

SIU Foundation Grant Application

Establishing a silage lab at Southern Illinois University, Carbondale

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Abstract (maximum 250 words)

Silages constitute the principal forage source for feedlot operations in North America. Therefore, silage fermentation research is critical in understanding the process, which provides vital information on improving the ensiling process for excellent silage quality. However, studying the ensiling fermentation using commercial-scale silos is challenging due to the lack of replicate silos, the requirement for continuous sampling, and variable silo management practices. Therefore, mini silos are an innovative approach to studying ensiling fermentation. The use of mini silos facilitates silage fermentation studies, even from small-scale experimental plots. Results of mini silo studies can be correlated to that from large-scale commercial silos when the ensiling conditions are kept identical. Parameters such as silage pH, fermentation products, microbial counts, and nutrient composition can be measured at each sampling using mini silos. These observations provide adequate information on the nature of silage fermentation and the means to improve the silage quality and forage value. Establishing a silage lab at Southern Illinois University, Carbondale would allow undergraduate and graduate students to have hands-on research experience on silage fermentation studies. There is also potential for research and innovation in silage improvement, identifying and characterizing novel silage microorganisms using metagenomic next-generation sequencing and data analysis. The silage lab will also allow graduate students to collaborate with industry partners to develop novel silage inoculants to improve silage fermentation and aerobic stability. Exposure to silage research, acquiring laboratory skills, and collaborative research opportunities can lead to student leadership, innovation, and student success.