



## Relevant Hypotheses and Statistical Approaches for Investigating Rotational Grazing in a Rangeland Context

Brien E. Norton; Utah State University; Contact Author Email: [brien\\_norton@comcast.net](mailto:brien_norton@comcast.net)

The origins of grazing systems research lie in European ecosystems where farms were relatively small compared to ranch enterprises in rangeland regions of the world. It was reasonable to assume that forage was equally accessible to all livestock in a paddock, and that forage utilisation was evenly or randomly distributed. In this context, grazing was viewed theoretically as a two-dimensional phenomenon across time, and spatial variation in both forage resources and herbivore activity could be safely ignored. The experimental questions of interest revolved around the effects on individual species of frequency and seasonality of defoliation, and data were analyzed on assumptions of normality. Rangeland scientists have tended to maintain this frame of reference, even though the managerial context is vastly different. Livestock grazing on rangelands introduces a suite of key variables whose relevance challenges the primacy of defoliation frequency in the design of grazing systems research. For example, the exploratory behavior of livestock grazing paddocks that may be 100 times the size of their temperate-zone counterparts; the restrictions imposed on grazing distribution by paddock infrastructure; the mix of vegetation and land types within one paddock, and their interactions with topography; and the consequences for dietary preference and range condition when large herds graze for short periods in spatially and ecologically diverse environments. Continuing to study grazing systems in small paddocks will side-step the reality of rangeland management. We need to adapt our research hypotheses and analytical tools to better serve rangeland managers.

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