



## Overview of Indirect Impacts of Predators on Livestock Foraging Behavior

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Sacrificing foraging efficiency to maintain a watchful or vigilant eye on a perceived threat is a tactic commonly utilized by prey species foraging in the presence of predators. However, vigilance is also influenced by social dynamics that transpire within a herd. For example, during an observational field study conducted in a wolf recovery area in Arizona, cows with calves were twice as vigilant as cows without calves ( $P < 0.001$ ). Cows whose calves were killed by predators dramatically increased vigilance (from 3-48%) and decreased foraging rates (from 89-44%) within 3 days after their calves were killed. These behaviors approached baseline levels 10-12 days after the predation event. Vigilance rates of cattle foraging in small groups (<6 cows) were higher ( $P = 0.03$ ) than cattle foraging in larger groups (>6 cows). Prey species also balance conflicting demands for food and safety by reducing foraging rates and time spent in areas with higher predation risk. For example, in a controlled study, wolf stimuli (visual and olfactory) caused cattle to avoid high-quality forage areas, increase vigilance, and reduce foraging rate. Antipredatory behavior was higher in response to wolf stimuli than mountain lion stimuli. Cattle foraging rate and use of high quality forage locations were higher for deer stimuli than controls, suggesting a “comfort response” by cattle in response to foraging near a heterospecific. Furthering our understanding of potential indirect impacts that predators have on foraging behavior and habitat use by domestic animals will improve livestock management in areas where prey and predators coexist.

2009. 62nd Society for Range Management Annual Meeting. Paper No. 16-1.