Project Information:

Project Title: Evaluating the use of injectable vitamin E and C to control for parasites in sheep production

Recipient Organization Name: University of Hawaii

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Project Report

Annual Report Type: Final Report

Reporting Period Start Date: 6/1/2023 End Date: 6/30/2024

Performance Narrative:

Management of parasites is often a problem for many Hawaii sheep ranches. Anthelmintic resistant parasites in sheep are increasing worldwide creating a need for better understanding and improvements of parasite management in sheep operations. Therefore, there are three objectives for the research currently being completed. Objective 1: Determine the effect of injectable vitamin E and/or C on parasite load of newly weaned lambs. Objective 2: Determine the effects of injectable vitamin E and/or C on health and performance of newly weaned lambs. Objective 3: Distribute the knowledge gained through the research with Hawai'i small ruminant producers on parasite management strategies.

Activities Performed

The trial was completed. Hairsheep lambs were assigned to one of 5 treatments: (1) Control (CON), (2) Commercial Dewormer (DW), (3) Vitamin E Only (VE), (4) Vitamin C Only (VC), and (5) Vitamin E and C (EC). FAMACHA score, fecal egg count (FEC), packed cell volume (PCV), weights, and serum were collected on days 0, 14, 28, 56, and 77 of the trial. Serum was used to analyze circulating vitamin E and C, total antioxidant activity, aspartate aminotransferase (AST), and alanine transaminase (ALT). Following completion of the trial, the information was shared at two University of Hawaii departmental seminars, a small ruminant webinar hosted by the University of Hawaii Cooperative Extension program, a podcast hosted by the University of Hawaii Cooperative Extension, and presented at the American Society of Animal Science annual meeting in Calgary, Canada.

Accomplishments

The purpose of this project was to identify potential alternatives to commercially used dewormers. FAMACHA score was improved ($p < 0.05$) in both DW and VE lambs. There was no difference ($p = 0.98$) between VE and DW lambs during the trial. Strongyle eggs per gram (EPG) tended to be impacted ($p = 0.06$) by treatment, with both DW and EC lambs having less strongyle EPG than CON lambs during the course of the trial. There was no difference ($p = 0.97$) between DW and EC lambs in regards to EPG during the trial. DW lambs also tended to have an increased ($p = 0.09$) pack cell volume compared to CON lambs. Treatment had no impact ($p > 0.89$) on serum antioxidant activity, AST, or ALT in the lambs during the course of trial.

This research suggests that vitamin E containing treatments may work similarly to commercial dewormers to decrease FEC in hairsheep. However, the results may be based on dewormer used and resistance to dewormers. This study utilized a dewormer that had historically not been used in the sheep flock. Future research is warranted to look at dosage of vitamin E and delivery method (oral vs. injectable) to assist with controlling gastrointestinal parasites in hairsheep lambs.

Estimate the Total Percentage (%) of work Completed on the Project 100%

#	Accomplishment/Activity	Relevance to Objective
	The live animal portion of the project has been completed. Additionally, all data (including blood metabolites, fecal egg count, performance, etc)	Relevant to objective 1 and 2
	Information was shared in a small ruminant webinar and in a podcast hosted by the University of Hawaii Extension. Both were recorded for future viewing	Relevant to Objective 3
	The data was presented at the American Society of Animal Science annual meeting in Calgary.	Relevant to Objective 3

Challenges and Developments

#	Challenge or Development	Corrective Action or Project Change
	No Challenges to report	

Outcome and Indicator Results to Date

#	Outcome/Indicator	Quantifiable Results
	FAMACHA Scores	Decreased in dewormed and vitamin E lambs
	Strongyle EPG	Decreased in dewormed and vitamin E and C lambs.
	University of Hawaii Livestock Extension Webinar	15 people attended the webinar.

Upcoming Activities

#	Activities	Anticipated Completion
1	Submit manuscript for publication. Planned submission is Small Ruminant Research	October 2024