



Bio Vet Innovator Magazine

Volume 2 (Issue 12) DECEMBER 2025



POPULAR ARTICLE

Animal Welfare: Bridging Animal Care, Economics and Livelihood

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DOI: <https://doi.org/10.5281/zenodo.18158763>

Received: December 29, 2025

Published: December 31, 2025

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Abstract:

Animal welfare is closely interconnected with animal health, productivity, human livelihoods, and economic sustainability. Across diverse production and service systems, including livestock farming, working animals, small ruminant rearing, and captive wildlife management, appropriate welfare practices directly influence performance, longevity, and economic returns. Adequate nutrition, proper housing, humane handling, disease prevention, and behavioural enrichment not only reduce stress, injury, and mortality in animals but also enhance productivity, work efficiency, and product quality. For resource-poor farmers and communities, animals often serve as a primary source of income, food security, and financial resilience, making welfare a critical livelihood issue rather than a purely ethical concern. Improving animal welfare leads to reduced economic losses, increased efficiency, and greater sustainability of animal-based livelihoods. Therefore, animal welfare should be viewed as an integrated approach that bridges ethical responsibility with economic viability and social well-being. Strengthening welfare standards, awareness, and practical implementation is essential for achieving sustainable development and resilient livelihoods dependent on animals.

Introduction:

Animal welfare is not merely an ethical concern but a practical necessity that directly influences animal productivity, human livelihoods, and sustainable development. Across the world, livestock and animals in various roles contribute significantly to the economy, food security, and social wellbeing. Globally, the livestock sector accounts for as much as 40 per cent of the agricultural output, supporting the food and nutrition security of nearly 1.3 billion people, particularly in low- and middle-income countries where rural communities depend on animals for survival. In countries like India, livestock plays a central economic and social role. The livestock sector contributes around 4-5 per cent of the national Gross Domestic Product (GDP) and approximately 25-30 per cent of the agricultural GDP. It also provides employment to nearly 8 to 9 per cent of the population, with millions of small and marginal farmers relying

on animal husbandry for income, food, and security. India alone has one of the largest livestock populations in the world, with over 535 million animals, including cattle, buffaloes, sheep, goats, pigs, and poultry, making it a key player in global dairy, meat, and egg production. Animals provide milk, meat, fibre, draught power, transport, companionship, and essential employment opportunities in both rural and periurban areas. Ensuring good animal welfare practices improves animal health, enhances productivity, reduces economic losses, and supports long-term livelihoods. Poor welfare, on the other hand, can lead to disease, reduced output, and weakened resilience among farming communities. In this article, we explore welfare practices for dairy animals, small ruminants, and working animals, discuss the importance of environmental enrichment for zoo species, and explain how countries are compared globally using tools like the Animal Protection Index.

1. Minimum Welfare Standards and Good Practices for Dairy Animals

Dairy animals such as cattle and buffaloes play a crucial role in food security and rural income. Poor welfare results in low milk yield, reproductive failure, increased disease incidence, and economic loss.

Breeding and Husbandry Practices

Minimum welfare standards require that breeding should not cause pain, fear, or stress. Artificial insemination and natural service must be carried out by trained personnel using hygienic methods. Forced breeding, repeated breeding without adequate recovery, and selection for extreme production traits are welfare concerns.

Good practices include selecting animals with good health, strong legs, disease resistance, and calm temperament. Balanced breeding programmes improve productivity while safeguarding animal welfare.

Nutrition

Proper nutrition is essential for the welfare and productivity of dairy animals. A balanced ration providing energy, protein, minerals, vitamins, and water should be fed according to age and physiological status. Adult dairy animals generally require about 60% roughage and 40% concentrate, along with adequate green fodder, dry fodder, mineral mixture, salt, and continuous access to clean drinking water. Concentrate is usually fed at 1 kg for maintenance plus additional amounts based on milk yield. Feeding should be adjusted for physiological stages: breeding bulls need higher roughage to maintain body condition; pregnant animals require extra concentrate during the last 2–3 months of gestation (“steaming up”); and lactating animals need energy, protein, and mineral-rich diets to support milk production and prevent metabolic disorders. Newborn calf care is vital for long-term productivity. Early colostrum feeding within the first hour of birth, proper navel care, clean bedding, and protection from cold and infections significantly reduce calf mortality and improve future growth and performance.

Housing

Housing is another key determinant of dairy animal welfare. Well-designed housing should allow

animals to express normal postures such as standing, lying, and rising comfortably. In tropical and subtropical regions, animal sheds are ideally oriented in an east–west direction to minimise direct solar radiation and heat stress. Loose housing systems with shaded resting areas, proper ventilation, effective drainage, and non-slippery floors are considered good welfare practices. Clean and comfortable bedding reduces injuries, mastitis, and lameness, thereby improving milk yield and animal comfort.

Healthcare

Healthcare is equally important for maintaining welfare and productivity. Preventive health measures such as regular vaccination and deworming programmes protect animals from infectious and parasitic diseases. Timely vaccination against common diseases like foot and mouth disease, haemorrhagic septicaemia, and black quarter, along with periodic deworming, reduces disease incidence and associated production losses. Sick, injured, or lame animals must receive prompt veterinary treatment, as delayed care leads to pain, suffering, and prolonged recovery. Proper healthcare, including mastitis control, hoof care, and pain management during necessary procedures, not only improves animal welfare but also enhances productive life. Failure to follow proper welfare practices has serious economic consequences. Studies have shown that poor nutrition, inadequate housing, and lack of healthcare can reduce milk production by 20 to 30 % increase calving interval and infertility by up to twenty per cent, and raise disease-related economic losses significantly. Conversely, adoption of good welfare practices improves productivity, reduces treatment costs, enhances reproductive efficiency, and ensures sustainable income for dairy farmers.

2. Welfare Issues and Good Practices in Small Ruminants

Sheep and goats are important livestock for small and marginal farmers due to their low investment needs, adaptability to diverse and harsh environments, and ability to utilize poor-quality feed. They play a major role in food security, poverty alleviation, and rural livelihoods, contributing significantly to meat production and household income, and often serve as a “living bank” during financial emergencies. Despite their importance, the welfare of small ruminants is often neglected. Common welfare challenges include malnutrition during droughts, parasitic infestations, lack of shelter, overcrowding, long-distance migration, predation, and limited veterinary care, leading to substantial productivity losses. Minimum welfare standards require proper housing that is dry, well ventilated, and protective against extreme weather and predators, along with adequate feeding through sufficient grazing, supplementary feed during lean periods, mineral supplementation, and access to clean drinking water. Good breeding, healthcare, and management practices such as avoiding inbreeding, regular vaccination and deworming, hoof trimming, hygienic lambing and kidding, and humane handling are essential to reduce stress, improve survival, and enhance productivity. Ensuring proper welfare of sheep and goats not only improves animal health but also strengthens sustainable livelihoods and income security for resource-poor farmers.

3. Welfare of Working Equines, Camels, Bullocks and Elephants

Working animals are vital for agriculture, transport, tourism, and livelihoods of economically weaker sections. Working animals such as horses, donkeys, camels, bullocks, mules, and elephants remain essential for agriculture, transport, forestry, tourism, and livelihoods of economically weaker communities, especially where mechanisation is limited. Their welfare is closely linked to human livelihoods and local economies. Minimum welfare standards require adequate feed and clean water, proper rest, shelter from extreme weather, well-fitting equipment, avoidance of overwork, and prompt treatment of injuries. Functionally, these animals provide significant draught power: bullocks produce about 0.5–0.75 HP, horses and mules around 0.8–1 HP, camels can carry 200–300 kg for long hours in arid regions, and elephants generate approximately 5–7 HP for heavy work such as logging and forestry.

Load Carrying Guideline

Load carrying is one of the most critical welfare concerns in working animals. Overloading leads to musculoskeletal strain, lameness, exhaustion, heat stress, and premature death. In bullocks, the permissible load depends on body weight, terrain, speed, and climatic conditions, but excessive draught work without rest significantly reduces working efficiency and lifespan. Camels require careful load adjustment based on desert temperatures, humidity, and availability of water, as dehydration and heat stress severely compromise welfare. Elephants are subject to strict load guidelines, particularly in tourism, where excessive weight from saddles and passengers can lead to chronic foot problems, joint disorders, and spinal injuries. Adherence to load limits not only prevents suffering but also extends the productive working life of these animals. Breeding capacity and age management are also important welfare considerations. Working animals should not be put to heavy labour at a very young age. Bullocks are generally trained for work only after 3–4 years of age, once skeletal growth is complete. Horses and mules are similarly introduced to work gradually after maturity to prevent long-term orthopedic problems. Camels reach working maturity later and should not be heavily loaded before 5–6 years of age. Elephants have a very slow reproductive rate, with sexual maturity occurring around 10–15 years and a long gestation period of about 22 months, making each animal extremely valuable from both welfare and conservation perspectives. Special care is essential to maintain welfare in working animals. This includes regular hoof trimming in equines and elephants, foot care in bullocks and camels, adequate nutrition with higher energy diets during working seasons, and routine veterinary health checks. Working animals should be withdrawn from labour during illness, injury, pregnancy, or old age. Evidence shows that poor welfare practices can reduce working efficiency by 20–30 per cent, while good welfare management can extend the working life of animals by several years, thereby increasing lifetime economic returns.

4. Environmental Enrichment and Welfare of Zoo Animals

Zoo animals live in confined, artificial environments that limit natural behaviours, often leading to

stress, boredom, and abnormal behaviours. Environmental enrichment is therefore essential to improve both physical and psychological welfare by reducing stress, preventing stereotypic behaviours, and promoting species-specific activities. Enrichment enhances behavioural diversity, physical fitness, cognitive function, and overall health in captivity. Environmental enrichment includes structural enrichment (climbing structures, shelters, pools), feeding enrichment (puzzle feeders, scattered or hidden food), sensory enrichment (sounds, scents, visual stimuli), social enrichment (appropriate grouping and social contact), and cognitive enrichment (problem-solving tasks and positive reinforcement training). Animal sanctuaries and national parks also contribute to welfare and conservation by providing natural or near-natural environments, especially for rescued or rehabilitated animals. Positive human–animal interactions, particularly through calm handling and positive reinforcement training, reduce fear and stress and improve management and healthcare. Conversely, improper interactions and human–animal conflict can harm welfare and safety, highlighting the need for good enclosure design, enrichment, visitor education, and responsible tourism

5. Comparing Countries on Animal Welfare: The Animal Protection Index

Animal welfare protection differs widely across countries because of variations in legislation, cultural attitudes, economic priorities, and the effectiveness of enforcement systems. To objectively assess and compare these differences, the Animal Protection Index (API) was developed by international animal welfare organisations. The API is a global benchmarking tool designed to evaluate how well governments protect animals through laws, policies, and their implementation. Its main purpose is to bring transparency, encourage accountability, and motivate governments to strengthen animal welfare frameworks rather than merely ranking countries for criticism.

Methodology and Assessment Criteria

The Animal Protection Index evaluates countries using a structured and evidence-based methodology. One of the most important criteria is the legal recognition of animal sentience, which refers to whether animals are formally recognised as beings capable of feeling pain, fear, and suffering. Recognition of sentience is considered the ethical foundation of animal welfare legislation. The API also assesses the level of protection provided to different categories of animals, including farm animals, companion animals, laboratory animals, and wild animals. This includes evaluation of housing, feeding, transport, slaughter, and protection from cruelty and neglect. Regulation of animal use in research, education, entertainment, tourism, and cultural practices is another important component, with attention to pain reduction and promotion of alternatives. A major emphasis is placed on government responsibility and enforcement, including the presence of dedicated animal welfare authorities, clarity of legal provisions, penalties for violations, and actual implementation on the ground. Countries are then graded into performance categories, allowing international comparison and advocacy for improved animal

welfare standards.

India's Position in the Animal Protection Index

India occupies a middle to lower-middle position in the Animal Protection Index when compared globally. India has a long-standing legal framework for animal protection, most notably the Prevention of Cruelty to Animals Act, 1960, and constitutional recognition under Article 51A(g), which places a fundamental duty on citizens to show compassion towards living creatures. Judicial interpretations by the Supreme Court of India have also acknowledged animal sentience in landmark judgments. However, despite these strengths, India's API score is affected by weak enforcement, lack of species-specific welfare standards, and limited implementation capacity. While laws exist on paper, practical challenges such as inadequate infrastructure, shortage of trained personnel, and low public awareness reduce their effectiveness. Farm animal welfare, transport conditions, and regulation of animals used in entertainment and informal labour sectors remain areas of concern.

Interpretation of India's API Ranking

India's position in the API reflects a strong ethical and legal intent but moderate practical outcomes. The country demonstrates cultural respect for animals and constitutional commitment, yet struggles with enforcement across a vast and diverse livestock population. This gap between legislation and implementation explains why India does not rank among the highest-performing countries despite having early animal protection laws. From a positive perspective, India's ranking also indicates significant scope for improvement. Strengthening enforcement mechanisms, developing clear welfare standards for farm and working animals, improving veterinary outreach, and enhancing public awareness can substantially improve India's API performance. Improvements in animal welfare would also bring added benefits such as better livestock productivity, reduced disease burden, improved food safety, and stronger international trade credibility.

Summary and Conclusion

Animal welfare is no longer limited to ethical responsibility alone; it has emerged as a critical link connecting animal health, economic productivity, and sustainable human livelihoods. Across livestock production systems, working animal management, wildlife conservation, and captive animal care, good welfare practices consistently lead to healthier animals, improved productivity, reduced economic losses, and enhanced livelihood security for millions of people. When animals are provided with appropriate housing, nutrition, healthcare, humane handling, and opportunities to express natural behaviours, both animals and humans benefit through increased efficiency, resilience, and long-term sustainability. The comparison of countries through the Animal Protection Index (API) further highlights that animal welfare is a measurable and policy-driven component of national development. Countries with strong welfare legislation, recognition of animal sentience, and effective enforcement systems not only achieve better

welfare outcomes but also demonstrate improvements in food safety, public health, trade opportunities, and social trust. Conversely, weak implementation of welfare standards often results in productivity losses, disease risks, and compromised livelihoods, particularly in agriculture and livestock-dependent economies. India's position in the Animal Protection Index reflects this connection clearly. While the country has a strong ethical and constitutional foundation for animal protection, gaps in implementation underline the need to strengthen welfare practices at the ground level. Addressing these gaps offers a dual advantage improving the quality of life of animals while simultaneously supporting rural incomes, employment, and economic stability. Thus, animal welfare truly acts as a bridge between animal care, economics, and livelihoods. The Animal Protection Index serves as an important tool to evaluate this bridge globally, encouraging nations to move from intent to action. Strengthening animal welfare is not only an investment in animals but also an investment in sustainable development, human well-being, and a more compassionate and resilient society.