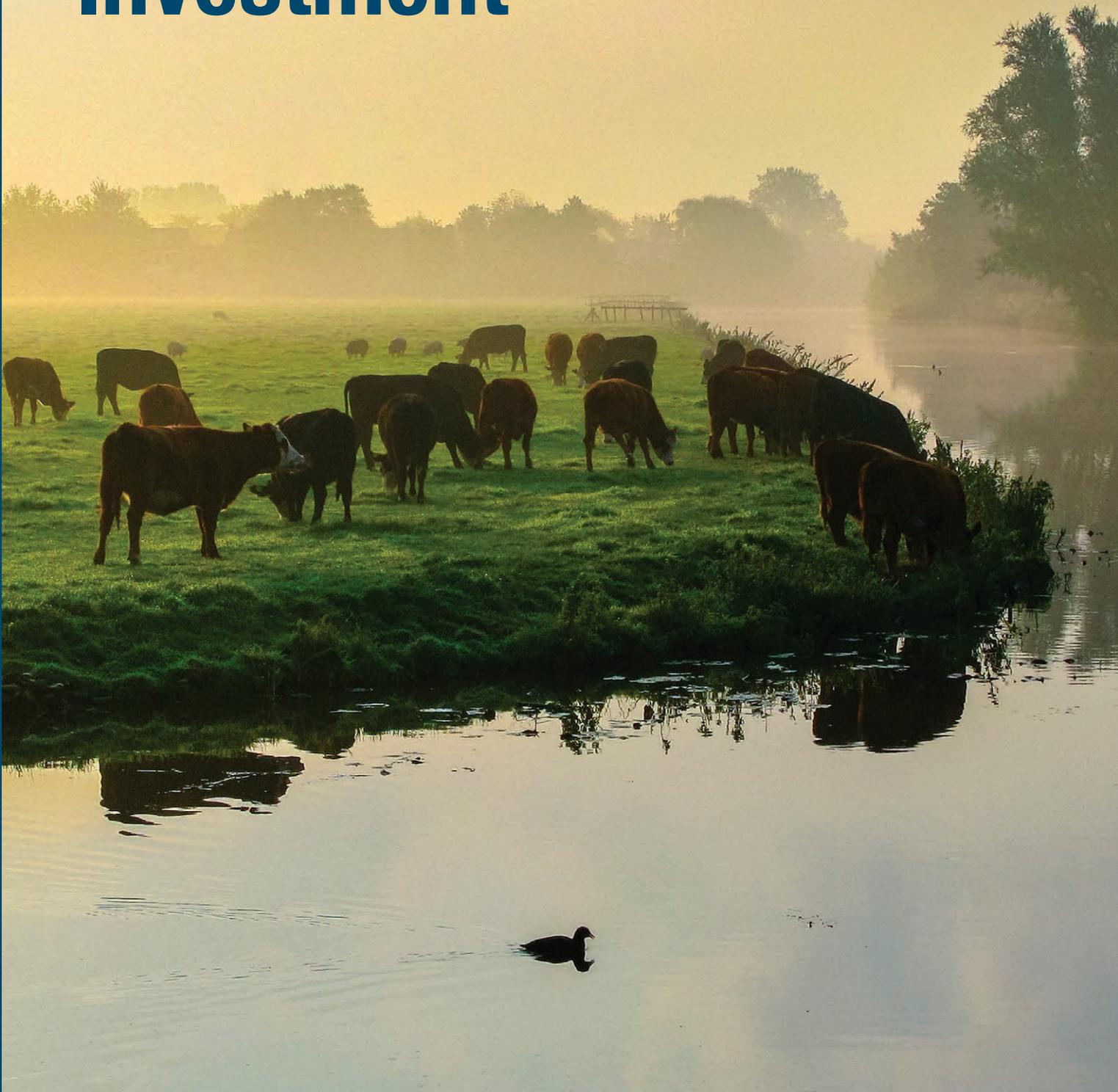


EDENTREE INSIGHT



Animals, Business & Investment



Foreword

Less than a decade ago (in 2011 to be exact), we conducted a survey of institutional investors on their approach to farm animal welfare. The results were disappointing, to say the least.

Even among those fund managers managing ethical or screened (retail) funds, farm animal welfare had received relatively little attention other than in relation to animal testing of cosmetics and toiletries and the sale and marketing of fur products. We found very few examples of investor engagement with companies on farm animal welfare issues, with most of this engagement being reactive (e.g. in response to press stories on issues such as the accuracy of labelling and marketing claims or the public health and safety implications of farmed products. We found even fewer examples of farm animal welfare being integrated into investment research and decision-making.

We identified various reasons for this: The common perception that animal welfare was primarily an ethical issue, the perception that animals were adequately protected by legislation, a general lack of familiarity in the investment industry of farm animal welfare issues, a lack of publicly available information on how companies manage farm animal welfare issues, the perceived inevitable need for intensive farming practices in light of the need to feed ever growing global populations, and the perception that higher welfare animal farming practices result in higher financial costs for companies.

Fast forward almost a decade and the situation is completely different. Consumer interest in farm animal welfare and its relationship with food safety and food quality is at an all-time high. The relationships between farm animal welfare, supply chain resilience, product quality and food safety are clear. The business case and reputational case for taking a proactive approach are clear, and leading companies see no benefit in pulling back from this position.

The financial and ethical cases for investors to account for farm animal welfare in their investment research and decision-making is clear.

We are seeing this across the investment industry with many investors now using data from the Business Benchmark on Farm Animal Welfare (BBFAW) to identify leaders and laggards, to assess the quality of risk and supply chain management processes, and to identify investment opportunities. Many are also using the BBFAW to identify areas where companies may improve their performance and raise these issues in their engagement with companies.

This EdenTree Insight: Animals, Business & Investment vividly illustrates how animal production and animal welfare are inextricably linked with ethical, political, economic, environmental and social issues. Discussions about supply chain resilience, about the use of antibiotics, about food safety, about food quality, to name just a few, are intimately linked with the manner in which animals are treated. And, as this report shows, these issues are not confined to the food sector but are also relevant to industries such as fashion, textiles, upholstery, traditional medicine, animal health, entertainment, and pharmaceuticals.

Incidents such as the 2012 Horsegate scandal, exposés on inhumane animal treatment, the desire for locally sourced products, the growth in vegetarianism and veganism, and, most topically, the coronavirus pandemic, have all played important roles in getting us to this point. But we should not forget the critical role played by investors. Since the BBFAW's inception in 2011, individuals such as EdenTree's Neville White have championed farm animal welfare in the investment industry.

In fact, EdenTree's involvement in the BBFAW Investor Collaboration and as a signatory to the BBFAW Global Investor Statement on Farm Animal Welfare since 2015 have resulted directly in many of the significant improvements we are seeing in corporate practice on farm animal welfare.

With a growing body of institutional investors involved in both the BBFAW Investor Collaboration and Investor Statement – each representing £2.3 trillion in AUM – investors are sending a clear signal to food companies that institutional investors see farm animal welfare as a key business issue, and one that needs to be managed alongside other corporate responsibility issues.

There is, of course, much more to be done, not just in the food sector but across other industries that utilise animals. But the progress we have seen to date with food companies shows that great change can be delivered, and that investors can play a catalytic role in delivering that change.

Nicky Amos is Executive Director of BBFAW and Managing Director of Chronos Sustainability.

Dr Rory Sullivan is Expert Advisor to BBFAW and CEO of Chronos Sustainability. Together they are the editors of *The Business of Farm Animal Welfare* (Routledge, 2017).



Introduction



By Neville White

Head of RI Policy & Research, EdenTree
Investment Management Limited

Animals are a much used and largely invisible constituent in business. A wide swathe of industries and sectors rely on animals and animal derived products in their manufacturing supply chains. Whilst food is only the most obvious, animals are used in a multiplicity of ways that go farther than perhaps many realise – from leather and down, to the animal fats and musks in cosmetics and the use of animal body parts in traditional medicine, to the use of animal enzymes in medicine and biotechnology.

This wide-ranging EdenTree Insight looks in turn at the myriad ways animals are utilised in and by business, and brings together in one place for clients our House thinking on issues such as animal testing, intensive farming and welfare.

In looking at these in turn, we show clearly where we would not invest, but the Insight also considers where positive opportunities exist in the field of genetics, companion animals and pharmaceuticals, where welfare need not be compromised.

Although business impact on nature and biodiversity lies beyond the scope of this particular Insight, the disturbing evidence presented by the United Nations and in the UK's State of Nature Report cannot be ignored – and in an Afterword, we point to the role business can and must play in 'making space for nature' – a subject as investors we expect to return to.

We were among the earliest investors to support the ground-breaking Business Benchmark on Farm Animal Welfare, and we are delighted our friends at BBFAW have written the foreword to this, our 37th Insight. We are justly proud of putting animal welfare at the heart of our investment considerations, and as ever we hope you enjoy reading this Insight, and welcome your feedback.

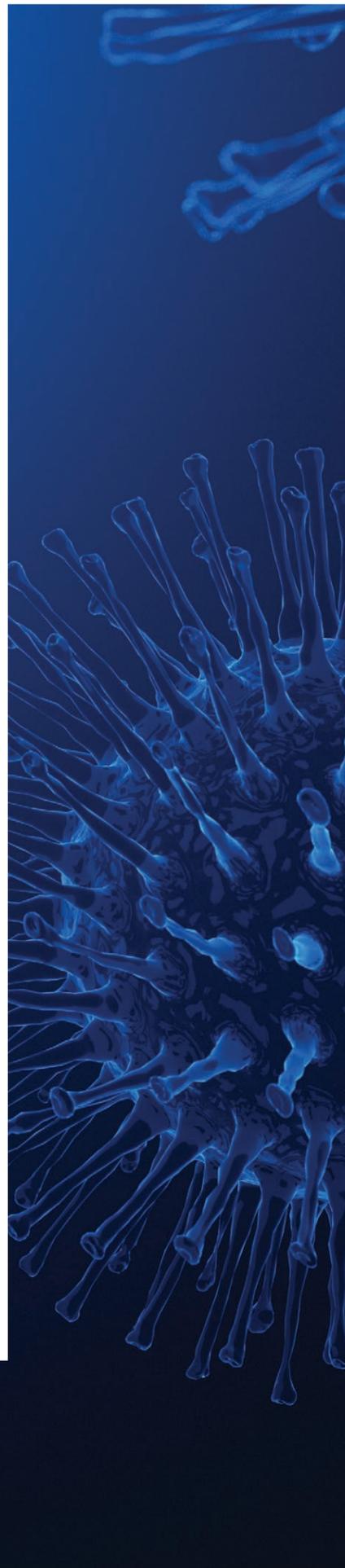


A Word on COVID-19

At the time of writing (early June), Europe was beginning, tentatively, to emerge from over six weeks of lockdown resulting from the COVID-19 virus which has affected communities across the world.

As well as the terrible human cost in lives (405,000+ currently), the majority of normal economic activity has ceased from live performance, to car manufacturing to getting a haircut. One would need to combine the effects of the Great Influenza Epidemic of 1918, the Great Depression of 1929 and the wartime economy of 1939-45 to gain some semblance of the impact of this strain of coronavirus on normal social and economic life. 'Best evidence' strongly leads towards this strain evolving in nature and jumping species, but it is important to stress that its definitive origins are still open to conjecture. Markets that trade wild animals as well as pets and farm animals are ideal vectors for pathogen transfer, such as SARS (2002-03). Again, best evidence suggests COVID-19 having far greater efficiency in infection transfer than influenza, for instance infection transfer from contact with door knobs or dishes. There are indications that the current coronavirus outbreak may have spread to humans from a live animal market in Wuhan, China, and continuing conjecture that the virus may have potentially originated in species such as bats. We have not seen any scientific evidence that conclusively proves this route, but it is the most likely origin and where the broad consensus of scientific opinion has so far settled. The relevance for this Insight is to consider, perhaps more urgently than ever, our relationship with nature, its treatment and wellbeing and the fundamental principles of animal welfare.

EdenTree Investment Management June 2020.



Animals in the Business Supply Chain

Think of the many ways animals can be used, utilised and managed as part of business supply chains and the reach and extent might surprise you. Few sectors and processes are completely free of some relationship to an animal derived product – and others depend on it. Here is our take on some – but maybe not all – of those ways!



Historical Context: Sentience and Emotional Intelligence

At least since the early Neolithic period, animals have been reared, tamed and exploited by humans. In particular, animal husbandry was fundamental to the development of settled agriculture, and has underpinned some of the most significant advances in early human evolution. The move from hunter-gatherer to settled farming in time led to the emergence of communities and settlements in which animals were at their heart. Early farmers, in addition to developing tools for hunting understood that animals provided milk, fur, meat and wool and could be used for burden, cultivation (ploughing) and carriage.

In Britain, early settled farming is usually dated from c5,000BC, at the end of the New Stone Age, but it is known from archaeological evidence to date from as early as 11,000BC in the modern Middle-East. The Middle Bronze Age (1,500-1,200BC), saw the first field systems laid down using ox and cattle to plough, with evidence of the horse emerging as essential to communal mobility as early as 6,000 years ago.

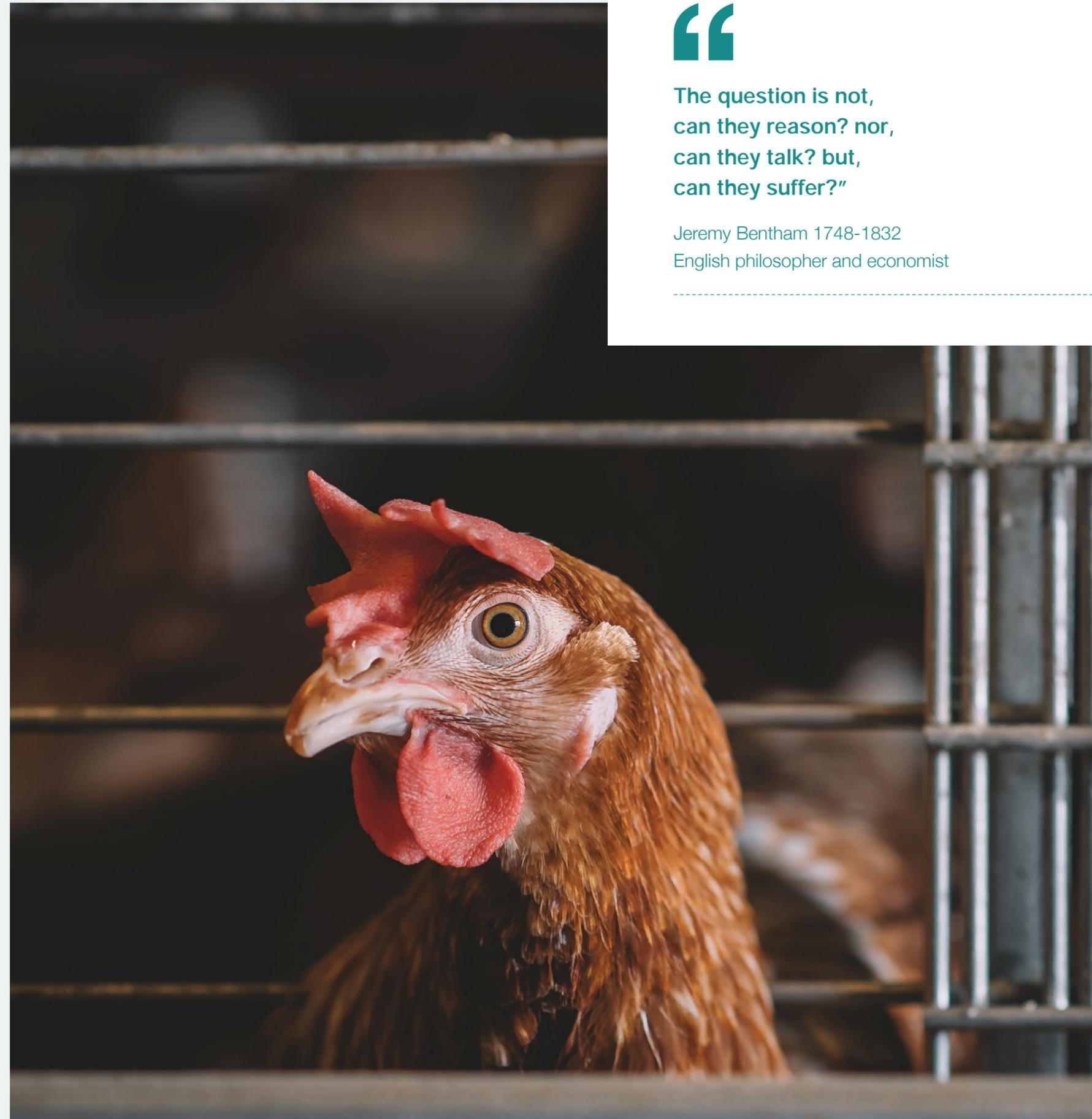
An important context for this Insight is that welfare is not just a 'nice to do' but *the right thing to do*.

Animals fear pain, anxiety and isolation and can suffer 'grief symptoms' at the removal of their young. Owing to the ubiquity of animals in the food chain, humans can often fail to relate to them in their own terms without biases created by their economic utility; and this bias is most extreme between companion and domesticated animals. The main breeds exhibit intelligence, learning and recognition skills – studies suggest sheep can facially recognise up to 50 individuals for two years (which may be why they study humans so intently). Intensive farming has numbed the ability to see animals as individuals with complex behaviours. Whilst the food industry is a reality, cruelty, neglect and harmful treatment should not be – the pursuit of high standards where animals are used, lies at the heart of this Insight.



The question is not, can they reason? nor, can they talk? but, can they suffer?"

Jeremy Bentham 1748-1832
English philosopher and economist

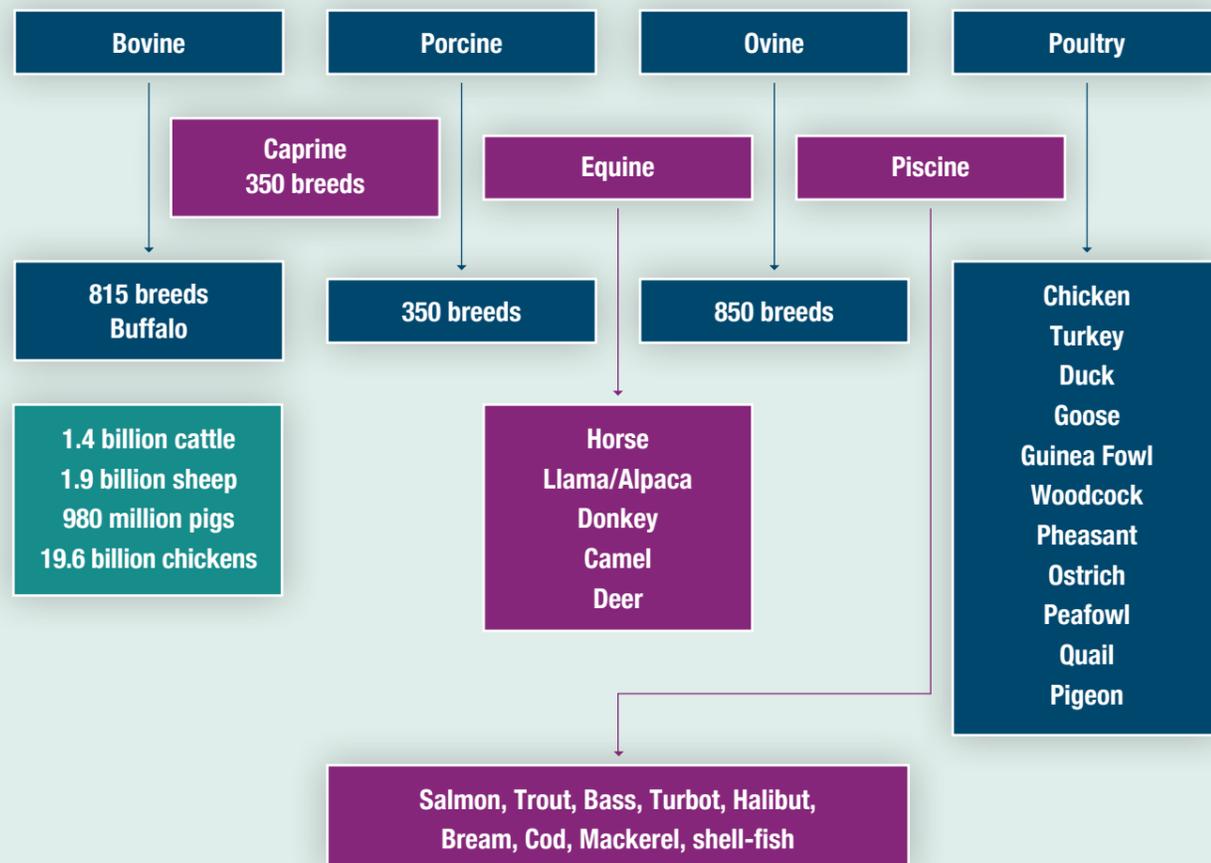


Food & Farm Animal Welfare

The global meat sector was valued at close to \$1trillion in 2018, with around 330m tonnes produced. Pork and poultry together are the two most produced meat types by weight globally, with poultry the #1 type of produced meat across the world.

Macro demographics have fuelled meat production – urbanisation and the creation of a global middle-class has fuelled protein enriched diets involving more meat and less rice and fewer pulses and vegetables.

The meat sector encompasses a wide variety of species and breeds raised for meat or produce.



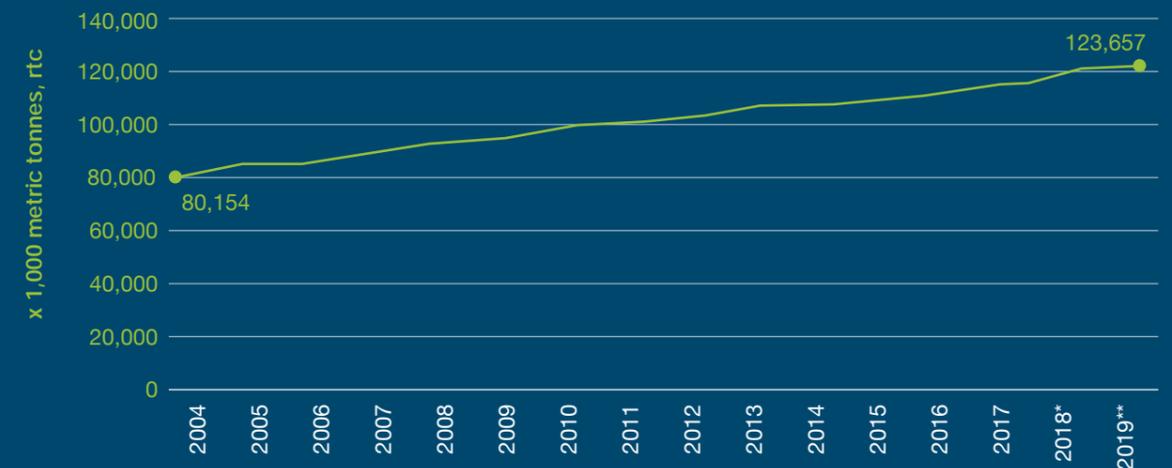
Fascinating Fact File:

- The US is the largest global producer of beef followed by Brazil
- The US also produced the most poultry globally, followed by China

- In the EU the majority of animals are reared in just a few states
- 75% of the European bovine herd are reared in just seven EU countries (the most in France)
- Almost 75% of pigs are reared in just six countries (the most in Spain)
- Over 25% of all Europe's sheep are reared here in the UK!

The EU28 headcount of reared livestock (bovine, sheep and goats) declined over the period 2010-18, although pig head count – fuelled by strong Chinese demand, boomed over the same period. Poultry based diets have seen the strongest growth manifested in the number of reared birds. The global industry produced nearly 125m tonnes of poultry meat in 2018 – in Europe alone production increased by 25% since 2010.

World poultry meat production trend 2004-19

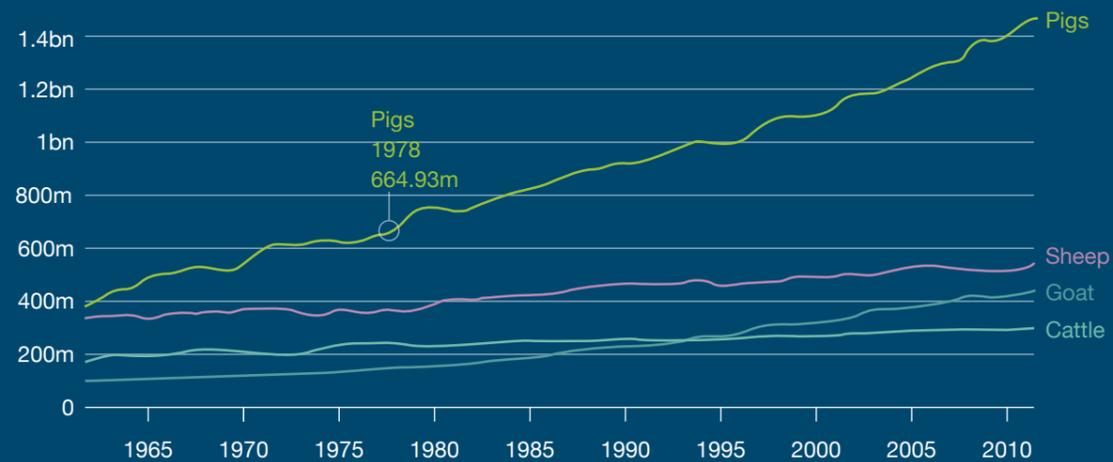


*Estimate **Projection Source: Adopted from OECD FAO Agricultural Outlook publications

Animals reared for meat represents husbandry and slaughter on an industrial scale. According to the *World Economic Forum*, an estimated 50bn chickens are slaughtered annually for food not counting 'disposable' male chicks. The numbers of pigs, sheep and cattle are equally large at 1.5bn pigs, 500m sheep and around 200m cattle.

Number of animals slaughtered for meat each year

Whilst the human population has doubled over the last 50 years the amount of meat consumed has tripled.



Data excludes chickens and turkeys. Most recent data is 2014

Source: UN Food and Agriculture Organization 2017

Most of the growing demand has come from developing and middle-income economies, whilst in the West, meat consumption appears to be in long-term decline. This is seen in the emergence of China – once an agrarian economy – as the primary source of growth in demand for meat.

Meat production is literally ‘costing the earth’. Meat, dairy and poultry now account for 75% of all agriculture-related GHG emissions (>9% of all global emissions). Land used for beef production has accelerated forest clearance and deforestation in particular, whilst 33% of the world’s grain production now supports animal feed, rather than human consumption. Beef production is also water intensive with c1kg of beef requiring over 15,000 litres of water to produce.



Implications for Welfare

At its simplest, modern intensive farming practices seek to maximise production via higher stocking density. Most forms of animal husbandry can be subject to intensive practices but milk, meat and eggs are the main outputs connected with intensive production.

Whilst this has allowed poorer populations to have access to protein as never before it has come at a cost – notably welfare and an increasing use of pharmacological intervention via the use of antibiotics. Even in the UK, intensive practices are becoming common as economies of scale place pressure on smaller enterprises. The Environment Agency in the UK has defined ‘intensive’ as places for 40,000 birds or 2,000 pigs and is most prevalent in the broiler, turkey and laying-hen poultry markets. There are now over 1,500 ‘intensive’ poultry farms in the UK and close to 800 ‘mega-farms’ with capacity for 125,000 broiler hens, 82,000 laying hens, 2,500 pigs or 700 head of dairy cattle.

None of these industrial scale enterprises are investible – all are privately owned. Outside Europe, this kind of scale is the norm: 99% of all US production is ‘intensive’. Clearly, whilst welfare need not be compromised, it often is. We identify the key welfare issues as:

- Lack of space and cramming in pens, crates or cages – inability to reflect natural behaviour
- Mutilation e.g. tail docking and beak clipping – it is believed over 90% of pigs tails are docked
- Growth stimulants to increase yield which typically leads to lameness, weak bones or fatality
- Overuse of antibiotics to counter health conditions brought on by environmental ones
- In the US 80% of all antibiotics are used in food production on farm animals
- Environmental degradation and animal ill health owing to poor control of slurry

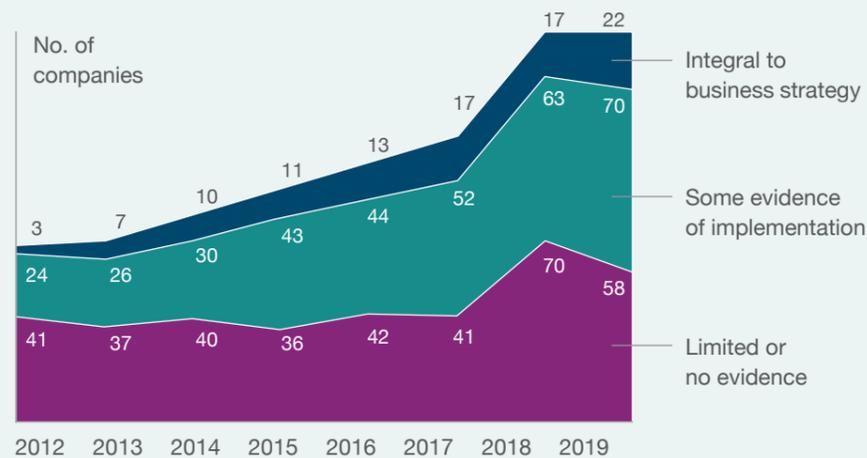
Responding to Welfare: Supporting Business Benchmark on Farm Animal Welfare (BBFAW)



BBFAW is the leading measure for investors on farm animal welfare, and we are proud to have supported it since inception.

BBFAW is a global measure of policy commitment, performance and disclosure by food producers, processors and retailers, and over its eight years of benchmark reporting, has established itself as an authoritative voice on animal welfare – a subject seldom reported on by companies prior to the Benchmark's launch. Coverage has increased from 68 global companies in 2012 to 150 in 2019. Progress has been strong – but also reveals how much there is still to do for this to be recognised as a material risk for companies in the sector:

Evolving improvement in reporting farm animal welfare



The Business Benchmark on Farm Animal Welfare Report 2019 (BBFAW)

Of the 150 companies surveyed in 2019, the majority now show evidence of Board oversight, and have formal implementation procedures in place, and 80% have improved their ranking since 2012. Companies are ranked in Tiers from Leadership (I) to 'little disclosure' (V). In our investible universe, we are delighted that so many holdings are ranked in the upper Tiers – M&S (I) and all three major UK food retailers (Tesco, J Sainsbury and Wm Morrison) in Tier II.



What is EdenTree's Approach?

We are proud supporters of two investor led animal welfare related organisations – BBFAW and FAIRR (Farm Animal Investment Risk and Return). Both are collaborative investor initiatives that seek to drive better business behaviour in the management of animal welfare risk.

EdenTree is signatory to the BBFAW Investor Statement with aggregate investor backing of \$2.4 trillion. We participate in the BBFAW annual engagement initiative, and through FAIRR we support their program of work on reducing the use of antibiotics in the food chain. Intensive farming is an Ethics negative screen in our Amity Funds. The Policy was adopted in 2010 and aims to avoid investing in the worst practices of global, mechanised animal husbandry. Particular attention is focused on poultry, cattle, piggeries, and caged fish-farming.

Although the Policy does not extend to retail, we engage with companies exposed to animal welfare issues on their approaches to managing the risk. Companies operating in transport and logistics are required to have 'best practice' policies in place. The number of companies caught by the Policy is fairly small – North American mega-farms and Asian sea food and caged fish farming are the most prevalent – we believe this is an important signal to send that EdenTree places animal welfare at the heart of investment policy. The policy is available on request.

Fur, Skin, Leather, Wool & Musk

Animal derived 'body products' are used in a wide variety of sectors and businesses e.g.

- Car industry – leather
- Fashion – leather, wool, fur and perfumes
- Household and furniture – leather, down, wool, feathers
- Traditional medicine – animal parts including skin and scales

In many instances these are sourced as a by-product of the meat industry, but in others animals may be bred, farmed or reared specifically for their body parts or fur. The use of animals specifically for these purposes raises challenges for responsible investors. For instance, whilst skins would generally be supported where supplied as a by-product, specific farming would not. EdenTree does not have a stated policy on fur and it is not among our Ethical screens within the Amity range. However, we recognise investment in fur is controversial and best avoided. We take a closer deep dive into this part of the market where animal parts are critical to everyday household products.



Fur

The global fur trade has been valued at c\$40bn (retail, sales and farming).

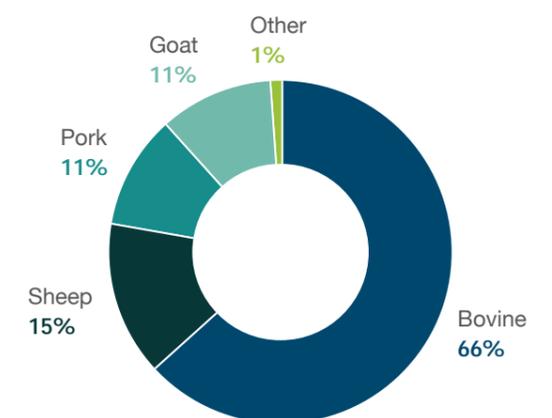
Whilst still significant, fur is in long-term decline owing to successful campaigns against its being secured through trapping and farming. The trade is dominated by fur farms in the USA and Russia and regulated trapping in Canada. In the US over 3 million mink pelts are farmed annually with over 650,000 animals bred specifically for their fur. Fur harvesting is legal almost everywhere except in a few European countries including the UK. The main animals from which fur is sourced are mink, fox, chinchilla and racoon.

Skin

The global skin trade is fairly niche but affects a wider range of animals than the fur trade.

Exotic skins sourced include bison, snake, kangaroo, zebra and reptiles such as alligator. As with fur, some species are farmed intensively including iconic reptiles. These products tend to be confined to high-end fashion, for instance where a snakeskin handbag might cost \$15,000. Some luxury goods companies have now a declared policy against the trade in skins including Burberry, Gucci, Versace, Armani, Calvin Klein, Paul Smith and Chanel.

Major sources of skins



Food and Agricultural Organisation of the United Nations (FAO)

Leather

Leather tanning and production is among the oldest of professions with the leather goods market having an estimated value exceeding \$100bn.

The global industry produces around 18bn ft² a year, and is today dominated by France, Italy and China – Italy being the global leader in finished leather goods (22% of world exports). The US is the leading exporter of raw hides at 28% of global trade. The process whereby raw hides are made into finished goods is ancient and intensive with the hide undergoing a multitude of cleaning, preserving, tanning and dyeing processes. Leather processing is environmentally intensive and toxic. Production is linked intrinsically with the meat industry, with JBS of Brazil, (among the world's largest meat processors) also being a global hide trader, curing 28,000 cattle hides a day in the US alone.

Leather interiors are not confined to luxury brands. Practically all car manufacturers utilise cow hide for their leather interiors with an estimate that 30% of all leather produced goes towards car interiors, the majority of the remainder is made into shoes. However with awareness of the growing vegan market, nearly all major manufacturers now offer at least one model that is leather-free including Ford, Honda, Hyundai, Mercedes-Benz, Nissan, Tesla, Toyota and Volkswagen.

Wool

The UK is home to more sheep than any other EU country, and is the 8th largest producer of wool in the world, which is dominated by Australia with 25% of global production.

The wool industry produces around 1.1bn kg of wool from around 1bn sheep. Wool, despite the growth in synthetics, is still popular in clothing, carpets, and household furnishings as a versatile natural fibre. Greasy wool processing entails removing lanolin which is used in cosmetics, lip balms and waterproofing. Wool is a natural product and sheep are least likely to be subject to intensive farming; wool can be washed at lower temperatures than cotton or comparable synthetics and is promoted as an environmentally beneficial fibre that is not implicated in micro-plastic contamination. *The International Wool Textile Organisation* (the industry trade body) provides over 500 companies with animal welfare guidance through its sponsored *Dumfries Declaration*. Detractors, however, point to the cruel and artificial manipulation of sheep for their fleeces. Left alone, sheep would produce just enough wool for their needs and no more. They also point to mass sheering as being stressful and in many cases abusive, with instances of sheep being cut and injured as sheering is paid on volume.

Musk

Natural musk is a niche part of the perfumery industry used as 'base notes' or fixatives.

Musk itself came originally from Musk deer which are trapped and killed for their secretive glands. Musk is also found naturally in civet cats, beaver and some water fowl. The Convention on International Trade in Endangered Species (CITES) effectively outlawed natural musk, but it survives in China where a musk pod might sell for \$200-250. More widely, the cosmetic industry utilises a wide range of animal derived products including castoreum; guanine (fish scales); carmine/cochineal; ambergris; tallow; squalene; snail slime; lanolin; collagen; elastin; glycerine and glycerol; keratin and shellac.

What is EdenTree's Approach?

The fur, skin and musk segments are niche with a limited investible universe. Mostly confined to the ultrahigh-end fashion market, most of these niches are under pressure, subject to boycott and in decline.

In our screened funds, EdenTree would not generally seek to invest where animals have been farmed for their fur or skin. The exposure to leather – largely a by-product of meat processing – would be more widespread across a range of industries, much of it fairly invisible. The main exposure might be retail (jackets, coats, belts, shoes etc.) and manufacturing where leather is a key component e.g. car seats or furniture.



Traditional Medicine

According to the World Health Organisation (WHO), the majority of modern medicine derives from plant and animal sources. This is particularly true of the TCM (Traditional Chinese Medicine) market, which is globally estimated at \$60bn. It is also widely implicated in driving some exotic species to the edge of extinction.

Although herbal remedies form the majority, around 36 animal species are still used. The basis for TCM lies with *Shennong* (28th century BC) who is credited with compiling the first herbological study. Exotic species such as tiger, bear, rhino and Musk deer have all been used as part of TCM remedies. Whilst the use of exotic animal parts in traditional medicine have no proven therapeutic benefit, their mythology continues to thrive. Domestic use of tiger bone was banned in 1993, but is still regularly sourced on the black market. Decoated Rhino horn has been principally blamed for the poaching of rhino almost to extinction, and has still not been banned by the Chinese government.

Over 90 TCM treatments contain seahorse, with 32 countries involved in harvesting 20m seahorses every year, such that eight species are now classified as threatened (vulnerable or endangered). The farming of 54 animal species purely for the TCM market is sanctioned by Beijing but this sector is prone to much black market intervention. Live wild animal markets are now flagged as the most likely host for zoonotic viruses such as SARS and COVID-19. A live animal market in Wuhan is widely suspected as the source of the global COVID-19 pandemic, where live animals are slaughtered and prepared on site.



Traditional Medicine and the Plight of the Pangolin

The little-known pangolin or scaly anteater has become the world's most trafficked animal, and the iconic wildlife story of the demand for animal parts for the TCM market.

The pangolin is a shy, secretive ant-eating mammal in high demand for their scales made of keratin, and their meat, which is a delicacy in China and Vietnam. Ground and turned into paste, pangolin scales are alleged to help with lactation, arthritis and other myriad ailments. However, there is little evidence to support any therapeutic positives. Demand is driving sub-species close to extinction. In January 2019, eight tonnes were seized worth HKD\$42m (\$5.4m) representing 14,000 animals. Between 2014 and 2018 140 tonnes of pangolin scales were seized. A possible bright note arising from COVID-19 are restrictions placed by China on the sale and trade in pangolins, given the genetic structure of the pangolin and human coronavirus is 90% similar. Despite the international trade in pangolins banned by 183 nations in 2016 as part of the Convention on the International Trade in Endangered Species, resulting in all eight sub-species having the highest protection in law. However, this has failed to halt illegal trafficking, as the survival of this shy, secretive mammal hangs in the balance.

What is EdenTree's Approach?

EdenTree has some exposure to the TCM market and this presents distinct challenges for the responsible and sustainable investor. Where seeking investment exposure we look for well regulated and responsible businesses with proprietary pharmacological solutions based on proven herbal or plant based therapies.

For our screened Funds where animal welfare is at the forefront of our thinking we would seek assurances that companies do not trade, farm or source animal parts – other than as legitimate by-products, and most specifically have policies not to source or deal in exotic or endangered species. One such company is **Eu Yan Sang** founded over 140 years ago and focussed on modern TCM remedies using over 1,000 natural plants and herbs and with a specific policy against using endangered or exotic animal parts, although it does source chicken and fish from responsible suppliers.

Animal Testing



Animal testing continues to be performed for a variety of regulatory and safety reasons. The term is used to describe any procedure performed on live animals for research purposes into basic biology, chemical reaction or toxicity. This can be for:

- Medicines, pharmaceuticals and medical devices
- Pesticides and industrial ingredients
- Food ingredients
- Cosmetic, household and beauty products
- Chemicals ingredients under the EU REACH Directive
- Ballistics testing

The UK has among the most rigorous animal research regulatory regimes in the world, being the first to ban the use of tests on Great Apes in 1986 and for cosmetic and beauty products in 1998. It is illegal in the UK to perform a test using an animal where alternatives are available and where the benefits *must* outweigh any suffering.

Licenses can only be granted for medical, veterinary, scientific or environmental research. Larger animals (dogs, cats, horses etc.) have special protection. Testing itself is inevitable – **Charles River Laboratories** is a global leader in outsourced animal tests. Around a quarter of procedures were carried out by commercial enterprises, with the majority conducted by universities and licensed centres.

In the UK in 2018, 3.5m procedures using 3.4m animals were carried out. Live animal experimentation is now at an historic low in the UK with over half of procedures counted as basic research (56%) e.g. oncology and the nervous system. 86% of all procedures used mice, fish and rats; 1% required 'protected' species such as horses. Half of all procedures now count as breeding and genetic modification related. 7% of procedures were rated 'severe' with death being the immediate consequence. In 2018 just 397 procedures related to industrial chemicals testing such as on household bleaches and astringents.



Case Study – Novo Nordisk

Novo Nordisk is a Danish pharmaceutical company founded in the 1920s. It is a global leader in insulin with key efficacies in Type I & II diabetes. It serves nearly 30m patients a year via its insulin pens and needles which are marketed in 170 countries.

The company is a leader in transparent disclosure and provides very granular detail on animal testing. Whilst it is committed to the 'reduce, refine and replace' discipline and has very high animal welfare standards, clinical trials mandate animal testing.

Novo Nordisk performs 80% of animal experiments in-house, with 20% provided by external parties. The company has actively sought to eliminate obsolete *in vivo* tests in drug release testing and by 2011 the last *in vivo* tests were conducted relating to 'quality control' for approved products.

Number of animals purchased from 2000 to 2018

Total number of animals purchased by Novo Nordisk and external contractors



Novo Nordisk with a market cap of \$146bn purchases over 60,000 animals per annum, 278,376 since 2015



The 3Rs – *Replacement, Reduction and Refinement* – provide a global best practice framework for humane animal research, and have been embedded in national and international approaches to the use of live animals in experiments. However, non-essential tests that have been outlawed in Europe remain a requirement in China (and elsewhere) which presents obstacles for the responsible investor in terms of the personal care and consumer goods segments, where products are required to be tested on animals prior to their being licensed for sale in country.

- **REPLACE** – avoid or replace the use of animals in experiments
- **REDUCE** – minimise the number of animals used per experiment
- **REFINE** – minimise suffering and improve welfare

What is EdenTree's Approach?

Animal testing is an Ethical screen in our Amity Funds with a policy adopted in 2010. The Funds will avoid investing where companies apply animal testing for cosmetic, personal care, household goods or industrial manufacturing purposes. This includes soap, cosmetics, detergents, bleaches, paint and other industrial processes.

These Funds will not invest in animal testing services companies such as Charles River Laboratories, but they *do* allow investment across the medical, pharmaceutical and healthcare sector where animal testing is required as part of clinical trials. The EU REACH Directive of 2006 added exceptional complexity regarding the licensing of chemical compounds and ingredients. We refined the Funds' Policy in 2018 to allow investment where testing had subsequently been required *solely* to meet REACH regulatory requirements. The Policy does not extend to the retail of products but does exclude well known consumer goods companies such as Reckitt Benckiser and Unilever. The Policy is available on request.

Genetics

This is a specialist area of science-related investment. On a case by case basis we seek opportunity in selective areas such as genetics that use animals predicated on high welfare and non-invasive technologies. On the whole these specialist areas focused, for instance, on selected breeding or enzyme extraction use animals that are able to live contented and comfortable lives and are well treated owing to their 'high value' status. EdenTree has exposure to two in particular:



Genus is a world leading UK based animal genetics company that selectively breeds bovine and porcine herds to produce high quality meat and milk.

Animal DNA is analysed to look for markers linked to desirable characteristics so that those with the strongest genetic profile are used for breeding in a continuous cycle. Distribution is by way of breeding animals, semen or embryos. Genus ABS manages wholly owned bovine studs in 20 countries with 1,800 head of cattle in various stages of 'product development'. Genus PIC is its porcine business providing genetically superior breeding pigs; more than 120m slaughter pigs contain PIC genetics.



Bioventix manufactures and supplies high affinity sheep monoclonal antibodies (SMAs). The technology secretes sheep monoclonal antibodies for use in immunodiagnostics.

SMAs are manufactured in laboratory conditions by fermentation of the cell lines and address genetic shortcomings in other antibodies where Bioventix SMAs target and where conventional antibodies fail to produce a suitable reagent. Sheep-based antibodies are then used on automated blood-testing machines globally. Therapeutic applications include thyroid, cardiac, fertility, oncology and Vitamin D deficiency. The business proposition is based on sheep making better antibodies than mice! A successful business has been built on selling just 10g of purified physical antibody per annum extracted from 50 sheep at 6-12 months, kept in an open field. Welfare standards are high.

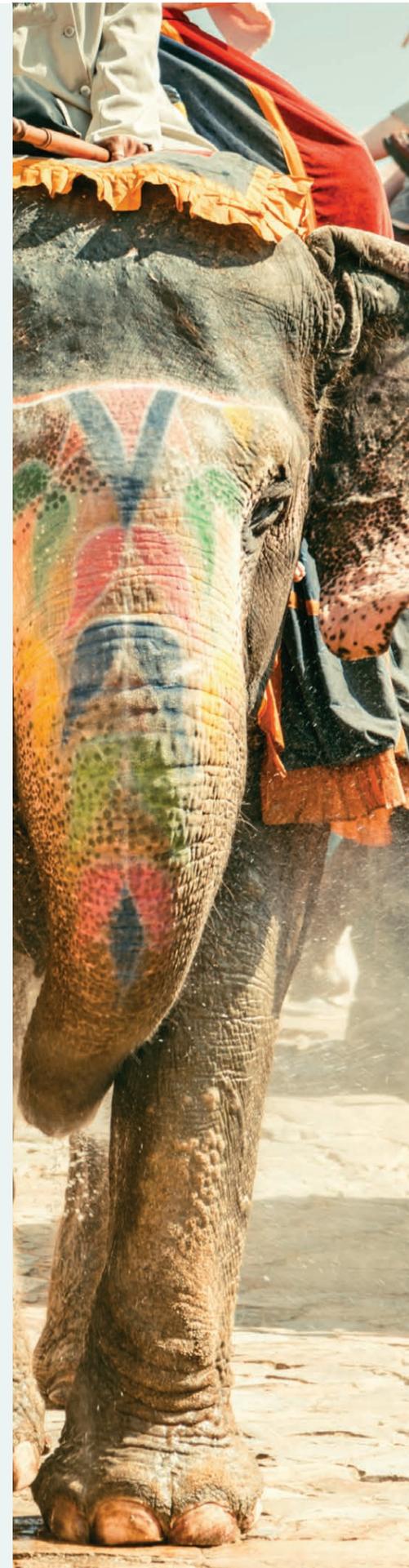
Entertainment & Work

Animals continue to be used for work particularly in rural and agricultural economies. These include horses, oxen and cattle as well as more iconic species such as camel and elephant.

These areas are, by and large, not investible, however, where there is evidence of use we would be cautious unless high welfare standards could be guaranteed e.g. timber sourcing and logging where animals may be used. In developed markets, animals may be used professionally – an example being horses used as funeral pall bearers, and of course they (and dogs) are used professionally by bodies such as the police and military. This section principally concerns entertainment and tourism where animals may be ill-treated and exploited. In other areas – e.g. racing (dogs and horses) – the studs themselves are rarely investible, and racecourse owners are excluded under our ethical gambling screens.



The Co-operative Group is the UK's largest provider of funerals and horse-drawn funerals are the 10th most popular form of hearse, behind canal boats, milk floats and a tandem bicycle! However, they and Dignity – the UK's second largest provider, say very little about animal welfare and how their horses are stabled.

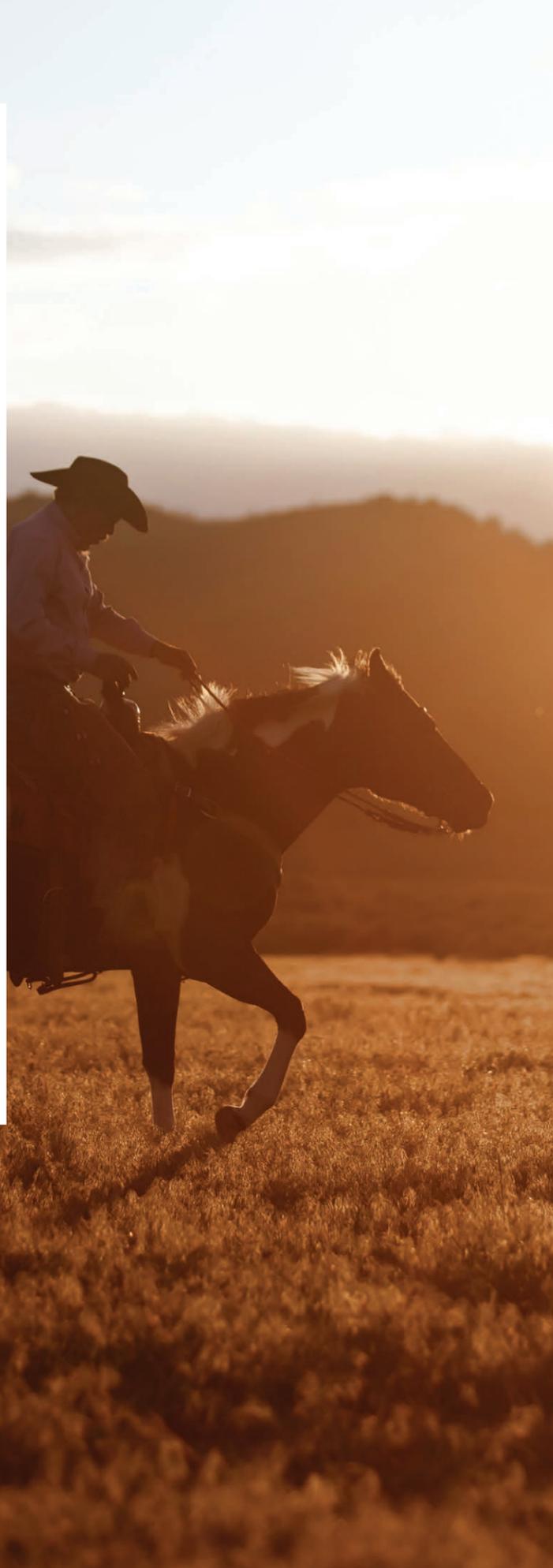


Film & Entertainment

Animals are used extensively in the creative industries. Every animal appearing in film or TV has to be sourced, trained and looked after. Production companies typically use specialist agencies that provide and train animals.

Welfare has become a critical consideration for producers. In the US, animal welfare is overseen by the AHA (American Humane Association) which has exclusive use of its 'no animals harmed' badge that appears in movie credits. The AHA also provide welfare and handling advice. Most of the major production studios are now part of wider media conglomerates, with only Disney retaining independent status.

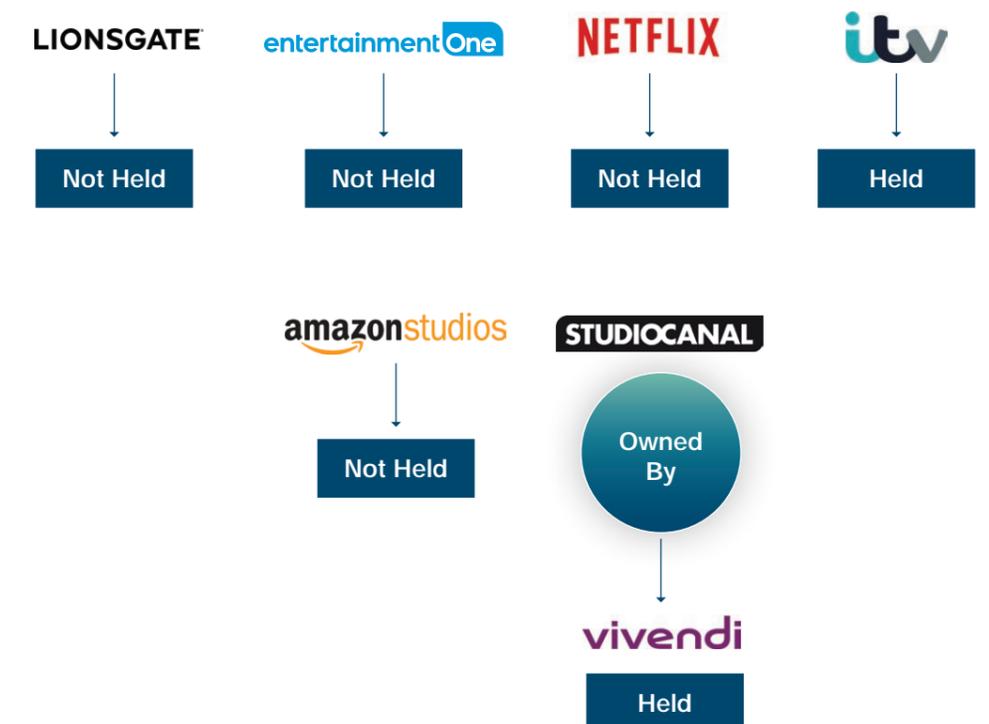
Despite welfare priorities, there is a school of thought that animals are involuntary actors, taken from the wild, bred in captivity and made 'dependent' on humans from an early age. There is little way of ensuring that animals used in film and television production have not been mistreated 'away from set' in being reared and trained; AHA ratings only provide assurance for 'on-set' treatment. 27 animals died in the making of The Hobbit, mostly owing to their being housed in poor conditions. This is a challenging and largely invisible area for responsible investors with little or no public disclosure by corporates.



EdenTree has exposure to three of the major studio groups:



Of six second tier production companies where animals may be used, EdenTree has exposure to two:



Tourism

Animal focused tourism and travel is a significant and growing part of the luxury recreation market. Eco-tourism can be a force for good in supporting conservation and deterring poaching, but it can also be destructive owing to the sheer volume of tourists now visiting pristine sites.

Kenya's Mara Reserve has increased from 300 beds in 1980 to over 3,000 today but it also contributes \$1bn in GDP and represents close to 10% of Kenya's employment opportunity. There is little reliable data regarding the value of conservation based tourism to Sub-Saharan Africa, but it has become a priority for 'premier' destinations such as Kenya, Tanzania and South Africa. In 2017, 14 countries derived \$142m in entrance fees to protected areas, and it supports 6% of employment across the sub-Saharan region. The managed trade is also vibrant, but generally realises less income.

Botswana has recently announced it is to commence auctioning licenses to shoot elephants at c\$43,000 per animal. Managed conservation can be a vital part of protecting and enhancing ecologies, but it should be recognised that Botswana is in changing course – controversially – earned just \$2.6m from elephant auctions in the 2019 season, compared to its safari based revenues of \$2.7bn. Overall, safari based wildlife watching is a vital part of protecting endangered species. Whilst it can be done well, the popularity of 'chasing' iconic species can disturb the very eco-systems tourists seek out – especially in vital wildernesses such as Antarctica.

Captive tourism – as opposed to managed conservation continues to be controversial. Aquaria and marine parks exist essentially to entertain and have been faced with boycott and criticism over the captivity of species such as dolphin and orca, given these raise very significant welfare issues. **Sea World** faced strong criticism and finally announced dolphin and orca entertainment shows would cease. However in some places – China and Japan – entertainment based marine parks remain popular. It has been illegal to 'host' captive orca in the UK since 1993.



Marine mammals simply cannot thrive in captivity. Almost all the species are wide-ranging predators – and the best we can provide for them are barren concrete boxes or small sea pen corrals. They need the complex ocean environment."

Naomi Rose,
Marine Scientist



Held in EdenTree Funds, the Disney Company is perhaps most famous for its family-friendly movie making, however within its theme parks business, Disney's Animal Kingdom presents managed conservation as part of an education focused visitor attraction, and is among its biggest draws.

Opened in 1998 and at 580 acres the Animal Kingdom is the largest theme park in the world and is dedicated and themed entirely around the natural environment and animal conservation, a philosophy once pioneered by Walt Disney himself. The park meets high standards of welfare but has always attracted criticism for holding animals in captivity – however it has also nurtured live births of rare and endangered species such as the park's southern white rhino. Disney does not host marine entertainment.

The balance between entertainment, exploitation and conservation is perhaps more acute in the mainstream holiday segment.

What is EdenTree's Approach?

We do not have a definitive policy on animal welfare in areas of film, television and tourism, which remains a novel issue for investors.

We recognise that work, entertainment and tourism present real challenges for the responsible investor, in that this remains fairly invisible in terms of disclosures about welfare risk. Animals are ever-present in some forms of entertainment but can hardly 'consent', whilst they can be exploited and stressed as a result of unnatural human interaction in captivity or in the wild. We rely on frameworks of best practice, such



TUI Group is the world's largest leisure, travel agency and tourism business. An Anglo-German conglomerate, TUI is listed in London and domiciled in Germany and brings together 1,600 agencies, six airlines, 400 hotels and 18 cruise ships all serving 180m customers.

By its nature, TUI offers multiple opportunities to 'interact' with animals e.g. feeding deer in Japan. The company removed all excursions involving elephant rides in 2016, but it has attracted persistent criticism over poor welfare. All of TUI's welfare disclosure focuses in the main on safari experiences, however it is now almost alone in not ruling out marine park entertainment excursions to see and interact with captive dolphins.

For instance it promotes packages to 16 dolphinariums in the Caribbean via their cruise ship business. TUI endorses the ABTA (Association of British Travel Agents) Guidelines on animals in tourism, but these are almost silent on marine parks. ABTA provides a list of unacceptable practices as part of its guidance, for instance contact with or feeding great apes, alligators, bears, sloths, wild cats, but remains coy about marine experiences.

as ABTA's, that support the best interests of the animals in terms of their being able to exhibit natural behaviour. We support conservation, learning and educative experiences which inform about the natural world, whilst as far as possible leaving wild animals to enjoy (as close to) their natural environment. Our exposure is most likely to be via media conglomerates such as Disney, and travel companies where a range of experiences are promoted to tourists. We will seek to engage over the long-term to ensure high welfare standards are not compromised in pursuit of short-term economic gains.

Growing Demand for Alternatives

This Insight has focused on several areas where animals are strongly impacted – in food, testing and the use of animal derived products such as leather and wool. Given acute recognition of some of the welfare implications, there is growing interest in alternatives to remove suffering and ill-treatment.

The vegan phenomenon is perhaps just the most obvious, but here we consider a few alternatives to the use of leather and wool, to animal testing, to the use of animal parts in TCM, and in entertainment from increasing the use of technology. A public focus on respect and dignity and the avoidance of animal exploitation is driving innovation. Some practices still demand the use of animals, e.g. clinical trials but even this is changing! Here we look at just some of them.

Alternatives: Peak meat? Perhaps the most vocal debate in recent times has been the growth in veganism, with around 1% of the UK population adopting vegan diets and lifestyles. The drivers are both environmental and lifestyle – the climate and ecological impact of rearing animals for meat, and the potential health benefits of plant-based diets in lower cholesterol levels and the risk of developing diabetes.

Whilst specialist companies are synonymous with veganism, it is now becoming a mainstream option with the major food retailers and hospitality outlets such as Whitbread and Mitchells & Butlers offering vegan menus. The global vegetarian market is conservatively put at \$50bn, with vegan options a further \$19bn and growing fast. Vegan cosmetics that remove or avoid all animal derived products, such as lanolin, are also gaining traction, with sales of over \$15bn. **Beyond Meat Inc.** is perhaps the best known and longest established plant-based meat company, originating the 'Beyond Burger' brand but now selling a range of plant-based meat alternatives to beef, pork and poultry.

Beyond Meat takes the five building blocks of meat – protein, fat, minerals, carbohydrates and water – directly from plants. Proteins include pea, mung bean, fava bean and rice; fats are taken from cocoa butter, coconut oil, sunflower oil and canola; minerals from calcium, iron, salt and potassium; colouring from beetroot and carbs from potato starch.



Alternatives: Beyond Animal Testing There are substantial alternatives to animal testing across the spectrum – however not all of these technologies are investible – but all are interesting:

Harvard's Wyss Institute has pioneered Human-Body-On-Chip platforms as an in vitro prediction of drug behaviours on humans



Hurel Corporation applies Wyss's technology to assess human relevance in a range of capabilities



Cyprotex specialises in in silico and in vitro testing services across the pharmaceutical, cosmetic, chemical and toxicology segments



MatTek is at the forefront of tissue engineering and a world leader in 3D human derived tissue modelling



Alternatives to Wool: For vegans wishing to avoid all animal derived products, alternatives to wool have largely consisted of synthetic man-made fibres. EdenTree's holding in **Mohawk** takes a problem waste product – PET single-use plastic bottles and re-engineers them into high-end floor coverings. Mohawk is now one of the largest recyclers of PET bottles in the US taking more than 5.5bn plastic bottles out of the waste chain annually. Whilst most carpets can still contain up to 20% pure wool, Mohawk removes the need for wool completely via the use of an abundant waste feedstock. A more sustainable solution than using virgin PET, nylon or acrylic.

Business Serving Animals

The first part of this Insight looked at how animals are used and sometimes exploited by business for human gain. However, businesses that serve animals provide a vibrant and diverse opportunity for investment and particularly in the companion animal space. Here we look at some of the possibilities and areas where EdenTree already has an exposure.

Animal Health

With our Health & Wellbeing theme, animal health presents an interesting and diversified opportunity for investment, and one in which we are well positioned. The global animal health market has an estimated value of \$46bn. The market is growing strongly and is estimated to reach \$67bn in just a few years. 60% of the market is animal led pharmaceuticals, the rest comprising diagnostics and feed supplements. Around two-thirds of the specialist animal health market derives from supporting the farm animal segment. The market remains fairly fragmented, with the top 10 global animal health companies being:



EdenTree has exposure to **Zoetis, Merck & Co** and, in the UK, **Dechra Pharmaceuticals**.



Case Studies – Zoetis and Dechra Pharmaceuticals



- Solely focused on animal healthcare
- Spun out of Pfizer in 2012
- Revenue (2019) \$6.3bn
- 54% is farm and 45% companion
- Eight species supported
- Six product categories; 300 product lines
- Major disciplines are:
 - Vaccines
 - Pharmaceuticals
 - Parasiticides
 - Medicated feed additives
 - Diagnostics
 - Instruments and reagents



- Pure animals pharmaceuticals play
- Revenue (2019) £481.8m
- Focused on companion and equine
- Companion animals c70% revenue
- FAP 11.9%
- Some exposure to pigs and poultry
- Nutrition division (dogs and cats)
- Therapy areas include:
 - Endocrinology
 - Dermatology
 - Anaesthesia & Analgesia
 - Ophthalmology
 - Equine pharmacology
 - Food producing animal pharmaceuticals
 - Pet diets

Companion Animal Pet Care Market

The UK companion animal market is substantial, valued in excess of £6.3bn, and comprises disparate businesses and elements:

- Food £2.7bn
- Accessories £850m
- Grooming £263m
- Veterinary £2.4bn

The investment case is based on a stable, well-supported dog and cat population as favoured companion animals in 40% of UK homes. This represents a growing insurance, veterinary and accessory market to support companion animal needs. There is a trend towards higher spend on companion animals that has moved away from a pure discretionary spend – higher quality food, nutrition, accessories. Advances in the veterinary market is supported by growing affordability in tailored insurance products. EdenTree's exposure to the companion animal market is primarily via pet food and insurance.

Pet Food: In the UK, 40% of households own a pet with dogs (25%) and cats (17%) the most common. After these species, numbers fall dramatically with 1% of households owning a rabbit, the next largest segment. The wet-led pet food market is therefore substantial. According to the Pet Food Manufacturer's Association (PFMA), the total pet food market was worth £2.7bn in 2018. PFMA has 85 members representing 90% of the UK pet food market showing its fragmented nature. The two dominant players are **Mars** and **Nestlé**. EdenTree has exposure to **Nestlé** and **DSM**.



Pet Insurance: The specialist global pet insurance market has seen strong growth and was valued at \$3.3bn in 2018. Projections suggest product innovation will see the market grow to reach \$10-11bn by 2025. Increasing pet ownership together with rising and unexpected veterinary costs has stimulated growth. Europe appears to dominate the global pet insurance industry, for instance 23% of pets have insurance in the UK compared to 1% in the US. The UK market is particularly strong with 3.6m insuring over 5m companion animals – but even this leaves two thirds of dogs (67%) uninsured. In the UK this growing, valuable market is dominated by Allianz and RSA.

The UK market is dominated by Allianz's PetPlan product, followed by RSA which provides underwriting for Tesco and M&S. UK Insurance is owned by Direct Line. Overall there are over 80 branded providers in the UK market with annual premiums of over £1bn.

UK's Biggest Pet Insurers



Quoted in Financial Times ft.com 10.06.2017

EdenTree has exposure to Allianz, RSA and Direct Line Group.



Afterword: Impact on Biodiversity

This Insight has focused on animals in business and investment by looking at the many industries that rely, at least in part, on animals or animal derived parts in their manufacturing supply chain.

It is beyond the scope of this particular Insight to consider the wider business impacts on biodiversity but this is a critically important issue that has to be more robustly acknowledged by investors. The final part of this Insight will therefore provide some context around biodiversity with a view to our providing more on this for clients in future publications.

Animals and the Sustainable Development Goals: The principal SDGs relating to animals are Goals 14 and 15 (*Life Below Water*

and *Life on Land*). These concern biodiversity, conservation and protection of critically endangered species rather than welfare. The Goals set key targets for restoring, conserving and sustainably promoting terrestrial and marine eco-systems.

The State of Nature 2019: For complex reasons nature remains under acute pressure and is in steep decline across many species. *The State of Nature Report 2019* for the UK is an exhaustive look at the UK's natural environment under pressure. It points to a decline of 13% in 696 'indicative' species since 1970 and 5% decline in the distribution across some 6,654 species. 41% of species show either 'strong' or 'moderate' decrease in abundance over the same time frame. Overall, 15% of 8,431 observed species are threatened with extinction in Great Britain.



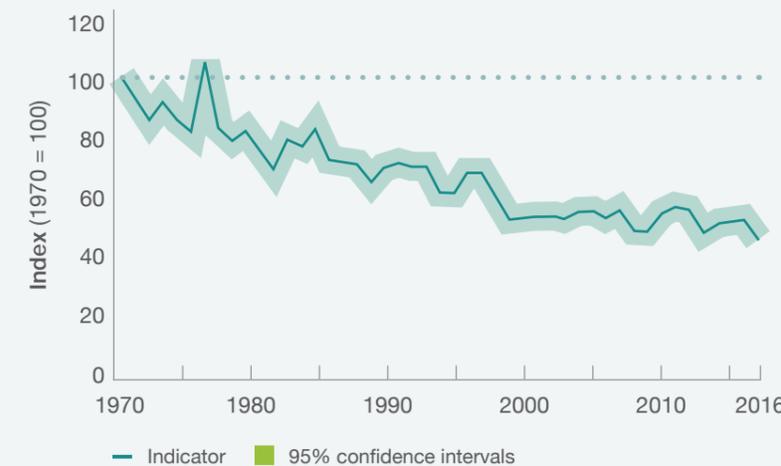
Pet Retail Services: The companion animal services market (pet shops) remains fragmented and local in the main – however **Pets at Home** has emerged as the dominant national player offering a range of integrated retail services for the pet owner.

The company, founded in 1991, now has 452 UK stores, and despite only listing in 2014 has grown to be a FTSE250 constituent. Pets at Home offers a full range of services, products and accessories. Its USP is its unique partnering model, with 400 veterinary surgeons operating from its premises.

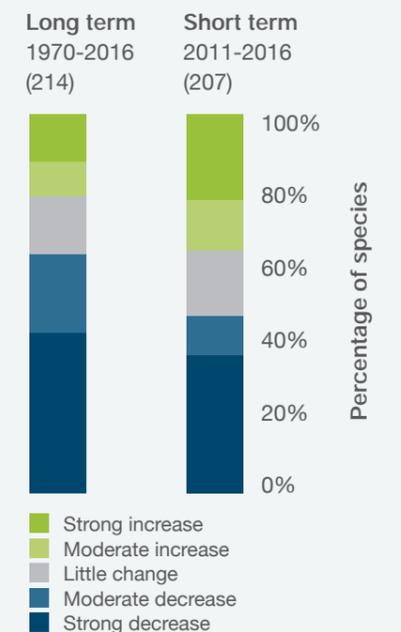
Vets4Pets offers a complete health plan and advice service, with a specialist referral service for complex health needs such as cancers and surgery. Its 'groom room' service has proved particularly popular by offering a full dog-grooming service at over 300 premises. Pets at Home has a turnover of close to £1bn. Given the volatile nature of retail operating from fixed premises, only niche multi-channel retailers continue to offer performance and diversification. Pets at Home presents an interesting model in a growing, stable and committed market based on strong market share as a 'one-stop-shop' for grooming, health needs and retail accessories.

UK Biodiversity Indicator: Change in the relative abundance of UK priority species, 1970 to 2016

Abundance indicator (214 species)



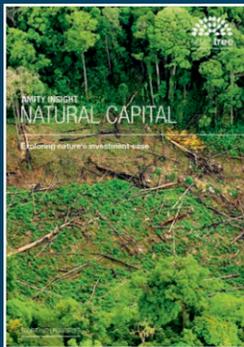
Source: jncc.gov.uk/ukbi-C4a



Dispiritingly, and despite decades of vital conservation work, nature appears to be in a losing battle. More species show relative decline in abundance than increases, or those 'doing well'. For instance 26% of mammals and 43% of native birds are under threat. The Report also notes the abundance of species that have become extinct since 1970 including 32 plant, 33 fungi, seven vertebrate and 61 invertebrate breeds.

The greatest impact is due to intensive farming practices, climate change, hydrological change, urbanisation and reduction in living space or nature corridors, invasive species, pollution and loss of woodland cover. Business and industry may not be the main contributor to decline, but its activities can inhibit or prevent the flourishing of nature, and to that extent it can have a positive as well as a negative impact. Construction and planning could seek to make 'space for nature', water utilities can influence the degree to which marine and bird life flourish, and business can invest in conservation. These remain fairly novel considerations for investors, but we have already sought to engage pro-actively with a wide range of companies on their impacts and management of biodiversity. Look out for more on this as we publish the results.

The escalating imperilment of nature is too immense to be ignored: The United Nations in a stark warning published its *Global Assessment Report* in 2019 which noted inadequate international policy responses to the potential loss of 1,000,000 animal and plant species across the globe as abundance has fallen by 20% since the turn of the 20th century.



If this Insight has inspired you, you may also like our previous EdenTree Insight on Natural Capital. In putting animal related issues at the heart of our research for some years, we have also written extensively on other relevant topics including Responsible Investment Expert Briefs on:

- Animal Welfare
- Non-Meat Proteins
- Palm Oil
- GMOs including cloned and modified animals, and
- policies on Animal Testing and Intensive Farming



Conclusion

Animals, business and investment is perhaps a surprising subject for an EdenTree Insight. However, hopefully this Insight has illustrated the extent of industry's reliance on animals and animal derived products and services. Some are obvious – however, how many investors would appreciate the dependent reliance of the auto industry on meat processing for hides?

Animals remain a largely invisible part of the supply chain, and their invisibility means welfare can suffer or be overlooked as animal and animal-derived products are used and exploited widely for human use. Some of these activities may present challenges for the responsible investor, and this Insight has clearly sign-posted these. Whilst food remains the main area of use, it is far from being exclusive. For us, intensive farming and unnecessary animal testing remain barred investment activities, but we will have moderate and indirect exposure to animals in leather, wool, entertainment and tourism.

There are also positive opportunities for investment that support the vibrant companion animal market in healthcare, pet food, accessories and pet insurance. In cases where animals are sourced or used we will seek high standards of welfare and where absent we may recommend avoidance. We also seek to engage with companies on the management of animal welfare risks – particularly with partners such as BBFAW.

Finally, we know nature is under pressure and needs help. Business has a role to play as it impacts biodiversity, and we have sought to horizon-scope the main challenges and how investors too can play a role in supporting biodiversity and eco-systems, although this remains an in-depth subject for another time.

How to contact us

We hope you have found this EdenTree Insight interesting and useful. If you have any questions, or would like to know more about our responsible investment, in-house research and analysis, please get in touch.

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