STOP KILLING OUR Rivers

End the pollution from industrial chicken farming, help bring our rivers back to life

Soil Association

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The story of a dying river

Executive summary

In 2020, a thick algal bloom extended along the River Wye for more than 140 miles, killing much of the life beneath the surface. The bloom was caused by eutrophication – nutrients from livestock manures (primarily phosphates from chicken manures) had washed into the waters, causing rapid algae growth, starving the river of oxygen. Agricultural activity had added to the pressures facing the river from other sources of pollution, such as sewage. For all the legal protections in place, the Wye was struggling to survive.

Many of these phosphates had travelled a great distance. They began life buried under the Atlas Mountains in Morocco and Western Sahara, where 70% of global reserves of phosphorus are held. Phosphorus is a vital nutrient for crop and animal growth, often in limited supply in farming systems. While agroecological systems aim to recycle nutrients as far as possible, most food production is reliant on mined minerals that are manufactured into fertiliser.

Having been mined, the phosphorus was shipped from Morocco to Brazil, where it was applied to soils beneath soya crops. Brazil is the world's soya capital and in recent years production has intensified, fuelled by agrochemical inputs and rising global demand for livestock feed.

Significant volumes of this soya – carrying this phosphorus – are imported into the UK each year to be fed to chickens. In the body of a chicken, phosphorus is converted to phosphate and excreted in manure, which is subsequently applied to the land as a fertiliser. When applied inappropriately, these phosphates leach into our rivers. They add to the burden of nitrate pollution, another nutrient responsible for river decline.

You wouldn't know it from looking at the label, and most consumers picking up a chicken breast in any UK supermarket are completely unaware of the impacts of the global supply chain behind our most popular meat. While there are many causes of river decline, the pollution they face cannot be disentangled from this extractive global supply chain and the import of millions of tonnes of livestock feed.

The pollution of the Wye has now, finally, caught the attention of the media and policymakers, and both industry and government have moved to respond. This response is welcome but narrow in scope, oriented towards closing loopholes in regulation and redistributing manures to other river catchments. Relatively little attention has been paid to the more structural challenge posed by industrial poultry, or the intrinsic unsustainability of feed supply chains.

'Stop Killing Our Rivers' seeks to address that gap, outlining the harms caused by industrial soya and intensive chicken farming, and the need for structural reforms to food systems and diets. This report argues that action is urgently needed and must go beyond the 'sticking plaster' solutions proposed to date. If UK poultry production is to be made truly sustainable, the hard truth is that we must consume and 'grow' far fewer birds, farm them more ethically, and feed them more sustainably.

Analysis contained within this report shows that broiler, or 'meat' chicken numbers in England and Wales have been rising at a rate of one million birds per month for the past ten years, reaching roughly one billion birds farmed per annum in the UK today. If these trends extend into the future, the result will be further environmental harms, both in the UK and overseas. If action is taken swiftly, the Wye might yet be saved, but other rivers and ecosystems in the UK will be put at risk. Diets and production must rapidly and radically change.

The report makes the following headline recommendations, calling on governments to:

1. **Implement a ban on new intensive poultry units**
2. **Support farmers to exit this damaging industry via a just transition to higher welfare, nature friendly and agroecological production**
3. **Take action to reduce chicken consumption to more sustainable levels (initially through a phase out of industrial chicken served in schools and hospitals and providing support for agroecological production to provide less and better meat)**
4. **Take action on feed to reduce reliance on imported soya for poultry feed.**

Food systems are complex. There are no silver bullet solutions to the challenge posed by polluting systems or globalised supply chains. The economics of food production are also complex, and hugely challenging for producers. There are sound economic reasons that farmers have chosen to invest in intensive poultry. It is ultimately the responsibility of government to ensure that farmers have the security and opportunities they need to invest in a greener future and avoid polluting practices that are impacting on the health of our rivers. It is also the responsibility of government to rein in the corporate actors benefitting from unsustainable production.

Time is short but it is not too late. If we act swiftly and carefully, we can end the pollution from industrial chicken farming, and help bring our rivers back to life.

Food not Feed

It's widely recognised that food and farming need to change in response to the climate, nature, and health crises. We need to eat differently, and we need to use our land differently. The Soil Association is squarely of the view that agroecology and organic are the crux of the solution and we are advocating for a 'ten-year transition' to agroecology and sustainable diets. There are trade-offs and challenges to navigate in the transition however, with lower yields posing a potential land-use puzzle. For agroecology to be viable, we will need to release land from feed crop production and phase out intensive livestock systems, aligning our diets accordingly.

Food not Feed is a Soil Association initiative promoting this dietary and land-use change. It asserts that livestock can play a key role in resolving the climate, nature, and health crises – the contribution of animals to our farming system can be socially and environmentally 'net positive' – but only if we farm the right animals, in the right way, and ensure both we and they are consuming an appropriate diet. Broadly speaking, this means that we stop competing with animals for land and food. Roughly 50% of UK arable land is used to grow feed crops, with an area approaching the size of Wales used overseas, primarily to grow soya for chickens in intensive systems. For the ten-year transition to be viable, we must use more land to grow plant foods for human consumption. This will mean shifting diets to 'less and better' meat (phasing out intensive meat and dairy) and 'more and better' plants.

95%

of the 1 billion chickens reared for consumption each year are raised in 'intensive poultry units'

The problem with industrial chicken farming

Production and consumption

UK levels of chicken production and consumption are inherently unsustainable. Around 1 billion broiler (or 'meat') chickens are reared for consumption each year in the UK[27]. 95% of these chickens are raised in so-called 'intensive poultry units', or IPUs, which hold 40,000 or more birds each. There are often hundreds of thousands of birds held across multiple units on a farm, producing large volumes of manure every year. Processing company Avara Foods reports that its around 104 farms in the Wye produce 142,263 tonnes of manure a year[3]. As well as presenting significant welfare risks to the chickens held, these units often cause environmental harm to the ecosystems around them, those overseas from where chicken feed is sourced and the wildlife and people who live in those areas in the UK and abroad.

Poultry makes up a disproportionately high percentage of meat consumed in UK diets with per capita consumption of ready-to-cook meat rising from 15.9 kg per annum in 1990 to 30.5kg in 2023[47]. Similar figures are seen in countries around the world, with consumption predicted to continue rising.

Health and welfare

These enormous production and consumption figures have significant impacts. Rising demand has fuelled the intensification of production and the drive for ever greater efficiencies of scale has led to fast growing breeds becoming the norm. The average broiler chicken in the UK lives between 30 and 40 days, a little over a month. They grow to maturity within a matter of weeks, causing them leg and heart conditions and are often crowded in indoor facilities with little natural light. At slaughter weight, these fast-growing birds are often unable to support their own weight, losing the ability to walk, with resultant mental and physical distress.

Unwell chickens require the administration of antibiotics, the overuse of which in farming systems is increasing the spread of bacteria that are resistant to them, including in UK rivers[73] and undermining our ability to cure life-threatening infections in people. Experts predict that 10 million people a year could die from antibiotic resistant infections by 2050[2]. Intensive poultry systems, especially when they are clustered into one area, also increase the risk of high pathogenicity avian influenza, threatening wild bird populations and human health.[17]

Although 20 million broiler chickens are slaughtered every week in the UK, many raised in farms around the country do not survive to slaughter. In a three-year period between 2016 and 2019, more than 61 million were rejected for processing at slaughterhouses due to diseases and defects. Thousands of birds also die or are euthanised on farm due to disease or injury, with an average mortality rate of around 4% (around 400 birds dying or being euthanised in a flock of 10,000[15]).

Environmental harms

Our reliance on cheap chicken as an almost daily fare also has devastating consequences for natural environments in the UK and overseas, the climate crisis and human and animal health and well-being. Chicken is, in fact, 'artificially' cheap. The low prices we pay for it in supermarkets and fast-food chains, sometimes less than the price of a cup of coffee, ignore the chicken industry's impact on our countryside, the quality of our air and water and our environmental footprint overseas.

These environmental and welfare harms are fuelled by the availability of industrial feed crops. The UK uses nearly 2 million tonnes of imported soybean meal a year to feed livestock, more than half of which is used in intensive chicken production. The majority of this 'high protein' soya, which contributes so effectively to the production of fast-growing chickens, is grown in Brazil using phosphate fertilisers and highly hazardous pesticides linked to an increase in childhood cancers, with production concentrated in sensitive ecosystems such as the Cerrado savannah, the most biodiverse grassland in the world and home to thousands of plants and animals found nowhere else. UK land that could support more nature friendly farming and biodiversity while growing food directly for human consumption is instead used to grow feed for chickens and, increasingly, to feed anaerobic digestor plants used to deal with vast volumes of chicken manure. An estimated half of the UK wheat crop goes to feed chickens[1].

Feed is also the largest source of the phosphorus imported into the River Wye catchment in the UK, with significant volumes being imported in soya and chicken feed each year.

Rivers at risk

UK rivers are widely at risk with only 14% meeting good ecological status. Sewage pollution has rightly been in the spotlight to blame for much of this but intensive livestock farming also has an enormous impact, including where intensive poultry units are concentrated in sensitive environments like the River Wye catchment.

The River Wye (Afon Gwy in Welsh) is one of our most important conservation sites for the protection of natural habitats and wildlife and a designated Special Area of Conservation, protected by national law. Yet flaws in the planning system and in environmental regulation enable phosphate pollution from chicken manure to destroy its vital ecosystems, bringing it rapidly to a demise from which it may never recover. The system that supports this is held up by a consolidated supply chain with international food processing companies and supermarkets pulling the strings and keeping prices low, all under the guise of consumer demand.

This fundamentally extractive industry can only be fixed if we eat less (and 'better') chicken, significantly reduce its reliance on soya and other cereals, grow birds more slowly and end the construction of intensive poultry units, reducing the number in existence. Instead, we need a 'circular' system, as agroecology and organic would aspire to, with more production focused directly on human consumption (food, not feed) within farming systems that work with and benefit nature and contribute far less to climate change.

The River Wye: death by chicken farm

The River Wye (rising as the Afon Gwy in Wales) flows for 155 miles from the Cambrian Mountains in mid-Wales to the Severn Estuary in the west of England.

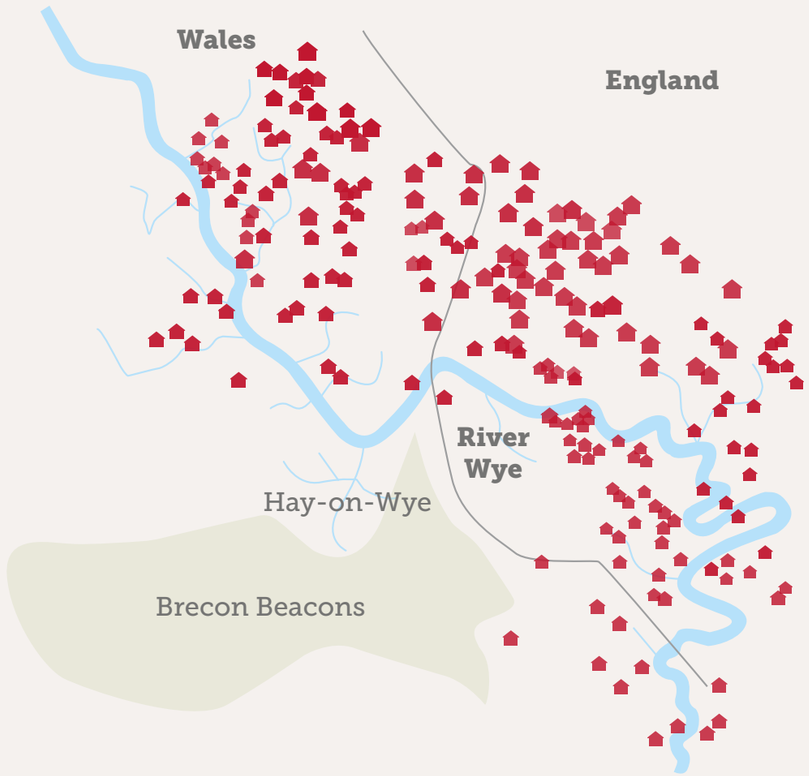
Where the river used to run clean over gravel, and through huge swathes of water crowfoot, the stones on its bed are now coated with green algae. Sometimes the algae become so dominant they "bloom", blocking out sunlight and removing oxygen from the water, killing native plants, fish and invertebrates (including some of our most protected species) and impacting on the wildlife that depend on them, including kingfishers, otters, dippers and water voles.[71]

In 2020, a thick algal bloom caused by pollution from agricultural runoff extended along the river for more than 140 miles, killing much of the life below the surface[26,58]. The extent of the impact was described by Herefordshire Council in a UK Parliamentary Environmental Audit Committee report as *"like pea soup. Blanket weed blocked out light and the water became oxygen depleted. Around 70 miles of river lost the protected plant water crowfoot (ranunculus) and therefore fish and invertebrate life were impacted as river keepers reported widespread loss of cygnets from starvation. Hardly any of this ranunculus came back in 2021 and as a consequence the river remains devoid of the natural and diverse ecosystem that we deserve"* [71].

The river has been described as *"very close to ecological collapse"*[35], a fear upheld by Natural England, who, in 2023, downgraded the river to an *"unfavourable-declining"* status, a result of declines in key species, due in part to the manure spread on adjacent land washing into the river sourced from local poultry units[36].

> The River Wye is very close to ecological collapse

The Wye catchment has a staggering concentration of poultry units.



The intensification of livestock and arable farming in the catchment over the past 50 years has created unsafe concentrations of phosphate in soils and the river, and a rapidly growing poultry industry has proven to be the 'final straw'. Local people have described a tipping point in the last five years, with their favourite river beaches covered in green slime, smelly and frightening.

More than 20 million meat and egg laying chickens are farmed in the River Wye catchment at any one time[54,58]. That's a quarter of all the UK's chickens produced in an area of around only 1.5% of the total land area.[54]

Chicken manure is high in phosphate which, in excess, can cause eutrophication of freshwater ecosystems (and those algal blooms), killing biodiversity. Significant volumes of phosphorus are imported into the Wye catchment each year in chicken feed, including soya from Brazil.

Map information sourced by Brecon and Radnor Campaign for the Protection of Rural Wales

Dr Alison Caffyn, who has extensively researched the impact of IPUs on rural communities in England, describes the impact of the huge volumes of chicken manure produced by these units:

"It requires clearing out from sheds and moving to AD [anaerobic digestor] units, field piles, spreading on fields or transporting elsewhere. It fertilises the ground, generates power in AD units and creates profit for farmers. It pollutes air with smells and ammonia, attracts flies and causes distress to neighbours. It pollutes rivers with its nutrient content and can poison wildlife. It may contain other ingredients such as drug residues, heavy metals, or antimicrobial resistant bugs. Manure increasingly requires management plans and legal agreements for disposal and [led] in one location (Tasley) to [an IPU referral] to the High Court and Royal Courts of Appeal".[8]

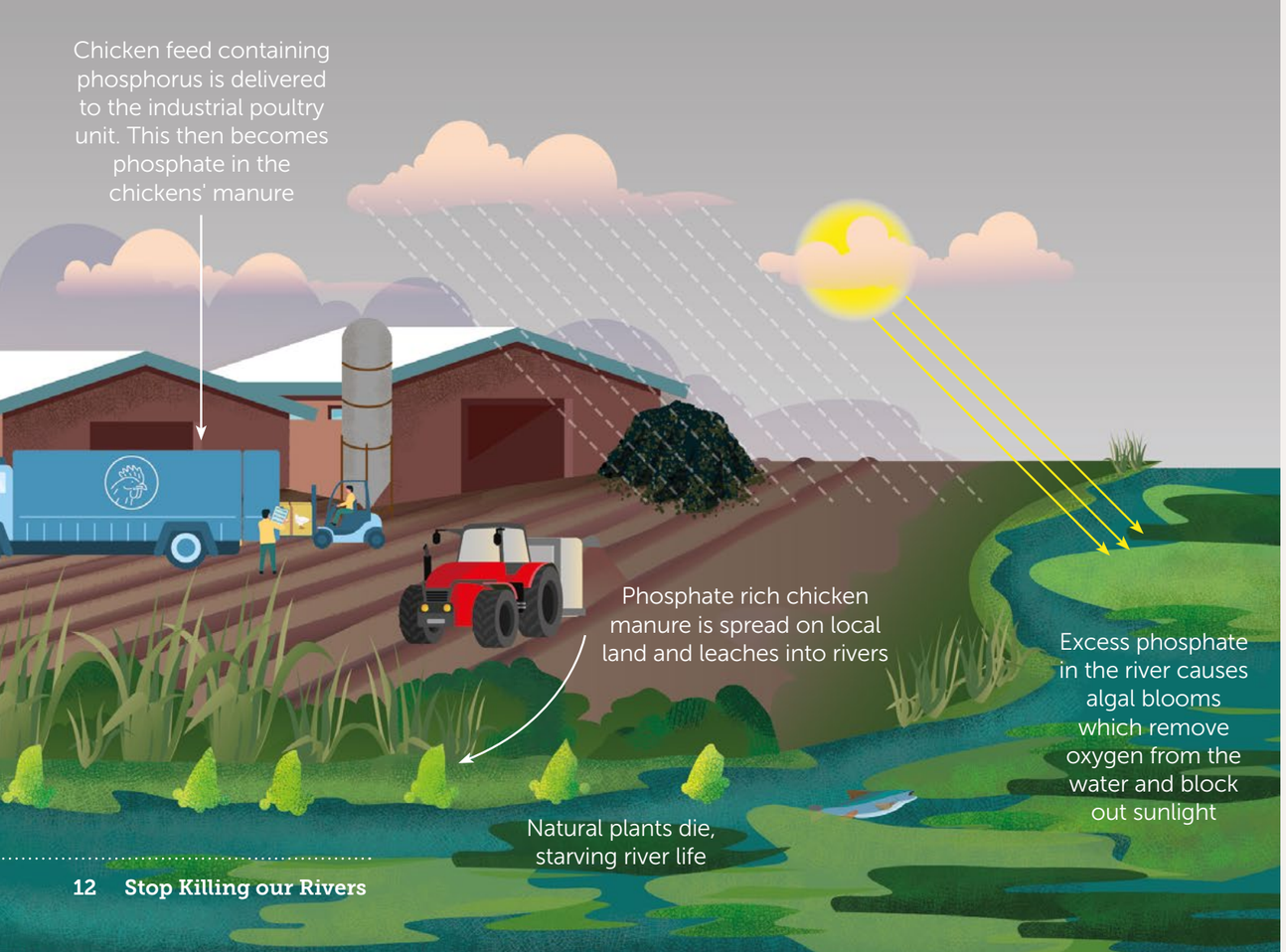
The impact of phosphate on natural ecosystems

Phosphorus is a vital nutrient for crop and animal growth, commonly applied as a fertiliser. But the way we use this finite resource is wasteful and polluting, with excess phosphorus (in the form of phosphate) from livestock manure spread on fields accumulating in our landscapes and leaking into our rivers and other watercourses.

Phosphate contributes to the eutrophication of freshwater ecosystems, which are particularly sensitive to an increase in the nutrient. In water it causes algae and other forms of plant life not normally dominant to grow too fast, removing oxygen from the water and disturbing the balance of organisms present, killing natural biodiversity.

A 2018 Environment Agency report on water quality raised concerns about *"unacceptable levels"* of the nutrient in over half of English rivers, that phosphate pollution was *"the most common reason for rivers not achieving good ecological status"* and that it was the main cause of eutrophication in England's rivers and lakes[20] although nitrates from agricultural run-off also cause eutrophication.

Phosphate enters rivers attached to soil particles through soil erosion, via surface run-off from manure spread on land or via drains spilling manure into rivers.



Phosphate pollution is a particular concern in the River Wye catchment, with the Environment Agency and Natural England identifying poultry farming as a key source. Chickens are the most numerous animals farmed in the catchment with the main pressure being the production and spreading of poultry manure as fertiliser onto arable land and subsequent leaching into watercourses.[21]

The largest source of the phosphorus imported into the River Wye catchment is their feed. According to data supplied by the poultry industry, 5,500 tonnes of phosphorus are brought into the catchment each year, with 4,200 tonnes of it imported in livestock feed[77] 80% of this feed goes to chickens.[44] Lancaster University's research project RePhoKUs suggests the excess phosphorus that's accumulated in agricultural soils in the River Wye catchment could provide 20 years of fertiliser for the area's crops without further input.[78]

RePhoKUs estimates that 60-70% of the total phosphate load comes from agriculture, noting that the main driver of the large annual phosphate surplus is the quantities of livestock manure which have significantly increased in the last several years due to rapid expansion of the poultry industry[78]. Leaching into the river is exacerbated by the presence of silty soils, in which nutrients such as phosphate disperse easily and high rainfall in the area increasing run-off from land.[72]

The impact of phosphate pollution on species declines

The plight of the freshwater pearl mussel

The River Clun in Shropshire, another Special Area of Conservation, is an important habitat for freshwater pearl mussels, an endangered species residing in only a few river systems in the UK. They rely on low nutrient environments[68] and have declined in the river as a result of deteriorating water quality due to nutrient run-off from manure spreading, algae growth and sediment increases. The River Clun population faces extinction in the next 10-15 years.[8]

The disappearance of freshwater crowfoot

The Wye is famous for its Ranunculus (water crowfoot) beds, a protected species under the Conservation of Habitats and Species Regulations, which means it is illegal to remove it from the river. Tragically, more than 90% of Ranunculus beds have been lost to algal blooms[52]. Wye campaigner Angela Jones describes how water crowfoot used to blanket sections of the river, providing food and shelter for birds and fish but that it has disappeared from the river in recent years.[66]

The impact of IPUs on human health and wellbeing

Human health and wellbeing are significantly affected by IPU developments. In addition to the impact of water pollution, smell and traffic volumes on daily life, recreation and enjoyment of the countryside, ammonia, an air pollutant emitted from livestock manure, including poultry, is responsible for 60% of particulate air pollution in the UK.[10] Health concerns arising from ammonia pollution includes asthma, lung and heart disease and various cancers.

Resultant health consequences can sometimes occur far from its source.[69]

Local opposition to IPU planning applications is commonplace. A number of different concerns raised by local residents in the River Wye catchment were reported by Herefordshire Council's Task and Finish Group on the Impact of the Intensive Poultry Industry on Human Health and Wellbeing:

> My enjoyment of our glorious countryside is often spoiled as I recall the dark secret hidden away of the chickens deprived of their right to a normal life.

> We live near a chicken farm and honestly if I'd known about the horrific stench this farm lets off frequently, I'd never have bought a house near it.

> Flies are attracted to the waste matter, and appear on our windows in hundreds, making it again very difficult to have windows open.

> The traffic on the lanes around our home have become increasing dangerous to the point my son is too scared to walk down some of them because of the fear of meeting one of the huge vehicles that go back and forth from these IPUs.

> I have found a significant link between the smell of poultry manure in the air and an aggravation in breathing difficulty.

> It is concerning that it is understood that the poultry are routinely dosed with antibiotics at a time when resistance to antibiotics is becoming an ever-greater issue.

> The benefits of exercise and of enjoying the natural beauty of the county are all compromised if we cannot breathe, swim in or enjoy the landscape and river without seeing the evidence of the seemingly unstoppable air, land and water pollution the poultry industry is causing.

> Not only have I witnessed first-hand the pollution that intensive poultry is having on river and wildlife, I taste it, I feel it on my skin. My eyes and skin burn, my throat is sore.[34]

Who is responsible?
The chicken industry explained

Chicken was once a marginal component of British diets, with meat consumption dominated by other products such as beef. Now chicken is an everyday staple, commonplace in ready meals, takeaways, sandwiches and many other foods. The global trend is similar, with chicken the most consumed meat worldwide.[56]

Chicken is now part of an industrial production system that can deliver vast volumes of meat at a low price to the consumer. It's a system of fast-growing breeds, efficient feed conversion ratios and rapid and voluminous processing.[56] This efficiency has been aided by the manufacture of industrial chicken feed, which is processed to contain the precise mix of amino acids needed for the birds' rapid growth. Attaining this balance typically requires soya, which makes up about 23% of chicken feed and is a product we import in huge volumes each year from Brazil, which has suffered significant deforestation and the impact of highly hazardous pesticides, as a result.[11]

In many ways, it is the availability of cheap industrial poultry feed that has fuelled the expansion of intensive poultry production. Though there has been a 'pull' from above, in the form of rising consumer demand, there has also been a 'push' from below, as agribusiness corporations investing in intensive cropping have sought a market for the commodity crops they produce. Industrial livestock systems have provided this market, creating a symbiotic relationship between agrochemical companies, grain traders, and the 'factory farmed' livestock sector.

Chickens sold for an average 46p in 1971, equivalent to £8.96 today, when the average chicken sells for £3.84.[56] But the cheapness of chicken doesn't account for the environmental impacts of its production, nor its impact on human wellbeing, society and culture, not only in the UK but in those countries that are part of our chicken supply chain. A cultural expectation of cheap chicken, coupled with retailer competitiveness, has created an unhealthy dependence on industrial chicken production, with devastating environmental consequences.

The supply chain is a consolidated one, with farmers raising chickens through a contract with companies who provide chicks and feed and then slaughter and process the birds and sell the meat. The three largest poultry meat companies in the UK are Moy Park, 2 Sisters Food Group and Avara Foods. After a flock's lifecycle of only around 30-40 days, the chickens are removed for slaughter, their manure and bedding removed and the unit cleaned before the process begins all over again (see infographic).

Feed supplies are equally consolidated, with the industry's dependence on multinational companies like Cargill providing the huge volumes of soya required. Intensive poultry, through its global supply chains, is an extractive industry, responsible for the plundering of overseas ecosystems at one end of the chain and the destruction of natural environments closer to home.

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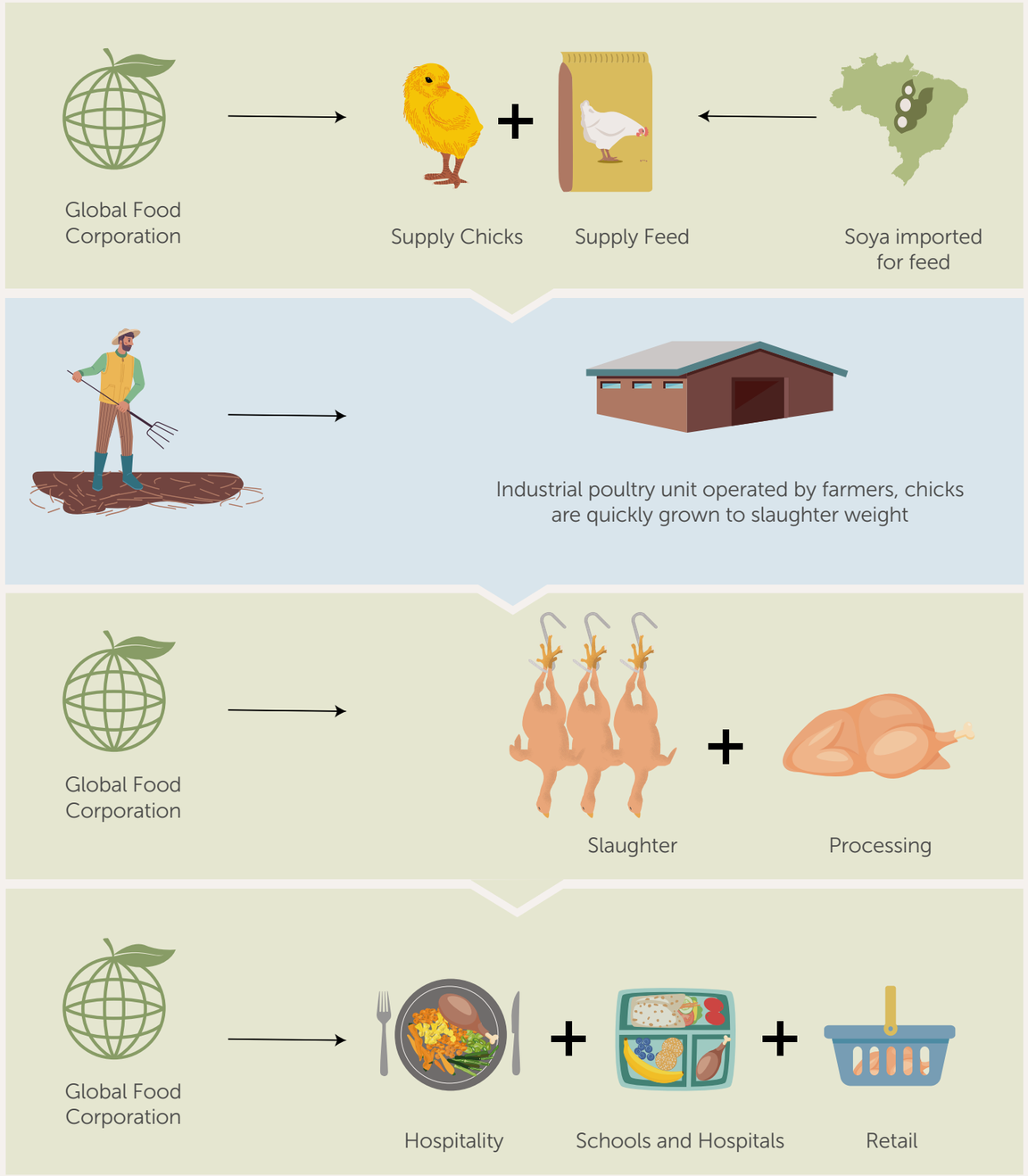

How Avara Foods came to dominate River Wye catchment chicken farming

Avara Foods, a subsidiary of Cargill, an American global food corporation and the largest privately owned company in the US by revenue, processes two million chickens at its factory in Hereford every week, supplying supermarket chains such as Tesco. It is supplied by over 100 poultry farms in the catchment[4] and is Tesco's primary fresh chicken supplier, processing 4.5 million of the around 20 million chickens processed in the UK each week.[57]

Following a £35million expansion of Cargill's (now Avara's) processing plant in Hereford and a new 2013 contract with Tesco, 93 new intensive poultry units were given permission to establish in Herefordshire, significantly increasing the number there. Shropshire has also experienced a significant growth in the number of these units.[8] This increase in the number of units has resulted in a rise in feed imports and large volumes of chicken manure being produced in the area which requires disposal. Disposal has almost entirely consisted of the manure being spread on land in the area to fertilise crops, risking ongoing pollution of the river.

1. River Swale
2. River Witham
3. River Tern
4. River Roden
5. River Vyrnwy
6. River Severn
7. River Frome
8. River Arrow
9. River Wye
10. River Wissey
11. River Thet

It's not only the Wye. Other UK rivers are at risk from poultry pollution.

Tragically for the Wye, one of our best loved rivers and a protected natural ecosystem, it is already close to ecological collapse, with resultant impacts on biodiversity and on the human populations who depend on it for their livelihoods and wellbeing. Local opposition to proposed livestock units has undoubtedly contributed to increased scrutiny around what's happening to the river and the urgent action needed to save it.

Current levels of UK chicken production are bad for chicken welfare, biodiversity and climate, both here and overseas. If demand continues at current levels or even increases, production looks set to expand into new parts of the nation, exposing other UK rivers to the same risks faced by the Wye. And while attention is focused on the Wye, it may already be the case that ecosystem decline is occurring in other areas where poultry units are concentrated.

Using the search term 'poultry' on the Environment Agency website, we found that environmental permits had been issued for 139 new or expanded intensive broiler operations across England since 2014. Expansions to existing operations involved adding more units and increasing bird capacity. By carrying out a similar search on the Natural Resources Wales website, we found that an additional 21 permits for new or existing intensive broiler operations in Wales had been issued since 2014 by Natural Resources Wales.

Across these 160 operations, space was approved for the holding of an additional 23,713,684 birds at any one point in time. As units have an average of 7 crops a year, that amounts to an additional 165,995,788 more birds being farmed for meat in 2023 than in 2014, the equivalent of more than 1 million more on average a month.

As well as Shropshire, Herefordshire and Powys there are concentrations of units in Norfolk, Yorkshire, Lincolnshire and Gloucestershire.

We found permits issued for 3 or more intensive poultry operations within 5 km of the Rivers Thet and Wissey in Norfolk, River Severn in Shropshire and Gloucestershire, Rivers Tern and Roden in Shropshire, River Swale in Yorkshire, River Witham in Lincolnshire, the Rivers Frome and Arrow in Herefordshire and the River Vyrnwy in Powys and Shropshire (see map for rivers at risk). According to the Environment Agency's Catchment Data Explorer, these water bodies were already failing government phosphate targets in 2019 and 2022[19].

In 2024, Compassion in World Farming mapped out the number of indoor-reared meat chickens across counties in England, Northern Ireland and Wales and across Scotland as a whole. Their research found that there are nearly 32 million meat chickens in Lincolnshire, nearly 22 million in Shropshire, nearly 21 million in Norfolk, nearly 19 million in Herefordshire and nearly 11 million in Yorkshire and Suffolk. County Tyrone in Northern Ireland farms more than 8 million meat chickens and there are more than 5 million in County Antrim in Northern Ireland, Gloucestershire, Nottinghamshire and Powys in Wales[16].

Broiler numbers in Scotland do not seem to have been rising as fast as in the other UK nations.[59] although Compassion in World Farming's research found there are nearly 16 million meat chickens being farmed across the country as a whole.

nearly
166 million
more birds were being farmed in 2023 compared to 2014

Photo © Lough Neagh to Friends of the Earth Northern Ireland

Lough Neagh, Northern Ireland

A national scandal emerged in 2023 as the UK's largest freshwater lake, Lough Neagh, a Site of Special Scientific Interest and home to many rare species of plants, birds and fish, which also supplies water to 40% of Northern Ireland's population, suffered a toxic blue-green algae incident linked to livestock manure. A growth in intensively farmed chickens, as well as cattle and pigs, has been part of a deliberate economic growth strategy in the country. The industry is also mired in scandal following revelations that fake soil sample results were used in dozens of applications approved for intensive livestock operations, including poultry units, between 2015 and 2022.[7]

Photo © Lough Neagh to Friends of the Earth Northern Ireland

The legislative landscape

While the legislative framework includes measures that hypothetically should protect Special Areas of Conservation like the Wye, address the management of manure to prevent phosphate pollution and provide the conditions for monitoring the cumulative effects of these units on our natural environments, in reality the framework is failing to prevent harm.

Environmental permitting

In all four UK nations, Environmental Permitting Regulations apply to poultry installations holding more than 40,000 birds. Many broiler units fall below this threshold and, presumably and cumulatively, risk harm to local environments despite not being subject to more stringent regulation.

For manure spread on land, the requirements of an Environmental Permit apply only to that spread within the IPU boundary. As most poultry units are sheds on concrete bases, manure is generally spread on other land owned by the IPU operator, exported for spreading on third party land or incinerated.

Agricultural pollution regulations

Where manure is exported from an IPU and spread on land outside of its boundary in England, the practice falls under the Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations, also known as "The Farming Rules for Water".

Under the Regulations, each application of manure must be planned to ensure that it does not exceed the needs of the soil or crop on that land or give rise to a significant risk of agricultural diffuse pollution, such as that resulting from the spreading of chicken manure on land.[39] The pollution in our rivers suggests there is insufficient adherence to the regulations. Similar rules extending to phosphate are being introduced in Wales under the revision of the Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021.[37,74]

Government pollution targets

The UK Environment Act 2021 introduced legally binding targets to reduce nitrogen, phosphorous and sediment pollution from agriculture entering the water environment by 40% by 2038, with interim targets of 10% by 31 January 2028, and 15% in catchments containing protected sites in unfavourable condition due to nutrient pollution.[38]

It is questionable whether these targets are ambitious enough to prevent irreversible biodiversity declines or the commitment made by the UK government to meet the Convention on Biological Diversity's Global Biodiversity Framework's target to cutting nutrient pollution in half by 2030.[18,48] Common sense suggests action to meet this target needs to include a reduction in intensive livestock production which leads to nutrient excess in our land and rivers.

Government enforcement, monitoring and advice

Funding for environmental regulator the Environment Agency was cut by more 50% in real terms in the decade prior to 2022 with the UK government Department for the Environment, Food and Rural Affairs (Defra) providing £94.3m for the Agency's Environmental Protection Services compared to the equivalent of £213.8m in 2009/10.[40] Water quality monitoring has suffered as a result, with the number of water quality samples taken by the Environment Agency falling by 45% between 2013 and 2019.[71] Furthermore, with the rapid growth in IPUs a relatively recent phenomenon, it's possible that the regulatory system has not yet caught up with the challenge presented by the intensity of production across IPU operations or the sustainable management of the birds' manure.

The UK government's Plan for Water commits to reducing water pollution from agriculture, including by improving *"the effectiveness of environmental permitting of pig and poultry farms in reducing water pollution while working to maximise the efficiency of the permit setting process"*.[28] We have yet to see specifics around how this will be achieved. In response to criticisms over government commitments to water quality, in 2023, Defra also announced increases in funding for face-to-face support for farmers in England in an effort to reduce water pollution.[29]

The regulatory regime must be improved to tighten restrictions on IPU developments and the management of their operations

Welsh Government funding for its environmental regulator, Natural Resources Wales, has also been cut by a third over the last decade[43,66] and similar challenges are faced in Scotland and Northern Ireland.[9,25]

Concerns have also been raised about the ineffectiveness of the regulatory regime, including by the regulators themselves, particularly in relation to the spreading of manure on land in preventing phosphate run-off into rivers. In a letter to Powys County Council in October 2023, Natural Resources Wales wrote *"we are not satisfied that the regulatory regimes covering spreading of manures, or resultant digestate (when applicable) to land, are adequate in preventing discharge of phosphorus to the river environment"*.[46] In light of such concerns, planning applications for IPUs have been paused in Wales.[33]

Welsh Government has proposed an action plan to relieve pressure on Special Area of Conservation river catchments, noting that more than 60% of SAC rivers in Wales fail phosphate targets. Commitments include funding for nutrient management plans, advice and guidance for farmers on good practice and exploring the role wetlands and other natural solutions could play in addressing phosphate pollution.[75] Wetlands, trees and cover crops can all help to break pollution pathways as well as increasing biodiversity[79,60] but should operate within a wider framework that controls pollution at source.[13]

Following input from the regulatory authorities, decisions on whether to approve planning applications for IPUs are ultimately made by Local Authorities with only limited technical expertise and resources who could face lengthy and costly appeals if they deny planning permission for operations to proceed. Cumulative impacts of IPUs have not been considered in the planning process and the population thresholds for permitting are too high at 40,000 and above, meaning many operations do not even require a permit.[8,44,71]

The Water Framework (Water Framework Directive) (England and Wales) Regulations 2017 require regular monitoring of the water status within each river basin district. However, the water quality monitoring programmes carried out by the Environment Agency and Natural Resources Wales are not considered adequate to capture river quality impacts accurately enough to establish robust evidence of cause and effect.[78] There is increasing reliance on citizen science in determining river health[8,76,71]. Monitoring and transparency around data collected must improve across all UK rivers.

In essence, regulations and the regulatory regimes that should be protecting our rivers and preventing our soils being saturated with harmful levels of phosphate are inadequate to prevent the pollution from poultry farms destroying natural ecosystems. This is at least partly because there is currently no viable way to address the huge numbers of chickens we farm each year, the challenge posed by the import of millions of tonnes of nutrients in soya and the vast volumes of manure produced by chickens in intensive poultry units.

The regulatory regime must be improved to tighten restrictions on IPU developments and the management of their operations, including around the disposal of manure. In the meantime, more radical action is needed to bring poultry production down to more sustainable levels.

Fixing the problem

A number of proposed solutions have been put forward by industry players and government departments to reduce the impact of phosphate pollution from the chicken industry in the River Wye catchment.

Anaerobic digestion

One of these is the treatment of manure in anaerobic digestors, or AD plants, which may be constructed on a farm with intensive poultry units on site or on a separate site serving a number of farms in the area. Around 15% of poultry farms in England process poultry manure in AD plants.[31]

AD plants work by being fed with manure and crops such as maize, which are broken down inside the plant by microorganisms producing methane which can be used to heat farm buildings or fed into the national grid.[24] A solid digestate material is also produced and can be used as a fertiliser for crops, which may then be fed back into the AD plant.

AD plant technology remains limited in its ability to remove phosphate from resultant digestate material and so its use on crops also risks water pollution.[31,80]

For the AD plant to work efficiently, crops such as maize are added alongside the manure. The growth in AD plants processing manure has resulted in widespread maize production, a crop which impacts on the soil's ability to retain run-off and, following harvest, leaves fields bare in winter, during wet weather periods, further risking pollution run-off into local watercourses.[65] The crop also uses valuable agricultural land that could be used for food production.[24]

Planned AD plants, often proposed as a solution to the huge volumes of manure produced by intensive poultry units,[42] have also been subject to local opposition, with similar concerns to those raised against IPUs.

Avara's roadmap

In January 2023, poultry processor Avara Foods pledged that by 2025, its supply chain would cease to contribute to excess phosphate in the River Wye by increasing the amount of manure sent out of the catchment and anaerobically digested.[4] This was followed by an announcement in August 2023 that poultry manure from Avara's supply chain would no longer be available for sale as fertiliser in the River Wye catchment[23] and updated in December to confirm it could not be used in a way that will contribute to excess nitrogen or phosphate levels.[6]

Big questions remain, however, about where the manure from the millions of chickens in the catchment will go and how the pollution risks will be managed. Shipping manure out of the catchment could simply shift the problem to other parts of the country and present a risk to other river systems, which may already be impacted by phosphate pollution.

It's unclear, too, how the transport of the manure will be managed. Think Tank Onward propose government funding for poultry farmers to convert manure into fertiliser pellets that are easy to transport but are currently costly to produce.[31] Such mitigations have not been detailed by Avara[3], however or how they will address the excessive levels of phosphate already in the Wye and adjacent soils which have and are continuing to cause pollution and the decline of the river.

RePhoKUs' recommendations

RePhoKUs, a Lancaster University project examining how we use phosphate more sustainably in the UK food system has produced a detailed study of phosphate in the River Wye catchment and published a series of recommendations to address pollution. These include better enforcement of existing regulations, improving river monitoring, scaling up advice and support, knowledge sharing and stakeholder coordination. They also recommend improved data to enable a more accurate understanding of crop fertiliser use and manure input, as well as reducing livestock manure by producing renewable fertilisers, exporting manure to other regions and reducing manure through a reduction in the number of livestock farmed in the catchment.

RePhoKUs notes that water quality in the Wye and in other livestock-dominated catchments will only improve by reducing excess phosphate in catchment soils and bringing phosphate levels in soils to at least the agronomic optimum required by crops grown in the catchment. They suggest this could take many years.[78]

While all of these offer a practical way forward beyond a 'business as usual' approach, which would destroy not only the Wye but other UK rivers where IPUs are concentrated, their potential to prevent future harms remains uncertain. To be more confident that poultry production will not lead to pollution and environmental harms, more radical action may be needed.

Only by reducing chicken numbers and imported feed can we address the harms of industrial poultry

Fixing the system

Only by reducing chicken numbers and imported feed, and subsequently the volumes of manure produced, can we confidently begin to address the harms caused by industrial poultry.

As long as consumer demand for chicken continues to grow, production expands and the system that supports it remains unchallenged, the impact on the Wye from excessive phosphate pollution from chicken manure is at risk of being transferred elsewhere. It will be another river, another catchment, the same damaging overseas and UK land-use, the same welfare failings for chickens, the harms to people and wildlife from agrochemical use on overseas feed production and to our climate from fertiliser inputs. The best solution to fully address these harms is to radically shift diets towards the consumption of 'less and better' chicken and to shift production to within the constraints of sustainable feed and agroecological principles.

RECOMMENDATION 1

No new intensive poultry units

The simplest solution to avoid further expansion of intensive poultry units is to implement a moratorium or ban on national regulatory and local planning authorities issuing further permits for IPU construction or expansion.

Governments should place an immediate moratorium on IPUs pending a comprehensive review into livestock permitting, with a new permitting system applied at much lower population thresholds and requiring significantly improved welfare standards and environmental protections, including restrictions on imported feed. We need to reach "peak poultry", with production and consumption reaching a 'peak' in 2024 and declining thereafter.

A de facto moratorium has already been introduced by Welsh Government, where current IPU application approvals have been 'paused' while it considers taking charge of the decision making process around the applications.[32] Herefordshire Council, which has been in the spotlight over IPU applications, also appears to have reached a stalemate position with no new IPU permissions granted since 2021. A formal moratorium should now be introduced more widely.

Is there a risk of unintended consequences if UK chicken production falls?

If UK chicken production falls, but current consumption levels continue, there will be more imports of cheap chicken from abroad to meet demand, with associated health, welfare and environmental risks.

The government must take action to reduce UK chicken consumption to more sustainable levels, building on commitments made for the public sector to serve more high quality and sustainable food produced by British farmers, expand this to other sectors and develop a more cohesive approach to trade with minimum standards for welfare and environmental protection. This will help prevent British farmers from being undercut by imports produced to lower standards and build on the welcome promise made in January 2024 by Environment Secretary Steve Barclay to improve country of origin labelling on food.[61]

RECOMMENDATION 2

Support farmers with a 'just transition'

Many farmers are locked into a long-term financial commitment to a poultry unit on their land, with loans having been taken out as part of a contract with a processor like Avara Foods.[14] In some cases, farmers face such poor profitability and financial uncertainty in other parts of the farming sector that investing in an IPU has been seen as a sound financial decision, given the consistently high demand for poultry. If we are to reform our food system, placing it on a more equitable and nature-friendly footing, then the transition must be carefully managed, with producer livelihoods protected and animal welfare prioritised.

A just transition[50]

The notion of a 'just transition' has gained traction in recent years as the scale of change demanded by the climate and nature crises has come into focus. Re-structuring the food system in response to these crises will have far-reaching consequences for farmers, workers, and communities, and the interests and needs of each must be carefully considered.

While there is no single agreed vision of a 'just transition', we might propose that such a transition for intensive livestock should take account of the following five considerations.

Complexity: recognition that changes are required not only on farm, but across the whole supply chain and throughout society. These changes must be driven by dietary change and changes in our food choices, supported by credible policy measures that shift both consumption and production in tandem.

Context: acknowledgement that animals can play a valuable role in the landscape, contributing to positive social and ecological outcomes, when farmed agroecologically and as seen in organic systems. There is accordingly no one-size-fits all model and the de-intensification of production must be tailored to local realities.

Trade-offs: appreciation that diet change away from intensively reared meat and dairy might not always result in positive environmental and human health outcomes. A move from intensively farmed meat to ultra-processed plant-protein products, for example, might not be desirable.

Finances: an emphasis on policies that deliver a fair deal for both farmers and citizens. This will mean addressing the challenge of stranded assets on farms and across the supply chain, taking account of debt, employment, and investment, and tackling food insecurity and inequalities.

Dialogue: recognition that food system transformation should be undertaken in active dialogue with stakeholders such as farmers and citizens. In the context of intensive livestock, this means engaging producers to ensure a democratic and, as far as possible, consensual transition.

RECOMMENDATION 3

Expanding support for farmers to move into less intensive and more nature-friendly production

Farmers should be paid a fair price through initiatives like the UK government's farm welfare grant scheme[30] and the supply chain to introduce slower-growing breeds[5,41] and provide more space for each bird. This would help farmers transition towards the Better Chicken Commitment, a set of six standards that retailers and food service operators can sign up to, committing them to sourcing chicken meat produced as a result of less intensive practices.[55] The amount of chicken on supermarket shelves from the fastest growing breeds was cut in half in Holland, when the country's three biggest supermarkets stopped selling meat from those chickens.[67] UK retailers should take similar action.

There are some concrete policies that governments can enact to support farmers to transition, though a more comprehensive set of policy options is needed. As a minimum, farmers should be offered tax relief and capital grants to help them repurpose poultry units. Governments should ensure policy and payment frameworks help farmers transition towards agroecological practices and, where appropriate, organic chicken farming.

In organic farming, chickens are raised in a more natural and humane environment with more space to engage in natural behaviours such as pecking, scratching and dust bathing. Organic soybean feed is also low deforestation risk compared to non-organic soya, with Soil Association standards designed to maintain High Conservation Values in organic production, aiming to protect biological, ecological, social or cultural values which are outstandingly significant or critically important at the national, regional or global level.[62]

Retailers and processors should also work down the supply chain and invest in alternative feed such as home-grown peas and beans.[63] Slower growing chicken breeds are better adapted to feed sources with lower protein quantity, thus helping the transition away from an overarching reliance on soya.

RECOMMENDATION 4

Less and better meat

The unsustainably high levels of production realised via industrial systems cannot be replicated in organic or agroecological systems. We therefore need to reduce overall production and consumption of meat, including chicken, with a shift towards 'less and better' meat (less overall and better quality of meat produced and consumed) and 'more and better' plants.

Significant reductions in meat consumption in the coming years are recommended by government advisory body, the Climate Change Committee, Henry Dimbleby in the National Food Strategy commissioned by the UK Government and by a French independent policy research institute modelling a 10 year transition to agroecology in Europe and the UK[12,45,53] as well as a host of non-governmental organisations around the UK, including the Soil Association.

Industrial poultry should be phased out through public procurement in schools and hospitals, with procurement and food buying standards revised accordingly. While much of the industrial poultry produced in the UK goes into retail and hospitality and those sectors should also take action towards providing less and better meat, new established dietary norms in public settings, including increased consumption of more and better plants can help shift public attitudes and habits. The viability of improving the food served in public settings has been demonstrated by the Soil Association's Food for Life initiative, where schools are already introducing meat-free days, adding beans and pulses to the menu, and trading-up to organic and higher welfare British meat and animal produce.[51]

In addition, Governments should integrate sustainability into dietary guidelines. Action on diets is required of government by the Climate Change Committee's 6th Carbon Budget, including reducing poultry consumption.[12]

RECOMMENDATION 5

Address feed imports to avoid further environmental destruction in the UK and overseas

Governments and the supply chain should invest in more sustainable feed. This should include support for programmes like the European OK-Net EcoFeed project, which is helping to transition livestock diets away from soya.[49] Peas, faba (broad) beans, sweet lupins and sunflower meals are all examples of suitable alternatives to soya. This is especially true for slower growing breeds who meet the requirements of the Better Chicken Commitment and who can tolerate lower protein feed.[63]

We need government and retailer support to increase UK production of alternative feed proteins for chickens and other livestock. This would increase the sustainability of the industry across several factors, including the environmental and monetary costs of importing large volumes of soya from across the globe. Investing in home-grown feed makes good environmental sense, reducing carbon emissions and overseas land-use, and would support a UK market for peas and beans, helping UK farmers at a time when they are facing rising costs and lower margins.

The impact of soya production on sensitive environments overseas

In 2022, the Soil Association published "Stop Poison Poultry", a campaign report outlining the impact on sensitive ecosystems, wildlife and people in Brazil of the use of highly hazardous pesticides, many banned for use in the UK due to their toxic nature. These pesticides are commonly applied to soya crops in Brazil, soya which is imported by the UK chicken industry to support the protein-dependent, fast-growing nature of the poultry we produce.[64]

Our "Stop Poison Poultry" campaign called on UK supermarkets to remove "wildlife-killing pesticides" from their soya supply chains and to support the use of alternative, home-grown or European proteins in chicken feed to reduce the threat to rainforests and grasslands in Latin America. A 2023 report by the Food and Agriculture Organization of the United Nations also recommended changes in the livestock feed industry and the promotion of new sources of feed[22].

RECOMMENDATION

6

Support for whole farm plans

Governments across the UK should be aiming to encourage a whole farm approach and where required, providing financial support and advice to help farmers produce Whole Farm Plans to help meet sustainability objectives.

Whole farm planning embraces the concept of circularity, where outputs from one part of the farm can become inputs in another. For example, composted poultry manure can be used in sustainable volumes to build soil fertility to reduce the need for artificial fertilisers. The process may also encourage farmers to consider whether home grown feed for chickens could help reduce reliance on imported soya.

So far, only the Scottish Government has stipulated that the development of whole farm plans should be a requirement for those in receipt of direct payments in future. We recommend that England, Wales and Northern Ireland similarly seek to embed the whole farm approach in agricultural support policy. This should include a requirement for Whole Farm Plans to help drive progress towards wider environmental and climate goals – through the Sustainable Farming Incentive in England, the Sustainable Farming Scheme in Wales and the Farm Sustainability Payment in Northern Ireland.

We need 'peak poultry' to save our rivers

The River Wye is in serious decline. If we don't act now to prevent further pollution by the intensive chicken farms concentrated in its catchment and other sources of pollution such as sewage, the river could be declared dead within the next few years. Other rivers are also at risk from livestock pollution, chemicals, climate change and a host of other threats.

The leading culprit here is a consolidated poultry industry, hooked on global supplies of industrial chicken feed. There is no way for the UK to farm one billion birds in a nature-friendly manner. Our chicken industry is inherently unsustainable. Urgent action must be taken by UK governments to prevent the environmental devastation it is causing in the UK and overseas.

A December 2023 report by the House of Commons Environmental Audit Committee on environmental change and food security was only one in a series of expert body reports recommending government action to address the impact of intensive livestock on our waterways, in this case through a presumption against the granting of planning permission where nutrient levels would lead to catchment pollution.[70] It also recommended that the UK Government publish national guidance on sustainable diets in the next 12 months. We believe this can be applied directly to poultry, with 'peak poultry' (peak consumption of poultry) reached within that time, progress made on phasing out industrial chicken meat from schools and hospitals and support provided for a just transition for farmers towards agroecology and the production of less and better, high welfare, more sustainable chicken meat.

Chicken remains the UK's favourite meat, and consumption of intensively reared animal products remains excessively high. The costs continue to stack up in polluted rivers, degraded soils, and escalating climate and nature emergencies. More must be done to encourage the consumption of less but better meat – from high welfare, nature-friendly farms.

We are therefore calling on the UK and devolved governments in Wales, Scotland and Northern Ireland to:

- **Implement a ban** on new intensive poultry units
- **Support farmers to exit** this damaging industry via a just transition to higher welfare, nature friendly and agroecological production
- **Take action to reduce chicken consumption** to more sustainable levels (initially through a phase out of industrial chicken served in schools and hospitals and providing support for agroecological production to provide less and better meat)
- **Take action on feed** to reduce reliance on imported soya and the phosphorus surplus associated with animal feed
- **Join us** in calling for urgent government action and sign our petition to the UK government's Secretary of State for the Environment, Food and Rural Affairs and Rural Affairs Ministers and Cabinet Secretaries in the devolved UK nations.

Sign our petition at

soilassociation.co/SKOR

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