

A sustainable food system: what role do animals play?

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The challenge to produce enough nutritious food for a growing and more prosperous population in a sustainable way is currently broadly acknowledged. It is now also largely undisputed that the animal sector uses a great deal of our natural resources, and contributes significantly to environmental issues. What role, if any, animals do play in an environmentally sustainable food system, however, is heavily debated. My aim is to show different narratives about the future role of animals in an environmentally sustainable food system, as outlined in the scientific literature, and to discuss underlying arguments, values and beliefs. One dominant narrative is “we need to produce more animal-source food (ASF) with less environmental impact”. Research that addresses this so-called **production narrative** explores opportunities to reduce the environmental impact per kg of ASF produced, and contributes to what is currently known as sustainable intensification of animal production. Solutions suggest, for example, a transition from grass-based to mixed feed-crop livestock systems, and breeding of high yielding animals. Another dominant narrative is “we need to consume less or even no ASF, or ASF with a lower environmental impact”. Research that addresses this so-called **consumption-narrative** focuses on changing human consumption patterns by reducing or avoiding consumption of ASF, or shifting from ASF with a high impact, such as beef, to ASF with a lower impact, such as chicken, fish or insects. Solutions presented suggest that shifting to a vegan diet has most potential to save the planet. Current studies that address the production or consumption narrative, however, do not acknowledge the complexity of the food system, such as the competition for natural resources between humans and animals or the interlinked production of, for example, wheat grain and straw, or milk and meat. A relatively new narrative is “animals are essential for resource-efficient food production, as they can convert biomass inedible for humans into nutritious ASF”. Research that addresses this so-called **circular narrative** shows that natural resources are used most efficiently if animals are fed on biomass inedible for humans mainly, also referred to as leftovers. The amount of ASF that can be obtained from leftovers, however, depends on their type and availability (e.g. by-products of food industry, food waste, crop residues, grass from marginal land), and their utilization potential by animals. The conclusion that consuming a small amount of ASF is most efficient from a natural resource use perspective contradicts the conclusion from the consumption-narrative that a vegan diet is most resource efficient. Similarly, according to the circular narrative, low-yielding ruminants grazing marginal land can be more resource-use efficient than high-yielding ruminants fed grain and maize silage (best from the production narrative) or chicken eating grain (best from the consumption narrative). The circular narrative, however, also demonstrates that developed countries have to significantly reduce their consumption of ASF. Understanding that our view on what drives the problem determines our solution is an important first step to move “beyond sustainability”.



Imke J.M. de Boer graduated cum laude from Wageningen University in 1989 and holds a PhD in Animal Sciences from Wageningen University (Animal Breeding and Genetics) since 1994. After her PhD, she joined the Animal Production Systems group, which she is chairing since September 2011. She is a leading expert in the domain of environmental sustainability of animal production systems.