



# CLIMATE CHANGE AND CRUELTY

Revealing the true impact of  
factory farming



#### About World Animal Protection

World Animal Protection is an international animal welfare organization. Our mission is to create a better world for animals. From the frontlines of disaster zones to the boardrooms of large corporations, we are fighting to create better lives for all animals. World Animal Protection is registered with the Charity Commission as a charity and with Companies House as a company limited by guarantee. World Animal Protection is governed by its Articles of Association. Charity registration number 1081849. Company registration number 4029540. Registered office 222 Gray's Inn Road, London WC1X

# CONTENTS

## Climate change and cruelty: revealing the true impact of factory farming

<b>Agriculture's impact on climate change is about more than beef</b>	<b>04</b>
<b>Tackling climate change means changing our food system</b>	<b>05</b>
<b>What are the key climate and environmental impacts of factory farms?</b>	<b>07</b>
<b>How we calculated the climate and environmental impacts of factory farming</b>	<b>08</b>
<b>Key findings</b>	<b>09</b>
Impacts from factory farming now	09
What happens if animal welfare standards are improved?	10
What happens if meat consumption is reduced?	11
<b>The sweet spot: 'eat less and better'</b>	<b>11</b>
<b>What needs to happen now: Key recommendations</b>	<b>13</b>
<b>What can I do?</b>	<b>14</b>
<b>References</b>	<b>15</b>

**Cover photo:** A group of mother pigs at feeding time. Production of animal feed is worsening the climate crisis. Credit: World Animal Protection





**Photo:** Bird of prey flying over fires, during the peak of the dry season, Chapada dos Veadeiros National Park, Cerrado region, Goias, Brazil. Fires in animal feed production hotspots like Cerrado are commonplace, unlocking carbon into the atmosphere and destroying wild animal habitats. Credit: Angelo Gandolfi / Alamy Stock Photo

World Animal Protection is sharing results from the world’s first study to measure the potential climate and environmental benefits of eating less factory farmed chicken and pork, while simultaneously ending the cruellest practices on factory farms and improving living conditions for the billions of animals currently trapped within them.

Our new report shows how what we choose to eat impacts upon our planet, how factory farming is pushing our climate to breaking point and how changing our diets could help to safeguard our future.

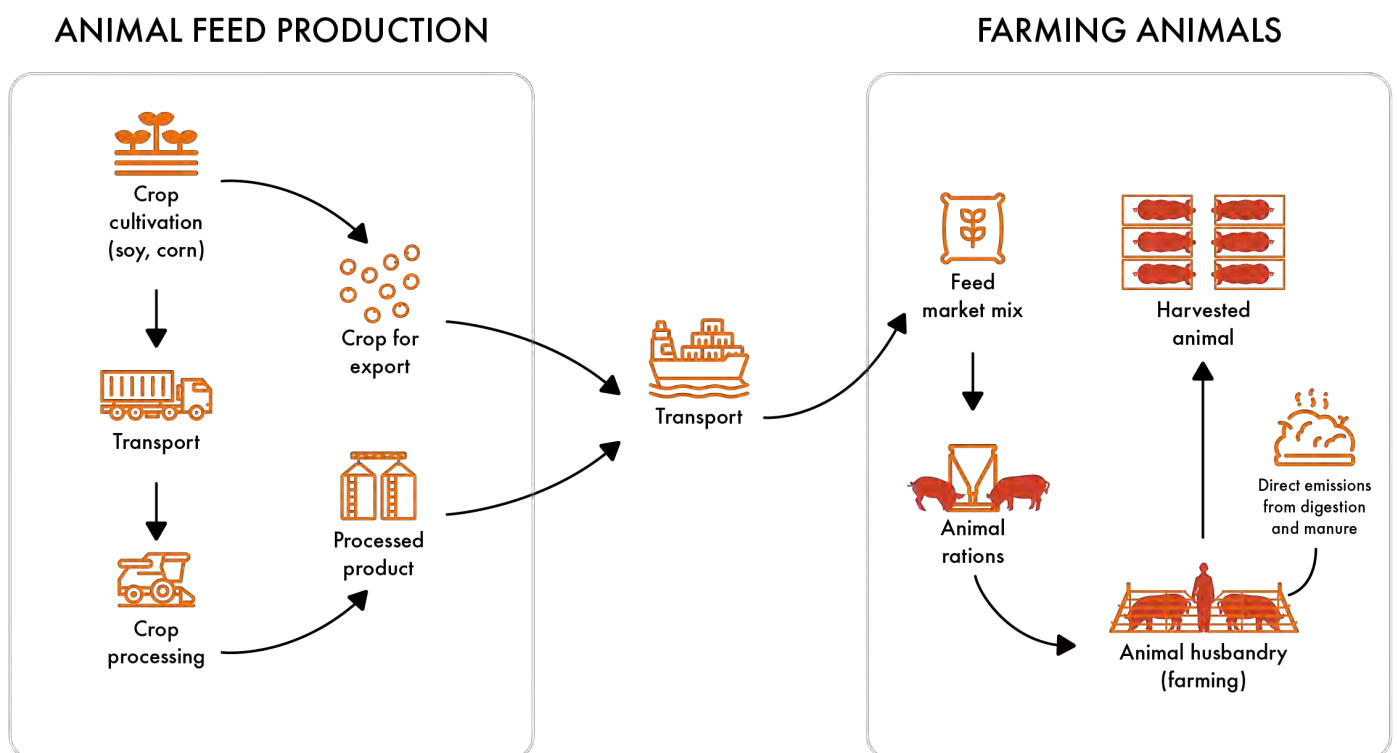
# AGRICULTURE'S IMPACT ON CLIMATE CHANGE IS ABOUT MORE THAN BEEF

When most people think of climate change, they think of fossil fuel being extracted and burnt for our energy and transport needs. If they think of agriculture at all, they think of cows burping methane.

Factory farming is the silent culprit we are failing to address, despite the clear climate impact of the 69 billion meat chickens

and 1.5 billion pigs factory farmed each year. It's a problem that is projected to grow hugely across the globe in the coming years, with overall demand for meat expected to increase by as much as 30% in Africa, 18% in Asia Pacific, 12% in Latin America, and 9% in North America by 2030<sup>1</sup>.

Figure 1. Measuring impacts on our climate and planet\*



\*Diagram applies for China, Brazil, Netherlands and USA. In the case of Brazil / USA - (feed and animal production is in country). Emissions within slaughterhouses is beyond the scope of study. Example taken on pigs.



# TACKLING CLIMATE CHANGE MEANS CHANGING OUR FOOD SYSTEM

Governments have promised to meet the Paris Climate Agreement target of limiting the planet to a 1.5 degrees Celsius rise in temperature, so we can avoid the worst impacts of climate change. But we know they can't do this without tackling factory farming<sup>2, 3, 4</sup>.

We looked at the current climate and environmental impacts from chicken and pork consumption in the world's four biggest factory farming hot spots: Brazil, China, Europe and the USA. The results show that a climate-safe future is out of reach unless we address the continued increase in meat consumption around the world.

Factory farming is not a precondition for food security - it undermines it. Although our research focuses on specific factory farming hot spots, the global message is clear - we need to rethink the current drive to build more factory farms in parts of the world where demand for meat is rising most sharply. More factory farms would take a heavy toll on our climate while condemning billions more animals to lives of suffering.

**We need a moratorium on factory farming now.**



**Photo:** Pesticides are sprayed onto soy crops in Brazil, adjacent to forest. The biggest climate change and environmental impacts within the factory farming system are created by the production of crops used to feed farmed animals. Credit: FR.Agro / Shutterstock

Figure 2. Current toll of factory farmed chicken and pork on our climate



**135**

million metric tons of greenhouse gas emissions



**347**

million metric tons of greenhouse gas emissions

**IN FOUR COUNTRIES**  
that is the equivalent of

10.2 million in China



44.4 million in China



9.9 million in the US



10.3 million in the US



5.2 million in the Netherlands



16.6 million in the Netherlands



3.8 million in Brazil



3.4 million in Brazil



= 1 million cars



# WHAT ARE THE KEY CLIMATE AND ENVIRONMENTAL IMPACTS OF FACTORY FARMS?

The factory farming system is cruel. Animals are trapped in cages, mutilated and squashed together and pumped full of antibiotics to stay alive. But its damaging impact reaches far further than the billions of animals living inside it.

It drives widespread destruction of forests to grow crops to feed farmed animals, causing habitat destruction and suffering for the wild animals that live there.

Pesticides and fertilisers are poured into animal feed crops resulting in water and soil pollution and serious human health problems. The animal feed is then processed and transported to farms around the world, using significant fossil fuel energy.

On factory farms, more energy is needed for heating, lighting and ventilation. Massive amounts of animal manure are generated

and spread on fields. This is contaminated with superbugs because antibiotics are overused on farms to compensate for stressful and inhumane practices. Manure storage also generates methane, a greenhouse gas that is released to the atmosphere with damaging consequences.

The global factory farming industry is strong and powerful. Our research provides the compelling case for governments to address the problem and impose a moratorium on factory farming. This means that no new factory farms should be built for the next ten years whilst regulations catch up, to ensure that factory farming big business is held accountable for the damage it does to animals, people and our planet.



**Photo:** Factory farming is pushing our climate to breaking point. Huge amounts of natural resources are needed including energy i for heating, lighting and ventilation. This image shows 7-day old meat chickens. Credit: World Animal Protection

# HOW WE CALCULATED THE CLIMATE AND ENVIRONMENTAL IMPACTS OF FACTORY FARMING

Researchers for World Animal Protection captured the environmental and climate change impacts of farmed pork and chicken meat production in the world's four biggest factory farming hot spots: Brazil, China, the USA and the Netherlands (representing Europe).

The researchers collected data on the production of crops to feed farmed animals, from the levels of water and energy used in growth and processing, through to the use of pesticides and fertilisers and the impact of transportation once the crop is harvested.

They also collected data from existing reports and industry experts on: the energy use in factory farms for lighting and heating; the greenhouse gases created by animal manure; and the transport emissions created by the farming industry. They then used this baseline data to model future scenarios of climate and environmental impact in 2030, 2040 and 2050.

The first set of scenarios they created looks at the cruelty of factory farming. The researchers compared the environmental impact of conventional factory farming, with the impact of industrial farms with higher welfare standards - where pigs are no longer kept in cages, meat chickens have more room to move, animals are not mutilated, and higher welfare breeds of animals are used to ensure they grow at a rate that does not impose painful health problems on them.

The second set of scenarios involved measuring the impact of diets containing less chicken and pork.

Finally, these scenarios were combined to discover the climate change and environmental impacts when people 'eat less and better', meaning they not only eat less chicken and pork, they also choose higher welfare meat when they do.



**Photo:** Illegal fires burn forest trees in the Amazon rainforest, Brazil. This image shows an aerial view of deforestation connected to soy and livestock farming.  
Credit: PARALAXIS / Shutterstock



# KEY FINDINGS

## Impacts from factory farming now

Meat consumption rates for the four factory farming hot spots are high. People in the Netherlands consume around 33kg of pork per person per year and 23kg of chicken, Brazilians eat 41kg of chicken and 12kg of pork each year, people in the USA eat 24kg of pork and 50kg of chicken and in China, pork is the most consumed meat, with 26kg per person and 14kg of chicken<sup>5</sup>.

**Across the 4 hot spots, annual consumption of chicken alone creates the same climate change impact as keeping 29 million cars on the road for a year<sup>6</sup>.**

Methane from animal manure is a significant component of the overall climate impact of pork production in factory farms, accounting for 21% of emissions from pork for the Netherlands, 22% for the USA, and 24% for Brazil<sup>7</sup>. Methane is a greenhouse gas with high potential to warm our climate. There is increasing pressure on governments to urgently address methane emissions and 113 governments have signed a pledge to reduce methane emissions by 30% by 2030<sup>8</sup>.

**But the biggest climate change and environmental impacts within the factory farming system are created by the production of crops used to feed farmed animals.** Increasing global demand for animal feed crops drives deforestation, causing carbon to be released into the atmosphere when the trees are cut down and the soil is disturbed by farming.

Brazil is the world's largest producer and exporter of soy crops to feed farmed animals, while also using feedstock for its own factory farmed animals. When deforestation for growing crops to feed

farmed animals is considered, it more than triples the climate impact of meat chicken production in Brazil.

Equally, when looking at the carbon impact of factory farming in countries that depend on imports of animal feed from Brazil and elsewhere, taking the deforestation caused by the growing of these feed crops into account doubles the overall climate change impacts of factory farmed meat in the Netherlands and increases the impacts by more than one and a half times in China.

The production of animal feed crops can be very damaging to water supplies, using large quantities in regions already suffering from scarcity. Through use of fertilisers and pesticides, it also pollutes rivers that people and animals rely on.

Already, where China grows corn and wheat domestically to feed pigs, water used on these crops comprises 90% of the overall water use for pork production in the country. And with **nearly two-thirds of the global population, experiencing severe water scarcity during at least one month of the year already<sup>9</sup>**, it will be difficult to sustain the predicted growth of factory farming around the world in future.

Ultimately, using land to grow crops to feed farmed animals that will eventually become our food, is a highly inefficient and destructive practice. For every 100 calories of crops fed to farmed animals, only 17-30 calories end up reaching humans in our food chain<sup>10</sup>. Meat and dairy provide only 18% of overall calories and 37% of protein for humans, but they use 83% of farmland<sup>11</sup>. It is far better to grow crops that feed humans directly through plant-based diets. This is the strongest path to food security.

**ACROSS THE 4 HOT SPOTS, ANNUAL CONSUMPTION OF CHICKEN ALONE CREATES THE SAME CLIMATE CHANGE IMPACT AS KEEPING 29 MILLION CARS ON THE ROAD FOR A YEAR.**

Figure 3. What's on your plate?



### What happens if animal welfare standards are improved?

Right now, every year more than 80 billion animals are farmed<sup>12</sup>, most condemned to factory farms where their lives are brief and full of suffering. Meat chickens exist squashed up against tens of thousands of other chickens, with no room to flap their wings or perch like they would naturally.

A mother pig lives her life in a cage, unable to turn around, often biting the steel bars around her in frustration, causing injuries. Her piglets are stripped from her as early as 21 days old, their tails and teeth are cut and males are castrated.

Enforcing higher animal welfare standards<sup>13</sup> would end the worst cruelty in factory farming. It would get mother pigs out of cages and into groups with bedding, giving piglets more time with their mothers before weaning, and ending painful mutilations. Meat chickens would not have to live crowded together without room to spread their wings.

With billions of animals trapped on factory farms, higher animal welfare production matters. We can help give these animals lives worth living. And contrary to what the industry claims, our research

finds that there is no excuse to delay improving animal welfare standards on climate grounds, because the production and processing of animal feed crops remains the primary contributor to climate change within the industry.

Overall, for pork, the research finds that higher welfare production leads to slightly less climate change impacts than conventional production. Animals in higher welfare systems are healthier and can use energy from their feed to grow, rather than fight disease. This means less feed is needed, and there is less climate and environmental impact. Manure from pigs in higher welfare systems also emits less of the potent greenhouse gas, methane.

For meat chickens, higher welfare production leads to slightly more climate change impacts than conventional production. The main reason for this is that higher welfare chickens are often slower growing breeds, rather than breeds engineered to reach consumption weight quickly, so they need more food over the course of their lives. This does not shift our moral responsibility to treat animals well. Climate benefits need to be sought without compromising animal welfare. Fast growing chickens often suffer from painful, sometimes crippling leg disorders, because their legs cannot keep pace with the rapid body growth.



If higher welfare breeds of meat chickens were to be fed diets adjusted for the needs of their breed, it is possible that the minor increase in climate change impacts could be offset. Whilst more feed would be needed, lower protein rations could be used and these would have a lower climate change impact. This fell outside the scope of our research for this report, but it is an area that would benefit from further investigation.

Food waste is another vital consideration which fell outside the scope of this study. Higher welfare production means less animal death or injury prior to slaughter. Low welfare farming leads to poor quality meat and injuries lead to bruising. This meat does not reach the consumer, so not only is the meat wasted, the climate cost of its production is too.

### **What happens if meat consumption is reduced?**

The world is on an unsustainable trajectory, with consumption of factory farmed meat expected to increase in most parts of the world, including in regions where meat-based diets are not yet the norm.

But we have a chance to stop this. Our research shows that reducing pork per person by 50% by 2040 would result in a 41% decrease in climate change impacts from pork consumption in China, 54% decrease for the EU, 44% for Brazil and 43% for the USA. For chickens, a 50% reduction in consumption by 2040 would result in a 44% decrease in climate change impacts from chicken consumption in China, 48% for the EU, 42% for Brazil and 41% for the USA.

Overall, the more chicken and pork consumption decreases in coming decades, the greater the benefits to our climate and planet. Substantial reductions in meat consumption would help reduce the profit margin of factory farms, which would make them increasingly unsustainable and ultimately a less appealing prospect for the businesses investing in them.

This would be a welcome step towards a humane and sustainable future containing far fewer farmed animals. Where high welfare animal production can support our environment rather than factory farming destroying it, and where an increase in plant-based diets will unlock land for wildlife habitat, helping to restore our planet's natural balance.

---

## **THE SWEET SPOT: 'EAT LESS AND BETTER'**

The reality is that high and growing rates of meat consumption will not collapse overnight. Factory farms will continue to exist for some time. Wherever animals are farmed, they deserve to be spared cruel treatment and to have lives worth living. Higher welfare standards provide that safeguard.

Consumers can play a key role but it's up to governments to hold the powerful factory farming industry to account. They must stop supporting and subsidising the damage the industry inflicts as it grows around the world.

The factory farming industry can no longer plausibly deny the massive toll it imposes on animals, our planet and climate. The best way to protect animals and our climate is to end factory

farming, starting with a ban on new factory farms. Substantial reductions in meat production and consumption will help to financially damage factory farming and unlock the humane and sustainable future we need.

Our research finds that a 50% reduction in consumption of both chicken and pork by 2040, along with a 50% adoption of higher welfare products would halve the annual climate impacts of chicken and pork production across the 4 countries analysed. This would be the equivalent of removing 3 million cars from the road for a year in Brazil, 22 million in China, 11 million in the Netherlands and 8 million in the USA. Combined, this is the equivalent of taking up to 45 million cars off the road for a year.

Figure 4. Eat less and better meat for a safe climate

By eating **50%** less meat



as well as adopting higher welfare meat consumption

in  
**2040**  
we would take

22 million cars off  
the road in China



11 million cars off  
the road in the  
Netherlands



8 million cars off  
the road in the US




3 million cars off  
the road in Brazil



which equals

**210 million metric tons  
greenhouse gas emissions**

 = 1 million cars



# WHAT NEEDS TO HAPPEN NOW: KEY RECOMMENDATIONS

***Factory farming is causing climate damage that can no longer be overlooked. The system depends on locking up land to produce crops to feed the animals suffering on factory farms. This destroys habitats and wild animals suffer. It is a highly inefficient way to deliver food to people and is worsening the climate crisis.***

The factory farming industry should ensure that there is no further habitat destruction for animal feed production by 2023.

.....

***Higher welfare production of chicken and pork is important – we need to end the worst cruelty in factory farming and to give farmed animals lives worth living. Our research finds that there is no excuse to delay improving animal welfare standards for animals remaining on factory farms on climate grounds.***

Governments should introduce compulsory minimum farmed animal welfare standards ([FARMS](#)).

.....

***The best way to substantially reduce climate change and environmental impacts from factory farming is to produce and consume 'less and better' meaning significant reductions overall and ensuring higher welfare animal production.***

Governments should redirect subsidies and policy support away from factory farming and to humane and sustainable, and plant-based food. Public procurement policies should reflect this shift. The factory farming industry should commit to reduce animal production in their operations by at least 50% by 2040.

***The main reason that higher welfare chickens have slightly higher climate impacts is because they are slower growing breeds, so they need more food over the course of their lives. Animal feed crop production is the most climate and environmentally destructive aspect of the factory farming system.***

From 2030, the factory farming industry should start phasing out the use of human-edible feed for farmed animals. Substantial reductions in animal production within their operations will allow for a shift to humane and sustainable plant-based food production and fewer farmed animals living outside factory farms where feed is sourced locally and sustainably.

.....

***Governments can contribute to meeting the Paris Climate Agreement and their commitments to end deforestation and reduce methane, by addressing factory farming.***

Governments should impose a moratorium on factory farming meaning no approvals of new factory farms or expansions for the next ten years. This will stop the growth of the problem and buy time for regulations to catch up with factory farming's negative impacts on animals, people and our planet.

# WHAT CAN I DO?

The factory farming system is unspeakably cruel, unsustainable and contributing to our climate crisis. World Animal Protection is working for a humane and sustainable food system where factory farming is a thing of the past. Where there are fewer farmed animals, and they are afforded dignified lives in sustainable systems. Where diets around the world are mostly plant-based, taking the pressure off our planet and giving wild animals a home once more.

We know that it is not enough only to take animals out of cages and end the worst forms of cruelty on factory farms. A moratorium on new factory farms is an immediate next step. Remaining factory farms need to raise animal welfare standards and relieve animal suffering.

If we are to safeguard our future environment and climate, we need to fundamentally reduce the amount of meat we produce and consume.

Your choices make a difference. Please help us by:

- Joining our call on governments to introduce a moratorium on factory farms;
- Supporting our campaign to make the world's biggest factory farming companies end the deforestation and environmental damage caused by feed crops and to reduce their meat production.
- Making the choice to eat less, and better meat.



**Photo:** An alligator killed by the drought and forest fires that hit the Pantanal in 2020 in Brazil. The production of animal feed crops can be very damaging to water supplies, using large quantities in regions already suffering from scarcity. Through use of fertilisers and pesticides, it also pollutes rivers that people and animals rely on. Credit: Lucas Ninno / Getty Images



# REFERENCES

1. OECD/FAO. 2021. OECD-FAO Agricultural Outlook (Edition 2021). *OECD Agriculture Statistics* (database), <https://doi.org/10.1787/4bde2d83-en> (accessed 8th September 2021).
2. Bajželj B., Richards K.S., Allwood J.M., Smith P., Dennis J.S., Curmi E. & Gilligan C.A. (2014), Importance of food-demand management for climate mitigation. *Nature Climate Change*, Vol 4, October 2014. <http://www.nature.com/doi/10.1038/nclimate2353>.
3. Springmann M., Godfray H.C., Rayner M. & Scarborough P. (2016), Analysis and valuation of the health and climate change cobenefits of dietary change. *PNAS* vol. 113 no. 15: 4146–4151.
4. Springmann et al, 2018. Op. Cit.
5. Data from 2020
6. Carbon dioxide equivalent emissions per kilogram of carcass weight of chicken per research findings multiplied by kilograms of chicken consumed across populations. Kilograms of carbon dioxide equivalent emissions against emissions from driving passenger vehicles for one year using US EPA greenhouse gas equivalence calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>.
7. Insufficient data for China.
8. <https://www.globalmethanepledge.org/>
9. [Scarcity | UN-Water \(unwater.org\)](https://www.unwater.org/)
10. Lundqvist, J., de Fraiture, "C. Molden, D., Saving Water: From Field to Fork - Curbing Losses and Wastage in the Food Chain," *SIWI Policy Brief*, 2008. [http://www.sivi.org/wp-content/uploads/2015/09/PB\\_From\\_Filed\\_to\\_fork\\_2008.pdf](http://www.sivi.org/wp-content/uploads/2015/09/PB_From_Filed_to_fork_2008.pdf).
11. <https://www.theguardian.com/environment/2018/may/31/avoiding-meat-and-dairy-is-single-biggest-way-to-reduce-your-impact-on-earth> Oxford Martin School, University of Oxford, Reducing food's environmental impacts, 2018: <https://www.leap.ox.ac.uk/article/reducing-foods-environmental-impacts>
12. This excludes tens or hundreds of billions of farmed fish each year.
13. FARMS initiative: <https://www.farms-initiative.com/>


## World Animal Protection

5th Floor

222 Grays Inn Road

London WC1X 8HB

UK

 +44 (0)20 7239 0500

 [info@worldanimalprotection.org](mailto:info@worldanimalprotection.org)

 W: [worldanimalprotection.org](http://worldanimalprotection.org)

 [/WorldAnimalProtectionInt](https://www.facebook.com/WorldAnimalProtectionInt)

 [/world\\_animal\\_protection](https://www.instagram.com/world_animal_protection)

 [/MoveTheWorld](https://twitter.com/MoveTheWorld)

 [/animalprotection](https://www.youtube.com/channel/UC...)

Copyright © World Animal Protection

08.22