



## RESEARCH BRIEF SUSTAINABILITY

## BEEF RESEARCH

### BOARD-INVITED REVIEW: Quantifying Water Use in Ruminant Production

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#### Abstract

The depletion of water resources, in terms of both quantity and quality, has become a major concern both locally and globally. Ruminants, in particular, are under increased public scrutiny due to their relatively high water use per unit of meat or milk produced. Estimating the water footprint of livestock production is a relatively new field of research for which methods are still evolving. This review describes the approaches used to quantify water use in ruminant production systems as well as the methodological and conceptual issues associated with each approach. Water use estimates for the main products from ruminant production systems are also presented, along with possible management strategies to reduce water use. In the past, quantifying water withdrawal in ruminant production focused on the water demand for drinking or operational purposes. Recently, the recognition of water as a scarce resource has led to the development of several methodologies including water footprint assessment, life cycle assessment, and livestock water productivity to assess water use and its environmental impacts. These methods differ with respect to their target outcome (efficiency or environmental impacts), geographic focus (local or global), description of water sources (green, blue, and gray), handling of water quality concerns, the interpretation of environmental impacts, and the metric by which results are communicated (volumetric units or impact equivalents). Ruminant production is a complex activity where animals are often reared at different sites using a range of resources over their lifetime. Additional water use occurs during slaughter, product processing, and packaging. Estimating water use at the various stages of meat and milk production and communicating those estimates will help producers and other stakeholders identify hotspots and implement strategies to improve water use efficiency. Improvements in ruminant productivity (i.e., BW and milk production) and reproductive efficiency can also reduce the water footprint per unit product. However, given that feed production makes up the majority of water use by ruminants, research and development efforts should focus on this area. More research and clarity are needed to examine the validity of assumptions and possible trade-offs between ruminants' water use and other sustainability indicators.

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