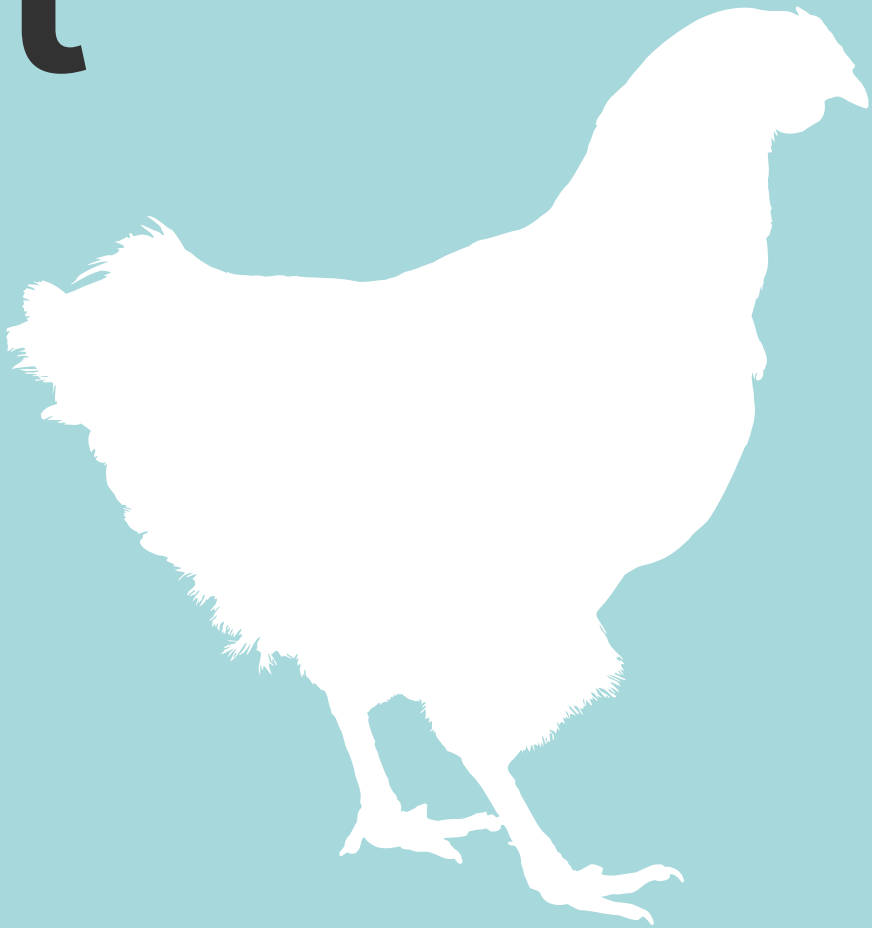
We need to talk about chicken



Eating Better

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Inside a UK chicken shed.

Chicken production is vast

Replacing beef and lamb with chicken has been suggested as a way to reduce greenhouse gas emissions, pollution and the land use footprint of our diets. Yet, the global scale of chicken production is already vast, and consumption is growing across the globe. Worldwide, we eat 65 billion chickens per year.
In wealthy countries, pork and beef consumption has remained unchanged since 1990, but chicken consumption has grown by 70% and continues to grow [1].

Chicken production has consequences

It is argued that intensively reared chickens produce the lowest amounts of emissions and waste per unit of meat. In this report we explore the features of modern-day chicken production that make this possible, and the impacts of producing chicken in this way. We look at trade-offs of this production; feed and deforestation, animal welfare and use of antibiotics, human nutrition, local pollution and the dominance of big business in the production.

Our diets do not need more chicken

Our diets do not need more chicken, and from deforestation to pollution, promoting further growth of the chicken industry as a sustainability solution does not make sense.
We should adopt an approach favouring small amounts of sustainably produced meat and dairy, of all types. This is most appropriate to help restore balance to our diets, farming landscapes and environment.

1. Why we need to talk about chicken

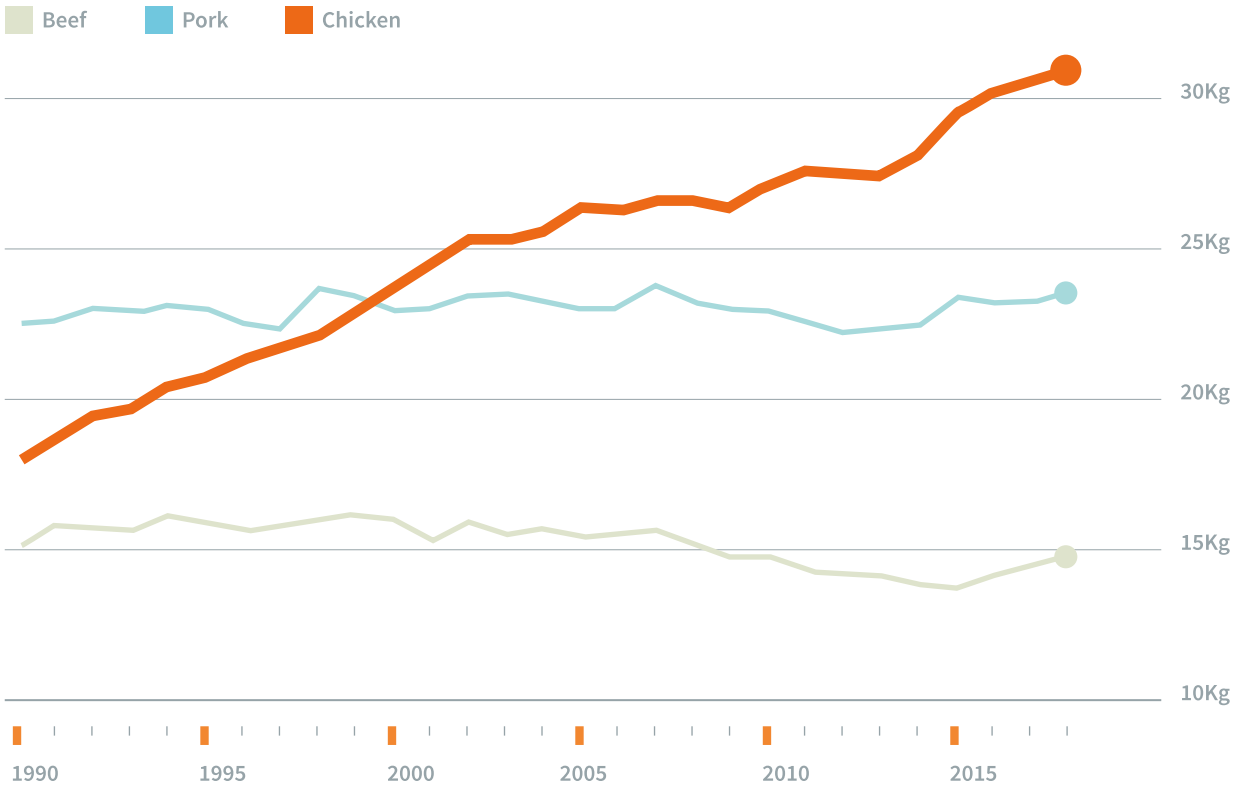
The impact of our current diet on the environment and nature is well documented. A solid body of research shows that changing the way we eat and produce food is necessary to stay within safe limits of climate change [2].

Beyond carbon emissions, we need a transition to a more sustainable food system that restores, rather than hinders nature and delivers healthy food for people now and in the future.

We have been encouraged to swap from red meat to poultry

All animal products have high environmental impacts [3]. In the UK, our diets are high in meat and dairy, we eat twice the global average[4]. Transitioning to a low-meat diet would enable the average person to reduce their dietary emissions by 35% [5]. Notwithstanding huge variability within production systems, beef and lamb production has been shown to have higher greenhouse gas emissions, pollution and land use footprints than other meats such as chicken [6]. Chicken, however, has considerably higher impacts than sources of plant protein, such as pulses and nuts [7].

The UK's Committee on Climate Change report 'Net Zero - the UK's contribution to stopping global warming,' for example, includes a 20% to 50% reduction in beef and lamb in its net zero scenarios[8]. In modelling beef and lamb consumption is replaced with pork and chicken.



OECD countries, meat consumption, Kg per person per year. Source: OECD

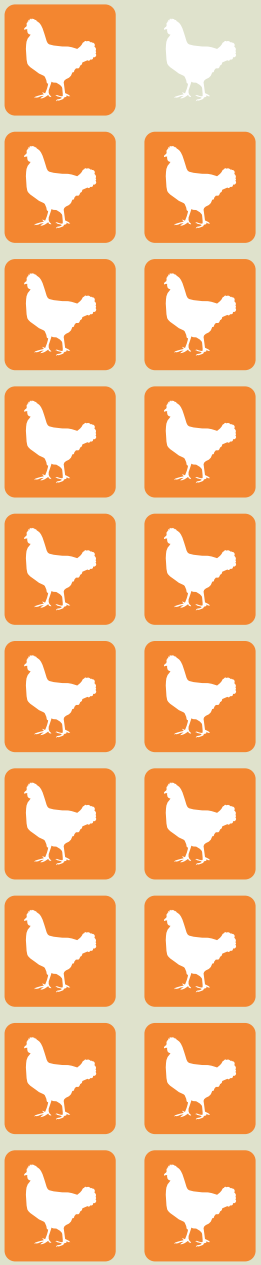
What is a broiler?

A chicken raised for meat is called a broiler. Other chickens are farmed for their eggs 'layers' (of which around 30 million are reared in the UK each year [9]) or to breed chickens for farms 'breeders'. Once past their production, layers and breeders may enter the chicken meat supply as 'boiling fowl'.

Chicken in numbers

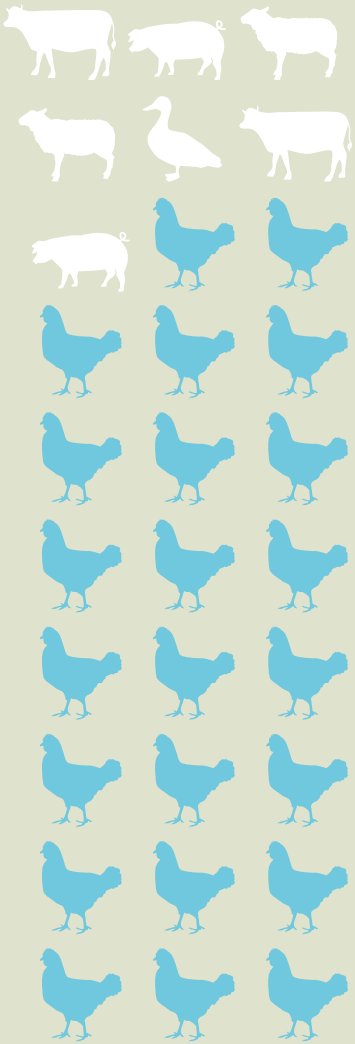
95%

of the UK's broiler production is in intensive indoor units.



23Bn

of the 30 billion land animals on farms are chickens.



Over the past 10 years, consumption in the UK has been growing at

2.6%

850M

chickens are reared for meat in the UK each year.

Since 1990, global chicken consumption in wealthy countries has grown by

70%

65Bn

chickens are eaten worldwide every year.

Poultry now accounts for over

50%

of meat consumption, more than any other meat.

Our diets are high in meat and dairy, we eat

2X

the global average.

Transitioning to a low-meat diet would enable the average person to reduce their dietary emissions by

35%

Transformed through genetic selection

Over the last 70 years, sophisticated genetic selection has dramatically transformed the biology and physiology of chickens[10], to the extent that modern broilers are demonstrably different to their chicken ancestors [11].

Through breeding, the genetics of broilers have been tailored to maximise production and lower costs. Breeding has determined the current shape and size of chickens, their health and lifespan, what they need to eat and how much. The uniformity of the flocks allows the commercial growing process to be very uniform across farms and highly automated.

23 billion of the 30 billion land animals living on farms at any one time are chickens [12]. Chickens have a combined mass exceeding that of all other birds on the planet, and they are the most numerous terrestrial vertebrate species [13].

Chicken consumption growing across the planet

Worldwide, we eat 65 billion chickens per year. In wealthy countries, pork and beef consumption has remained unchanged since 1990, but chicken consumption has grown by 70% and continues to grow[14]. Other countries are moving in the same direction, with strong consumption growth seen in all regions over the last 10 years [15].

850 million chickens are reared for meat in the UK each year [16]. Consumption has been growing at 2.62% over the past 10 years[17], to current levels of 27.5kg of chicken per person per year [18]. Red meat sales are slowly declining and were overtaken by poultry for the first time in 2017 [19]. Poultry now accounts for over 50% of meat consumption, more than any other meat.

UK poultry processing in operation.

Since 1990, chicken consumption in wealthy countries has grown by

70%

65Bn

chickens are eaten worldwide every year.

Over the past 10 years, consumption in the UK has been growing at

2.62%

850M

chickens are reared for meat in the UK each year.

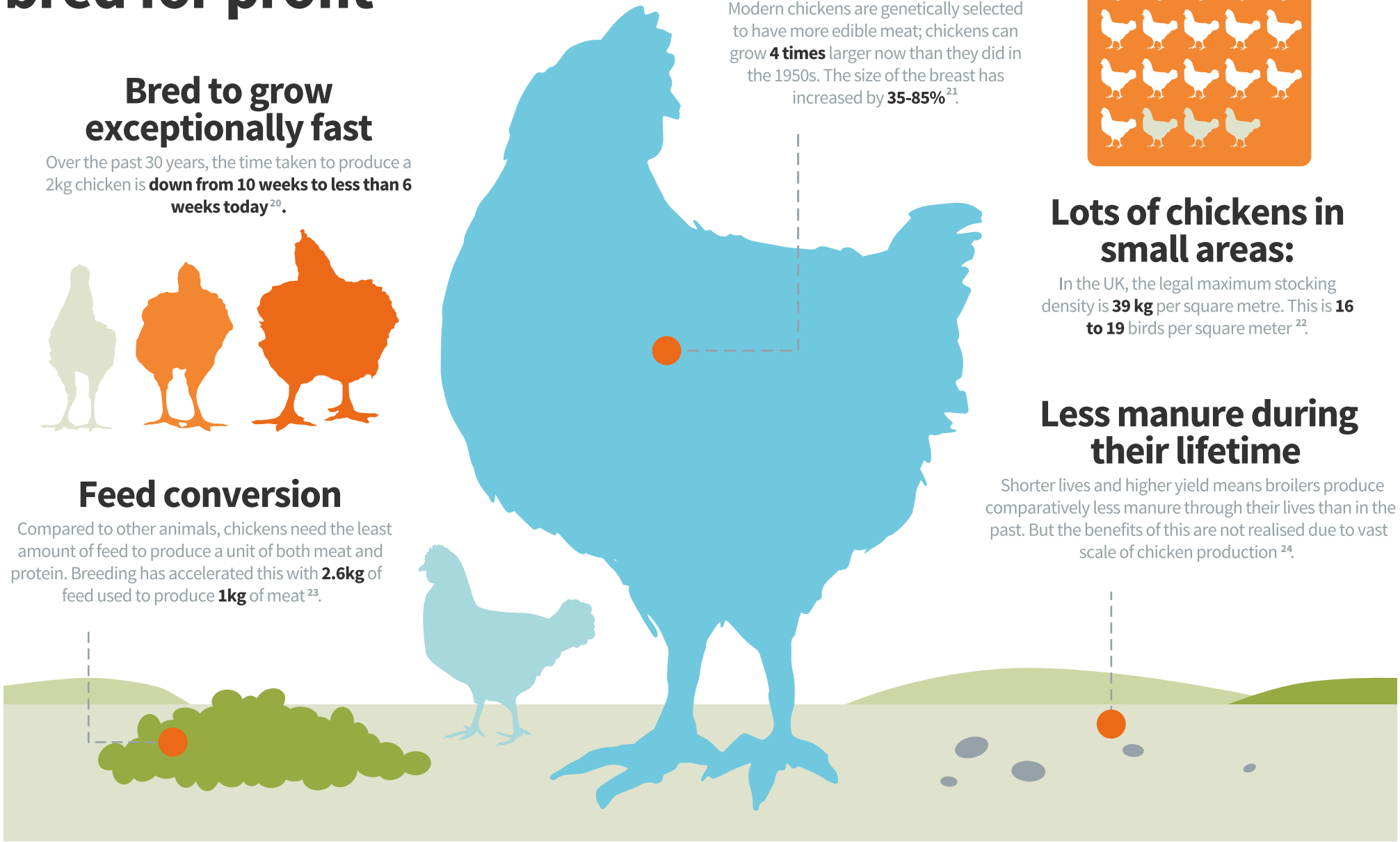
Chickens: bred for profit

Bred to grow exceptionally fast

Over the past 30 years, the time taken to produce a 2kg chicken is **down from 10 weeks to less than 6 weeks today**[20].

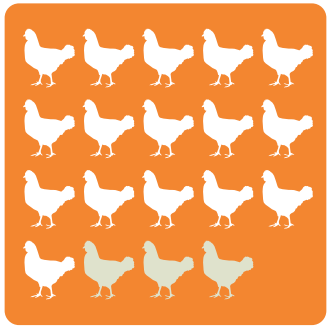
Feed conversion

Compared to other animals, chickens need the least amount of feed to produce a unit of both meat and protein. Breeding has accelerated this with **2.6kg** of feed used to produce **1kg** of meat[23].



Bred to grow very large

Modern chickens are genetically selected to have more edible meat; chickens can grow **4 times** larger now than they did in the 1950s. The size of the breast has increased by **35-85%**[21].



Lots of chickens in small areas:

In the UK, the legal maximum stocking density is **39 kg** per square metre. This is **16 to 19** birds per square meter[22].

Less manure during their lifetime

Shorter lives and higher yield means broilers produce comparatively less manure through their lives than in the past. But the benefits of this are not realised due to vast scale of chicken production[24].

2. Trade-offs of mass chicken production

Not a life worth living

Many would argue that intensive broiler production does not provide chickens with a life worth living [25].

Often 30,000 or more broilers are crammed into sheds which are so crowded that, as the birds grow bigger it is difficult to see the floor. At higher stocking densities, pathologies and walking ability are worse than at lower densities [26].

Chickens are sentient beings, they can feel emotions just like us, such as pain and fear, so regularly suffer in these harsh conditions. Today's broilers have been bred to grow so quickly that often their legs cannot properly support their bodies. As a result, many suffer from painful leg disorders - or succumb to heart disease. 27-30% of chickens have levels of lameness that are likely to be painful [27] [28].

A chicken's life is transformed when they are given more space, natural light and can do what comes naturally: pecking, scratching, wing flapping and perching.

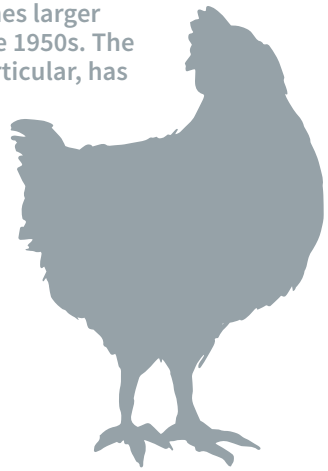
What about higher welfare chicken?

In the UK 95% of broiler production is in intensive indoor units[29].

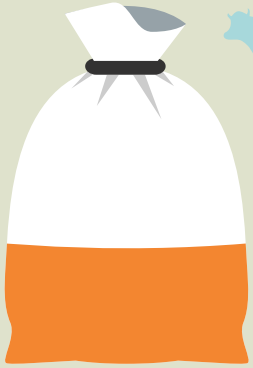
A very small proportion of broiler production adheres to higher welfare standards, mainly free-range and organic. These chickens typically have more space to move, some outdoor access and smaller flock sizes. The varieties used are bred to reach slaughter weight more slowly and live longer lives, typically up to 80 days in organic systems. This can result in a greater use of feed and production of larger amounts of emissions and waste . At the point of sale, higher welfare chickens typically cost considerably more than chickens raised intensively.

Bred to grow very large:

Modern chickens are genetically selected to have more edible meat; chickens can grow 4 times larger now than they did in the 1950s. The size of the breast, in particular, has increased by 35-85%.



Trade offs of modern-day chicken in numbers

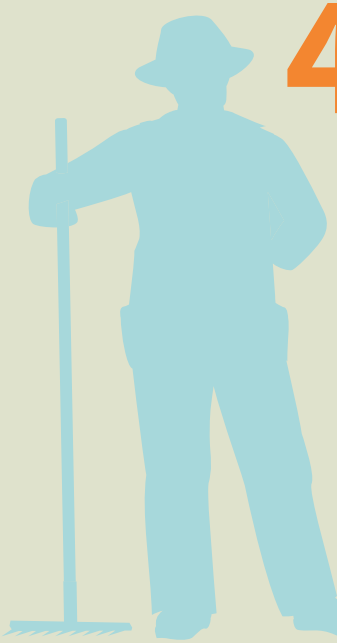


5.9Kg

15.8Kg

Ruminants use 5.9 kg of human-edible feed per kg of protein whereas monogastrics need 15.8 kg.

41.5% of world's crop based feed is used for poultry production.

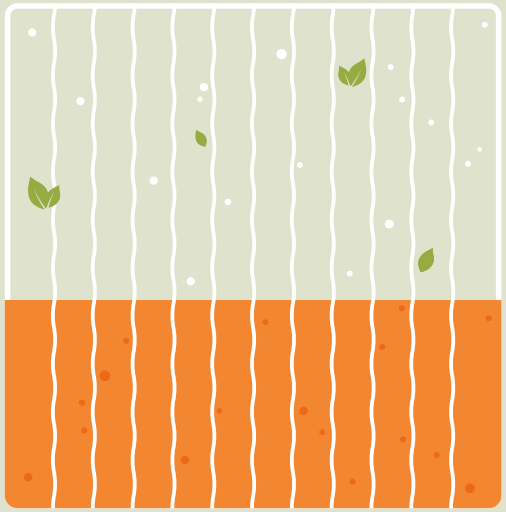


27-30% of chickens have levels of lameness that are likely to be painful.

5X Chickens have 5 x less Omega 3 than in 1970

75% of the poultry industry's emission footprint comes from feed production.

60% of soy imported into UK is used by poultry industry.



100,000 chickens can be managed by 1 worker, inspecting the sheds daily to remove dead birds and cull unhealthy ones.

+33% The use of ionophore antibiotics has increased by 33% in five years.

40% Growing food for animals requires nearly 40% of the world's arable land.

Intensive chicken production relies on antibiotics

In most countries intensive chicken production relies on the routine use of antibiotics to keep chickens healthy [30]. In intensive production, chickens live very close to each other and their waste, providing the supportive conditions for disease incubation.

The growing emergence of antibiotic resistance of pathogens is a critical risk to human health [31]. Antimicrobial resistance in the farming sector can be transferred across to the human sector [32], as humans and farm animals occupy a single ecosystem which we also share with pathogenic microbes.

The British Poultry Council (BPC) began collecting and publishing annual data on its antibiotic use in 2012, which helped put pressure on high users to cut their use. In 2016 the BPC announced that it was voluntarily ending all preventative use of medically important antibiotics and all use of the last resort antibiotic colistin. These restrictions subsequently became part of Red Tractor standards. This has contributed to an 80% cut in the use of medically important antibiotics per unit of poultry between 2012 and 2018 [33 34].

The industry increased its use of 'non-medically important' ionophore antibiotics by 33% between 2012 and 2017 [35]. Ionophores are not currently used in human medicine due to concerns about their toxicity. However, several scientific studies have suggested ionophores may have the potential to be developed in the future as effective treatments for a number of serious infections, such as MRSA or multi-drug resistant clostridium difficile [36 37 38].

The Federation of Veterinarians of Europe (FVE) is concerned about the overuse of ionophores in poultry production and has called for the drugs to be made prescription-only, as is the case for all other antibiotics used in European farming [39].

Inside a UK chicken shed.

We can't keep feeding chickens in this way

Chickens would naturally spend their day foraging for food, scratching the ground looking for insects and seeds.

The genetics of modern-day broilers means they have high requirements for protein and energy and cannot tolerate high fibre levels in their diets. They require composite feed to survive, comprising of grains, oils, fishmeal and legumes such as soy.

Globally, poultry production has the greatest demand of crop-based feed, using 41.5% of the world's feed in 2009 [40]. With 23 billion chickens on earth [41], more than three per person, it's not a surprise that the biggest user of crop-based feed globally is poultry. It uses 38% of global grain production [42].

Chickens consume human edible food

Intensive chicken production does not contribute favourably to the food supply. Broilers need to eat more human-edible foodstuffs per kilogram of both protein and meat produced than pastured cattle, this provides a counter to the argument that chicken is a more efficient source of protein than ruminants. At a global level, ruminants consume 5.9 kilograms of human-edible feed per kilogram of protein whereas monogastrics need 15.8 kilograms [43].

Feeding human-edible foods to animals is an inefficient use of land.

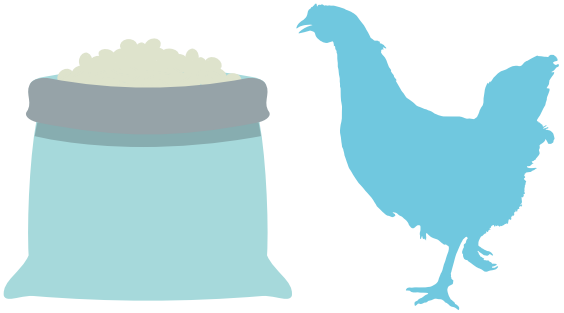
Feed production is the main source of emissions from chicken production

Producing animal feed is a key impact of raising livestock: growing food for animals requires nearly 40% of the world's arable land[44]. Feed production is the main source of GHG emissions from chicken production, amounting to 75% of its emissions footprint [45].

The UK imports around 3 million tonnes of soy annually [46]. It is estimated that up to 60% of soy is used by the poultry industry [47].

Soy is the largest source of protein for animal feed in the world. Its production is a major driver of deforestation and land-use change, well documented in existing production zones in the Amazon, Cerrado and Gran Chaco regions in South America . Over half of the soy used to feed poultry in the UK is not certified deforestation free [48].

Compared to other animals, chickens need the least amount of feed to produce a unit of both meat and protein. Breeding has accelerated this with **2.6kg** of feed used to produce 1kg of meat [49].



2.6kg = 1Kg

UK chicken shed alongside a feed silo.

Polluting our land and air

Chicken production can pollute land and waterways with excess nitrogen

Synthetic fertilisers often used to grow chicken feed crops contain high levels of nitrogen. Chickens excrete nitrogen from their feed in manure, which may be spread on local land as fertiliser. Good farming practice in the UK as set out by DEFRA suggests that if poultry litter is spread and ploughed into the soil this can minimise leaching of nitrogen [50].

However, unabsorbed nitrogen can leach from the soil into groundwater, which can contaminate sources of drinking water and damage aquatic and marine ecosystems [51]. Nitrate leaching can be high from poultry operations, due to the high nitrogen content of slurry. Within the UK, livestock production is estimated to be responsible for 60% of nitrate pollution and 25% of phosphorus pollution of waterways. 55% of the land in England is at risk of nitrate pollution [52].

Ammonia pollution is harmful to humans and wildlife

Intensive chicken sheds can release ammonia emissions from damp litter and from spreading of manure on land. The UK Government has offered guidance to minimise impacts of this [53], but there is evidence that this is not being monitored or enforced effectively, leading to high levels of emissions near intensive pig and poultry farms [54].

Ammonia pollution is harmful to humans and wildlife. It is a major cause of poor air quality, reacting with transport and industrial emissions to form the particulate matter found in smog, and it builds up in the water and soil, reducing biodiversity [55].

Slurry being applied to ploughed land.

Chicken now has fewer nutrients and more fat

Some have recommended chicken as a healthier alternative to red meat because they see it as lean, and saturated fats have been linked to coronary heart disease [57]. Modern husbandry and chicken feed that relies on energy and protein-rich crops has changed the nutritional profile of chickens. Chicken now provides:

Fewer nutrients: Chicken now has fewer essential micronutrients (with, for example, 69% less iron and 26% less phosphorus in 2002 than in 1940) [58]. Genetic selection for breast meat means modern chickens contain less iron and B vitamins, which are found in dark meat [59].

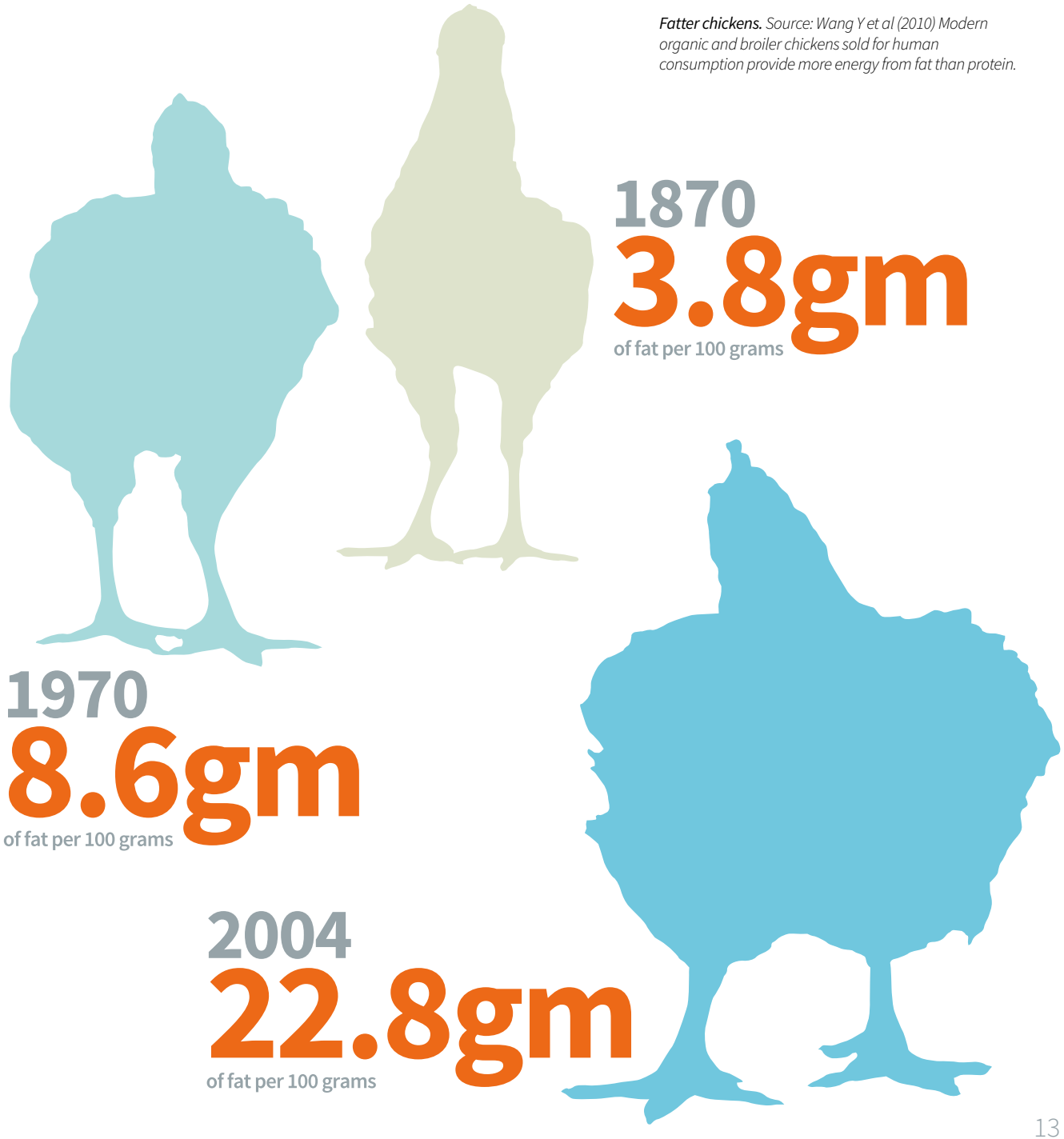
More fat: The fat content of broilers has increased from 8.6 grams per 100 grams in 1970 to 22.8 grams in 2004. Whereas chickens used to provide more calories from protein than fat, today's broilers deliver three times more calories from fat than protein [60].

Less Omega 3: Poultry and eggs were one of the few land-based sources of healthy Omega 3 fatty acids. The switch to grain-based feed and lack of access to external forage means that chicken now contains five times less Omega-3 fatty acids than in 1970 [61].

How do prepare the chicken we eat?

Chicken is relatively cheap and widely available, it can be cooked in a variety of ways some considered to be healthy, others less so. It features heavily in pre-prepared, ultra-processed food products.

Our recent Eating Better high street food surveys, found that chicken was the most popular meat in two prominent convenience food categories in the UK. It is included in 55% of meat sandwiches and 61% of meat based ready meals. Chicken is also central to fast food menus. Over 40% of people visited chicken outlets and restaurants in 2018. Chicken meals are so popular that the value of the chicken restaurant market is expected to surge by 5% in 2019, with sales of just over £2.3 billion [56].



Fatter chickens. *Source: Wang Y et al (2010) Modern organic and broiler chickens sold for human consumption provide more energy from fat than protein.*

Good for the few not the many

The chicken production industry is highly consolidated: poultry production companies control the entire process, from feed mills to meat processing. The majority of Britain's poultry meat is produced by a small number of multinational companies including Faccenda, Moy Park, Cargill, 2 Sisters and Banham Poultry.

The genetics of commercial broilers are proprietary [62]. Breeding is highly consolidated globally. In the UK, the two largest international breeding companies, Aviagen and Cobb-Vantress, supply over 90% of the broiler stock [63].

Incubator used in chicken production.

Chicken production does not create many good jobs - 1 worker can manage

100,000

chickens, inspecting the sheds daily to remove dead birds and cull unhealthy ones.

Contract chicken production

Chicken production companies subcontract commercial growing to farmers, who will invest in constructing sheds on their land capable of up to eight production cycles per year. Commercial growers typically receive all inputs (including one-day old chicks as well as composite feed) from the poultry company.

Shed conditions are controlled electronically and require minimum input from the farmer. One worker can manage 100,000 birds, inspecting the sheds daily to remove dead birds and cull unhealthy ones. Once the birds have reached the target weight, the removal and transport to the processing plant is carried out by the multinational poultry company.

3. How should we move forwards?

Our diets do not need more chicken, and from deforestation to pollution, promoting further growth of the chicken industry as a sustainability solution does not make sense.

Replacing red meat with chicken, without substantially lowering consumption, is not a sustainable solution. It is an extension of business as usual, focused on producing more food and lowering price. It perpetuates a system that dissociates food production from its effects on the local environment, those who produce it, animals and human health.

There is change on the horizon, chicken free alternatives are being developed and brought to market. The production of food is increasingly commoditised, but we want to see a shift to less and better meat and dairy including chicken.

Chicken free alternatives – a process well underway

Intensive chicken production offers a protein product that is consistent and replicable, and more affordable than other meat options. Other technology-based food solutions are already appearing which may challenge its position on those grounds.

Advances in cellular agriculture paired with a significant level of investment have made cultured meat grown in a laboratory an option [64]. Demand is growing and other alternative meat products are already on shelves: the burgeoning alternative-meat industry aims to provide increasingly affordable and mild tasting products that look and feel like meat and can be cooked in the same way.

Typically processed from ingredients of plant origin (such as wheat, soybeans and peas), meat-like alternatives can be produced with substantially fewer resources and lower emissions, devoid of the biological constraints and welfare considerations involved in breeding and raising chickens.

The impact of these novel foods on a range of issues, from human health to food access, is not yet known. Early concerns have focused on the content of specific alternative meat products, such as high levels of salt [65]. More widely, there are questions around whether ultra-processed food products may fit within healthier eating patterns based on a varied diet with minimally processed foods.

Whilst the commercial viability of production at scale is not yet proven, companies such as Daring Foods, Beyond Meat, Rebellyous and Planted Foods are already in the market, attracting interest from consumers, food businesses and investors.

There are concerns that a shift towards meat alternatives and further along lab-processed foods would further corporate control of food supply, and therefore negatively impact farmers and rural communities.

What we want to happen: less and better

There is a different way. Livestock farming has a role to play in delivering sustainable food and restoring nature. Different animals have different abilities to interact with the landscape, and support soil fertility for growing crops that people can eat. Minimising diet impacts means utilising these unique abilities more efficiently, keeping livestock numbers low and growing more crops for human consumption.

In the UK, our diets are high in meat and dairy (twice the global average [66]) and do not contain enough fruit, vegetables or wholegrains for optimal health. Intake of protein from plant sources is also not high enough. To meet the Government's nutrient recommendations, we need to get more protein from plant sources such as beans and pulses, increasing our consumption by 86% [67].

An approach favouring small amounts of meat and dairy produced 'better' has the potential to help restore balance to our diets and farming landscapes.

Organic chickens in the UK

Nature friendly farming

Raising livestock can be an important conservation tool in managing semi-natural habitats such as plant and wildlife-rich meadows and pastures.

It can help support soil fertility for crop production. Cattle and sheep thrive on natural pasture, while pigs and chickens can make good use of crop by-products and food waste. There are many examples of good practice in the UK we want to see these expanded and replicated.

We want to see:

A significant reduction in chicken consumption in the UK

We are calling for a 50% reduction in all meat and dairy consumption by 2030. A transition to diets rich in fruit and vegetables, with less meat of all types and more plant proteins such as beans, pulses and nuts would bring a host of health and sustainability benefits.

A transition to mixed and regenerative farming systems

Farmers should be incentivised and supported to transition to better farming practices, which will deliver public benefits for health, environment, biodiversity, pollution control and climate resilience. In practice, this includes increasing the production for human consumption of vegetables, wholegrains, nuts, seeds, fruit and pulses that grow well in the UK.

It also means driving a transition to 'better' livestock farming that delivers a smaller amount of higher value meat and dairy, and moving away from intensive modes of production.

Intensively reared chicken replaced

Modern-day chickens have lower levels of nutrients and eat vast quantities of human edible food, this means they are now replaceable. We want to see the intensive part of the chicken market switched to much lower volumes of meat produced to 'better' standards.

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COMPASSION in world farming
ciwf.org

THE FOOD FOUNDATION

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The Grayston Centre 28 Charles Square London N1 6HT
To view all organisations that are part of the Eating Better Alliance, click here.

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15 OECD/FAO (2019) Table A.28.2 - Poultry meat projections: Consumption, food. Agricultural outlook 2019-2028. https://doi.org/10.1787/agr_outlook-2019-en

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17 Between 2008-2018. OECD/FAO (2019) Table A.28.2 - Poultry meat projections: Consumption, food. Agricultural outlook 2019-2028. https://doi.org/10.1787/agr_outlook-2019-en

18 kg retail weight per capita in the United Kingdom, average 2016-18, OECD/FAO (2019) Table A.28.2 - Poultry meat projections: Consumption, food. Agricultural outlook 2019-2028. https://doi.org/10.1787/agr_outlook-2019-en

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