

# Drawing the Line: Animal Agriculture, Animal Welfare, and the Need to Feed the World

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The shift from traditional production systems toward intensive animal agriculture has facilitated impressive increases in production efficiency, improvements in animal health, and a decrease in the carbon footprint of animal production [1,2]. This evolution has also dramatically transformed the environments in which food animals are reared which by design often suppress natural behaviors of production animals [3,4]. Concomitant with this transformation has been the emergence of concepts such as the One Health Initiative and a growing public attention directed toward production practices utilized by the livestock and fish farming industries.

The One Health concept was borne out of an acknowledgement that human, animal (both domestic and wild) and environmental health is inextricably linked [5]. Thus, the sustainability of any endeavor necessitates a multidisciplinary view of the systems affected and a balanced impact of the endeavor on humans, animals and the environment that does not benefit one element to the significant detriment of the others [6]. Animal scientists and veterinarians play important roles in the One Health concept through research and educational endeavors that allow the prevention or better treatment of disease, improvements in production practices, and a more benevolent impact of animal production upon the environment. But despite obvious successes on these fronts, is intensive animal agriculture at odds with One Health concept?

The National Research Council Committee on Twenty-First Century Systems Agriculture has defined agricultural sustainability in terms of four goals that can be summarized as 1) meeting the human need for food and biofuels, 2) enhancing environmental quality, 3) sustaining the economic viability of agriculture, and 4) improving the quality of life for those involved in farming and their surrounding communities [7]. In that the interaction between humans and the environment are positively linked, this definition of sustainability is largely consistent with the goals of the One Health Initiative. However, a declarative position on animal welfare is noticeably absent from the NRC goals despite animal welfare issues becoming an increasingly significant concern when considering the sustainability of agricultural endeavors. The public is becoming more aware of current production practices through the media and advertising campaigns. A significant portion of consumers will not support products that they associate with immoral actions and often reject the notion that greater production efficiency justifies perceived increases in animal suffering [4].

The Farm Animal Welfare Council (FAWC) has addressed this aspect of animal production by explicitly defining animal welfare in terms of five freedoms listed below from their website [8]:

- 1. Freedom from Hunger and Thirst** - by ready access to fresh water and a diet to maintain full health and vigour.
- 2. Freedom from Discomfort** - by providing an appropriate environment including shelter and a comfortable resting area.
- 3. Freedom from Pain, Injury or Disease** - by prevention or rapid diagnosis and treatment.
- 4. Freedom to Express Normal Behaviour** - by providing sufficient

space, proper facilities and company of the animal's own kind.

**5. Freedom from Fear and Distress** - by ensuring conditions and treatment which avoid mental suffering.

The FAWC freedoms 1, 2, 3 and 5 are largely synergistic with the goals of intensive animal production as providing these freedoms tends to be associated with better animal performance. Often, industrialized agricultural settings can be quantitatively shown to exhibit superior animal health status, production efficiency and decreased incidences of injury compared to traditional systems where the rearing setting allows animals to display natural behaviors toward their environment and each other [2].

Generally, producers have proven to be well-intentioned stewards of resources. But FAWC-freedom #4 reveals an important discord in the way animal welfare is viewed by the food industry and by animal advocates. Production environments that maximize production efficiency by decreasing space and handling requirements tend to eliminate opportunity for animals to express natural behaviors. Thus, though intensive agriculture can be associated with improved health status and growth rates, the five freedoms concept implies these benefits come at the expense of increased suffering through the suppression of the individual animal's nature. It is this concept that also often resonates with consumers as illustrated by growing public opposition to the cage confinement of laying hens, a strategy that greatly increases flock production efficiency at the expense of severely suppressing the natural behavior of the hen.

The world population is projected to exceed 9 billion souls by the year 2050 with demand for agricultural products growing 1.5% annually [9]. In response to this population crisis, the United Nation's Food and Agriculture Organization projects that seventy-percent of the world's additional food needs will have to be satisfied by improving existing production methods and by developing new technologies [9]. If such projections prove accurate, there will be even greater tension between the need to adopt practices that increase food production and concerns for animal welfare.

Clearly implicit to intensive agriculture is the belief that considerable limitation of an animal's individual freedom is justified by the need to meet the growing demand for an inexpensive and safe supply of meat, milk and eggs. It is equally clear that public consensus is

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not always in agreement with this view. Given that human, animal and environmental health is inextricably linked, where should society draw the line? To what extent does an animal need to express its nature to be considered free of suffering? To what extent do we owe it to an animal to satisfy this condition? Does the answer to this question change if it's a matter of preventing famine rather than merely maximizing profit? Do the future threat of famine and the potential to alleviate this threat through continued pursuit of technological advances change where the line is drawn when weighed against a tangible negative impact on animal welfare in the present? Is the opportunity for an animal to exhibit all natural behaviors even a requisite for achieving a state consistent with acceptable animal welfare?

Adopting the appropriate balance between the limitation of an animal's individual freedom to manifest its nature and the human need to eat and thrive is a critical issue. Animal scientists and veterinarians need to carefully consider the proper balance between these often competing ideals so that, if appropriate, a clear, rational, ethical argument justifying common industry practices can be articulated to the public. Technical advances that continue to improve production efficiency need to be pursued as the world population grows but scientists also need to evaluate the impact of limiting a set of behaviors upon the state of the animal so that fact-based decisions can be made about animal welfare and sound policy can be adopted. In the face

of a burgeoning world population and the potential for famine and widespread human suffering, it is imperative that animal scientists, veterinarians, and producers do not lose this argument.

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