DO IT FOR YOUR PLANET

APPETITE FOR DESTRUCTION

SUMMARY REPORT

EXECUTIVE SUMMARY

Food is at the heart of many of the issues WWF focuses on. Through our work on sustainable diets, we know a lot of people are aware of the impact a meat-based diet has on water, land and habitats, and the implications of its associated greenhouse gas emissions. But few know the largest impact comes from the crop-based feed the animals eat.

In a world where more and more people adopt a Western diet – one that's high in meat, dairy and processed food – producing crops to feed our livestock is putting an enormous strain on our natural resources and is a driving force behind wide-scale biodiversity loss. The UK food supply alone is directly linked to the extinction of an estimated 33 species at home and abroad.

WWF's vision of a future where people and nature thrive is threatened by this current food system.

This report looks at the impacts our appetite for animal protein – and in particular the associated hidden impacts of animal feed – has on our planet. We focus on the production of soy as feed for chicken, pork and fish and the consequences this has for the environment. We link the increased use of feed to the reduced nutritional value of these animal products, before exploring solutions through changing diets and alternative feed production systems.

THE UK FOOD SUPPLY ALONE IS DIRECTLY LINKED TO THE EXTINCTION OF AN ESTIMATED 33 SPECIES AT HOME AND ABROAD

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FOOD, FEED AND BIODIVERSITY

Rarely a week goes by without a headline about the negative effects of meat on our health or our environment. The reality is that we eat much more animal protein than we need to lead healthy lives. While the UK nutritional guidelines recommend 45-55g of protein per day, the average UK consumption is 64-88g, of which 37% is meat and meat products.

While the livestock systems used to rear animals for meat vary enormously, many require inputs such as manufactured feed: the more animal products we eat, the more feed we need to produce. But growing the crops used for feed, such as soy and maize, eats up land. Today, protein-rich soy is such an important feed ingredient that the average European consumes approximately 61kg of soy per year, largely indirectly through the animal products that they eat like chicken, pork, salmon, cheese, milk and eggs. In 2010, the British livestock industry needed an area the size of Yorkshire to produce the soy used in feed. And if the global demand for animal products grows as anticipated, it's estimated that soy production would need to increase by nearly 80% to feed all the animals destined for our plates.

Feed crops are already produced in a large number of Earth's most valuable and vulnerable areas, such as the Amazon, Cerrado, Congo Basin, Yangtze, Mekong, Himalayas and the Deccan Plateau forests. Many of these high-risk regions already suffer significant pressure on land and water resources, are not adequately covered by conservation schemes. The growing demand for livestock products and the associated intensification and agricultural expansion threaten the biodiversity of these areas and the resource and water security of their inhabitants, as well as the stability of our food supply.

BRITISH LIVESTOCK INDUSTRY NEEDED AN AREA THE SIZE OF YORKSHIRE TO PRODUCE THE SOY USED IN FEED

NORTHERN GREAT PLAINS

One of only four remaining intact temperate grasslands in the world, this prairie still contains a rich variety of plants and wildlife.

Species include: American bison, black-footed ferret, black-tailed prairie dog, pronghorn.

ATLANTIC FOREST

One of the most diverse ecosystems on the planet, this forest is home to around 20,000 species of plants, plus thousands of species of birds, mammals, reptiles and amphibians, many unique to the region.

Species include: jaguar, golden lion tamarin, woolly spider monkey, maned three-toed sloth, red-tailed parrot.

CERRADO

The largest savanna region in South America is home to around 5% of all species on Earth including over 10,000 species of plants, almost half of which are found nowhere else.

Species include: jaguar, maned wolf, giant anteater, giant armadillo, tapir, marsh deer, red-legged seriema, Spix's macaw.

EASTERN HIMALAYAS

These grasslands, forests and mountains are home to over 10,000 species of plants, 900 species of birds and 300 species of mammals.

Species include: Bengal tiger, Asian elephant, one-horned rhino, snow leopard, red panda, takin, Himalayan black bear, golden langur, Ganges river dolphin.

CENTRAL DECCAN PLATEAU

In a heavily populated region, this area contains large blocks of intact forest that provide crucial habitat for threatened wildlife.

Species include: Bengal tiger, wild buffalo, wild dog, sloth bear, chousingha, gaur, blackbuck, Jerdon's courser.

AMUR-HEILONG

This ecoregion covers vast areas of grasslands and forests, including some of the best-preserved temperate forests in the world, and its wetlands provide a haven for many species of waterfowl.

Species include: Amur leopard, Amur tiger, brown bear, Asiatic black bear, lynx, musk deer, Far Eastern curlew, scaly-sided merganser, swan goose.

YANGTZE RIVER BASIN

This rich and diverse landscapes support high levels of biodiversity including 378 species of fish, more than 280 mammals, 145 amphibians, 166 reptiles and vast numbers of migratory birds.

Species include: finless porpoise, alligator, Siberian crane, giant panda.

CONGO BASIN

With its mosaic of rivers, forests, savannas, swamps and flooded forests, this area is home to the second-largest tropical forest in the world.

Species include: gorillas, chimpanzee, bonobo, forest elephant, okapi.

GREAT RIFT LAKES

These vast and ancient lakes host the richest freshwater fauna in the world, and provide water, food and livelihoods for millions of people. The surrounding region is also rich in wildlife.

Species include: 800 species of cichlids, lesser flamingo, elephant, hippo, crocodile, giraffe, lion, cheetah.

GREATER MEKONG

This is the home to the world's most productive inland fishery; over 2,200 new species have been found since 1997.

Species include: tiger, saola, Asian elephant, Mekong dolphin, Mekong giant catfish.

REGIONS AND SPECIES THREATENED BY EXPANSION AND INTENSIFICATION OF FEED CROP PRODUCTION

Feed crops are already produced in a large number of Earth's most valuable and vulnerable areas. Many of these high-risk regions are not adequately covered by conservation schemes, and have low national conservation spending and high agricultural growth; some already suffer from relatively high land and water constraints. The growing demand for livestock products and the associated intensification and agricultural expansion threaten the biodiversity of these areas and the resource and water security of their inhabitants, as well as the stability of global food supplies.

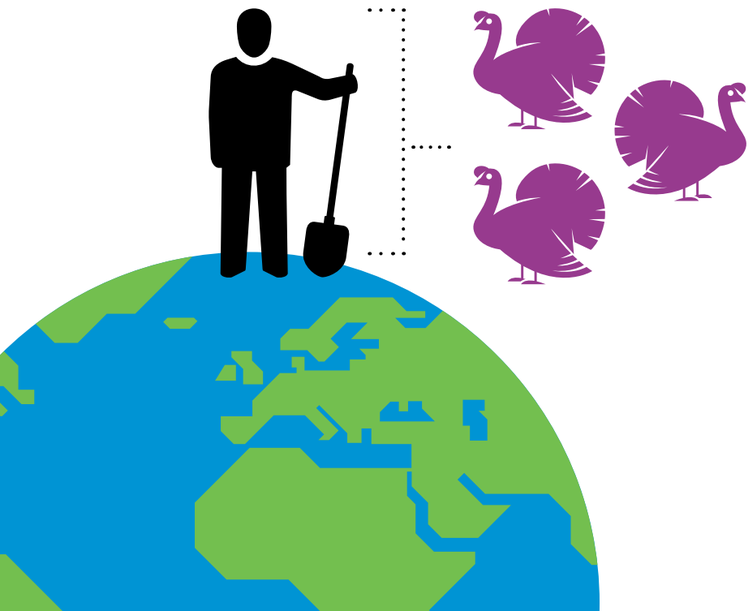
Source: WWF website (2017)

FEEDING CHICKENS, PIGS AND FISH

Globally, the biggest user of crop-based feed is the poultry industry in Asia-Pacific, Europe and North America, which used 41.5% of the world's feed in 2009. Poultry increased its share of world meat production from 15% in the mid-1960s to 32% by 2012 as per capita consumption increased threefold. In 2014, there were over 23 billion chickens, turkeys, geese, ducks and guinea fowl on the planet – more than three per person.

The second largest feed crop consumer, with 30% of the world's feed in 2009, is the pig industry. It's grown steadily in the past decade and is forecasted to continue to climb to meet rising demand. In the UK, **pork is the second favourite meat after chicken, with each person eating on average 25kg** a year in 2015 – nearly the whole recommended yearly intake for all meats. With the rapid expansion of the middle class in China, demand for pork has also escalated there. Today, over half the world's pork is produced and consumed in China.

Aquaculture also uses crop-based feeds – around 4% of the global total in 2009. The global average consumption of fish per person per year has almost doubled in the last 50 years, from 9.9kg in the 1960s to 19.7kg in 2013, and is projected to continue to rise. With wild fish stocks already under immense pressure, an ever-increasing quantity of seafood is now farmed. But, as in other livestock production sectors, aquaculture has seen a shift towards industrialisation, with intensive systems centred on crop-based formulated feeds being more common. To grow these feeds, the aquaculture indirectly used an additional 26.4 million hectares in 2010 – an area about the size of the UK.

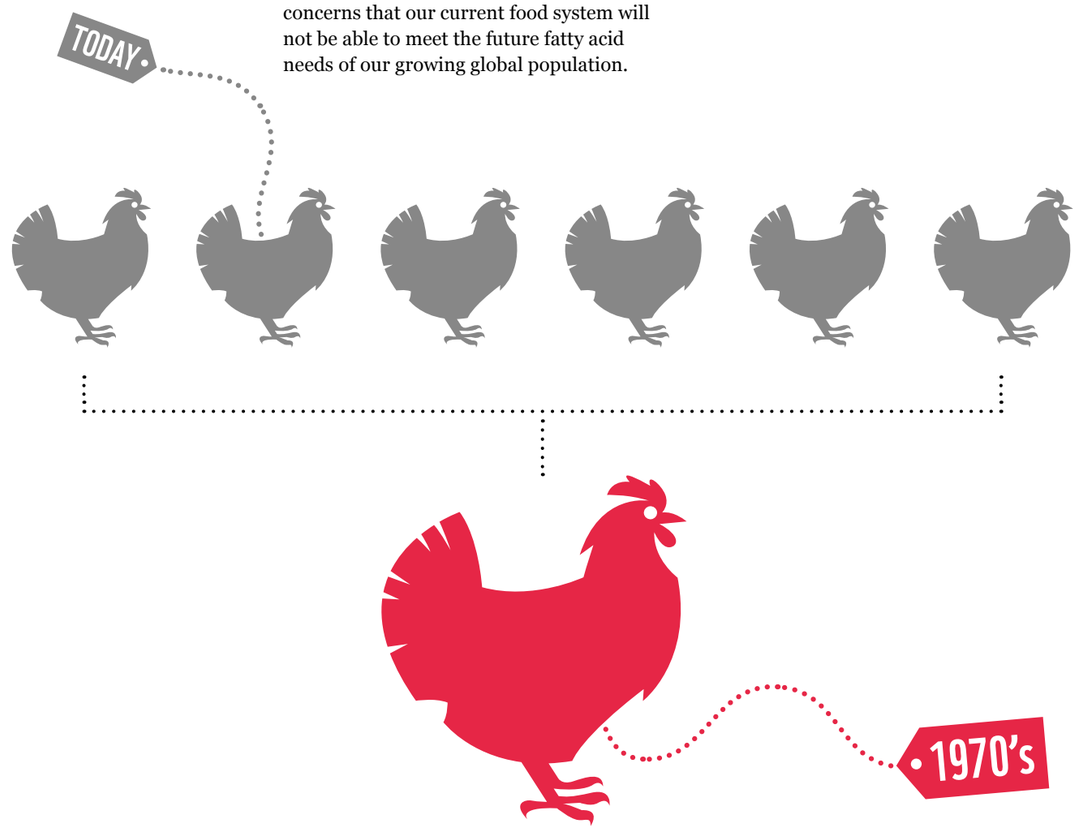


23 BILLION CHICKENS, TURKEYS, GEESE, DUCKS AND GUINEA FOWL ON THE PLANET – MORE THAN THREE PER PERSON

OMEGA-3 FATTY ACID

The loss of species and habitats is not the only outcome of our current animal protein consumption. Intensive animal husbandry, relying on feeding animals energy- and protein-rich crops, has been linked to a decrease in the healthy omega-3 content of our animal products and an increase in their unhealthy saturated fat content. One study shows the difference is so profound that you'd have to eat six intensively reared chickens today to obtain the same amount of the healthy omega-3 fatty acid found in just one chicken in the 1970s. The majority of calories from chicken come from fat as opposed to protein.

This reduction in nutritional benefit is also seen in farmed fish. The omega-3 in farmed Scottish Atlantic salmon has decreased by half since 2006, and farmed carp and tilapia have much lower levels of omega-3 compared to their wild counterparts. While feeds can be supplemented with fishmeal, fish oil and various vegetable oils containing omega-3, there are serious concerns that our current food system will not be able to meet the future fatty acid needs of our growing global population.



SUSTAINABLE DIETS

We already produce enough to feed the world. But overconsumption, inequality, waste, and inadequate production and distribution systems stand in the way of enough food for everyone and space for wildlife. To feed the world in an equitable and environmentally sustainable way, we need to consume and produce food differently.

Significant environmental benefits could be achieved by simply sticking to the nutritionally recommended amount of protein. **If everyone reduced the amount of animal products that they ate to meet their nutritional requirements, the total agricultural land required would decline by 13%.** That means nearly 650 million hectares – or an area 1.5 times the size of the European Union – would be saved from agricultural production.

WWF's Livewell Plates and six Livewell principles are good guides on how to put this into action. They illustrate how we can ensure people get their necessary nutritional requirements without a further increase in agricultural land area and still contribute towards meeting the Paris Agreement commitment to keep global warming well below 2°C. Eating less animal protein would also make production systems with lower environmental impact and healthier, more nutritious outputs that much more possible.

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LIVEWELL PRINCIPLES

EAT MORE PLANTS

Enjoy vegetables and whole grains.

EAT A VARIETY OF FOODS

Have a colourful plate.

WASTE LESS FOOD

One third of food produced for human consumption is lost or wasted.

MODERATE YOUR MEAT CONSUMPTION, BOTH RED AND WHITE

Enjoy other sources of proteins such as peas, beans and nuts.

BUY FOOD THAT MEETS A CREDIBLE CERTIFIED STANDARD

Consider MSC, free-range and fair trade.

EAT FEWER FOODS HIGH IN FAT, SALT AND SUGAR

Keep foods such as cakes, sweets and chocolate as well as cured meat, fries and crisps to an occasional treat. Choose water, avoid sugary drinks and remember that juices only count as one of your 5-a-day however much you drink.

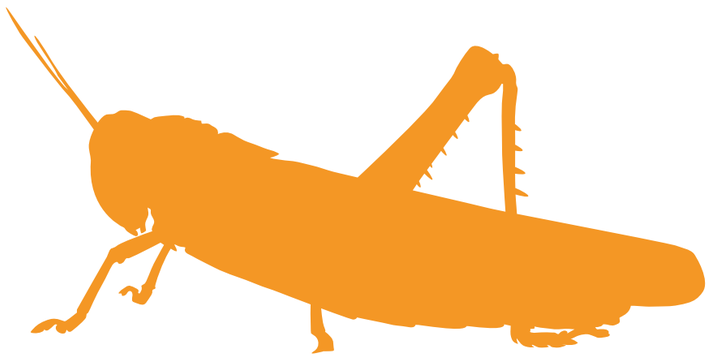
FEED INNOVATIONS

Along with reducing our consumption of animal protein, we also need to produce feeds with lower resource requirements that don't compromise the nutritional content of animal products. A number of innovative options are being considered as potential feed ingredients to replace terrestrial crops such as soy and maize.

Microalgae and macroalgae (or seaweed) are one promising alternative. Algal growth is relatively straightforward, as they only need a basic form of energy (such as light and sugars), CO_2, water and a few inorganic nutrients to grow. Trials to date have shown positive impacts on both livestock nutrition and aquatic environments.

Another example is integrated multi-trophic aquaculture (IMTA), a synergistic approach to aquatic production which uses the waste products from one species to provide feed or fertiliser for another. This approach has potential benefits in terms of improving the final yield of both species with less waste and improved environmental and economic performance.

Using flies, crickets and other insects as food and feed for livestock could also reduce the mounting pressure on land and biodiversity. Insects can produce the same amount of edible protein as soy and animal products, with less land, lower greenhouse gas emissions and similar amounts of energy. Trials have shown that piglets' gut health improved when their feed was supplemented with insect protein, while chickens fed on insect protein performed as well as those given current commercial feeds; **research also shows that insect meal could replace up to 50% of fish feed without affecting animal performance.**



CONCLUSION

The growth in intensive industrial farming coupled with an increased need for protein- and energy-rich animal feed has had a devastating impact on nature. Feed crops threaten the biodiversity of many of Earth's most valuable and vulnerable areas.

Feeding animals with crops that could be eaten by humans is not only an inefficient way to add protein to our diet; it's also having a knock-on effect on our health. This perpetuates the negative impacts of the Western diet which is already linked to health concerns such as heart attack, stroke and type II diabetes.

We believe it's possible, and essential, to change food production systems and consumption patterns to secure enough nutritionally complete and environmentally sustainable food for everyone on Earth. Adopting a healthy, sustainable diet is one part of the solution: WWF's six Livewell principles form the basis of a sustainable diet and a well-functioning food system. But we also need to produce food and feed differently.

TO ACHIEVE OUR VISION, WE WELCOME THE OPPORTUNITY TO WORK WITH BUSINESS AND POLICY-MAKERS TO CREATE A FOOD SYSTEM WHICH PROVIDES US WITH HEALTHY FOOD, SUSTAINABLE FEED, AND THRIVING BIODIVERSITY

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