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Abstract: Evaluating Behavioral Sampling Methods in Cattle Research

Accurate behavioral sampling is essential in livestock research, shaping our understanding of animal welfare and management. This study examines the effectiveness of focal sampling versus scan sampling in cattle behavior research, specifically exploring whether scan sampling at 15-minute intervals sufficiently captures group dynamics or if focal sampling provides a more comprehensive representation of behavioral variability.

Focal sampling involves continuous observation of a single cow, allowing for the detailed documentation of all behaviors, including rare or short-duration actions such as aggression, grooming, or exploratory movements. While this method captures individual variability, it may not accurately reflect group-wide behavioral patterns.

Conversely, scan sampling records the entire herd's behavior at predetermined intervals, such as every 15 minutes. This method provides a broader picture of collective behaviors like feeding, resting, and movement but risks missing brief or infrequent actions that occur between observations. Research on pigs during transport has shown that while lying behavior can be effectively recorded at 15-minute intervals, more dynamic behaviors, such as aggression, require more frequent sampling.

As a student researcher at Tennessee State University, I actively participated in this study by collecting and analyzing behavioral data from cattle observations. My responsibilities included recording behaviors using both focal and scan sampling techniques, comparing their effectiveness, and identifying potential data gaps. This hands-on experience provided me with a deeper understanding of behavioral research methodologies and their real-world applications in livestock management.

Our findings suggest that scan sampling, while efficient for capturing broad behavioral trends, may overlook rare but significant behaviors. Meanwhile, focal sampling, though detailed, may not accurately represent herd-wide behavior due to individual differences. To address these limitations, a hybrid approach combining focal and scan sampling or increasing scan frequency could improve data accuracy.

Ultimately, selecting an appropriate sampling method depends on research objectives. This study highlights the trade-offs between focal and scan sampling, emphasizing the need for methodological precision in livestock behavior research to enhance animal welfare and improve management strategies.