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# Recognising the role of the livestock sector in human health and nutrition

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## Abstract



Global livestock narratives have hit an interesting, and increasingly conflicting, point in recent history, with the often-lauded 'livestock revolution' accompanied by increasing 'anti-livestock' rhetoric driven largely by environmental concerns and calls to decrease, and in some cases halt, global production and consumption of animal-source foods altogether. However, while the world's wealthier countries have ready access to a broad and diverse range of healthy plant-based diet alternatives, animal-source foods remain integral to the health and economies of an estimated 70% of the world's rural poor. Moreover, existing opportunities for smallholder and pastoralist livestock-keepers to contribute to improved human health and nutrition are often overlooked by 'blanket' narratives that fail to appreciate the distinct differences between commercial and smallholder/pastoralist livestock systems. Smallholder livestock producers have opportunities to directly contribute to improved human health and nutrition through improving the quality, sufficiency and safety of animal-source foods. Livestock-keeping also has indirect benefits: for example, livestock-derived income can facilitate better and more diverse food choices, and promote health-seeking behaviour and illness-prevention measures. Good governance of smallholder livestock sectors that promotes the social, economic and nutritional benefits of livestock-keeping, while minimising environmental, welfare and public health impacts of livestock intensification, is a balancing act; but one that has never been more important as the world's population continues to grow.

The focus of my work in ACIAR's Livestock Systems Programme is 'One Health'. One Health explores the increasingly complex issues at the human–animal–ecosystems interface. I doubt that anyone in this room would dispute there is a linkage between livestock and human health and nutrition. However, will that also be so in the future?

Understanding trends, and ensuring we are investing in systems and technologies that will still be relevant for the next 20 years, and beyond, is an important part of what we do at ACIAR. At first glance, livestock systems seem a pretty good bet to remain relevant. Demand for animal-source foods is expected to rise by 70% by 2050, to feed an estimated global population of around 9.6 billion. However, we cannot deny that global livestock narratives are moving towards an increasingly interesting and important 'crossroads', and the outcomes will continue to shape human and animal nutrition for the foreseeable future.

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This paper has been prepared from a transcript and the illustrative slides of the presentation.



**Figure 1.** Direct roles of livestock in human health and nutrition. (Image ©FAO/Karel Prinsloo, at Qardho, Somalia, at a displaced-persons' camp. The girl holds a mug of goat's milk.)

### Direct contributions to human health and nutrition

For millennia, livestock have directly affected human health and nutrition, and continue to do so (Figure 1). For instance, dietary change, around 2.3 million years ago, from plant-based foods to partially animal-source foods, was the catalyst for humans to develop larger brains, which led to different physical outcomes such as bipedal motion. Domestication of plants and animals led to more stable food supplies, which encouraged communities to become more sedentary than nomadic and changed societal development. Also, authors including Jarred Diamond have noted that close contact with livestock helped human immune systems develop and change, in response to zoonotic disease.

Currently, livestock provide 14% of the total calories and one-third of the global protein consumed on the planet. Animal-source foods also help combat micronutrient deficiency, or 'hidden hunger', by providing people with essential vitamins and minerals in an efficient way: I have been told that you would have to eat the equivalent of 17 bananas to get the same intake of vitamin A contained in 100 g of sardines. Animal-source foods, particularly eggs and milk, are a source of dietary diversity and supplement, and during times of grain shortage and famine animal-source foods help cover the nutritional gap. They have an important role in overall food security and our humanitarian response to such situations.

Animals are also a source of human disease: over 60% of the diseases that we can get as humans come from animals; the types of pathogens and the risk pathways differ depending on the species and type of production system.

### Indirect contributions to human health and nutrition

Livestock production also has a number of multiplier effects (Figure 2), particularly in countries where incomes are low or middling, where ACIAR's work is focused. These effects are often much harder to define and quantify.

The obvious example is that the production and sale of livestock generate household income which in theory, and often in reality, can result in improved choice and diversity of diet. There can be negative as well as positive consequences.

**Livestock make indirect contributions to health and nutrition**

- Income generation – improved choice and diversity
- Animal traction and manure boost crop productivity
- Financial instruments – alternative for savings storage
- Social status – access to services, resources, increased risk factors
- Gender differences in access to – and impact of – livestock resources

**Figure 2.** Indirect roles of livestock in human health and nutrition.

Livestock are also vital for pulling equipment, carrying goods such as water and trade items, and for producing manure: very important roles in sub-Saharan Africa. Manure helps boost crop productivity and hence food security, and nutrition is an important component of that. And livestock are a well-documented 'bank'; animals can be rapidly converted into cash which improves household resilience to unexpected shocks such as sick family members. Livestock investment and ownership also often lifts a smallholder's social status. There are numerous benefits to this in terms of social security and access to natural resources.

There can also be some negative benefits in terms of social standing; for example, outbreaks of some foodborne parasites in South East Asia have been linked to attendance at wedding and funeral celebrations. Also there are negative gender aspects of livestock's impacts to health and nutrition which must be acknowledged; for example, women are often disproportionately impacted by zoonotic diseases, through their role in husbandry and the handling of raw meat during food preparation.

In summary, there are many positives to the production and consumption of livestock products; but if the risks are not known or not mitigated then there are also potentially negative consequences to the health of individuals, communities and the broader ecosystems within which animal and humans coexist.

### **Global narratives**

In terms of global livestock narratives, since the turn of the century there have been two main themes. On the one hand, the livestock revolution – the narrative that acknowledges that animal-source foods are a means to meeting the growing nutrition requirements for a growing global population, particularly in many emerging and middle income economies.

On the other hand, there are very real and valid narratives around negative impacts to health, nutrition and the environment from consuming animal-source foods. In the more extreme cases these are accompanied by calls for the world to go vegan, or to end animal husbandry altogether and instead rely on cheap sources of artificial meat which is increasingly available.

However, you cannot compare average western meat consumption – around 100 kg/head/year – and meat consumption in sub-Saharan Africa which is less than 10% of western levels. The choices these people face are not equivalent.

### Need for balanced communication

Having outlined the background, my objective now in this presentation is to promote balanced and inclusive problem statements about livestock production.

Balanced statements need to make it clear that different livestock production systems offer different effects, risks and opportunities, depending on the livestock species and on the system in which these species are produced.

Naturally, balanced statements will also acknowledge the multiplier effects of livestock production, and the risk to humans, animals and the broader environment and, very important, the opportunities to mitigate these risks.

Contrast the two images in Figure 3: on the left, sheep in a laneway in Tasmania; on the right, one of our small ruminant projects in Pakistan, in Sindh Province. The differences are stark, but look beyond the obvious socioeconomic or environmental differences and focus on the different production systems, namely the commercial sheep station versus a smallholder sheep and goat enterprise. It is important to be thinking about the broader challenges and the opportunities that each of these different types of production systems presents, and what each context contributes to human health and nutrition.

Looking at it from a livestock systems perspective, there are several overarching criteria that define each production type. In general, commercial systems are characterised by high inputs, high outputs, large land size, large numbers of animals, linkages into formal market chains and, more often than not, some form of paid labour – at least during certain times of the year. Smallholder systems, on the other hand, tend to be low-input low-output, exist on relatively small land sizes and have fewer animals. More often than not they supply informal market chains, and they use free (often family) labour. Both systems are of extreme importance to the overall health and food security of the populations they are feeding, but we cannot deny these systems are different and will therefore require different sets of solutions to mitigate the potential risks of each.



**Figure 3.** Contrasting production systems. *Left:* sheep in a large-scale operation in Tasmania, Australia (*from Google images*); *right:* sheep, goats and cattle in a smallholding in Sindh Province, Pakistan (*photo: Rebecca Doyle, the University of Melbourne*).

We need to consider what happens if problem statements are *not* inclusive and do *not* recognise that these are two distinct but interrelated global livestock production systems.

What happens when we do *not* acknowledge that (i) the two systems may pose *different* risks to the health of humans, animals and the broader ecosystems in which they coexist, and that (ii) each system may require a different set of solutions?

Importantly, what happens if we do not acknowledge the role of livestock in the broader social, economic and cultural fabrics of our various societies, and that in many cases those roles extend far beyond contributing meat and milk to the country's GDP?

### **Consequences**

There are consequences to imbalanced and non-exclusive problem statements. According to the Global Livestock Advocacy for Development initiative (GLAD), funded by the Bill and Melinda Gates Foundation, the livestock sector receives no more than 2.5% of official development assistance (ODA) for agriculture from major donor countries, despite contributing up to 40% of agricultural GDP – and 80% of total assets to rural farmers in East Africa.

The International Livestock Research Institute (ILRI) claims that a so-called 'increasingly anti-livestock rhetoric', highlighting the valid but negative aspects of livestock production, is starting to exert undue influence on global livestock investments and policies. From that, according to ILRI, people are beginning to question why aid agencies should put money into livestock if the animals are so bad for the environment and human health.

The obvious risk from this movement is its potential negative impact on the 900 million global poor, half of whom depend directly on livestock for their health and livelihoods.

It is up to those of us working in international agricultural development to ensure that our problem statements and our research questions – and therefore our solutions – are inclusive of both the smallholders and the pastoralists who provide a large proportion of the world's animal-source foods, and who depend both directly and indirectly on livestock for their health, nutrition and broader livelihoods.


### **What ACIAR is doing to negate those potential consequences**

ACIAR's Livestock Systems Research Programme takes this responsibility seriously (Figure 4), with a focus on smallholder and pasture systems, anchored around six key themes. One of the themes is

- to better understand the linkages and the contributions of livestock to human health, nutrition and wellbeing, particularly in relation to some of the multiplier or indirect effects mentioned above.

We also emphasise holistic approaches, being acutely aware that intervention in one part of the system is very likely to have impacts on other parts of the system

**ACIAR Livestock Systems Programme:**  
**“Livestock research for people, animals and the environment”**



- **Holistic view of livestock systems** - animal welfare, health, production, human health and environmental impacts
- Focus is on **smallholder** crop-livestock and pastoralist systems
- **Six thematic areas:**
  - 6 - Understand and promote the contribution of livestock to human nutrition, health and wellbeing

**“Research that promotes a more inclusive understanding of livestock’s contribution to women, men and their families will assist the global debate”**

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Figure 4. ACIAR’s Livestock Systems Programme themes. (Image: ACIAR website.)

– such as the environment or human health. Impacts may be either positive or negative, and ACIAR is interested in how these things can be addressed.

Ensuring that problem statements are inclusive – that they promote social, economic and nutritional benefits of livestock keeping, to women, men and their families while minimising environmental, animal welfare and public health impacts of livestock production – is a crucial balancing act.

This is a conversation we need to have, and one that has never been more important.

## Reference

ACIAR Livestock Systems Programme:

<https://www.aciar.gov.au/programarea/Livestock%2520Production%2520Systems>

Anna is the Research Programme Manager of Livestock Systems at ACIAR. Since graduating with a veterinary degree from The University of Melbourne in 2002, the majority of Anna’s career has been spent working in the veterinary public health and livestock development sectors, including 10 years researching zoonotic Neglected Tropical Disease control in sub-Saharan Africa and South East Asia. Anna completed a PhD in political science (public health policy) at the University of Edinburgh’s Centre for African Studies in 2012, and has worked in various project management and technical advisory roles for international NGOs, the Australian Government, the World Health Organization and the University of Edinburgh. Anna holds an adjunct teaching position at the University of Edinburgh’s Global Health Academy, and is the One Health Adviser to the Australian Indo-Pacific Centre for Health Security.