Animal health and welfare: cornerstones of sustainable animal farming

Vision Paper



World Organisation for Animal Health
Founded in 1924

INTRODUCTION

Terrestrial livestock farming is an age-old practice – social and cultural heritage, and even a way of life for many communities. It contributes many economic benefits and environmental services and helps feed the growing world population. Aquaculture is a more recent, burgeoning sector that now provides more than half of the world's animal sourced protein [1]. Today, the benefits of both terrestrial and aquatic animal farming face a number of concerns and criticisms about their impact on greenhouse gas emissions, environmental degradation, wildlife populations and biodiversity more broadly, as well as on animal welfare and global health.

Farming practices must evolve to address these concerns and to maintain the value of the sector: in this context, **animal health and welfare must be seen as key contributors to its sustainability**.



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Animal health and welfare are essential to maintaining terrestrial and aquatic farming systems, which are crucial assets to global food security.

Definition

In this document, animal farming refers to the rearing of animals to provide products such as meat, milk, eggs and wool. It includes both land-based farming (cattle, small ruminants, pigs, poultry) and aquaculture (finfish and shellfish), although some points may not apply to all sectors.

Animal farming sustainability: at the heart of several global challenges

Terrestrial and aquatic livestock farming is the daily work and main source of income for billions of farmers and industry stakeholders. It makes a vital contribution to food security and nutrition, especially in regions where arable land for crops is scarce. It also provides society with clothing, fertiliser, building materials, money savings and traction power, and contributes significantly to the economic sustainability of many countries and regions. Animal husbandry is part of the ancestral culture of many nomadic peoples and communities around the world. Thus, it is not merely a link in a production chain, but an entire socio-cultural heritage to be valued and preserved.

Yet, regardless of the production, this sector is increasingly facing scrutiny for a number of legitimate reasons, including the associated environmental degradation and growing societal and consumer concerns about animal rearing conditions. There are also health implications, primarily, the misuse and sometimes overuse of antimicrobials in animals and the potential transmission of diseases to humans, wildlife and other domestic animal populations. That said, the animal farming sector is diverse, and practices and impacts vary widely.

The importance of making optimum, humane and environmentally friendly use of farmed animals in both terrestrial and aquatic settings is growing as losses affect animals, farmers and consumers directly and society as a whole indirectly. Animal husbandry practices need to evolve to address current concerns, while continuing to provide benefits to entire communities. This complex task needs to take into account a number of factors, in particular, environmental risks, societal expectations, economic constraints and evolving health threats to animals, humans and the environment.

As animal diseases and poor rearing conditions continue to cause many production losses with wider implications, it is essential to consider the contribution of animal health and welfare [2] to more sustainable terrestrial and aquatic livestock farming practices.



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The livestock sector is central to many global issues, including food security and safety, global health, rural resilience, trade in animals and animal products, nutrients sourced from wildlife, greenhouse gas emissions, water resource management, wastewater treatment, and the conservation of animal genetics.



The contribution of animal health and welfare to sustainable farming

It is estimated that 20% more animal protein will be needed to feed the world's growing population by 2050 [5]. Meeting this demand will require an increase in supply from terrestrial and aquatic livestock, in particular in low- and middle-income countries, where consumer habits are changing to include more animal-based foods in their diets, combined with increased production of alternative protein sources, such as synthetic or cell-based meat, in some countries.

Stakeholders involved in animal husbandry and animal health must collectively improve their capacity to anticipate, prevent and control the spread of animal diseases to secure the required level of animal protein production. This is a challenge in the context of climate change, which is driving seasonal variations and evolutions in the epidemiology and distribution of many diseases, particularly vector-borne diseases, such as bluetongue, lumpy skin disease and others that are influenced by seasonal migration: avian influenza is a case in point. In aquatic environments, even small changes, such as rising water temperatures, can influence the development of disease.

The World Organisation for Animal Health (WOAH) believes that the development of sound and humane animal farming systems that incorporate key animal health and welfare principles is a prerequisite for achieving sustainable practices that meet the needs of rearing animals for food, livelihoods and socio-economic well-being, while minimising negative environmental and health impacts.



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Improved animal health has direct benefits for farmers. It reduces animal losses, preserves farm capital and allows for investment in improved farming conditions and technological innovation. It also reduces the environmental impact of livestock farming [6], regardless of a country's income level.
For example, it has been shown that reducing the prevalence of porcine reproductive and respiratory syndrome in pigs from 60 to 10% could reduce greenhouse gas emissions intensity by 22.5%, while reducing the prevalence of foot and mouth disease in beef cattle from 45 to 5% could reduce greenhouse gas emissions intensity by 9.11% [7].

Healthy farm animals underpin productivity, rural livelihoods and socio-economic development

Healthy and well cared for animals grow faster, produce higher quality products (e.g.: meat, milk, or eggs), make better use of the feed they are given and have better reproductive performance, leading to increased productivity. Certain animal diseases, such as African swine fever, foot and mouth disease and infectious salmon anaemia, can have a devastating impact on production levels. Globally, it is estimated that around 20% of terrestrial animal production is lost to disease, threatening the economic sustainability of animal food production and the livelihoods of millions of people around the world, particularly in rural areas. Worldwide, 1.7 billion people depend directly on livestock for their livelihoods and 70% of those employed in the livestock sector are women [3]. Furthermore, 800 million people depend on small-scale fisheries and aquaculture for their livelihoods [4] and 50% of workers in the aquatic sector are women [8]. Women often own small ruminants or poultry, and sometimes fish ponds, which are easier to acquire than other physical and financial assets [9]. Farmed animals provide a source of income that helps meet specific household expenses, such as children's school fees or medical costs, and are also key to their empowerment.

More broadly, healthy and well-treated farmed animals are often a prerequisite for access to local, regional and international markets, increasing opportunities for trade and economic growth.

Disease management and good animal welfare practices improve the performance of animal production, which is essential to meet the growing global demand for animal protein, alleviate poverty and promote gender equity for those who depend on farming for their livelihoods. Access to efficient, cost-effective and equitable animal health management services and practices is vital. It supports better disease surveillance and control, and animal welfare. In addition, compliance with animal health and welfare regulations and standards is crucial to ensure fair trade practices and reduce unnecessary barriers.

Land food animals



constitute

40%

of the value of global agriculture [10]

Their contribution to the agricultural GDP varies greatly across countries averaging

25% for low- and middle-income countries

and

nearly **50%** for high-income countries [11]

because the consumption of animal products increases as incomes rise.

Healthy farm animals help to build a healthier future for all

Farm animals are an important source of high-quality protein and nutrients that are not readily available from plant-based foods. In many countries, food insecurity and malnutrition remain unchecked scourges. In fact, as many as 828 million people may go to bed hungry every night [12]. Beyond direct losses, diseases can affect how and whether animal products are processed. They undermine food security by reducing the availability and affordability of quality products.

Healthy animals are less likely to carry and transmit pathogens that can contaminate consumers, or spread diseases that can affect human populations, wildlife or the environment. Animal health is closely linked to human and ecosystem health. Recent decades have seen an increase in the emergence and re-emergence of major transboundary animal diseases. The avian influenza situation, for example, is of great concern as in recent months, a rising number of spillover cases have been observed in wildlife, including mammals, leading to a higher risk of transmission to humans. Furthermore, some aquatic animal diseases can spread through water between farms and exchange with local wild populations, which could be devastating for areas producing animal protein for local consumption.



3 out of 5

emerging human infectious diseases are of animal origin [13]

Another growing global health threat is the spread of antimicrobial resistance. The responsible use of antimicrobials in farmed animals, both terrestrial and aquatic, is essential to combat this problem, maintain a stable and productive farming sector and protect global health.

Improved farmed animal health management is an integral part of the "One Health" approach that aims to optimise human, animal, and environmental health. Controlling animal diseases that have a major impact on fish, meat, milk and egg production contributes to consistent and safe food supply for communities. Not only does investing in animal health and welfare through disease prevention measures such as vaccination and biosecurity help prevent disease outbreaks that can destroy animal populations, but it reduces the risk of zoonotic diseases and public health crises, and thus the need to use antimicrobials.



The global demand for meat and dairy products is expected to increase by

52% and 40%

respectively by 2050, compared to 2012, under a "business as usual" scenario [14].



Demand for aquatic animal products is projected to rise by at least

32%

by 2030 compared to 2021 [1].

Healthy farm animals have a lower environmental footprint

Animal farming is sometimes perceived as simply the exploitation of land and water resources, using more and more land to grow feed for animals that could be better used to grow crops for people or to provide habitat for wildlife. Intensive livestock farming and its environmental impacts, such as the release of nitrates and deforestation to expand pasture or crops for animal feed are of particular concern. Here too, improved animal health can play a role. While many factors such as feed quality and genetics influence productivity levels, animal diseases can also reduce productivity and thus increase the resources needed to attain a given yield: more animals are raised to achieve the same output, which ultimately uses more land and water, produces more waste and emits more greenhouse gases, contributing to climate change.

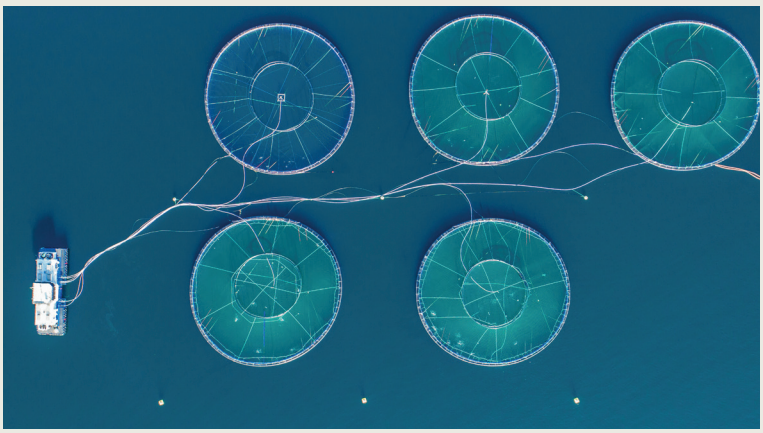
Much of the land used for livestock grazing cannot be used directly for crop production. Of the 2 billion hectares of grassland currently used by cattle, 1.3 billion hectares cannot be converted due to various limiting factors [15], such as steep terrain or marginal soil depth. The optimal use of this land is therefore to raise food animals, particularly ruminants such as cattle, buffalo, sheep, and goats.

Diseases in farmed animals can also affect the wider ecosystem and wildlife, including some protected species. In 2017, an outbreak of peste des petits ruminants in Mongolia spilled over into Saiga antelopes, killing more than 10% of this rare and critically endangered species. More recently, in 2023, avian influenza reached Antarctica for the first time, causing mass die-offs in seals and raising fears for the conservation of isolated penguin populations that had never been exposed.

On a positive note, animal husbandry can help maintain soil health and fertility, seed dispersal and a wide range of other important ecosystem services in dryland and mountain areas, which cover more than 40% of the world's land surface and are unsuitable for crop production. In these harsh environments, animal farming is often the only way to sustainably convert natural resources into food, fibre, and work power for local communities.

While the environmental and climate change impacts of animal farming are widely discussed and communicated, environmental degradation and climate change also affect the health of farmed animals, as well as the distribution and prevalence of both terrestrial and aquatic diseases, due to rising air and water temperatures. In this context, healthy animals are often more resilient to climate-related stressors and diseases.

Improving farmers' access to animal health services and knowledge of best husbandry and animal health practices improves the sustainability of farming systems and optimises feed and resource management, thus limiting the environmental footprint of animal farming. Climate-smart farming systems based on healthy and well-managed animals can help mitigate the effects of climate change and adapt to subsequent changes.



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In the aquatic setting, environmental sustainability includes the potential for pathogen exchange between wild and farmed animals. Although pathogens are often introduced to farms through exposure to wild populations, farming conditions can increase infection pressure and pose risks to local wild populations. Reducing the likelihood of exposure to wild fish pathogens through bioexclusion comes at an environmental cost. The increased use of water resources for such containment must be balanced against the reduced exposure to pathogens.



Agriculture is responsible for **10-12%** of greenhouse gas emissions

with meat, poultry and dairy production accounting for **75%** of that [16]

CASE STUDY

Improved animal health and associated greenhouse gas emissions

A simulation based on livestock data for cattle herds in the Sahel countries showed that a small improvement in animal health could reduce the average annual mortality rate for calves to 15% (instead of 20%) and for adult cattle to 5% (instead of 7%), resulting in a 23% increase in the number of animals reared. For the same amount of meat produced, this would also result in a 17% reduction in methane gas emissions from the herds studied [17].

Healthy farm animals provide socio-cultural benefits and contribute to human and animal well-being

In some communities, animal husbandry constitutes traditional knowledge and practices that lie at the heart of culture and identity. These populations, particularly Indigenous Peoples and other long-settled communities of farmers, pastoralists, or fishers, possess a deep ecological understanding of nature [18], or traditional ecological knowledge (TEK), that has been forged over thousands of years. Their herd management practices are compatible with the sustainable use of dryland and mountain areas and have significant conservation benefits, in particular the prevention of under- and overgrazing and the targeted removal of pasture weeds, litter, encroaching shrubs, tall competing plants, and invasive alien species [19]. However, these practices and the transmission of this knowledge are under serious threat from globalisation, rapid urbanisation and the expansion of agricultural land and are gradually disappearing. Their continuation is also threatened in part by changing animal disease patterns and lack of access to relevant animal health services and infrastructure, which are key to the sustainable management of herd health.

Animal disease epidemics can affect all types of farming systems and their prevention is essential to reduce the need for sometimes unavoidable drastic control measures, such as mass culling, which can have devastating animal welfare, environmental, psychological and economic consequences. In some situations, early detection and intervention avoids the biocontainment issues associated with larger numbers of sick or dead animals – a particular challenge in containing the spread of pathogens in aquatic environments. Indeed, the issue of animal welfare [2] needs to be better integrated into farming systems and consumers are increasingly concerned about the conditions in which animals are raised, from farm to slaughter.

Keeping farm animals healthy helps to preserve ancestral practices and the continuation of traditional ceremonies. Caring for their welfare increases public confidence and promotes a positive image of the farming sector.

CASE STUDY

Rinderpest, a major threat to livestock sustainability until its eradication

For generations, rinderpest caused massive livestock losses and economic disruption on several continents. Decimating entire herds, the fast-spreading disease led to famine in pastoral communities in Africa and hampered agricultural development in Asia, with livestock-dependent households bearing the brunt of its impact on food security and livelihoods. For subsistence farmers, the loss of their oxen for ploughing made it impossible to prepare their fields for planting, and they too starved. It was also a major impediment to livestock trade and a threat to wildlife [20].

The 1920 outbreak in Belgium gave new impetus to joint action to control this cattle plague. Its huge economic and social impact led to the creation of WOAH, whose efforts and collaboration with international partners paved the way for the complete eradication of rinderpest. The last case was reported in 2001. This remarkable achievement demonstrates how effective disease control measures, including mass vaccination campaigns, can support the sustainability of the livestock sector and how **animal health professionals contribute to supporting animal resources and reducing poverty and hunger**.

WOAH'S ACTION

Supporting sustainable livestock and aquaculture transformation

Today, animal farming faces a wide range of challenges, as diverse as the many husbandry and aquaculture systems and the multitude of geographical contexts that exist around the world. The challenges that large, intensive farming systems need to overcome in temperate climates differ in many ways from those faced by smallholders in low- and middle-income countries. But some of them are common: the threat of animal disease and animal welfare [2] considerations set against economic constraints.

Animal health and welfare are cornerstones of sustainable animal farming. That is why the World Organisation for Animal Health (WOAH) has been working for many years to improve access to animal health services and to strengthen the links between animal health professionals and farmers. The latter are the key sentinels of animal diseases in the field and the first beneficiaries of Veterinary Services. One of WOAH's aims is to help countries strengthen their animal health systems in peacetime, so that they are better prepared when an animal health event becomes a threat to farming.

To this end, the Organisation fosters international cooperation and promotes the exchange of knowledge, experience and perspectives across sectors, countries and regions in order to find effective solutions to common threats. WOAH also promotes dialogue at national level between its national Delegates and their respective ministries, as well as between Veterinary Services and the various government bodies involved in one way or another in animal farming, including those responsible for the environment, agriculture, health, and the economy.

Among its many initiatives, the Organisation notably convened a global Animal Health Forum during its last General Session in May 2023, which provided an innovative opportunity to discuss and challenge the available strategies for the prevention and control of avian influenza, taking into account different production systems and the constraints of all relevant stakeholders, including the private sector. Such initiatives demonstrate WOAH's ability to challenge its strategic approaches to ensure that they remain relevant and actionable at global and local levels.

WOAH develops comprehensive strategies on a range of topics to support coordinated efforts to address terrestrial and aquatic animal health and welfare issues, including antimicrobial resistance, priority livestock diseases such as peste des petits ruminants, African swine fever and foot and mouth disease. It also proposes training and capacity building activities to facilitate their implementation. Competent, well-equipped and structured animal health services are at the heart of countries' readiness to cope with potential health threats. The veterinary workforce plays a central role in containing animal diseases and in communicating best practices to farmers and other stakeholders in the farming sector.

The Organisation works with international and regional partners, as well as experts in different fields to foster multilateral cooperation within and between countries and sectors. This is key to developing an international regulatory framework that is realistic and adaptable to local contexts. Based on scientific evidence, WOAH international standards aim to facilitate dialogue between countries and ensure the safe rearing and trade of farmed animal and their products, contributing to more resilient husbandry systems that integrate humane and ethical animal treatment.

Veterinary and aquatic health service providers also need to collaborate with other health professionals, under a One Health approach to address zoonotic diseases and other health challenges that arise at the animal-human-environment interface, including those associated with interactions between livestock or farmed aquatic animals and wildlife.

At the farm level, WOAH aims to ensure access to efficient, cost-effective and equitable animal health services and practices that reduce herd mortality and morbidity, particularly in remote areas where the veterinary workforce is limited.



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The veterinary workforce makes a vital contribution to the social well-being of those who depend on animal farming for their livelihoods.

Towards more sustainable animal farming systems

Animal farming is at the centre of several global challenges that will inevitably affect the current practices of a range of stakeholders. Far-reaching and sustainable transformation of the sector is now seen as crucial, not only to improve food security, but also to address the many concerns associated with current methods and to safeguard animal farming for generations to come. The aim is to fundamentally evolve practices and question their relevance rather than respond to recurring challenges on an *ad hoc* basis.

Do we need to raise more food animals to feed the planet, or should we seek to develop alternative farming systems with lower environmental impact and faster growth? How will patterns of disease spread be affected by the transformation of farming systems and current global challenges such as climate change or antimicrobial resistance? There are a number of fundamental questions that need to be assessed, even if they go beyond the principles that have been mastered so far. It should be remembered that the complexity of the changes affecting the world is fraught with uncertainty. There is a need to build farming systems that are resilient to unpredictable events and adaptable to potential disruptions and emergencies, while remaining efficient, nutritionally adequate, environmentally sound and conducive to the welfare of animals and the well-being of communities.

Addressing these issues effectively requires the involvement of multiple sectors, including the animal health sector, and can only be achieved through innovative thinking that brings new solutions. The areas where innovation and alternative animal health practices are needed are many and varied. They include in particular: improved evidence-based disease prevention, access to high quality training, transformative adaptation of current farming models.

Initiating these profound changes towards more sustainable animal farming systems calls for a multifaceted approach involving policies, stakeholder cooperation, and the exchange of knowledge and experience.

While specific policies and strategies will vary between countries and regions, a commitment by decision-makers to improve and invest in animal health and welfare is central to achieving sustainable farming systems.

Governments should become more aware of the changes needed, so that they can support an open dialogue across relevant sectors and ministries, encourage the creation of partnerships at national, regional and global levels, and support effective responses through suitable policies.

In many areas, the creation of Public-Private Partnerships (PPPs) can bring added value both to the public sector in fulfilling its responsibilities more efficiently, and to the private sector by creating the conditions for better, more sustainable business. PPPs have already proven successful in delivering vaccination campaigns or initiatives to combat antimicrobial resistance, for example. Few such partnerships are fully used in the animal health sector. Yet, they can transform the development of more sustainable farming systems, particularly through improved disease prevention and control programmes.

The combined impact of improved animal health and welfare on a more sustainable world extends beyond the livestock and aquaculture sectors. It also has far-reaching positive effects on human health, environmental protection, the economic well-being of communities and several other Sustainable Development Goals (SDGs).

Promoting and investing in animal health and welfare is an integral part of efforts to create more sustainable farming systems. The pursuit of greater productivity only makes sense if these systems respect the conservation of natural resources, the environment and the health and welfare of animals. Veterinary Services are key actors in this field and therefore must have a voice in international platforms on this issue.

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