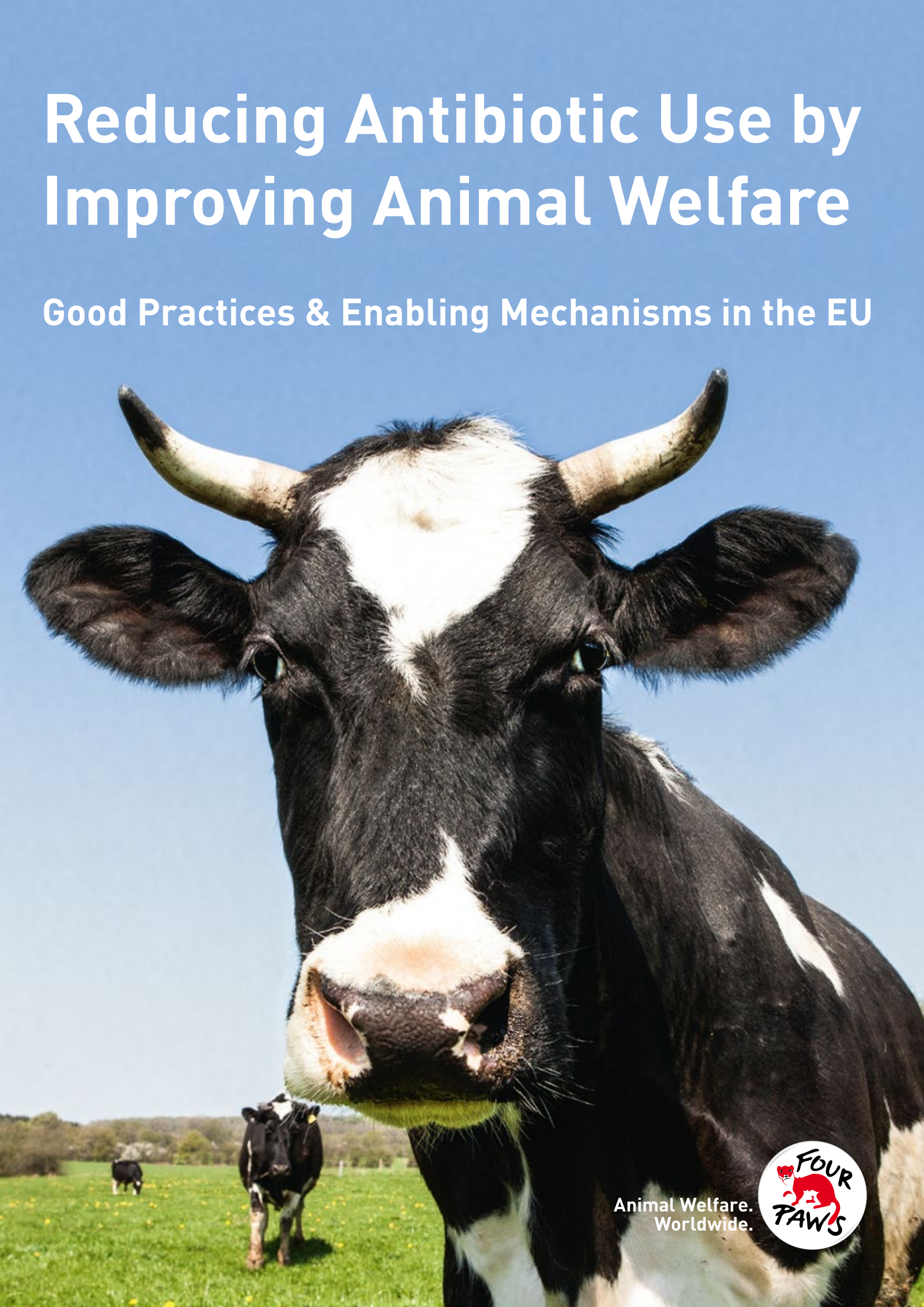
Reducing Antibiotic Use by Improving Animal Welfare

Good Practices & Enabling Mechanisms in the EU



Animal Welfare.
Worldwide.

FOUR PAWS

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Table of Contents

About FOUR PAWS

FOUR PAWS is the global animal welfare organisation for animals under direct human influence, which reveals suffering, rescues animals in need and protects them. Founded in 1988 in Vienna by Heli Dungler and friends, the organisation advocates for a world where humans treat animals with respect, empathy and understanding. The sustainable campaigns and projects of FOUR PAWS focus on companion animals including stray dogs and cats, farm animals and wild animals – such as bears, big cats and orangutans – kept in inappropriate conditions as well as in disaster and conflict zones. With offices in Australia, Austria, Belgium, Bulgaria, Germany, Kosovo, the Netherlands, Switzerland, South Africa, Thailand, Ukraine, the UK, the USA and Vietnam as well as sanctuaries for rescued animals in eleven countries, FOUR PAWS provides rapid help and long-term solutions.

Foreword

By the year 2050, antimicrobial resistance could cause 10 million deaths each year and bring economic losses comparable to the 2008 financial crisis if no action is taken – warns the World Health Organization.

Antimicrobial resistance (AMR) is one of the greatest threats to global human health, and intensive animal agriculture, accounting for over 70% of the worldwide use of antimicrobials, drives this silent pandemic. In 2016, the United Nations General Assembly recognised the inappropriate use of antimicrobials in animals as a leading cause of rising AMR. To protect human health from AMR, immediate action is needed.

To address this challenge, the European Commission states that national Common Agriculture Policy strategic plans should include measures to reduce the use of antibiotics. Furthermore, the Veterinary Medicinal Products Regulation, applicable from 28 January 2022, imposes new restrictions for the use of antibiotics in the farming sector and prohibits antibiotic use for the purpose of compensating for poor hygiene, inadequate animal husbandry, lack of care, or poor farm management.

In light of the developments at EU level, FOUR PAWS together with veterinary and legal experts has created this guidance document to support decision-makers in implementing the necessary measures for improving animal welfare on European farms in order to reduce the use of antibiotics, tackle AMR, and align with the new EU regulations. One element worth keeping in mind is that all efforts put into improving husbandry build towards preparing for the revision of the animal welfare legislation announced by the Commission.

A significant reduction in the use of antibiotics in agriculture is urgently needed and is possible only if we address the root causes that make antibiotic treatments necessary: the husbandry conditions of animals and the sheer size of industrial farming.

On intensive farms, antibiotics are heavily administered to curtail sickness in animals living in conditions in which diseases spread easily. Providing high welfare will ensure that the animals are in good health and their immune systems are strong, making them less prone to infections that require antibiotic treatment. This is the way forward to effectively decrease the use of antibiotics.

At the same time, transitioning to high animal welfare farming can only happen along with a transition to sustainable, predominantly plant-based diets that lift the pressure of intensive agriculture off our environment and are critical for mitigating the climate crisis. In the end, to safeguard human health, we need to rethink and remedy the relationship between humans, animals, and the environment.

Dr. Martina Stephany
Director Farm Animals and Nutrition
FOUR PAWS

1 Policy context (background)

The fight against antimicrobial resistance in the European Green Deal

In December 2019, the then newly appointed European Commission presented the "European Green Deal", the European Commission's five-year work program. Among other overarching objectives, the European Green Deal "seek[s] to maximise benefits for health to improve public health."[1]

In pursuing this objective, the European Commission identifies the need to take action against antimicrobial resistance primarily through the implementation of the Common Agricultural Policy (CAP). Specifically, the European Commission refers to the national "Strategic Plans," which are the list of implementing measures Member States must develop, in compliance with the rules set out in the CAP's regulations.[2] The European Green Deal provides that such "strategic plans will need to reflect an increased level of ambition to reduce significantly the use and risk of [...] antibiotics."[3]

Animal welfare and antimicrobial resistance in the Farm-to-Fork Strategy

The Farm-to-Fork Strategy was presented a few months after the Green Deal, in May 2020. The Farm-to-Fork Strategy is a plan developed by the European Commission to implement the objectives of the Green Deal in the specific policy fields of agriculture and public health.

Among the listed actions to achieve more sustainable food production in the EU, the European Commission committed to revising "the animal welfare legislation, including on animal transport and the slaughter of animals, to align it with the latest scientific evidence, broaden its scope, make it easier to enforce and ultimately ensure a higher level of animal welfare."[4]

The necessity to reduce the use of antimicrobials in animal agriculture is referred to several times in the Farm-to-Fork Strategy. The European Commission thus acknowledges the "urgent need to reduce dependency on [...] antimicrobials"[5] and that "antimicrobial resistance (AMR) [is] linked to the excessive and inappropriate use of antimicrobials in animal and human healthcare leads to an estimated 33,000 human deaths in the EU/EEA every year, and considerable healthcare costs."[6]

The Farm-to-Fork Strategy further provides that the EU should "take action to reduce overall sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030," primarily by way of the implementation of the new Regulations on Veterinary Medicinal Products and Medicated Feed.[7]

Restrictions on the use of antimicrobials in animal agriculture

The Veterinary Medicinal Products Regulation imposes specific, additional rules regulating the use of antimicrobials – as opposed to medicinal products[8] and immunological veterinary products.[9] The overarching requirements of the Regulation state that antimicrobials shall not be used routinely.[10]

The use of antimicrobials for both metaphylaxis and prophylaxis purposes will only be allowed if it is prescribed by a veterinarian, who must be able to justify such a use after having conducted a "clinical examination or any other proper assessment of the health status of the animal or group of animals."[11] Although the previous regulatory framework[12] allowed Member States to restrict the use of antimicrobials for prophylactic purposes, such a restriction in prophylactic use is now mandatory for all operators in the EU under the new Veterinary Medicinal Products Regulation.

The Regulation further specifies that antimicrobials are also not permitted "for the purpose of compensating for poor hygiene, inadequate animal husbandry, lack of care, or poor farm management."[13]

While the Medicated Feed and Veterinary Medicinal Products Regulations impose a much stricter regulation of antimicrobials use on farms, their proper enforcement depends on the regulation of husbandry practices. As shown by the strong correlation between poor animal welfare levels and high use of medication, the type of husbandry practices ultimately determines the degree of reliance on medication, including antimicrobials. For this reason, the legislation pertaining to animal welfare, which limits density levels on farms, among other measures, is central to ensuring that the Medicated Feed and Veterinary Products Regulations produce their intended effects.

Review of the animal welfare legislation and potential changes

The alignment between the regulatory framework on the use of veterinary products and medicated feed will likely be achieved through the revision of the EU animal welfare legislation, which was announced in 2020 by the European Commission as part of the European Green Deal.[14] In 2021, the European Commission specifically committed to ending the use of cages in response to the European Citizens' Initiative "End the Cage Age,"[15] signed by 1.4 million EU citizens petitioning the EU "to propose legislation to prohibit the use of:

- **cages for laying hens, rabbits, pullets, broiler breeders, layer breeders, quail, ducks and geese;**
- **farrowing crates for sows;**
- **sow stalls, where not already prohibited;**
- **individual calf pens, where not already prohibited."[16]**

The passing of a general prohibition on the use of cages, and additional measures the European Commission is currently studying to improve the treatment given to farmed animals,[17] will thus likely contribute to the proper enforcement of the Veterinary Products and Medicated Feed Regulations by lowering density levels. More generally, depending on the level of ambition of such a revision, new animal welfare rules will have the effect of improving the animals' immune systems and reduce reliance on the use of medication. This will be the case especially for sectors where extreme confinement is currently norm, such as pork and poultry production.

> New animal welfare rules will have the effect of improving the animals' immune systems and reduce reliance on the use of medication.

A legal analysis of the provisions of the Veterinary Medicinal Product (VMP) and Veterinary Medicated Feed (VMF) and what this means for veterinarians and farmers can be found in chapter 4.

2 Animal farming and antimicrobial resistance: understanding the link

The European Medicines Agency (EMA) and the European Food Safety Authority (EFSA) (2017) recognize that, "To minimise antimicrobial use, a multifaceted integrated approach should be implemented, adapted to local circumstances. Recommended options (...) include (...) improving husbandry and management procedures for disease prevention and control, and rethinking livestock production systems to reduce inherent disease risk."[18] (EMA and EFSA 2017)

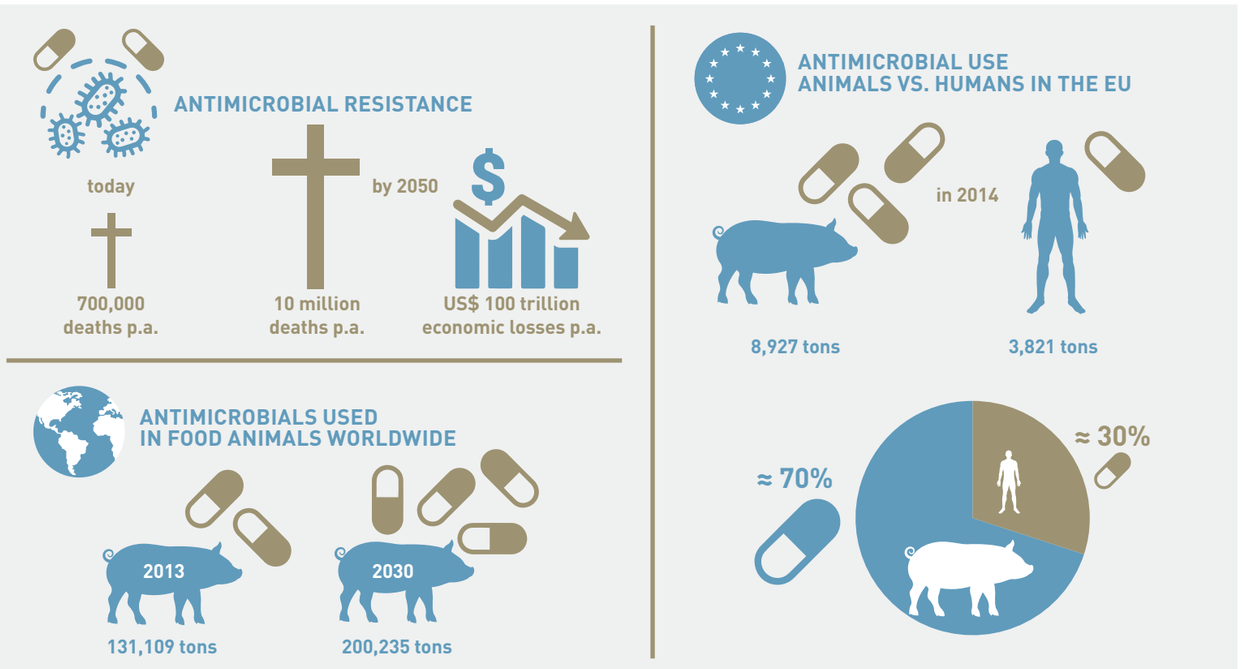
Antimicrobial resistance (AMR) is a major threat to public health: it causes 700,000 deaths annually and it is estimated that it will account for 10 million deaths and US$ 100 trillion economic losses every year by 2050 if no urgent actions are taken.[19]

It is widely accepted that, globally, the massive and irresponsible use of antimicrobials contributes significantly to AMR. Although there is a large variation across countries, the livestock sector accounts for a large proportion of the total amount of antimicrobials used. For example, an estimated 131,109 tons of all antimicrobials were used worldwide in food animals in 2013, and the figure is projected to rise to 200,235 tons by 2030.[20] In the EU, according to EFSA (2017), 8,927 tons of antimicrobials were used for animals in 2014, compared to 3,821 tons used for medical purposes in humans, which means that roughly 70% of the total amount of antimicrobials were used for animals.[21]

> Antimicrobial resistance is a major threat to public health.

Antimicrobials are administered to farmed animals for:

- **therapeutic purposes (i.e., administered to clinically diseased animals),**
- **metaphylactic purposes (i.e., administered to healthy animals that are in the same group as diseased animals),**
- **or prophylactic purposes (i.e., administered to healthy animals when the probability of becoming sick is considered high.[22]**



In some countries, although no longer permitted in the EU, antimicrobials are also used as growth promoters. Indeed, the heavy use of antimicrobials other than for therapeutic purposes is of particular public concern, as AMR is significantly rising. The main pathologies of farmed animals for which antimicrobials are used have been described in detail by EMA and EFSA (2017) and include respiratory and gastrointestinal conditions, lameness, and mastitis, among others.[23]

Improving farm animal welfare can be an effective strategy to reduce the use of antimicrobials

Farm animal welfare has gained increased importance over the last few decades, as citizens in many countries demand that farm animals are reared, transported, and slaughtered humanely. The welfare of an animal can be measured objectively and may range from very poor to very good. Welfare states can be measured scientifically; however, judgment on what an acceptable welfare state constitutes is a social and societal matter, as it is strongly interrelated with animal ethics (a critical evaluation of the human-animal relationship).

For many years, the Five Freedoms have provided a useful ethical framework to define what animal welfare is and, consequently, to identify the welfare problems of farmed animals.[24] More recently, the Five Freedoms have been criticised on the grounds that they can be misunderstood as aiming to eliminate all negative experiences (which is not realistic). Moreover, they fail to capture our current understanding of the biological, mental and emotional abilities of animals, resulting in a lack of comprehensive indicators that reflect a good welfare state.

As an alternative, the Five Domains Model for animal welfare was developed to encompass new developments. The Five Domains Model incorporates four domains of "nutrition", "environment", "health", and "behaviour", as well as a fifth "mental" domain.

Each physical domain has an impact on the affective state of the animal (i.e., on the fifth domain), and the net outcome in the mental domain resulting from the combination of the four physical domains represents the animals' overall welfare state.[25, 26, 27]

Poor animal welfare often leads to a chronic stress response that reduces the immune function of animals, therefore rendering them more susceptible to infectious diseases, which in turn may lead to an increase in the use of antimicrobials. For example, heat stress and lack of comfort increase the risk of lameness in dairy cattle, and cold stress increases the risk of respiratory conditions in calves.

Exposure to stress-related behavioural problems may lead to physical injuries (this is the case, for example, with tail biting in pigs, which is a multifactorial problem that is more likely to develop when pigs are stressed and prevented from performing their natural exploratory behaviour), warranting veterinary treatment, including antibiotics.

Finally, many welfare problems which do not fall into the health domain and hence are not directly related to physical health have nevertheless a direct impact on the health of the animals and increase the risk of disease.

In summary, poor animal husbandry and management both lead to poor welfare and thus contribute to the excessive use of antibiotics in livestock. Therefore, as indicated by EMA and EFSA (2017), rethinking current systems of animal production to guarantee higher welfare standards that reduce the risk of disease must be an important element of the multifaceted strategy to reduce antimicrobial use.[28] In this regard, improving the quality of life of farmed animals so that the use of antimicrobials and the threat of AMR to human health can be reduced is a good example of the "One Welfare" principle, i.e., the interconnection between animal welfare, human wellbeing, and their physical and social environment.

> Poor animal husbandry and management lead to poor welfare.

3 High animal welfare farming to reduce stress and the risk of infectious diseases that require antibiotic treatment

Stress is a critical factor when it comes to animal health. There are two kinds of stress: acute and chronic stress. Acute stress can be compared to the fight-or-flight response, whereas chronic stress appears in prolonged or permanent stressful conditions and has a negative effect on homeostasis, leading to vulnerability to diseases.

Research has found that when stress levels in poultry are too high, diseases are more prevalent.[29] Also, stress is the lead cause of immunosuppression in birds, leaving them more susceptible to infectious agents.[30]

Improved husbandry reduces stress and increases the animals' immune capacity, thus lowering the risk of infections that require antibiotic treatment. Improved husbandry that ensures high animal welfare is only possible when it is coupled with a reduction in the number of farmed animals and a shift towards more sustainable, predominantly plant-based food systems. Improvements in animal husbandry tackle several key areas, as outlined below.

Reduction of stocking density

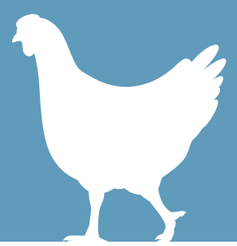
The crowded conditions in intensive farming systems are a major driver of pathogen emergence and spread in farm animal populations. In crowded conditions, the animals experience chronic stress and become more vulnerable to diseases. Additionally, the close proximity favours the transmission of pathogens from sick or dead animals. The common measures to attempt to control pathogen spread consist of prophylactic administration of antibiotics or culling.

The reduction of stocking density is, however, one of the most effective measures to improve animal welfare and health. Increased space allowance affects the animals' behaviour in a positive way. They are calmer, rest longer, show better usage of functional areas, and have less competition for resources.[33] When stocking density is lowered, it becomes more difficult for pathogens to spread.

SPECIES-SPECIFIC EXAMPLE

In poultry farming, for example, stocking densities lead to greater litter moisture, increased microbial activity, increased temperature and ammonia concentration. Researchers found that higher stocking density in broiler chickens decreases macrophage activity and increases susceptibility to Salmonella.[31]

High ammonia concentrations can cause irritation (such as keratoconjunctivitis) in the eyes and respiratory system, increasing the susceptibility to respiratory disease.[32] Even at low concentration, chronic exposure to ammonia seems to contribute to the severity of concomitant respiratory diseases caused by viral or bacterial agents (ex. Mycoplasma infection).



Nutrition

The gut is an important organ when it comes to health. The intestinal microbiome plays an essential role in maintaining the immunological balance. When the microbiome balance is disturbed through inappropriate feed, the risk for diseases increases.

For example, a highly concentrated, grain-based diet would disturb and acidify the digestive tract of cattle and other ruminants; whereas grazing on pasture is appropriate for them and their multi-stomach digestive systems, which naturally extract nutrients from grass and plants.

The high stocking density in intensive farms increases the risk of diseases.

As feed can improve the microflora and strengthen the resistance of the gut, animals should have free access to water and quality feed with good nutritional balance and adequate formulation according to the species.[34]

Genetic diversity

A high genetic diversity in farmed animals forms the basis for environmental suitability, climate tolerance, disease resistance, fitness, and fertility, as well as the qualitative and quantitative performance of breeds. However, the constant economic pressure for cheap animal products has favoured particularly "efficient" or higher performing breeds (single-purpose breeds), leading to a homogenisation of the genetic pool of farm animals in European countries. The intensification of livestock systems has further shifted the focus of breeding on extreme production and/or physical traits, such as high yield, fast growth, and meat quality traits that impair the health and welfare of the animals. Genetic selection for extreme traits leads to animals with an increased susceptibility to infectious and metabolic diseases. The energy of intensively farmed animals bred for high performance is fully occupied with the specific performance or growth traits, leaving no capacity for building up a well-functioning immune system.

> A high genetic diversity in farmed animals forms the basis for environmental suitability.

For example, dairy cows have been selected for high milk yield, which makes them less reproductive and more susceptible to mastitis and other health and welfare issues, which altogether dramatically reduce their lifespans.[35] EFSA (2009) underlines that, "In order to improve dairy cow welfare there is an urgent need to promote changes in the criteria used for genetic selection in the dairy industry. Higher weight should be given to fitness and welfare traits when these may conflict with selection for milk yield."[36]

Traditional autochthonous breeds and their genetics may be less "performant" in classical output traits, but they are generally robust and well adapted to local circumstances and resources. They are less prone to illness, and some are also resistant to parasites. Selection should be focused on resilience and longevity as well as robustness; for example, fitness and claw health in dairy cows or less daily weight gain in broilers, which also has a positive effect on the chickens' health. Genetic selection has the potential to improve innate and adaptive immune responses.

Extensive outdoor conditions

In intensive farming, a high number of animals are kept indoors at high densities. These unnatural conditions, mostly with artificial lighting and no outdoor access, increase the susceptibility of these animals to infections.

SPECIES-SPECIFIC EXAMPLE

In the case of dairy cattle, lameness is one of the major animal welfare problems. It decreases their immune capacity, making them more prone to infections that, in turn, require antibiotic treatment. The prevalence of lameness varies across production systems, being generally highest in systems where cows are tethered and lowest in systems where cows have access to pastures. Standing or walking on hard or abrasive floors has a negative effect on claw health and locomotion. Also, floors that are wet or covered in slurry increase the risk of lameness.

Animals that are raised according to their species-specific needs with free access to good-quality pastures, where they are exposed to direct sunlight and natural environmental conditions, are generally healthier and under less stress than those raised in confinement. They can roam freely, experience outdoor climate and express natural behaviour.[37] When ensuring outdoor access, it is important that the pastures are in good condition, the animals have adequate shelter from sun and rain and are protected from wild animals, and that the paths to the pastures are well-maintained.

> Animals show certain behaviour measures to deal with temperature fluctuations.

Stable climate

Every farm animal species has its own thermal comfort zone. Confronted with heat or cold, the animal has to make an effort to regulate its temperature. The higher the discrepancy between thermal comfort zone and thermoregulatory capacity, the higher the level of stress.

For example, high performance breeds are more affected by heat than they are by cold. Animals show certain behaviour measures to deal with temperature fluctuations such as seeking shade, water, huddling or avoiding physical contact to conspecifics. Some animals can sweat (like cows) and some cannot (like pigs). Pigs normally wallow in mud and water, but in intensive systems, they have to wallow in their excrements to regulate their temperature. Normally, they would avoid contact with their faeces. In poultry, heat is an important stressor which leads to reduced performance and immunosuppression, although in general, birds have a much higher body temperature.

To avoid chronic stress that impairs the immunocompetency of animals, a stable climate must fulfil the species-specific thermal comfort zone and the environment must allow animals to perform their natural behaviours that contribute to regulating their body temperature.

Natural behaviour

Intensive farming creates environments which result in behavioural disorders like stereotypies and damaging behaviour against conspecifics, such as tail biting, feather picking, etc., resulting in injuries that require antibiotic treatment or result in the culling of animals.

> Animal welfare measures improve the immuno-competence.

Most animals are naturally inquisitive, have a strong urge for foraging, and require stimuli from their environment to support that need. The interactions between behaviour and the neuroendocrine and immune systems show that animal welfare measures improve the immunocompetence, resulting in an increased resistance to infections.[38] Normal behaviour can be supported by environmental enrichment, allowing the animals to perform normal behaviour patterns in natural time budgets, such as exploration, comfort behaviours, foraging, and social interactions, consequently improving the health status of the animals.

> Farms which support the natural needs use fewer antimicrobial treatments.

For example, straw as enrichment for pigs helps to reduce the incidence for gastric ulcers and wounds from tail biting. Farms which support the natural needs use fewer antimicrobial treatments than conventional farms. Studies have shown that cognitive enrichment, like call-feeding stations, improve IgG concentration, in-vitro T-Cell proliferation, and wound healing.

No mutilations

Mutilations are painful and very stressful for the animals and are often carried out without proper anaesthesia and analgesia. When resulting in wounds, these are likely to become infected and require antibiotic treatment. In addition to the physical impact of mutilations, there is a long-term negative effect on natural behaviour. Mutilations are performed by farmers to adapt the animals to intensive husbandry systems that ignore animals' natural needs and behaviour (i.e., dehorning of cattle, beak trimming of laying hens, tail docking of pigs).

SPECIES-SPECIFIC EXAMPLE

Pigs, for example, in the absence of material to explore and interact with, redirect their motivation to explore 'alternative stimuli' present in the pen, such as the tails of conspecifics. Tail biting is a widely spread welfare problem that starts with small bites of a soft tissue, but it can rapidly escalate to severe lesions or even the loss of the tail.[39]

Facilitating the display of natural behaviours (such as foraging or exploring) with straw, ropes, substrate, or any other supplementary material, is a very effective way to reduce tail biting. In addition, it has been proven that providing environmental enrichment positively drives important aspects of the development of the immune system and the establishment of gut microbiota in early life.[40]

Husbandry and management conditions must adapt to the natural needs and behaviour of animal species, so that no mutilations are practiced. The animals' physical form is kept intact, and no harm is done to their health and behavioural expressions, leaving the animals more resilient to harmful influences.

Animal-human interaction

The human-animal relationship impacts the welfare and health of animals. This relationship is determined by a variety of factors, but mostly it is the reflection of the quality of the stockmanship towards animals.[41]

Painful handling, such as slapping, kicking or using electric prods, has a direct effect on the stress level of animals and causes animals to respond with fear every time humans approach. The stress response triggered by fear, which may cause immunodepression, makes animals more prone to infections that require antibiotic treatment.

Ultimately, fearfulness in animals impacts the ease of management, as fearful animals are more difficult to handle. Therefore, good animal handling will have several benefits, including the safety of stockpersons, better animal welfare, and higher productivity.

Better stockmanship can improve the human-animal interactions, and training of farmers for better handling can enhance this relationship.[42] Due to the impact of animal handling on their welfare, the quality of handling is incorporated in numerous welfare assessment protocols that are used for certification and labelling.

During transport, animals suffer from stress, hunger and dehydration, extreme temperatures; they are often injured or fall ill.

Good animal handling is associated with better health.

This makes stockworkers more conscious about the quality of handling and willing to keep good standards of animal welfare, therefore improving its quality. Also, animals that receive better-quality handling improve their productive performance, showing, for instance, more reproductive success.[43] Similarly, good animal handling is associated with better health, as lower stress levels facilitate immunocompetence.

Weaning

Weaning is stressful for young animals and their mothers. In many farming systems, it happens very early, before the young animal would naturally wean itself. Early weaning creates an immunological gap: It leaves the young animals without maternal immunity (antibodies found in the mother's milk) while their own immunity is not yet well developed. Besides the abrupt change of diet, the separation from the mother and the change of environment also lead to a reduced immune function and abnormal behaviours. Following early weaning, youngsters are particularly susceptible to diseases. For example, weaned piglets often suffer from diarrhoea and calves from respiratory diseases.

SPECIES-SPECIFIC EXAMPLE

Early weaning is a major welfare problem for calves. Calves are born without antibodies (agammaglobulinemic) because of the structure of the bovine placenta. Instead, calves rely on drinking colostrum, which contains antibodies from the cow. Suckling increases the release of enzymes (renin, pepsin etc.) and hormones (e.g., insulin, cholecystokinin) that are important for digestion.[44] Also, suckling stimulates the closure of the oesophageal leak, so the milk goes directly to the abomasum, preventing it from reaching the rumen and causing abnormal fermentations[45] that can increase the risk of diarrhoea.
Diarrhoea is a multi-factorial disease. However, most important factors for calf diarrhoea problems are infections by viruses, bacteria or parasites, dietary factors, stressors, and lack of passive immunity.

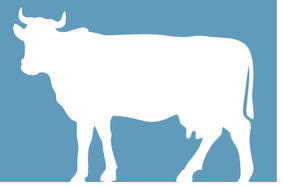
Young mammals of herd species need to grow up in fixed family groups, ensuring good emotional status, social learning, and feeding on milk for as long as physiologically needed. Cow-bonded rearing allows calves to stay with their mothers. They can drink milk at the udder, ensuring immunological protection and learning essential social behaviour together with other calves.

Transport

According to the Food and Agricultural Organization of the United Nations (FAO), the transportation of livestock is "the most stressful and injurious stage in the chain of operations between farm and slaughterhouse." The stress of prolonged transport and the risk of injury increases the animals' susceptibility to infections that require antibiotic treatment.

SPECIES-SPECIFIC EXAMPLE

The impact of transportation stress has generated great economic and welfare-related concerns because of its association with increased incidence and severity of bovine respiratory disease, commonly referred to as "shipping fever."[46] Bovine respiratory disease (BRD) is the leading cause of morbidity and mortality in fattening calves. Thus, high-intensity beef production is reliant on antimicrobials to reduce the incidence of clinical illness when calves are weaned, transported and mixed in groups.



If animals develop infections while transported to the slaughterhouse, they will be slaughtered for consumption without treatment, which could lead to infections, such as Salmonella being passed on from the animal to humans.

Transports must be avoided, and long-distance transports must be prohibited. To avoid unnecessary transports, animals must be born and reared on the same farm and transported to the nearest slaughterhouse or, better yet, be slaughtered on the farm.

4 Legal analysis (legal context)

The new EU regulations on Medicated Feed and Veterinary Medicinal Products

Scope

The Veterinary Medicinal Products Regulation
The Veterinary Medicinal Products Regulation covers veterinary medicinal products, defined as "any substance and/or combination of substances which fulfils at least one of the following conditions:

- it is presented as having properties for treating or preventing disease in animals;
- its purpose is to be used in, or administered to, animals with a view to restoring, correcting or modifying physiological functions by exerting a pharmacological, immunological or metabolic action;
- its purpose is to be used in animals with a view to making a medical diagnosis;
- its purpose is to be used for euthanasia of animals."[47]

The Regulation also applies to active substances used as ingredients and inactivated immunological veterinary medicinal products.[48] Finally, some provisions in the Regulation also apply to veterinary medicinal products prepared in a pharmacy.[49] The scope excludes medicated feed, which is covered in the Medicated Feed Regulation, and which is not subject to a marketing authorisation.

The Medicated Feed Regulation
The Medicated Feed Regulation applies to medicated feed, defined as "a feed, which is ready to be directly fed to animals without further processing, consisting of a homogenous mixture of one or more veterinary medicinal products or intermediate products with feed materials or compound feed"[50] – or, more simply put, a type of animal feed mixed with medicine given to animals.

The Medicated Feed Regulation regulates the manufacturing, storage, and transport of medicated feed, as well as the commercialisation of medicated feed and its ingredients[51] ("intermediate products"[52]). Furthermore, the Medicated Feed Regulation applies to all medicated feed manufactured, stored, transported, and placed on the EU markets – including when such feed is destined to be exported outside the EU.[53]

Main Provisions

Restriction on the use of antimicrobials in animal agriculture
The Veterinary Medicinal Products Regulation imposes specific additional rules regulating the use of antimicrobials – as opposed to medicinal products[54] and immunological veterinary products.[55]

- **Prescription and examination requirements**
  The use of antimicrobials for both metaphylaxis and prophylaxis purposes is allowed only if it is prescribed by a veterinarian, who must be able to justify such a use, after having conducted a "clinical examination or any other proper assessment of the health status of the animal or group of animals."[56] By definition, in the case of antimicrobials use for metaphylaxis purposes, the veterinarian must further provide a diagnosis (see Table 1).[57]

- **Prohibition on uses**
  Furthermore, certain uses of antimicrobials are prohibited as follows in Table 2.

Under the Medicated Feed Regulation, the use of medicated feed is subject to the following cumulative conditions:

- the presentation of a veterinary prescription;[66]
- delivered by a veterinarian;[67]
- who has examined the animal or the group of animals;[68]
- and who has diagnosed a disease in this or these animals.[69]

However, certain exemptions apply, according to Table 3.

Table 1: Requirements for the use of antimicrobials for prophylactic and metaphylactic purposes

TYPES OF USES	REQUIREMENTS: Clinal examination or proper assessment of the health status of the animal or group of animals	Diagnosis	Prescription
Prophylactic	✓	✗	✓
Metaphylactic	✓	✓	✓

Table 2: Prohibited uses of antimicrobials

	PROHIBITED USES	EXEMPTION
USE RELATED TO THE ADMINISTRATION FREQUENCY	Routine use[58]	None, but the term "routinely" is not defined.
USE RELATED TO THE PURPOSE	Use for the purpose of compensating for poor hygiene, inadequate animal husbandry, lack of care, or poor farm management[59]	None, but what constitutes "poor hygiene, inadequate animal husbandry, lack of care, or poor farm management" is not defined.
	Use for the purpose of promoting growth[60]	None
	Use for the purpose of increasing yield[61]	None
	Use for prophylactic purposes[62]	1. For an individual animal 2. Or a "restricted number of animals when the risk of an infection or of an infectious disease is very high and the consequences are likely to be severe"[63] 3. Or in a group "when the risk of spread of an infection or an infectious disease is very high and where no other appropriate alternatives are available."[64]
USE OF CERTAIN SUBSTANCES	The use of antimicrobials reserved for treatment of certain infections in humans[65]	None

Under both regulations, the veterinary prescription must further comply with a set of specifications, including the full name and contact information of the veterinarian, the issue and expiration dates of the prescription, the full name of the animal keeper, the designation of the veterinary medicinal product, and the quantity of medicated feed. The validity of a veterinary prescription for medicated feed for animals used for food and fur purposes is limited to three weeks from the date of issuance.[73] Finally, the original and copies of the prescription must be kept for five years from the date of issuance.

Record-keeping requirements

- **Sales by retailers**
  The Veterinary Medicinal Products Regulation provides that retailers of veterinary medicinal products must keep "detailed records of the [...] information in respect of each transaction of veterinary medicinal products requiring a veterinary prescription."[74]

- **Use by keepers**
  Furthermore, owners and keepers of food-producing animals must keep records of the

veterinary medicinal products as well as the medicated feed they use and, where applicable, a copy of the veterinary prescription. [75]Such records must include the name and quantity of the product administered and the identification of the animal(s) treated.[76]

Equivalence rules for imports

Producers of animals or animal source products from outside the EU must comply with the prohibition on the use of antimicrobials used for the purpose of promoting growth and to increase yield.[77]

Legal coherence and consistency

The Medicated Feed and Veterinary Medicinal Products Regulations pursue the ultimate goal of reducing the use of medication on farms. One demonstrable way of achieving such a reduction is to improve the treatment of animals on farms, which is the main goal of the revision of EU animal welfare legislation. In that regard, the entry into force of the Medicated Feed and Veterinary Products Regulations, followed by the enactment of more ambitious provisions in animal welfare legislation, will provide a more coherent regulatory framework when it comes to regulating on-farm methods of production on farms.

> Reducing the use of medication on farms is the ultimate goal.

The entry into force of the Medicated Feed and Veterinary Products Regulations thus constitutes a first step towards the transition away from inhumane practices and threats to public health in animal agriculture. To that extent, the implementation of these two regulations should be regarded by farmers as an opportunity to anticipate the upcoming changes to animal welfare rules in EU law. Notably, a significant reduction of density levels on farms will have the effect of facilitating compliance with the Medicated Feed and Veterinary Products Regulations, as well as with the new provisions resulting from the upcoming revision of EU animal welfare legislation.

Table 3: Requirements for the use of medicated feed

RULE	EXEMPTION
1. Presentation of a veterinary prescription	None
2. Delivered by a veterinarian	Member States may allow non-veterinarian professionals to issue prescriptions for medicated feed. However, the prescription of medicated feed containing antimicrobials must always be prescribed by a veterinarian.[70]
3. Who has examined the animal or the group of animals	For medicated feed containing antiparasitics without antimicrobial effects, the knowledge of the parasite infection in the animal(s) is enough to issue a prescription.[71]
4. Who has diagnosed a disease in this or these animals	The presence of a diagnosed disease is not required for the prescription of feed containing immunological veterinary medicine products.[72]

5 Financing higher animal welfare with EU public funds

The main vehicle to fund measures improving animal welfare are the payments available to producers under the EU's agricultural policy: the Common Agricultural Policy (CAP). Since the 2021 reform, the CAP provides two types of subsidies that compensate the undertaking of good animal welfare practices on farms: the eco-schemes (nested under so-called "Pillar I measures") and the rural development measures (also known as "Pillar II measures").

Eco-schemes

The 2021 CAP reform creates a new type of subsidy, called "eco-schemes," which funds, on a yearly basis, measures that improve the welfare of animals on farms. The eco-schemes are considered a "green payment" in that they aim to reduce the environmental footprint of agriculture, as well as reducing the risk posed by antimicrobial resistance.[78] In fact, among other requirements, producers must pursue goals relating to either climate mitigation, animal welfare, or reduction in antimicrobials use to be eligible to receive payments under the eco-schemes.[79]

The European Commission published a list of animal welfare measures for which eco-scheme funding can be granted, including the following:[80]

- friendly housing conditions: increased space allowances per animal, improved flooring (e.g., straw bedding provided on a daily basis), free farrowing, provision of enriched environment (e.g., rooting for pigs, perching, nest-building materials, etc.), shading/sprinklers/ventilation to cope with heat stress;
- practices and standards as set under organic farming rules;
- practices increasing animal robustness, fertility, longevity, and adaptability (e.g., lifespan of dairy cows); breeding lower-emission animals, promoting genetic diversity and resilience;
- animal health prevention and control plans: overall plan for reducing the risk of infections that require antimicrobials and covering all relevant husbandry practices; e.g., crawl space between two rearing belts, vaccination and treatments, enhanced biosecurity, use of feed additives, etc.;
- providing access to pastures and increasing grazing period for grazing animals;
- providing and managing regular access to open-air areas.

Rural development measures

There are several measures that Member States can adopt in their national rural development plan to improve the welfare of animals.

Animal welfare payments (Measure 14)

Pillar II consists of measures that aim to improve farm animal welfare beyond minimal legal requirements, with the objective of developing rural areas. Member States willing to include funding for animal welfare measures can therefore choose to do so. Such measures typically fund programs that improve animal health (such as better hoof care or nutrition plans), increase space allowance and outdoor access, or prolong weaning periods.[81]

Other measures benefitting farm animal welfare

Even though there is no specific measure for good practices aiming to specifically reduce antimicrobials use on farms, other measures exist that can contribute to reaching this goal as well as improving animal welfare. For instance, Measure 4 for on-farm investment, which can be used to improve outdoor areas for poultry. Measure 11 for the conversion maintenance[82] of organic agriculture also benefits animals to the extent that organic standards in animal agriculture are higher than legal standards.[83]

Conclusions

The World Health Organization has identified antimicrobial resistance as one of the top ten global public health threats facing humanity and calls for urgent action to protect human lives and safeguard the advancements of modern medicine. Given the heavy use of antibiotics in intensive animal farming, it becomes clear that AMR cannot be tackled without decreasing the use of antibiotics in farming.

The only way to address this threat and achieve a long-lasting reduction of antibiotics in agriculture is to look at the root cause that calls for their unsustainable use, namely the poor husbandry conditions in intensive farms, which make animals sick and thus heavily reliant on antibiotic treatment. By implementing measures that create high animal welfare in farming, policymakers can ensure the proper conditions in European farms for animals to have strong immune systems that can fight off many diseases naturally. This reduces the need for antibiotics and preserves their efficacy. Not least, any measures aimed at improving animal welfare build towards aligning with upcoming regulations announced by the European Commission.

Once again, animal welfare and environmental sustainability go hand in hand, as high-welfare husbandry can only be achieved if it is coupled with a reduction of the livestock sector and a transition towards more sustainable, predominantly plant-based food systems. Such a transition is crucial for ensuring that a growing population has access to nutritious, diverse diets and our environment is protected from the detrimental effects of intensive agriculture.

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