

The History of Animal Trade

1.1 Introduction

Our ancestors existed as hunter gatherers, and before that as anthropoid apes. The hunter gatherers had varied diets, which gave them security as a population against climatic extremes that favoured certain plant and animal types (Milton, 2000). The costs and risks of procuring meat and animal products were high and many were primarily gatherers. However, meat, once it was obtained, was a concentrated source of energy and protein, the most important nutrients that they required for survival. Not only did hunter gatherers in different parts of the world have quite varied diets, depending on availability, they were also free to migrate to utilize different fauna and flora sources, depending on the season and weather patterns.

Settled agriculture, adopted over a period of just a few thousand years beginning about 10,000 years ago, offered the opportunity for higher yields from plants and animals that were farmed in small areas. However, the static nature of this activity and the enhanced resource requirements of this form of food production, in the form of a regular water supply and a nutrient-rich soil, increased exposure to climatic and seasonal extremes. The inevitable variation in productivity could only be absorbed into a successful existence if humans cooperated with neighbouring groups, so that food surpluses in one region were transported to others where the need was greater. Thus our cognitive skills in organizing this trade, coupled with our highly social behaviour, combined to make plant and animal raising a viable alternative to hunter gathering when societies cooperated by trading in surplus goods.

In parts of the world characterized by low rainfall, the rainfall is also highly variable. Settled agriculture would have been particularly unpredictable, and in these regions hunter gatherer communities persisted at low density until relatively recently, for example the Aborigines of Australia and !Kung bushmen of the Kalahari desert of southern Africa. Such communities were small, isolated and self-sufficient, without the need or capacity to trade. However, encouragement from the governments of these regions for the nomadic populations to settle and pressure for the land that they occupied to be utilized for extensive livestock ranching has encouraged some to adopt this farming method themselves.

At the same time as animal husbandry spread from the Fertile Crescent of the Middle East to Europe and other parts of the world, an animal-centred mythology developed in the human populations. Myths were their inner language that represented their fears and hopes, which were a living testament to their sense of morality. They came to be associated with religions, again with strong animal-related symbolism. The Old Testament of the Bible and the Koran both contain many admonitions to look after animals well, particularly cattle and sheep, which were the basis of animal agriculture in the Fertile Crescent. In Hinduism gods took mainly animal forms, a strategy to encourage humans to look after animals well and a means of assuaging their concerns about using animals in the way that they did. While it seems likely from the evidence of cave paintings and rock art that animals featured strongly in the aspirations of hunter gatherer societies, and may even have had religious significance, it also seems likely that the inclusion of animals in mythology and religion assumed a new meaning during the establishment and early pursuance of animal agriculture. For example, the ancient Egyptians had a number of gods based on cattle, of which Apis was the most famous. These cattle were revered for their strength and virility, but still ritually sacrificed on a regular basis, demonstrating a combination of dominance over the animals but appeasement of their spirit for taking their life. The Israelites worshipped a golden calf amongst other deities, but were encouraged to adopt monotheism. Crete became an important trading post in the ancient world and it is here that we see some of the first evidence of trading in animal products, dating from the period between 2000 and 1500 BC when woollen textiles were sent to Egypt, then itself a major civilization. As in the Fertile Crescent, Cretan animals were centrally engrained in society's folklore, including a mythical minotaur that had the head of a bull and the body of a man.

The development of an animal trade was predicated upon humans owning animals, or their products. The concept of ownership of animals probably arose originally from our use of animals to assist in hunting, but it achieved much greater significance with the development of animal agriculture. Deeply engrained in human culture, animal ownership was initially respectful, saying prayers for the soul of animals, for example, when they were robbed of their lives in a hunt. Large animals offered more than could be consumed by the hunters themselves and so, as society advanced and humans began to specialize in different tasks, meat would be shared with the rest of the community, in return for work by members of the society that specialized in other tasks – flint knappers, bone carvers, shamans and potters. Crucially, this sharing of tasks enabled knowledge to be passed between generations, and thus skills advanced over time. Such a society is more likely to be successful than a society where everyone is able to perform every task. Thus as society progressed only a proportion engaged in the hunt, and later in animal agriculture an even smaller proportion of society was involved with animals. The domestication of animal and plant species further facilitated settled agriculture and its ability to support a greater population of humans than hunter gatherer societies, but it also made the population more susceptible to climatic extremes. Animals were able to buffer these extremes through their ability to gain and lose body weight. Good weather allowed cereals and grasses to grow well, providing surplus to supplement the livestock. However, in bad weather or in preparation for

winter animals had to be slaughtered because of food restrictions, whereas hunter gatherers would continue to take animals, even if this meant following them or encouraging them with food to stay close to the humans. Thus society evolved to domesticated animal keeping from harvesting animals from the native fauna when required, to keeping animals at the homestead, which resulted in surpluses and shortfalls as conditions varied.

Settled agriculture allowed humans to accumulate artefacts that nomadic hunter gatherers could not. As society became more sophisticated goods began to be traded to make best use of resources in different regions. Animal products played a part in this, for example shells formed an early currency in many parts of the world, beginning 3000–4000 years ago. The cowrie shell from the Maldives islands became the first form of Chinese money. About 3000 years ago, ivory from elephants' and other animals' tusks was sent from the Indus valley to be purchased by the Egyptians. The Chinese were the first to learn how to make silk by unravelling the threads of the silk-moth's cocoons, a skill that led to a trade that gave its name to the 4000 km trading road through Asia, the Silk Route. This was a primary trading network across Asia and into Europe. Assisted by the development of pack animals, in particular the camel and the horse, the routes, for there were many, allowed exchange of silk and other goods beginning about 2000 years ago. As well as silk, the ancient trading route from China through the mountains of Nepal and Afghanistan, and eventually to the Mediterranean brought sheep, tallow and other animal products. The price of delivering silk from Asia to Europe was high, but was reduced, and the security of delivery improved, when ships came to be used across the Indian Ocean. However, the trade routes also spread disease, particularly when ships were used, with conditions on board that were perfect for the spread of disease. Most notoriously a bubonic plague called the Black Death was spread by fleas on small rodents travelling from East to West, reaching Europe about 600 years ago.

These forms of long-distance trade in luxury durable animal products may have been matched by local trade in perishable products, but there is little record of this happening. However, the major livestock species were probably traded as they made their way from the centres of domestication, especially south-western Asia, including Mesopotamia, for sheep and goats, and central Africa for the earliest domestication of cattle, to almost all parts of the globe. As an early example of such trade, chickens and camels crossed the Indian Ocean to Africa to be used in agriculture, and probably such trade also introduced zebu bulls to be mixed with the domesticated African taurine cows.

1.2 Early Developments in Livestock Trade

The first opportunities for trade in animal products in the agriculture period would not have been possible without the development of the sail and wheel in the Neolithic period (8th–4th millennia BCE), as well as pot containers in which to hold agricultural products. Initially land was seen as publically owned, but over time specialized areas for animal farming were created, owned by individual families.

However, for most of the history of domestic animal use in agricultural systems, over approximately the last 10,000 years, each farmstead had a small number of animals, cattle, sheep and goats mainly, that directly met their needs. The majority of the population lived on the land and opportunities to trade in farm animals or their products were limited. Where this did occur it is believed to have contributed to diffusion of culture. Mostly however the trade was in low-volume, high-value items such as exotic materials and semi-precious stones. Regrettably, with the development of trade came the advancement of warfare (Rothman, 2004).

One of the main limiting factors was fodder supply in winter. Before the development of techniques to conserve fodder, livestock were often slaughtered before the onset of cold weather, with just a small number of breeding stock retained. Standing fodder was used for winter feed for these remaining animals, often in forest clearances where trampling losses could be controlled better than in large fields. Before the development of the scythe in the 1st century BCE, grass could only be harvested in small quantities with a sickle. The scythe, operated by two hands, could be used to harvest enough grass to be stacked around a pole and left in the field over winter until needed for stock. Shaping the grass stack so that it had a roof allowed most rain to run off, minimizing the leaching losses. Such techniques were increasingly used over the 1st millennium CE and allowed herds and flocks to increase in size. Eventually this allowed surplus animals and their products to be sold in the growing concentrations of the human population in towns and cities.

Continuous cropping of the land, for both grain and straw, reduced its fertility, and livestock were as much valued for their ability to return fertility to the land as their products. Livestock excreta also assisted in the breakdown of straw before its return to the land as farmyard manure. However, the ability to harvest the excreta and transfer it to arable land was limited. Night corralling of livestock was common but transport of the dung to the land was tedious before horses and carts were utilized. Hand cultivation of the soil was slow and it was not until around 1000 CE that animal-drawn ploughs were developed, cementing the essential place of cattle and horses in feudal systems of agriculture. After this major breakthrough in integrated arable and livestock systems, it was not until the development of mechanized agriculture in the 19th century, in particular tractors and metal ploughs, together with artificial fertilizers, that livestock could be dispensed with on arable farms. Stabling was also introduced and eventually conservation of grass as silage, rather than the hay, which had lower nutritional value, further allowed for intensification of livestock farming.

1.3 Expansion of the Role of Livestock in the Ancient Civilization of the Inca Empire

The Inca tribes of South America developed a sophisticated system of agriculture that included livestock in the highlands and crops cultivated on lower land (Mazoyer and Roudart, 2006). At its peak 15 million people were fed from intensive agriculture that stretched from the Pacific Ocean, across the Andean highlands to the Amazonian

plains, a distance of 300–400 km, and for 4000 km from north to south. The climate and terrain are challenging, the plains between the sea and the mountains rarely receiving rain and the hilly terrain limiting cultivation, except by hand. What rainfall there is falls irregularly, influenced by weather systems generated in the Pacific, which were even less predictable to the ancient Inca than they are today. Nevertheless, in the 13th–15th centuries a highly specialized system of agricultural production evolved, with livestock on the higher ground and crops lower down, often on terraces and irrigated by a complex system of water conduits. Although the society was largely agrarian based, livestock, in particular llamas, alpacas, guinea pigs and chickens, were used for food, wool, leather, pack animals, fertilizer producers and even as a currency. Livestock accumulation was one of the only methods of growing rich, the society being organized on egalitarian lines.

Given the highly variable climate and challenging terrain, the Inca had worked out a system of food storage in silos to avert hunger in times of adverse conditions. They knew that food had to be transported around the kingdom, otherwise social and political unrest ensued, and pack animals were crucial to this. The main pack animal was the llama, a large camelid with appropriate adaptation to long distance transport, being surefooted, tolerating a varied diet, and easily handled. They can carry 35 kg about 30 km/day. The transport of goods by this early example of a complex society is believed to have contributed to cultural development. Bulky, low-value items, such as food, were transported short distances and it was only high-quality goods, such as the much-prized obsidian, that were transported long distances. One of the items that was extensively traded throughout the empire was textiles, including woollen goods from llamas and alpacas. The system was successful, but it eventually failed suddenly on the arrival of invaders from Spain, aided by their horses, swords and exotic diseases, none of which was known to the Incas. These diseases included a mange that afflicted llamas, resulting in the deaths of two-thirds of the population of this vital animal in Inca society (Chepstow-Lusty *et al.*, 2007) and paving the way for the introduction of Old World herbivores: cattle, sheep, goats and horses.

One of the lessons of the collapse of Inca agriculture is that intensification brings risks of the system failing when any part is threatened. The system managed by the Incas worked well in the face of considerable climatic and agricultural difficulties. But new challenges proved too much for it and it collapsed within a few years of the Spanish invasion. Less intensive systems show resilience to outside influences, maintaining a smaller but more sustainable population.

1.4 European Livestock Trade from 1066 to the Modern Day

In Europe development of animal production systems lagged behind that of the Incas until the demise of their empire. However, after that period European systems began to develop rapidly. Europe led the intensification of animal production systems in the 19th and 20th centuries, but first

we need to consider animal production before that time and its position in relation to agrarian production.

1.4.1 Animal production and trade in mediaeval times and the Middle Ages in England and continental Europe

Following the Norman invasion of England in 1066, and subsequent installation of many lords of the manor, English village agriculture was initially based on rotation of pasture and arable land. The expanding population favoured the use of land for the latter purpose, to provide cereals for the staple food at the time, bread. The diminishing numbers of sheep and cattle caused the arable land to decline in fertility. In the 13th century successful London merchants often bought country estates, rather than there being merchant dynasties (Chambers and Mingay, 1966, p. 201). Later, the intimate mix of merchant and agricultural interests gave British agriculture a dynamism and entrepreneurial advantage over many of their European competitors when intensification was required. However, in 1348–1350 the Black Death pandemic dramatically reduced the population, and hence the pressure on land use was eased. It took 150 years for Europe to fully recover, but by mediaeval times the expansion of wool and milk production resulted in sheep and cattle, respectively, being traded over considerable distances to replenish stock in English royal manor houses, including some coming from continental Europe (Chambers and Mingay, 1966, p. 8). By the middle of the 16th century sheep farming was transforming from its domination by baronial and monastic organizations to a new breed of yeoman farmers with ownership of the land or long-term tenancies. These farmers developed large flocks throughout Great Britain, with centralized stores so that wool could be traded. Often it was not the cloth that was traded, but the wool itself, with the best weavers to be found not in England but in Flanders. The Hundred Years War with France was in part to protect England's woollen trade with Flanders, and resulted in many Flemish weavers fleeing the hostilities to establish themselves in East Anglia. The wool trade brought prosperity to the best grassland areas of England and continental Europe, which fostered a trade in other animal products. This trade was most prominent in pigs, pork being a favoured food of the ruling classes. The wealth created during the Middle Ages and the trading strengths that developed encouraged merchants to import animal products from overseas. Cattle hides were included in the many goods imported from the Baltic States into London and Amsterdam under the Hanseatic League that controlled trade in northern Europe.

1.4.2 Agricultural intensification in Britain in the 18th and 19th centuries

To meet the growing demand for food for an expanding British population more land was enclosed, facilitating the co-existence of arable and pasturing of livestock.

This renewed the pattern of intensification of production to meet the demands of the growing population. Enclosure facilitated expansion of farm enterprises, and small farms were gradually becoming unsustainable. Enclosure Acts in England legalized the removal of small farmers, producing protestors such as the celebrated agriculturist Arthur Young in England: 'All I know is that I had a cow, and an Act of Parliament has taken it from me' (Chambers and Mingay, p. 98). Soil quality began to be improved by fertilizing with manure, and marling of light land, rather than fallowing. A major problem was the availability of fodder for winter feeding of livestock, but with improved soil fertility and dedicated fields this could be addressed by using suitable leguminous crops, such as clovers, and root crops. These were widely used for winter feeding by the 17th century, which allowed the best livestock to be kept for breeding. By the 18th century the selective breeding of livestock of high genetic potential for beef and wool production was being pioneered by farmers such as Robert Bakewell in England, where the limited land availability meant that improvement of livestock breeds was favoured to increase output. Animal trade began in earnest and 75,000 cattle and 500,000 sheep were sent annually from the rich pastures of the southern counties, East Anglia and the Midlands to the Smithfield market in central London by this time (Chambers and Mingay, 1966, pp. 10, 33). The upland areas of Scotland and Wales also came to be used more intensively for livestock production. The Scottish Highland's sheep population increased from less than 0.5 million in the 1750s to more than 2.5 million in the 1870s (Collins, 1978, p. 17). This was facilitated by both clearance of the land of smallholders by brutal landlords and the breakdown of the clan system as a result of the Napoleonic wars. Roads from the more remote regions, which had hitherto just been used by drovers, were improved to allow more trade. Mining brought prosperity to many remote parts of Britain and for a time it appeared that this would permanently transform the upland economy, 'bringing wealth and people (who would) by consuming the provisions, bring the soil to be cultivated, and its cattle consumed at home' (Collins, 1978, p. 18). However, demand for animals was still relatively elastic compared to cereals, which were required to produce the basic foods of bread, porridge and beer (a safer drink than water, which was often contaminated). This led to more consistent prices for livestock than cereals, whose price fluctuated widely with meteorological conditions. The industrial growth increased demand for livestock near the busy mining districts. Livestock were, however, subject to regular disease outbreaks, such as rinderpest of cattle, which diminished supply. For most of the 18th century the improvement of land and livestock production was not sufficient to keep pace with the increasing population in Europe, leading to ever increasing prices. Increased prosperity in the urban population led to a growing demand for meat and milk, a trend mirrored by increased demand in Asia in the late 20th and early 21st centuries. However, by the late 18th and early 19th centuries Europe was at war, which resulted in rapid price escalation in the UK due to suspension of the animal and grain trade with continental Europe.

Regular famines were commonplace, especially in wartime, and there was little time or money for trade in goods other than food for the majority of the population. In northern Europe the growing population of cities such as London promoted the animal trade. Pigs were often produced on dairy units, fattened on

skimmed milk and whey or with the use of brewing by-products. Cattle brought in from Wales, Scotland, Ireland and even continental Europe were fattened nearer to London on pastureland. They would be required to walk 10–20 miles per day and were shod to protect their hooves. Sea and rivers had to be swum across, and cattle were tied nose to tail and had a noose around their lower jaw to keep their heads above water (Chambers and Mingay, 1966, p. 31). Occasionally they crossed in barges. They were often bled to provide sustenance for the drovers. In the early 18th century Daniel Defoe reported while on a tour of England that there were about 40,000 cattle coming annually from Scotland for fattening, mostly around London, but increasingly to the north of England during the Industrial Revolution. He also observed hundreds of thousands of store sheep being sent to the southern downlands for fattening from the more northerly counties of England. Turkeys and geese were driven on foot or in carts from East Anglia to the capital. Animal products were largely transported on England's waterways, including Stilton cheese with its accompanying maggots and mites, and across to continental Europe in times of peace. Better roads allowed animals to be driven further to market, including in winter, which encouraged specialization across the country. Mutton began to be replaced by lamb as the main meat from sheep.

At the start of the 19th century most animal production was as a component of a mixed farming feudal system, with landlord and tenants, who were often little better off than serfs. The growth of trade in agricultural animals was a response to industrialization and the development of the cities. Eggs and meat started to be brought in from neighbouring farmlands. In Europe this process developed slowly with the gradual change in agricultural systems of the 19th century. Feudal systems gave way to more widespread land ownership or proper tenancy agreements. This process was initially led by northern Europe, in particular Great Britain, Belgium, northern France and Germany, with the rest of the world remaining predominantly self-sufficient rural societies. Fertilizers and animal improvement in the 19th and early 20th centuries increased output so that surpluses could be marketed. In the period from 1840 to 1870 large volumes of guano, or accumulated bird excreta, were extracted by indentured Chinese labourers from the Pacific islands off Peru and shipped to Europe and the USA for use as fertilizer (Chambers and Mingay, 1966, p. 174). Restricting the volume sold to British merchants artificially inflated the price and made a small number of Peruvian businessmen wealthy, especially those close to the president, who had nationalized the industry (CHA, 2011). However, it was not long before exhaustion of supplies, development of a nitrate industry in the Atacama region and global recession together cemented a rapid collapse of the industry and eventually plunged Peru into poverty and war. This example serves as a reminder of the danger of plundering of resources that was all too common in the 19th century (recently a sustainable guano mining industry has emerged in the region, with indigenous labour, decent wages and sustainable extraction).

Back in European rural communities, most food and clothing were home-made and meat consumption was rare. Meat was reserved for holidays, if at all, and even bread was largely baked at home. Milk from sheep, goats or a house cow provided

the main source of animal-based protein. Eggs were the main animal product that could be sent to market, with refrigeration technology not yet developed to allow the preservation of meat. Some Irish salted beef began to be marketed as corned beef as early as the 17th century for the benefit of the British naval fleets and North American armies. However, hides and tallow were the main tradable products from the keeping of cattle, and meat was for home consumption; sheep were kept primarily for their wool. Malnutrition and nutritional deficiencies were common and often followed the weather patterns and quality of the harvest. Emergence from this peasant economy was desperately slow.

In the 18th and early 19th centuries, Britain led the first agricultural revolution that changed the fabric of society, largely in response to increased demand for food following industrial development and growth of cities. Fields were enclosed, which gave greater control of their use and reduced overstocking of common grazing lands, which had seriously limited the production of livestock. Early maturing breeds of sheep and cattle were developed that could be fattened in one or two seasons, respectively. These were smaller, more rotund animals, such as the down sheep breeds that emerged in southern England and the Hereford cattle from central England. By reducing the size of the animal and the time taken to get the offspring to an adequate fat cover, the number of breeding animals that had to be maintained to produce marketable animals in a specific time could be diminished. This released land for fattening livestock. The fat content of the meat was more valued than nowadays, because of the use of tallow in candles and because of its high energy content that manual workers needed.

The first half of the 19th century in Britain was a time of agricultural revolution from another perspective. Protectionist policies for agricultural products were tested and found wanting. Rapid fluctuations in agricultural product prices during the war in Europe at the beginning of the century led the British government to attempt to guarantee fixed prices for the most erratically priced commodity, cereals. A sliding scale of taxes on imported cereals, dependent on the home price, was introduced through a series of Corn Laws. This encouraged farmers to grow cereals rather than produce livestock and supported the income of the landed gentry, who were politically much more influential then than now, at the expense of affordable food for the masses, who were politically less important. Landowners commanded two-thirds of the seats in Parliament and were more numerous in the Tory than Whig party (Chambers and Mingay, 1966, p. 153). However, the demand for free trade grew with the evident iniquities of such a tax and it became a political issue. In France the inequalities between rich and poor had led to a widespread purge of the aristocracy during the Revolution, and British politicians were wary of a repeat of this at home. Supported by such radicals as Jeremy Bentham, a notable utilitarian at the time, the Corn Laws were eventually repealed in the mid-19th century, encouraged by a depressed economy and famine in Ireland. For a few years, cereal prices dropped sharply, but inclement weather for a few years restricted supply and livestock flooded on to the market. Lean times were unsurprisingly accompanied by disease outbreaks in the cattle – rinderpest and pleuropneumonia in particular – and the government experimented with movement

restrictions and compensation payments for slaughtered stock. However, the market stabilized somewhat within a decade and many arable farmers turned increasingly to livestock production and, at a time of expanding home market, actually saw an increase in their profits. Imports from the New World grew, mainly of cereals, with livestock products being difficult to transport, at least until the last quarter of the 19th century when refrigerated transport made it possible for South America and South Africa to export meat to Europe, with the inevitable reduction in price. Between 1850 and 1900 exports of wheat from the USA to Europe expanded fivefold, at the same time as the wheat price fell by more than one half (Mazoyer and Roudart, 2006, p. 369). Oils, fats and wool also flooded into Europe, with devastating effects on home production. Wool and cereal production in England reduced by one-half, even though it was efficient compared to other countries. The sheep flock in France and Germany was reduced by one-half between 1870 and 1914 as a result of growing wool imports from Australia. The rest of the century saw an increase in agricultural commodity transport, with European farmers being unable to resist the competition from areas with the best soil, lowest labour costs and most innovative farmers. The competition resulted in widespread intensification, often led by the younger generation of farmers, many of whom had been educated in the new methods in agricultural colleges established in the second half of the 19th century. Mechanization increased and this began to compensate for the high labour costs that had previously required the involvement of women and children at times of peak labour requirement, such as harvesting.

This was an early example of the impacts of free trade in agricultural products and its benefits for the consumers. Advocates of free trade argued that it would lead to cheaper food, more employment, more exports and increased prosperity. The middle class industrialists in particular were afraid that the high cost of food would render the meagre wages paid to factory workers inadequate. Opponents of free trade argued that there was instability of income for the landed gentry at home, which reduced their capacity to employ, and feed, the rural population. In Britain the issue pitted the landed gentry against the industrialist, and on this occasion the latter won. It was also a class issue, an attack on the aristocratic landowners by the rapidly expanding middle classes, and an early stage in the process of globalization of food markets.

In a foretaste of prominent debates of the 20th and 21st centuries, Richard Cobden, a prominent free trade advocate at the time, lobbied for a free trade in land, as well as corn, which he hoped would lead to a land-owning peasantry. A lesson of the Corn Laws and their Repeal was that fixed prices were generally undesirable. A free trade in livestock and their products had been created, which expanded from 1875 to 1900 by 300% in the case of British meat imports (Chambers and Mingay, 1966, p. 209). Increased prosperity raised the demand for meat and dairy products, with reduced consumption of bread. Not everywhere was aided by the industrial growth. Areas of upland Britain without mining growth saw unprecedented decline because the free market policies adopted allowed food products to enter from the continent without restriction. Poor soil

and weather prevented farmers in the remote parts of Britain from improving their production, with low returns from use of fertilizers and intensive cultivation. Improved transport, particularly with the coming of the railways, facilitated competition to supply nearby towns and cities with their food requirements, aided by peace in Europe through most of the 19th century. Thus the more mobile elements of livestock production – capital, labour and entrepreneurship – migrated from the upland areas. Mining areas too went into decay in the late 19th century, accelerating the upland decay. Thomas Telford, the engineer who orchestrated improved transport to remote parts of Britain, berated the Scottish landowners that had cleared the crofters from the land to make way for sheep and hoped that improved transport to the region would prevent the decline. It was not to be and local interests were subsumed by national interests.

Similarly land leasing was under scrutiny, with short-term leases and restricted farming methods, for example a fixed 4-year rotation in Norfolk, England, failing to encourage investment. Free trade was again advocated, leading to greater flexibility in production and an ability to meet changing market demand. The ability of the land to feed a growing population was a popular topic in the early 19th century, with Thomas Malthus famously predicting an ever increasing gap between food production and world population of humans. Nearly 200 years later, the debate is still not concluded. The agricultural revolution of 1750–1880 in the UK highlighted tensions between landowner and industrialist, whereas in reality the latter, and the population as a whole, were dependent on the former to invest in their land to increase food production. Such investment could only be justified over a long period of time.

High rents, disease outbreaks and income taxes encouraged many British farmers to emigrate, mainly to North America. But British colonization was also spreading further afield. The lost access to America in 1776 following the War of Independence started a search for other territory in which to deposit their criminals. Australia, discovered 12 years later by Cook, and occupied by an indigenous population of just 300,000 living in about 500 disparate small tribes, provided the perfect solution. In the biggest land annexation since the 16th century, British convicts were given land on which to produce grain, cattle and sheep. The Aborigines had no legal redress as they were unable to give evidence in court, not being recognized as a civilized people. The competitive individualism of the white settlers, otherwise known as squatters, benefited them when compared to the communal ownership and reciprocal rights philosophies of the Aborigines. The settlers even believed that they had divine instruction to till the land and that agriculture had civilizing virtues, the latter being a belief that had some validity since most of the crime existed in the relatively lawless towns at that time.

In 1808 George III was shown a coat made from the wool of Merino sheep taken originally to Australia from his own flock in 1805. The Napoleonic wars had made it desirable for Britain to find a reliable source of wool from outside Europe. Britain was industrializing and its woollen manufacturing factories in the north needed a constant supply of high quality wool to produce garments for the burgeoning middle class. Increasing from just 8% of Britain's wool for manufacturing

in 1830 to almost 50% in 1850, Australian wool production grew as fast as squatters could clear the land. Capital was readily supplied from Britain. Surplus sheep carcasses were boiled down to produce tallow, which was then returned to Britain in drums to make candles.

1.4.3 Animal trade in the 20th century

In Europe the First World War brought rapid changes in land ownership as a result of high male mortality in many countries. At its simplest level, the war increased demand for animal products, which supplied high quality food for the troops. This brought a temporary restraint to the depopulation of the upland areas of Britain that had been suffering decline for about 30 years. At the same time the proletariat revolution in Eastern Europe resulted in the creation of cooperatives and land banks, which assisted peasants to buy their own land, purchase equipment and market products. In 1906, 80% of Russian peasant land was held communally (Wasserstein, 2007, p. 23). However, in 1929–32 forced collectivization of the farms brutally transformed the Russian countryside, with expulsion of many peasant farmers to Siberia and removal of others to work in the heavy industry that was being developed in and around the cities. In much of the rest of the world subsistence farming was still common at the beginning of the 20th century and trade was often by barter. In the more prosperous parts of Europe, English country towns for example, shops emerged where people could buy animal products and other necessities. In the cities department stores were established, led by such notables as Harry Selfridge, who opened his first store in London in 1909, and Charles Harrod, who opened a small store in Knightsbridge in 1840, which by 1911 employed 6000 staff. In continental Europe cafés became established, 30,000 in Paris alone in the early 20th century. By 1914 annual meat consumption in Germany and England had risen to 50 kg per person (Wasserstein, 2007, p. 27), not far short of the 80 kg per person that it is today. Elsewhere markets were the main trading opportunity, other than itinerant pedlars.

In the New World, trade in basic commodities, such as animals, proceeded even more rapidly than in the Old World. In Quebec, for example, there was strong growth following the harmonization of British–French relations and development of the fur trade in the late 18th and 19th centuries, which was made possible in part by the ready supply of eggs, poultry and the meat of deer, caribou and moose from the farmlands of the Levis area on the opposite shores of the St Lawrence (Porter, 1961). Horses, oxen and even dogs were used to pull the goods on sleds to the city on the hill.

Back in Europe, because of its propensity to deteriorate rapidly, milk was initially produced in the cities from small numbers of cows kept in yards within the city confines. The development of refrigeration and rail travel enabled milk to be produced in farms that were remote from their market. For example, in England, rather than being produced in the city, the 19th-century development of a widespread rail network enabled milk to be increasingly produced from cows grazing the rich pastures of the western part of the country, Somerset and Gloucestershire

in particular. Livestock could also be brought to market by rail, ship and barge with less loss of live weight than if they were droved. The accompanying intensification of animal production included importation of high quality supplements for livestock feeding, use of more fodder crops, yard feeding and the recycling of livestock bonemeal as fertilizer. The British government made low cost loans available for agricultural improvement, payable over long periods; a wide variety of dependent industries benefited when livestock products were readily available: shoe and harness makers, soap boilers, candle makers, cutlers and glue manufacturers. Developments in steam transport also affected the fishing industry. It made trawling more effective, with larger boats driving the small boats out of business and decimating the inshore fishing grounds. Employment in the fishing industry of the Scottish Highlands declined from 30,000 in 1900 to only 13,400 by 1938 (Collins, 1978, p. 23).

The majority of the lower classes in Europe had existed on a diet consisting largely of home-grown food in the early 19th century: staples such as bread and butter and potatoes. However, over the course of the century meat importation from Argentina and Australia grew, providing high quality protein in the diet. Britain was the world's largest trader when the animal trade, along with other trades, developed during the 19th century. That process was aided by a largely free trade with low interest rates (Wasserstein, 2007, p. 8). Although Britain's share of world trade fell in the lead up to the First World War, from 20% in 1876–1880 to 14% in 1911–1912 (Wasserstein, 2007, p. 11), her merchant fleet was the largest in the world and represented one-half of all motor and steam tonnage. Her shipyards launched twice as much tonnage as the rest of the world put together. She was ahead of the rest of Europe in the development of railways and an inter-urban road network was beginning to be developed.

By the beginning of the 20th century can openers had been invented and tinned food was widely traded. Beef was salted (corned) or boiled (bully-beef) and was particularly important for the troops in the world wars of the first half of the 20th century. During the First World War, the numbers of livestock kept in Britain were restricted in order to increase the land devoted to cropping. Towards the end of the war shortages of meat and lard resulted in escalating prices and led to rationing. In addition to meat and lard, cheese and butter were also imported, but the German U-boat activity that devastated merchant shipping in the middle of the war came close to bringing the war to an early close (in Germany's favour) by starving the British of their food importations; 111 submarines aimed to deprive Britain of food in this way. However, after a large number of the merchant ships had been sunk in early 1917, the British, with their superior naval forces, developed a system of using convoys of ships, and sometimes also used aircraft to chaperone their merchant ships on their routes, largely transatlantic, to Britain. This safe passage, together with the entry of the USA to the war after the damage done to their shipping became intolerable, changed the course of the war (Wasserstein, 2007). Ironically, these merchant ships also devoted space to the transport of performing animals, so important were animals to the entertainment industry in the UK (Wilson, 2015, p. 27).

The animal trade, and the trade in other important food commodities such as grain for bread, played a role in the outcome of the First World War, but on a broader scale it was also implicated in the reasons why such an apparently futile war was fought. Britain had been amassing colonies at a rapid rate throughout the 18th and 19th centuries and these had become successful trading partners. Amongst these, Australia and New Zealand had developed a highly successful trade in meat, wool and butter, which supported the growing industrialized population in Britain. In time of war Australian animals also had their role to play, with about 136,000 horses being sent with the First World War troops to assist in transporting them and hauling supplies, equipment and ammunition. France had also colonized much of Africa and that other major European power, Spain, had long held territories throughout Latin and South America. Germany, by contrast, had little territory abroad to support its industrial growth at home, yet it was to some extent at the intellectual and regal heart of Europe. Hence the major reason for this most wasteful of wars was the territorial ambitions of Central European states, led by Germany. Indeed the entry of minor partners into the war was usually determined not by the considered moral rectitude of the action, but by potential territorial gains for the partner should they prove to be on the winning side. The Second World War followed the first because of the humiliation of the Germans at the end of the First World War and the punitive reparations imposed by the allies. Even at the start of the final year of the First World War, 1918, it had looked like it might end in Germany's favour, yet the Allies showed little mercy in the treatment of their foe and widespread starvation ensued.

The First World War was accompanied and succeeded by socialist revolutions in Russia and spreading across much of Eastern and Central Europe. Food shortages led to the old monarchies and their bourgeois followers being largely thrown out in favour of proletarian rule. In Russia the development of agriculture along Western capitalist lines had involved expanding farming by individual families, developing agricultural education, focusing on land improvement and developing credit lines for farmers. By the first decade of the 20th century this was reversed. Surplus products had to be surrendered to the government for a fixed price, initially just bread and fodder, but later in 1919/20 including meat. Private sales were prohibited.

A major drought in Russia in the early 1920s halved the grain harvest and, humiliatingly for the Russian leaders, the USA provided relief aid to the beleaguered peasants. However, the situation had eased by the mid-1920s and by the middle of the decade the losses in livestock that had occurred since 1913 had ceased (Wasserstein, 2007). An easing of the transformation of agricultural land ownership allowed some return to private enterprise, which was Lenin's final legacy before his death in 1924.

Communism and the collectivization of agricultural production

Communism, with its collective farming principles developed under Stalin in the late 1920s, spread across much of Central and Eastern Europe where the proportion of the population engaged in agriculture was in excess of 75%,

compared with less than 50% in most of Western Europe. Release of the Russian peasantry from serfdom in the late 19th century, even though requested by the peasants themselves, had led to an inequitable distribution of land. The Russian government took this as an opportunity to experiment with collectivization of both land and the peasants' livestock, aggregating them into commonly owned units of 5000–10,000 ha, with little regard for traditional villages. This they believed would provide opportunities for more mechanized production, increasing output, as well as quelling any potential political dissent from a troublesome sector of society. The result was exactly the opposite. It was strongly resisted by the peasants, who slaughtered their livestock for food and hoarded the grain, which resulted in mass deportation of 'kulaks', or the most affluent and successful farmers, to distant agricultural labour camps.

Although the world wars did nothing for Germany's territorial ambitions (in fact they lost significant territory), they did heighten the tension surrounding the politics of the commercial food production sector in a way that was to set the pace for the 20th century. The Germans fiercely opposed collectivization, releasing land from this mantle, that was perceived by many Russians as coming from the devil himself whenever their temporary territorial gains allowed it. Communism embraced cooperative farming principles, whereby workers contributed to mass food production in huge cooperative, or communally owned, farms. However, salaries were meagre and many peasants hoarded the grain they produced or resisted the forced labour schedules, viewing the new system as just a new form of serfdom. The Soviet leaders had grandiose, and to many unrealistic, ideals, and through the course of the first half of the 20th century collective farms increased in size, from an average of 3500 acres in the 1940s to 16,000 acres in 1960. State control too was increased after the Second World War in a further attempt to make them sustainable.

Although the collective farms were considerably larger than the peasants' holdings, even larger State Farms were also created, either from struggling cooperative farms or using spare land and landless workers. These were essentially run as factories, set up mostly in the period from 1960 to 1980. Most were specialized for production of a particular commodity, e.g. milk or meat. Each worker played his (or her, for women were involved equally) part, men taking more mechanical roles, women usually responsible for jobs that involved animals, milking, cleaning animal sheds, etc. Workers sometimes had small plots themselves to allow them to produce extra commodities, many of which would be taken to local markets for sale. However, during the peak periods of collectivization even this was forbidden as it was seen to promote individual production, which was supposed to be forfeited for the benefit of common good. The Communist system prided itself on full employment, and ideology was essentially egalitarian, with the farming system organized by a central committee. Planning and forecasting was introduced on a grand scale, but often the targets were unrealistic and led at times to neglect of the environmental considerations of land management. Massive fields were constructed and machinery to match, leading to soil erosion; herbicides and pesticides were used indiscriminately, sometimes with dangerous consequences.

Communism embraced mechanized production, which was seen as one of the advantages of the massive farms that had taken the place of small family units. An inevitable consequence of this wide-scale system of production was increased trade, at least internally, including animal products. In theory at least, products could be made in parts of the Soviet Union where they could most efficiently be produced, milk from the lush pasture of the Baltic States for example, and transported around the empire. Forced transmigration of peoples around the Soviet states enabled workers to be placed where it was most strategic to do so; however, this was also driven by a desire to reduce nationalist tendencies by mixing the various races in the vast area dominated by communism.

In the late 1920s agricultural trade was badly hit by a severe drought in the USA. The hardship was exacerbated in Europe by political instability following border changes after the First World War and economic disparity as a result of the high level of reparations from Germany to Britain and France and from Britain to the USA for First World War costs. International trade slumped by 60% in 1929/1930 and wool prices, for example, declined by 46% (Wasserstein, 2007). Many farmers had to revert to self-sufficiency, especially the peasants in Central and Eastern Europe. They relied on horsepower, a single house cow and had little access to capital that would enable them to invest in mechanized production, as for example could those in Britain (Wasserstein, 2007). Meat largely disappeared from the peasant diet. Transfer of land tenure in the central and eastern states was frustrated by nationalistic tendencies following border changes after the end of the First World War. Governments preferred to transfer land to their own nationals in the new territories, even though they often had not the skills to efficiently farm the land. Many countries retreated from democracy, for example in Italy where Mussolini led the country to embrace Fascism and a totalitarian government.

Free trade was progressively challenged in the late 1920s with a creeping protectionism that was used to safeguard markets. By the 1930s free trade was largely abandoned, with import duties often averaging 50% (Wasserstein, 2007). Britain was one of the last to change, but increasingly adopted an imperial preference for trade with its colonies. Import duties had a beneficial effect on Britain's upland livestock industries, which had been suffering from European competition in the latter part of the 19th century. International institutions were not sufficiently well developed to control the situation. The League of Nations, the forerunner to the United Nations, was in its infancy and the international monetary conferences that preceded the founding of the International Monetary Fund had little useful outcome. National boards were established to regulate supply and pricing, such as the Milk Marketing Board in the UK, established in 1934.

The massive experiment with collective farming in Central and Eastern Europe and much of Asia continued almost unchecked until the later stages of the 20th century. In it workers were responsible not to themselves, or their families, but to the state. It was present not only in the Soviet empire; communist ideology of forced collectivization also spread to other regions, from Albania in the south, to Lithuania in the north, and eastwards spreading across the Asian continent to Mongolia, China and Vietnam. Collective farms often were turned into state farms and enlarged.

However, it was becoming increasingly clear that workers' diminished responsibility to their family for their work led to low levels of commitment and massive inefficiencies. Collectivization was associated with high levels of bureaucratic controls, often with little regard to local conditions. Goals were set for production over 5-year periods (the notorious Five Year Plans), but these were often unreasonable and unattainable. Achieving targets was not helped by the infiltration of corruption deep into the managerial system.

Livestock-keeping systems that had evolved over hundreds of years in central Asia were replaced by collectivized agriculture. In Tibet a nomadic system of keeping yak, Bactrian camels, cattle and sheep on the highlands of the Tibetan plateau had proved efficient at utilizing the scant resources available. Pastoral nomadism, or transhumance, ensured a transfer of animals from low ground to high ground in summer and on return surplus animals were sold, which enabled the pastoralists to buy essentials such as wheat flour for bread making (Kreutzmann, 2013).

The impact of communism on pastoral nomadism over the last half century has varied between regions of Asia (Anon., 2011a). In Kirghiz there has been forced settlement of much of the high ground pastures, including the erection of fences to contain stock and create identifiable 'farms'. At the same time there have been townships built to facilitate marketing of livestock products and provision of services, including agricultural extension. This has been supported by external subsidies from central administration. Another approach has been settling the nomadic pastoralists into low lying areas between the mountains and desert, with transfer of stock between high and low ground by vehicle, rather than the traditional movement on foot. Production in the low-lying areas is supported by animal housing and the availability of stored fodder, in the form of silage or hay. Arguments made to support the transition include the modernization of livestock keeping, including better health care for their stock, and the opportunities to limit grazing of degraded pastures, allowing them to regenerate. In addition, the lifestyle of the herders is generally improved, with access to basic resources, such as health care, electricity, clean water, housing, schools, cultural centres and shops (Kreutzmann, 2013). Nevertheless, this approach threatens the cultural heritage and lifestyle of the nomads, which is viewed by many as idyllic and sustainable.

In Tibet, which comprises 68% alpine rangeland, the Chinese invasion in the 1950s and subsequent forced collectivization left a huge resentment of the attempts to interfere with Tibetan culture, including livestock keeping practices. At its worst in the early 1960s, the Chinese authorities forcibly seized thousands of tonnes of animal products and grain in lieu of taxes. Workers' enthusiasm for animal production declined as a result, which together with forced settlement in communes resulted in widespread famine between 1968 and 1973, when a third of a million people died (in comparison, Stalin's purges of the countryside and the famines of Soviet lands are estimated to have killed approximately 11 million people). In the Tibetan occupation by China, animal grazing on mountain pastures was restricted and livestock slaughter controlled by central authorities without regard for their condition and suitability. In 1978 Deng Xiapeng started

the process of decollectivization with dissolution of the people's communes (Kreutzmann, 2013). Since that disastrous period in Tibetan agriculture there has been relaxation of central planning control, with a re-emergence of pastoral nomadism in parts of Tibet. However, the settlement of large numbers of Chinese in Tibet since the 1980s has placed an enormous strain on the food resources available, threatening food security again. More recently the progression of the Chinese economy into a market-based system has produced pressure to utilize Tibet's precious land resources for the benefit of all of China.

The Second World War

In the Second World War, food supplies were once again used as a weapon of war, just as they had been in the First. Before the war, Britain imported approximately 60% of its food supply (Ministry of Information, 1945). During the war food supplies to the civilian population were limited because of the reduced labour availability on farms (men being required on the battlefields and both men and women for the production of armaments), insufficient opportunity to transport them safely, both nationally and internationally, and increased food demands for the troops. Women were enlisted to work the farms of the warring nations, and by the end of the war 80% of workers on Soviet collective farms were women (Wasserstein, 2007). Britain replaced 98,000 men on the land with 117,000 women (Ministry of Information, 1945). Early territorial gains by Russia, in league with Germany, led to an expansion of collectivization to Poland, Belorussia and Ukraine in a programme of Russification of the newly acquired territories.

Limited food stocks led to rationing and a thriving black market. Eggs and poultry were smuggled from neutral Ireland to Britain, for example. Rampant inflation led to the devaluing of many currencies and gold or barter was often used for trade. Under a Lend-Lease agreement, food supplies continued to be exchanged between America, Britain and the Commonwealth. Tinned meat production doubled in the early war years in response to troop needs, beef and pork being the most common meat traded in this way. This trade in food supplies between America and Britain, albeit under a blockade, prevented the British from facing the starvation that devastated the populations of many Central and Eastern European countries. Butter and meat were nevertheless rationed, and nutritious but new foods such as whale meat and spam¹ were introduced as substitutes for the traditional meat supplies. Mock meats were constructed with ingenuity, 'goose' from potatoes, cooking apples and cheese for example. Nevertheless, there was widespread reduction in calorific intake at the very time that extra nutrients were needed for labour. This was partly dependent on one's ethnic background; for example, in an instance of appalling Germanic racism, the allocation of staples to Jews was only 30% that of Germans.

The Russian retreat from the front with Germany in 1941 in a Soviet Union much expanded to the west not only temporarily halted collectivization, it resulted in grave loss of farm production. The 'scorched earth' policy holding sway over vast swathes of Central and Eastern Europe required farmers to drive away their cattle and destroy anything that would be of value to the advancing German army.

Not surprisingly, agricultural output declined dramatically as a result of slaughter of herds, and a shortage of both draught animals and manpower. In 1943 output was just one-half of its level of 1940 and it did not recover until the end of the war. Soviet industrial and armament production recovered rapidly, however, and this was crucially underestimated by Hitler. As the war progressed, and the eventual outcome for the German nation began to become apparent, many farm animals were again requisitioned by the Germans in their over-run territories 'for the benefit of the Reich'. Removal of cattle and horses from Polish farms, for example, rapidly reduced the population to starvation.

During the war the US/Britain-led Allies were able to use their access to food supplies to their advantage, withholding food from neutral Spain, for example, unless they limited supplies of iron ore and other strategic raw materials to Germany. Food was still in short supply, but not to the same extent as in Russia, where millions starved to death. British farmers were encouraged to increase food production by converting pasture to cropping land, and over 1.5 million ha was ploughed up for this purpose. Farmers' duty to the children of Britain was emphasized, in their quest for increased production. 'England expects...' was a common dictate to farmers of the day, a protected occupation. Although dairy cow numbers increased, numbers of beef cattle, sheep, pigs and poultry plummeted, by 400,000, 6.3 million, 2.5 million and 19.2 million, respectively. 'The dairy farmer, in addition to making his direct contribution to the granaries of this country, has now to fill his own barns, rickyards, silos and mangold claps with animal feeding stuffs grown on his own farm in order to feed his herd and thereby provide the people of this country with one of the essential and most valuable foodstuffs – milk. Life is going to be harder for him, but he can take it' (Ling and Egdell, 1941). Milk was seen as an essential food to provide nutrition in the place of meat, butter and eggs. Not everywhere did stock numbers decline – in the Scottish Highlands where lax grazing had allowed the ingress of bracken, deer were shot out on the mountains and replaced by sheep and cattle (Ministry of Information, 1945).

Wool supplies from Australia assumed a new importance for serge battledress for the troops. However, the popularity of wool was short-lived; after peaking in the 1950s the wool prices steadily declined in response to competition from artificial fibres and less need for warm, hard-wearing clothing. Wool, which had been Australia's most valuable export for much of the 19th and early 20th centuries, had had its day.

We can now reflect that the German plan for a much expanded Reich, with supplies of food sent from satellite states in the periphery of the empire to the fatherland, was only narrowly averted.

Post-war food supplies

After the war, the victorious Soviets exacted a terrible price from the territories in Eastern Europe that they had occupied in their advance to Berlin to overthrow the German army. Large numbers of people were forced to move east from Central European countries to work in the Soviet collective farms. Communist governments were introduced into these countries and in 1949 the Soviet Union

established a Council for Mutual Economic Assistance, or Comecon. Although formally bound by ideology, this group was established initially to further economic ties between the Soviet Union and the Central European states. It was established in part in response to Western European plans, through Marshall Aid, to support countries with market economies and a free currency. In 1950 the Soviet Union adopted a more autocratic role and the Comecon agreement was restricted to practical facilitation of trade within the region.

Soviet responses were partly a reaction to events in Western Europe, which was unifying at a rapid pace. One of the stimuli to unification was the growing tension in the late 1940s between the Soviet and Allied zones in Berlin, with the latter isolated in the Soviet-controlled part of Germany. Berlin itself had been divided into French, American, British and Soviet administrative sectors at the end of the Second World War. Eventually, in 1949, the Soviets blockaded the Allied sectors by severing their road and rail supply lines from the west. Food supplies in the Allied Berlin sectors ran perilously low and the Allies attempted to airlift food in. Stalin desisted from challenging them, knowing that if the planes had been attacked it would probably lead to a third world war.

The establishment of the European Economic Community in 1958 united Belgium, France, Italy, Luxembourg, the Netherlands and West Germany in free exchange of goods, workers and capital. At the same time there were several factors that led to a desire in Western Europe, and Britain in particular, to intensify animal production, a move that was facilitated by an increase in trade. First, continental Europe and Britain had been exposed yet again in the Second World War to being dependent on food imports, as it had in the First World War. Attempts to increase food from British resources started in the war itself, employing such schemes as ploughing up permanent pasture to grow more productive sown pastures or other crops, using non-traditional labour on farms and increasing the genetic potential of animals and plants utilized. Intensification was introduced in part to reduce between-animal contact by placing them in cages and hence improve the capability to reduce infectious disease and control individual feeding. Also, inactive caged animals needed less feed and rapidly became fat, an important nutrient for a human population used to hard physical work. Better control of hygiene was possible in intensive housing, but the close contact between animals was eventually to lead to an increased risk of epidemics in the animal population. At first antibiotics, which were just being introduced in the middle of the 20th century, were effectively and routinely used to control diseases, but resistance and novel diseases have since assumed a new importance.

Another factor favouring intensification was the shortage of labour on the farms, after millions were killed during the war (in all of Europe, but most in Germany and the Soviet Union). Although the intensification movement was not obviously led by either of these countries, the large collective farms in the Soviet Union had barns with long rows of individually tethered cattle where they had been pastured or in small sheds beforehand. A less recognized factor in the acceptability of intensification of animal production was the wide-scale suffering that people had witnessed or personally experienced in the war years, and the resulting

failure to recognize that close confinement caused any serious degree of animal suffering in intensified systems.

By the mid-1950s poultry production had changed dramatically and was at the vanguard of the livestock industrial development. 'Since ... 1935, the pattern of poultry-keeping in England and Wales has undergone great changes. Economic considerations have stimulated a very great interest in intensive methods, while specialised poultry-keeping has recovered from its war-time depression and is already exceeding in importance its pre-war standing' (MAFF, 1955).

The 1960s heralded an era of relatively rapid growth and improvement in Europe and most other developed regions of the world. The austerity of the war years and their immediate aftermath became a distant memory for many. In Britain the continued industrialization, and the absence of rationing and national service, encouraged a spirit of experimentation with new technologies, including more intensive animal management. Human life had only recently been wasted irrationally, in two World Wars, and caged animal systems which did nothing more than deny them their freedom must have seemed relatively harmless by comparison. Increased ownership of refrigerators, for example in France from 17% in 1957 to 90% in 1974 (Wasserstein, 2007, p. 378), enabled households to more safely store meat, raw and cooked, and dairy products. Self-service supermarkets were introduced, with competition from major retailers that required farmers to lower their costs of production. This led to expanding farm size, to maintain profit levels, facilitated by opportunities offered to feed the growing populations in the cities. To limit the ensuing rural depopulation, the European Commission introduced a Common Agricultural Policy, which provided support to small farmers in Europe. The support stimulated production, creating surpluses that distorted prices and frustrated countries, such as the USA and Australia, that did not support their farmers. Ultimately many of the surpluses, such as the 'milk lake', had to be controlled with quotas to avert conflict with the free trading countries. From the 1950s to the 1980s the General Agreement on Tariffs and Trade (GATT) encouraged liberalization of trade, and formed the precursor to the World Trade Organization (WTO), which was founded in 1995, with broader representation than GATT.

The push for intensification pervaded not just the pig and poultry industries, but also cattle and sheep production, which revived areas of the hills and uplands, in Britain for example. Improved pastures, with faster growing varieties of grass that responded to the application of artificial fertilizers, better access to the hills and more controlled grazing all combined to increase output of cattle and sheep.

However, as animal production intensified to meet increased demand from the growing middle classes, a social movement started that rejected the use of intensive housing systems, such as small cages for chickens and narrow pens for farrowing sows. A seminal work, *Animal Machines*, by Ruth Harrison (1964) captured and encouraged the mood of rejection by the public in 1964. Predictably it came from England, at the vanguard of animal intensification and also one of the bastions of free speech and democracy in capitalist Western Europe. It led to the formation of a technical committee to enquire into the welfare of animals kept

under intensive livestock husbandry systems, headed by Roger Brambell. Their report (Brambell, 1965) stated that farm animals should have freedom 'to stand up, lie down, turn around, groom themselves and stretch their limbs'. In 1967 Britain was the first Western country to establish a body to provide independent and scientific advice to government on animal welfare, the Farm Animal Welfare Advisory Council.

Western European governments generally favoured a high level of control of agricultural systems (and other aspects of society) and subsidies/welfare payments to those in need. In much of Western Europe food was locally produced and traded, and on the continent a greater proportion of the population was engaged in agriculture than in more industrialized Britain. Maintaining people on the land was seen as a goal, in contrast to the USA and Australia, which have more readily witnessed and accepted widespread rural depopulation with the growth of industrial production in urban and suburban zones. Furthermore, given the strong culinary heritage of continental Europe, maintenance of high quality food using traditional methods of production was strongly supported, and the emergence of convenience 'fast' food of poor quality rejected. When the economics of the maintenance of a small-scale rural agriculture was questioned in Europe in the 1980s by net contributors to the European Economic Community, such as the UK, the leaders of countries like France and Germany made it clear that this was an important part of the fabric of their nations.

The Western systems of food production also attempted to embrace the philosophy that food could be produced in regions most suited to the purpose; this was one of the founding principles of the Treaty of Rome that inaugurated the European Common Market in 1960. At the same time, eating habits were changing due to less physically demanding jobs, requiring less high-energy food, and central heating in houses and offices reduced demand both for high energy food to keep warm and for woollen garments that retained heat better than their artificial counterparts. The proportion of the population engaged in agriculture continued to shrink rapidly, with increased mechanization and larger, more efficient farms. In former communist countries this trend was even more exacerbated because the state farms had been a large user of surplus labour, which was abruptly halted following collapse of the communist states. In Western Europe rural pursuits like hunting came under sustained attack from urban dwellers, who failed to understand the necessity for such blood sports. The new eco-idealism favoured the production of agricultural products without cruelty to animals and without the use of potentially noxious chemicals.

In the Comecon countries the advance of television enabled viewers to become aware of the increasingly affluent lifestyle of those in the West. One of the commodities that was most commonly in short supply was meat. Soviet leaders agreed to subsidize livestock products to keep retail prices affordable, and feed-stuffs were imported for this purpose, in particular high quality oilseed products.

Beginning in 1989, the communist apparatus was systematically and suddenly dismantled in the face of overwhelming support for capitalist enterprise. The material success in the West had encouraged a revolution in favour of a system based

on individual enterprise. Enforcement of power by secret police and corrupt governing bodies added to the disillusion with communist regimes. Ironically for many, in particular the elderly, meat consumption actually declined, as imports of livestock products and feed were almost wiped out overnight. A poverty-stricken sector of the population emerged, which was widespread in the early years of the 1990s, and reverted to a staple diet of bread and potatoes.

Communism was not the only authority to crumble; the church in Western Europe saw a steady decline in influence over the last quarter of the 20th century, aided by an ultraconservative pope, John Paul II, who failed to take account of the liberalization of ideals towards homosexuality and abortion in particular. Western governments too found their power diminishing in the vanguard of campaigners for women's, homosexuals', ethnic minorities' and animals' rights. Many opted to appeal to the centre ground in an attempt to secure the democratic licence to govern. Power to the people went hand-in-hand with the liberalization of trade worldwide, creating a generation of ideologues in the name of capitalism.

The capitalist system of production was based on allowing individuals the chance to develop successful, independent enterprises, which were essentially market-led. The old monarchies of the early 20th century, with their power and opulent splendour, were mostly dismantled, or were retained only symbolically. Whereas communism had narrowed the divide between rich and poor, the loss of opportunity to advance personal wealth, the corruption at the head of communist governments, and the setting of and failure to reach unrealistic production targets combined to erode confidence in Marxist ideals. A new set of oligarchs emerged to lead large multinational companies, often with interests in food production that gave them a power that rivalled the pre-revolutionary monarchies in Europe in the early 20th century. The new McDonald's in Pushkin Square, Moscow, which opened in 1990, symbolized an avid embracing of the Western diet. Coming as it did at a time when the price of bread and milk quadrupled in 1 year, it demonstrated the enthusiasm of the former Comecon countries for fast food. The re-entry of Russian troops into Ukraine in 2014 prompted Western countries to impose sanctions, to which the Russian government responded by closing the Moscow McDonald's, ostensibly because of health concerns (Marson and Jargon, 2014). Evidently the availability of Western-style fast food in Russia had become a major political football.

After the rapid exit of communism from Europe in the early 1990s, Nestlé and Mars began to peddle their wares as avidly as the Western cigarette manufacturers. However, hunger became widespread in several of the former communist countries after the Soviet empire collapsed, mainly due to escalating food prices following economic liberation. In Romania the new government distributed salami from the private stockpiles of the secret police (Securitate) to combat the poverty. Meat shortages in the 1980s had led to the manufacturing of soya-based salami, and foreigners, or rich Romanians returning home from overseas, were heralded as those 'who did not eat soya-based salami' (Buscu and Catavencu, 2010). After a belated rescue package by the G7 nations stability returned to Romania, but the proletariat, and in particular the pensioner population, struggled with poverty for many years.

The Western European proletariat, if indeed it still existed in the relatively classless society that was emerging, was not immune to change; indeed an ability to change with public sentiment was one of the characterizing features of capitalism. Early on the society showed evidence of embracing ideals based more on ecological and libertarian values than on any allegiance to a crumbling set of morality standards established by the church. In the 1960s and 1970s students in the expanded higher education system of post-industrial Europe clashed repeatedly with their authorities to espouse a desire for freedom of expression. Into this miasma emerged a radical youth that later came to challenge the might of the major industries and, more profoundly, advocate respect for all life forms and the integrity of the planet's flora and fauna. A new philosophy was born to rival the power that Marxism had inflicted on much of the world 100 years earlier. Nowhere did the growing philosophy of respect for life and freedom to live as one wants have the power to inflict greater change than in our diet. Although meat consumption has expanded worldwide in recent years because of a growing capability of Asians to purchase meat, in some Western countries demand has diminished or stagnated due to ethical and health concerns (see Chapter 4).

Free enterprise was literally the trademark of the new Europe, facilitated by the adoption of a common currency. Nevertheless, the vast diaspora of people in the European continent and the cultural diversity made for an uneasy common market. Issues like animal welfare and environmental impact of animal production systems were more carefully controlled in some regions than others, leading to inequalities of market externalities that artificially manipulated production economics. To make matters worse animals and animal products were imported from outside the European Union (EU) because countries there were not subject to EU legislation.

The last few decades of the 20th century saw the expansion of large-scale animal production in many regions of the world, in response to changing socio-economic circumstances. Nowhere did the animal trade develop faster than in the Americas at the end of the last century, as exemplified by one of the largest companies involved, Cargill Inc. The enterprise started almost 150 years ago when a young American, William W. Cargill, bought a grain store in Iowa. The company expanded to include a wide range of food production and processing enterprises, prospering most in times of food shortage, such as the world wars of the 20th century and more recently with the diversion of grain to produce biofuels and to feed an expanding world population. Global revenue from sales is now in the region of US\$120 billion per annum, with earnings of US\$2.7 billion. The company is still 90% family owned and employs 130,000 people worldwide. Now with undisclosed personal fortunes estimated in the billions, the Cargill family is one of the richest in the world. In Australia the merger in 2012 with beef processing giant Teys Bros provided the expanded Australian division with the opportunity to manage the entire food chain from production of feed to processing the carcasses of 1.5 million beef cattle per year.

In recently colonized countries, the USA and Australia in particular, the strong work ethic from the pioneering days and desire for convenience led to the

emergence of a fast-food culture. Food was increasingly obtained in just a few minutes from a local 'take-away', rather than being elaborately prepared at home. This allowed both partners in a family to work and enabled them to pursue their goal of ever-increasing living standards. Some British colonies, including Australia, New Zealand and Canada, had little food heritage, unlike the African nations that had been colonized by Mediterranean European countries. In the former, convenience products such as homogenized beef were enjoyed by the masses and supported by trade with Britain. Most of the European powers retained some trading connection with their former colonies, which were mostly formally relinquished in the 1960s. The ready acceptance of fast food paved the way for the development of large-scale food animal industries to mass produce the necessary animal ingredients. The USA and Australia favoured development of large enterprises; it is ingrained in their culture, which places emphasis on personal freedom to develop businesses, with limited government intervention. This has led to the development of many interest groups, which seek to lobby government on individual causes. The relevant governments have become subservient to these interests, which diminishes their ability to act in the national interest. Farming interests, by virtue of their historical importance and appearance of representing a vulnerable group of people, are strongly supported. This explains how farming activities, such as the export of livestock long distances, can be supported by government when they are apparently not supported by the majority of the population of Australia.

In contrast to this, most of Western Europe, Africa and South-east Asia have continued with small-scale agriculture, supported in Europe by government subsidies organized under the Common Agricultural Policy. However, within the last few decades this has started to change in some developing countries, supported by importation of grain or destruction of indigenous forest to support home-grown animal production. Emerging and other developing economies in Latin America and Asia are changing their diet over a period of perhaps 20–40 years, compared with the 100 years that it took in the West (Guyomard *et al.*, 2013). In the first stage the quantity of food available increases and calorie intake increases. After this there is a transition away from consumption of cereals and vegetables towards increased consumption of animals and animal products, particularly those with a high fat content, and a transition to a 'mature consumption market' (Guyomard *et al.*, 2013). These changes are driven by urbanization, economic growth and demographics, together with increased food processing and supermarket sales. At the same time livestock production has become more specialized, with advances in animal genetics, nutrition and a farm structure that is increasingly based on hired labour, borrowed capital and importation of feed and fertilizer on to farms in large quantities. However, even with rapid production growth in a few key developing countries in Latin America and Asia, especially Brazil and Thailand for poultry, developing country importation of animal products has grown far more rapidly than in developed countries. Currently approximately 80% of export trade in ruminants and poultry is in the hands of just five countries. For pigs it is less, about 20%, and imports are slightly less concentrated into a few key countries than exports (Guyomard *et al.*, 2013). This raises serious concerns about the risks

that volatile markets could pose to developing countries. Under these conditions, small increases in grain prices could have catastrophic effects on affordability of the products. Growth in animal production in developing countries is logical as it is cheaper to transport grains than animals, and the developing country itself has the benefits of low labour costs and the opportunity to add value.

1.5 Conclusions

The trade in animal products is several thousand years old and since its beginnings it has consistently grown, but most rapidly in recent years with the onset of globalization in the world's commodity trading. During its growth, there have been many models followed for animal production, which have impacted on the way in which animal products are traded. In the early days feudal systems were largely self-sufficient, but with serfs yielding a portion of their production to the lord of the manor. This was followed by the beginnings of industrialization of agriculture in the 18th century, coupled with the development of an urban population with the potential and desire to consume animal products. The development of improved transport facilitated the process of rural areas supplying animals and their products to the cities. At the same time, there were proletarian revolutions in the 17th to early 21st centuries that demonstrated reluctance on the part of the peasantry to accept serfdom as a system of agricultural production. After this the world divided, with a large sector having egalitarian styled, communal land ownership imposed by government, with the rest of the world allowing entrepreneurs to develop their own animal production enterprises, with a focus on the capital growth of their businesses. Both systems facilitated major growth in animal trade within each of the two sectors. A more rapid pace of growth in living standards in the capitalist system caused the rapid collapse of most of the world's communist regimes, which then embraced the capitalist ideals. The 21st century has seen the emergence of large multinational animal trading companies. At first this was focused on the developed countries, but as trading restrictions eased with a move towards free-trading markets, the developing countries increased their animal production and now export at a rapidly growing rate. The sustainability of this growth will be tested over the coming century, as the challenges of environmental impact and concerns about the welfare of mass-produced animals escalate.

In the light of the central position of the animal trade in the transition from hunter gatherer societies to settled agriculture, it is relevant to consider the implications for animal ethics. Surely animals were put on the earth for our benefit and we can use them as we wish, or were they? Philosophers have long argued for equal consideration of interests in animals and humans, principally to maximize happiness and minimize suffering. This might seem at odds with nature, which seeks to allow some animals to exploit the interests of others, through predation or parasitism for example. However, the philosophers and anyone that has thought deeply about the subject come to the conclusion that this exploitation is ultimately detrimental to the harmony of humans and animals on the earth. In humans a

failure to recognize the interests of other humans leads to racism, tyranny and war, and similarly our failure to recognize the interests of other sentient beings leads to extensive suffering on their part, and because of the intertwined nature of human and animal lives, also to humans. Even though Darwin tried to play down the impact of his discovery of natural selection for our understanding of the suffering of animals in nature, it was a fundamental change in our thinking. In his seminal essay on the origin of species Darwin (1859) wrote ‘We may console ourselves with the full belief, that the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy, and the happy survive and multiply.’ His discovery of nature’s harsh methods of maintaining appropriate species in a varied ecosystem had damaging impacts for about a century in justifying artificial selection of supposedly superior humans and animals. If animals exposed each other to untold cruelty in the name of natural selection, surely it was acceptable for humans to keep animals in conditions in which they suffer for the benefit of humans? It was not until the 1970s that a substantial movement towards recognizing equality of interests in humans and animals began with the writings of Peter Singer (e.g. Singer, 1975). This movement began to redress the damage caused by the integration of Darwinian principles into our moral behaviour, causing a belief that the methods of nature were acceptable for human–animal interactions. This movement had at its core the belief that the minor human benefit from farming animals for food did not justify the major impact on their welfare. While considered extreme in its infancy, it has gained more widespread support in recent years and is likely to be an accepted principle in the future (see Chapter 10).

Note

¹ Special army meat. The poor quality of the meat led to the term eventually coming to mean useless electronic messages.