [Farmers](#) and [ranchers](#) who raise livestock are considered to practice *animal husbandry*.

History

Birth of husbandry



The domestication of ruminants, like these [fat-tailed sheep](#) in Afghanistan, provided [nomads](#) across the Middle East and central Asia with a reliable source of food.

The [domestication](#) of livestock was driven by the need to have food on hand when hunting was unproductive. The desirable characteristics of a domestic animal are that it should be useful to the domesticator, should be able to thrive in his or her company, should breed freely, and be easy to tend.^[2]

Domestication was not a single event, but a process repeated at various periods in different places. Sheep and goats were the animals that accompanied the [nomads](#) in the Middle East, while cattle and pigs were associated with more settled communities.^[3]

The first wild animal to be domesticated was the [dog](#). Half-wild dogs, perhaps starting with young individuals, may have been tolerated as scavengers and killers of vermin, and being naturally [pack hunters](#), were predisposed to become part of the human pack and join in the hunt. Prey animals, sheep, goats, pigs and cattle, were progressively domesticated early in the history of agriculture.^[3]

Pigs were domesticated in the [Near East](#) between 8,500 and 8000 BC,^[4] sheep and goats in or near the [Fertile Crescent](#) about 8,500 BC,^[5] and cattle from wild [aurochs](#) in the areas of modern Turkey and Pakistan around 8,500 BC.^[6]

A cow was a great advantage to a villager as she produced more milk than her calf needed, and her strength could be put to use as a [working animal](#), pulling a plough to increase production of crops, and drawing a sledge, and later a cart, to bring the produce home from the field. Draught animals were first used about 4,000 BC in the Middle East, increasing agricultural production immeasurably.^[3] In southern Asia, the [elephant](#) was domesticated by 6,000 BC.^[7]

Fossilised chicken bones dated to 5040 BC have been found in northeastern China, far from where their wild ancestors lived in the jungles of tropical Asia, but archaeologists believe that

the original purpose of domestication was for the sport of cockfighting.^[8]

Meanwhile, in South America, the llama and the alpaca had been domesticated, probably before 3,000 BC, as beasts of burden and for their wool. Neither was strong enough to pull a plough which limited the development of agriculture in the New World.^[3]

Horses occur naturally on the steppes of Central Asia, and their domestication, around 3,000 BC in the Black Sea and Caspian Sea region, was originally as a source of meat; use as pack animals and for riding followed. Around the same time, the wild ass was being tamed in Egypt. Camels were domesticated soon after this,^[9] with the Bactrian camel in Mongolia and the Arabian camel becoming beasts of burden. By 1000 BC, caravans of Arabian camels were linking India with Mesopotamia and the Mediterranean.^[3]

Ancient civilisations



Milking cattle in ancient Egypt

In ancient Egypt, cattle were the most important livestock, and sheep, goats, and pigs were also kept; poultry including ducks, geese, and pigeons were captured in nets and bred on farms, where they were force-fed with dough to fatten them.^[10]

The Nile provided a plentiful source of fish. Honey bees were domesticated from at least the Old Kingdom, providing both honey and wax.^[11]

In ancient Rome, all the livestock known in ancient Egypt were available. In addition, rabbits were domesticated for food by the first century BC. To help flush them out from their burrows, the polecat was domesticated as the ferret, its use described by Pliny the Elder.^[12]

Medieval husbandry



Shepherd with sheep in woven hurdle pen. Medieval France. 15th century, MS Douce 195

In northern Europe, agriculture including animal husbandry went into decline when the Roman empire collapsed. Some aspects such as the herding of animals continued throughout the period. By the 11th century, the economy had recovered and the countryside was again productive.^[13]

The *Domesday Book* recorded every parcel of land and every animal in England: "there was not one single hide, nor a yard of land, nay, moreover ... not even an ox, nor a cow, nor a swine was there left, that was not set down in [the king's] writ."^[14] For example, the royal manor of Earley in Berkshire, one of thousands of villages recorded in the book, had in 1086 "2 fisheries worth [paying tax of] 7s and 6d [each year] and 20 acres of meadow [for livestock]. Woodland for [feeding] 70 pigs."^[15]

The improvements of animal husbandry in the medieval period in Europe went hand in hand with other developments. Improvements to the plough allowed the soil to be tilled to a greater depth. Horses took over from oxen as the main providers of traction, new ideas on crop rotation were developed and the growing of crops for winter fodder gained ground.^[16] Peas, beans and vetches became common; they increased soil fertility through nitrogen fixation, allowing more livestock to be kept.^[17]

Columbian exchange

Exploration and colonisation of North and South America resulted in the introduction into Europe of such crops as maize, potatoes, sweet potatoes and manioc, while the principal Old World livestock – cattle, horses, sheep and goats – were introduced into the New World for the first time along with wheat, barley, rice and turnips.^[18]

Agricultural Revolution



The [Lincoln Longwool](#) breed was improved by [Robert Bakewell](#) in the 18th century.

[Selective breeding](#) for desired traits was established as a scientific practice by [Robert Bakewell](#) during the [British Agricultural Revolution](#) in the 18th century. One of his most important breeding programs was with sheep. Using native stock, he was able to quickly select for large, yet fine-boned sheep, with long, lustrous wool. The [Lincoln Longwool](#) was improved by Bakewell and in turn the Lincoln was used to develop the subsequent breed, named the New (or Dishley) Leicester. It was [hornless](#) and had a square, meaty body with straight top lines.^[19] These sheep were exported widely and have contributed to numerous modern breeds. Under his influence, English farmers began to breed [cattle](#) for use primarily as beef. Long-horned heifers were crossed with the Westmoreland bull to create the [Dishley Longhorn](#).^[20]

The semi-natural, unfertilised pastures formed by traditional agricultural methods in Europe were managed by grazing and mowing. As the ecological impact of this land management strategy is similar to the impact of such natural disturbances as a [wildfire](#), this agricultural system shares many beneficial characteristics with a natural habitat, including the promotion of [biodiversity](#). This strategy is declining in Europe today due to the intensification of agriculture. The mechanized and chemical methods used are causing biodiversity to decline.^[21]

Husbandry

Systems



Herdwick sheep in an extensive hill farming system, Lake District, England

Traditionally, animal husbandry was part of the [subsistence farmer's](#) way of life, producing not only the food needed by the family but also the fuel, fertiliser, clothing, transport and draught power. Killing the animal for food was a secondary consideration, and wherever possible its products such as wool, eggs, milk and blood (by the [Maasai](#)) were harvested while the animal was still alive.^[22] In the traditional system of [transhumance](#), people and livestock moved seasonally between fixed summer and winter pastures; in [montane](#) regions the summer pasture was up in the mountains, the winter pasture in the valleys.^[23]

Animals can be kept extensively or intensively. Extensive systems involve animals roaming at will, or under the supervision of a herdsman, often for their protection from [predators](#). [Ranching](#) in the [Western United States](#) involves large herds of cattle grazing widely over public and private lands.^[24] Similar cattle stations are found in South America, Australia and other places with large areas of land and low rainfall. Ranching systems have been used for [sheep](#), deer, [ostrich](#), [emu](#), [llama](#) and [alpaca](#).^[25]

In the uplands of the United Kingdom, sheep are turned out on the fells in spring and graze the abundant mountain grasses untended, being brought to lower altitudes late in the year, with supplementary feeding being provided in winter.^[26] In rural locations, [pigs](#) and [poultry](#) can obtain much of their nutrition from scavenging, and in African communities, hens may live for months without being fed, and still produce one or two eggs a week.^[22]



Pigs in an [intensive system](#), [Midwestern United States](#)

At the other extreme, in the more developed parts of the world, [animals are often intensively managed](#); dairy cows may be kept in zero-grazing conditions with all their forage brought to them; beef cattle may be kept in high density [feedlots](#),^[27] pigs may be housed in climate-controlled buildings and never go outdoors,^[28] poultry may be reared in barns and kept in cages as laying birds under lighting-controlled conditions. In between these two extremes are semi-intensive, often family-run farms where livestock graze outside for much of the year, silage or hay is made to cover the times of year when the grass stops growing, and fertiliser, feed, and other inputs are brought onto the farm from outside.^[29]

Feeding



[Cattle](#) around an outdoor feeder

Animals used as livestock are predominantly [herbivorous](#), the main exceptions being the pig and the chicken which are omnivorous. The herbivores can be divided into "concentrate selectors"

which selectively feed on seeds, fruits and highly nutritious young foliage, "grazers" which mainly feed on grass, and "intermediate feeders" which choose their diet from the whole range of available plant material. Cattle, sheep, goats, deer and antelopes are [ruminants](#); they digest food in two steps, chewing and swallowing in the normal way, and then regurgitating the semidigested cud to chew it again and thus extract the maximum possible food value.^[30] The dietary needs of these animals is mostly met by eating grass. Grasses grow from the base of the leaf-blade, enabling it to thrive even when heavily grazed or cut.^[31]

In many climates grass growth is seasonal, for example in the temperate [summer](#) or tropical [rainy season](#), so some areas of the crop are set aside to be cut and preserved, either as [hay](#) (dried grass), or as [silage](#) (fermented grass).^[32] Other forage crops are also grown and many of these, as well as crop residues, can be ensiled to fill the gap in the nutritional needs of livestock in the lean season.^[33]



Cattle feed pellets of pressed [linseed](#)

Extensively reared animals may subsist entirely on forage, but more intensively kept livestock will require energy and protein-rich foods in addition. Energy is mainly derived from cereals and cereal by-products, fats and oils and sugar-rich foods, while protein may come from fish or meat meal, milk products, [legumes](#) and other plant foods, often the by-products of vegetable oil extraction.^[34] Pigs and poultry are non-ruminants and unable to digest the [cellulose](#) in grass and other forages, so they are fed entirely on cereals and other high-energy foodstuffs. The ingredients for the animals' rations can be grown on the farm or can be bought, in the form of pelleted or cubed, compound foodstuffs specially formulated for the different classes of livestock, their growth stages and their specific nutritional requirements. Vitamins and minerals are added to balance the diet.^[35] Farmed fish are usually fed pelleted food.^[35]

Breeding

The breeding of farm animals seldom occurs spontaneously but is managed by farmers with a view to encouraging traits seen as desirable. These include hardiness, fertility, docility, mothering abilities, fast growth rates, low feed consumption per unit of growth, better body proportions, higher yields, and better fibre qualities. Undesirable traits such as health defects and aggressiveness are selected against.^{[36][37]}

Selective breeding has been responsible for large increases in productivity. For example, in 2007, a typical broiler chicken at eight weeks old was 4.8 times as heavy as a bird of similar age in 1957,^[36] while in the thirty years to 2007, the average milk yield of a dairy cow in the United States nearly doubled.^[36]

Animal health



Vaccinating a goat, Niger

Good husbandry, proper feeding, and [hygiene](#) are the main contributors to animal health on the farm, bringing economic benefits through maximised production. When, despite these precautions, animals still become sick, they are treated with [veterinary medicines](#), by the farmer and the [veterinarian](#). In the European Union, when farmers treat their own animals, they are required to follow the guidelines for treatment and to record the treatments given.^[38] Animals are susceptible to a number of diseases and conditions that may affect their health. Some, like [classical swine fever](#)^[39] and [scrapie](#)^[40] are specific to one type of stock, while others, like [foot-and-mouth disease](#) affect all [cloven-hoofed](#) animals.^[41] Animals living under intensive conditions are prone to internal and external [parasites](#); increasing numbers of [sea lice](#) are affecting farmed

salmon in Scotland.^[42] Reducing the parasite burdens of livestock results in increased productivity and profitability.^[43]

Where the condition is serious, governments impose regulations on import and export, on the movement of stock, [quarantine](#) restrictions and the reporting of suspected cases. [Vaccines](#) are available against certain diseases, and antibiotics are widely used where appropriate. At one time, antibiotics were routinely added to certain compound foodstuffs to promote growth, but this practice is now frowned on in many countries because of the risk that it may lead to [antimicrobial resistance](#) in livestock and in humans.^[44]



Familiar livestock: ink and watercolour drawing of a farmyard with cow, horse, pigs, and chickens, 1869

Governments are concerned with [zoonoses](#), diseases that humans may acquire from animals. Wild animal populations may harbour diseases that can affect domestic animals which may acquire them as a result of insufficient [biosecurity](#). An outbreak of [Nipah virus](#) in Malaysia in 1999 was traced back to pigs becoming ill after contact with fruit-eating [flying foxes](#), their faeces and urine. The pigs in turn passed the infection to humans.^[45] Avian flu [H5N1](#) is present in wild bird populations and can be carried large distances by migrating birds. This virus is easily transmissible to domestic poultry, and to humans living in close proximity with them. Other infectious diseases affecting wild animals, farm animals and humans include [rabies](#), [leptospirosis](#), [brucellosis](#), [tuberculosis](#) and [trichinosis](#).^[46]

Range of species

There is no single universally agreed definition of which species are livestock. Widely agreed types of livestock include cattle for beef and dairy, sheep, goats, pigs, and poultry. Various other species are sometimes considered livestock, such as horses,^[47] while poultry birds are sometimes excluded. In some parts of the world, livestock includes species such as buffalo, and the South American camelids, the alpaca and llama.^{[48][49][50]} Some authorities use much broader definitions to include fish in [aquaculture](#), micro-livestock such as [rabbits](#) and [rodents](#) like [guinea pigs](#), as well as insects from [honey bees](#) to [crickets raised for human consumption](#).^[51]



Shearing a Merino sheep for its wool

Products

Animals are raised for a wide variety of products, principally [meat](#), [wool](#), [milk](#), and [eggs](#), but also including [tallow](#), [isinglass](#) and [rennet](#).^{[52][53]} Animals are also kept for more specialised purposes, such as to produce [vaccines](#)^[54] and [antiserum](#) (containing [antibodies](#)) for medical use.^[55] Where fodder or other crops are grown alongside animals, [manure](#) can serve as a fertiliser, returning minerals and organic matter to the soil in a semi-closed organic system.^[56]

Branches

Dairy



A modern rotary milking parlour, Germany

Although all mammals produce milk to nourish their young, the cow is predominantly used throughout the world to produce milk and milk products for human consumption. Other animals used to a lesser extent for this purpose include sheep, goats, camels, buffaloes, yaks, reindeer, horses and donkeys.^[57]

All these animals have been domesticated over the centuries, being bred for such desirable characteristics as fecundity, productivity, docility and the ability to thrive under the prevailing conditions. Whereas in the past, cattle had multiple functions, modern dairy cow breeding has resulted in specialised [Holstein Friesian-type](#) animals that produce large quantities of milk economically. [Artificial insemination](#) is widely available to allow farmers to select for the particular traits that suit their circumstances.^[58]

Whereas in the past, cows were kept in small herds on [family farms](#), grazing pastures and being fed hay in winter, nowadays there is a trend towards larger herds, more intensive systems, the feeding of [silage](#) and "zero grazing", a system where grass is cut and brought to the cow, which is housed year-round.^[59]

In many communities, milk production is only part of the purpose of keeping an animal which may also be used as a beast of burden or to draw a plough, or for the production of fibre, meat and leather, with the [dung](#) being used for fuel or for the improvement of [soil fertility](#). Sheep and goats may be favoured for dairy production in climates and conditions that do not suit dairy cows.^[57]

Meat



The [Hereford](#) is a hardy breed of [beef cattle](#), now raised in many countries around the world.

[Meat](#), mainly from farmed animals, is a major source of dietary [protein](#) around the world, averaging about 8% of man's energy intake. The actual types eaten depend on local preferences, availability, cost and other factors, with cattle, sheep, pigs and goats being the main species involved. Cattle generally produce a single offspring annually which takes more than a year to mature; sheep and goats often have twins and these are ready for slaughter in less than a year; pigs are more prolific, producing more than one litter of up to about 11^[60] piglets each year.^[61] Horses, donkeys, deer, buffalo, llamas, alpacas, guanacos and vicunas are farmed for meat in various regions. Some desirable traits of animals raised for meat include fecundity, hardiness, fast growth rate, ease of management and high food conversion efficiency. About half of the world's meat is produced from animals grazing on open ranges or on enclosed pastures, the other half being produced intensively in various factory-farming systems; these are mostly cows, pigs or poultry, and often reared indoors, typically at high densities.^[62]

Poultry



Battery hens, Brazil

Poultry, kept for their eggs and for their meat, include chickens, turkeys, geese and ducks. The great majority of laying birds used for egg production are chickens. Methods for keeping layers range from free-range systems, where the birds can roam as they will but are housed at night for their own protection, through semi-intensive systems where they are housed in barns and have perches, litter and some freedom of movement, to intensive systems where they are kept in cages. The [battery cages](#) are arranged in long rows in multiple tiers, with external feeders, drinkers, and egg collection facilities. This is the most labour saving and economical method of egg production but has been criticised on animal welfare grounds as the birds are unable to exhibit their normal behaviours.^[63]

In the developed world, the majority of the poultry reared for meat is raised indoors in big sheds, with automated equipment under environmentally controlled conditions. Chickens raised in this way are known as broilers, and genetic improvements have meant that they can be grown to slaughter weight within six or seven weeks of hatching. Newly hatched chicks are restricted to a small area and given supplementary heating. Litter on the floor absorbs the droppings and the area occupied is expanded as they grow. Feed and water is supplied automatically and the lighting is controlled. The birds may be harvested on several occasions or the whole shed may be cleared at one time.^[64]

A similar rearing system is usually used for turkeys, which are less hardy than chickens, but they take longer to grow and are often moved on to separate fattening units to finish.^[65] Ducks are particularly popular in Asia and Australia and can be killed at seven weeks under commercial conditions.^[66]

Aquaculture



Freshwater [fish farming](#), France

Aquaculture has been defined as "the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants and implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or [corporate ownership](#) of the stock being cultivated."^[67] In practice it can take place in the sea or in freshwater, and be extensive or intensive. Whole bays, lakes or ponds may be devoted to aquaculture, or the farmed animal may be retained in cages (fish), [artificial reefs](#), racks or strings (shellfish). Fish and prawns can be cultivated in [rice paddies](#), either arriving naturally or being introduced, and both crops can be harvested together.^[68]

[Fish hatcheries](#) provide larval and juvenile fish, crustaceans and shellfish, for use in aquaculture systems. When large enough these are transferred to growing-on tanks and sold to fish farms to reach harvest size. Some species that are commonly raised in hatcheries include [shrimps](#), [prawns](#), [salmon](#), [tilapia](#), [oysters](#) and [scallop](#)s. Similar facilities can be used to raise species with conservation needs to be released into the wild, or game fish for restocking waterways. Important aspects of husbandry at these early stages include selection of breeding stock, control of water quality and nutrition. In the wild, there is a massive amount of mortality at the nursery stage; farmers seek to minimise this while at the same time maximising growth rates.^[69]

Insects



Crickets being raised for human consumption, Thailand

Bees have been kept in hives since at least the **First Dynasty of Egypt**, five thousand years ago,^[70] and man had been harvesting honey from the wild long before that. Fixed comb hives are used in many parts of the world and are made from any locally available material.^[71] In more advanced economies, where modern strains of domestic bee have been selected for docility and productiveness, various designs of hive are used which enable the combs to be removed for processing and extraction of honey. Quite apart from the **honey** and **wax** they produce, honey bees are important **pollinators** of crops and wild plants, and in many places hives are transported around the countryside to assist in pollination.^[72]

Sericulture, the rearing of silkworms, was first adopted by the Chinese during the **Shang dynasty**.^[73] The only species farmed commercially is the domesticated **silkmoth**. When it spins its **cocoon**, each larva produces an exceedingly long, slender thread of silk. The larvae feed on **mulberry leaves** and in Europe, only one generation is normally raised each year as this is a deciduous tree. In China, Korea and Japan however, two generations are normal, and in the tropics, multiple generations are expected. Most production of silk occurs in the Far East, with a synthetic diet being used to rear the silkworms in Japan.^[74]

Insects form part of the human diet in many cultures.^[75] In Thailand, **crickets** are farmed for this purpose in the north of the country, and **palm weevil** larvae in the south. The crickets are kept in pens, boxes or drawers and fed on commercial pelleted poultry food, while the palm weevil larvae live on **cabbage palm** and **sago palm** trees, which limits their production to areas where these trees grow.^[76] Another delicacy of this region is the **bamboo caterpillar**, and the best rearing and harvesting techniques in semi-natural habitats are being studied.^[76]

Effects

Environmental impact



Livestock production requires large areas of land.

Animal husbandry has a significant impact on the world environment. Being a part of the [animal-industrial complex](#), animal agriculture is the primary driver of climate change, ocean acidification, biodiversity loss, and of the crossing of almost every other planetary boundary, in addition to killing more than 60 billion non-human land animals annually.^[77] It is responsible for somewhere between 20 and 33% of the fresh water usage in the world,^[78] and livestock, and the production of feed for them, occupy about a third of the earth's ice-free land.^[79] Livestock production is a contributing factor in species [extinction](#), [desertification](#),^[80] and [habitat destruction](#).^[81] Animal agriculture contributes to species extinction in various ways and is the primary driver of the [Holocene extinction](#).^{[82][83][84][85][86]} Habitat is destroyed by clearing forests and converting land to grow feed crops and for animal grazing, while predators and herbivores are frequently targeted and hunted because of a perceived threat to livestock profits; for example, animal husbandry is responsible for up to 91% of the [deforestation in the Amazon region](#).^[87] In addition, livestock produce [greenhouse gases](#). Cows produce some 570 million cubic metres of methane per day,^[88] that accounts for from 35 to 40% of the overall [methane emissions](#) of the planet.^[89] Livestock is responsible for 65% of all human-related emissions of the powerful and long-lived greenhouse gas [nitrous oxide](#).^[89]

As a result, ways of mitigating animal husbandry's environmental impact are being studied. Strategies include using [biogas](#) from manure,^[90] genetic selection,^{[91][92]} immunization, rumen [defaunation](#), outcompetition of methanogenic archaea with [acetogens](#),^[93] introduction of [methanotrophic bacteria](#) into the rumen,^{[94][95]} diet modification and grazing management, among

others.^{[96][97][98]} A diet change (with *Asparagopsis taxiformis*) allowed for a reduction of up to 99% of methane production in an experimental study with three ruminants.^{[99][100]}

Animal welfare

Since the 18th century, people have become increasingly concerned about [the welfare of farm animals](#). Possible measures of welfare include [longevity](#), [behavior](#), [physiology](#), [reproduction](#), freedom from [disease](#), and freedom from [immunosuppression](#). Standards and laws for animal welfare have been created worldwide, broadly in line with the most widely held position in the western world, a form of [utilitarianism](#): that it is [morally acceptable](#) for humans to use non-human animals, provided that no unnecessary suffering is caused, and that the benefits to humans outweigh the costs to the livestock. An opposing view is that [animals have rights](#), should not be regarded as property, are not necessary to use, and should never be used by humans.^{[101][102][103][104][105]} [Live export](#) of animals has risen to meet increased global demand for livestock such as in the [Middle East](#). Animal rights activists have objected to long-distance transport of animals; one result was the banning of live exports from New Zealand in 2003.^[106]

[David Nibert](#), professor of sociology at [Wittenberg University](#), posits that, based on contemporary scholarship by ethologists and biologists about the sentience and intelligence of other animals, "we can assume that, for the most part, the other animals' experience of capture, enslavement, use, and slaying was one of suffering and violence." Much of this involved direct physical violence, but also structural violence as their systemic oppression and enslavement "resulted in their inability to meet their basic needs, the loss of self-determination, and the loss of opportunity to live in a natural way." He says that the remains of domesticated animals from thousands of years ago found during archeological excavations revealed numerous bone pathologies, which provide evidence of extreme suffering:

Excavations from 8500 BCE revealed bone deformities in enslaved goats and cows and provided "some indication of stress, presumably due to the conditions in which these early *domestic* animals were kept." Remains of sheep and goats from the early Bronze Age show a marked decrease in bone thickness, reflecting calcium deficiencies "resulting from the combined effects of poor nutrition and intensive milking."^[107]

In culture



Opening of the budget; – or – *John Bull* giving his *breeches* to *save his bacon*^[note 1] by *James Gillray* (d. 1815)

Since the 18th century, the farmer *John Bull* has represented *English national identity*, first in *John Arbuthnot*'s political satires, and soon afterwards in cartoons by *James Gillray* and others including *John Tenniel*. He likes food, beer, dogs, horses, and *country sports*; he is practical and down to earth, and anti-intellectual.^[108]

Farm animals are widespread in books and songs for children; the reality of animal husbandry is often distorted, softened, or idealized, giving children an almost entirely fictitious account of farm life. The books often depict happy animals free to roam in attractive countryside, a picture completely at odds with the realities of the impersonal, mechanized activities involved in modern intensive farming.^[109]



Dressed pigs in *Beatrix Potter*'s 1913 *The Tale of Pigling Bland*

Pigs, for example, appear in several of [Beatrix Potter](#)'s "little books", as Piglet in [A.A. Milne](#)'s [Winnie the Pooh](#) stories, and somewhat more darkly (with a hint of animals going to slaughter) as Babe in [Dick King-Smith](#)'s *The Sheep-Pig*, and as Wilbur in [E. B. White](#)'s *Charlotte's Web*.^[110] Pigs tend to be "bearers of cheerfulness, good humour and innocence". Many of these books are completely [anthropomorphic](#), dressing farm animals in clothes and having them walk on two legs, live in houses, and perform human activities.^[109] The [children's song](#) "Old MacDonald Had a Farm" describes a farmer named MacDonald and the various animals he keeps, celebrating the noises they each make.^[111]

Many urban children experience animal husbandry for the first time at a [petting farm](#); in Britain, some five million people a year visit a farm of some kind. This presents some risk of [infection](#), especially if children handle animals and then fail to [wash their hands](#); a strain of *E. coli* infected 93 people who had visited a British interactive farm in an outbreak in 2009.^[112] Historic farms such as those in the United States offer farmstays and "a carefully curated version of farming to those willing to pay for it",^[113] sometimes giving visitors a romanticised image of a [pastoral](#) idyll from an unspecified time in the pre-industrial past.^[113]

See also

- [Agribusiness](#)
- [Animal science](#)
- [Dairy industry in the United Kingdom](#)
- [Dairy industry in the United States](#)
- [Fishery](#)
- [Food vs. feed](#)
- [Wildlife farming](#)
- [Zootechnics](#)

Notes

1. *Both the name Bull and the reference to bacon indicate the archetypal livestock farmer.*

References

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