

## **Final Report Review**

**Project Title:** Investigation of injectable vitamin C before and after transit on feedlot performance, inflammation, and oxidative stress in beef steers.

**Principal Investigator:** Dr. Stephanie Hansen

**Co-investigator:** Erin Deters

**Primary Institution:** Iowa State University

**Award Amount:** \$65,532

**Reviewer:** Dr. James Russell

**Date:** August 20, 2019

### **Project Objectives:**

- To determine the effects of an 18-hr transit event on Vitamin C status, tissue breakdown, inflammation, and oxidative stress in beef steers.
- To assess the effects of injectable Vitamin C given before or after trucking on growth and metabolic parameters of transit stress in beef steers.

### **Project Results:**

- An 18-hr transit decreased plasma concentrations of Vitamin C, ferric antioxidant potential (FRAP; a measure of antioxidant potential), and malondialdehyde (MDA; a measure of oxidative damage of lipids) and increased serum concentrations of nonesterified fatty acids (NEFA; a measure of tissue breakdown) and Haptoglobin (Hp; a measure of inflammation) from 1 to 2 days post-transit, but returned to pre-transit values by 7 days post-transit of yearling steers.
- While pre- and post-transit injections of Vitamin C increased plasma vitamin C one- and two-days post-transit respectively, neither affected liver Vitamin C status or any of the measures of tissue breakdown, inflammation, or oxidative stress post-transit
- Pre-transit injection of yearling steers with Vitamin C increased average daily gain by 10% and dry matter intake by 5% over 57 days after an 18-hr transit event.

## **Final Report Summary**

### **Nontechnical Summary:**

**Title:** Investigation of injectable vitamin C before and after transit on feedlot performance, inflammation, and oxidative stress in beef steers.

### **Project Directors:**

Stephanie Hansen, Ph.D. Title, address, email, and phone needed

Erin Deters, M.S. Title, address, email, and phone needed

Nontechnical summary not included in report.

### **Impacts**

- Not included in report

### **Conclusions**

- Long-distance transit decreased antioxidant defense of beef steers.

- A pre-transit Vitamin C injection mitigates the decline in ascorbate concentrations and improved post-transit feedlot performance of beef steers.

## **Technology transfer**

### **Refereed journal publications:**

Deters, E.L. and S. L. Hansen. Pre-transit vitamin C injection improves post-transit performance of beef steers. In preparation.

### **Reviewed abstracts:**

None reported

### **Extension/Outreach publications:**

None reported

### **Scientific presentations:**

None reported

### **Extension/Outreach publications:**

None reported

### **Podcasts:**

None reported

### **Other:**

None reported

## **Personnel support:**

### **Faculty:**

1 Faculty member (Summer salary for 2 years) \$3,222 (Budgeted)

### **Post-doctoral associates:**

None

### **Technicians:**

None

### **Farm labor:**

None

### **Graduate students:**

1 Graduate student (1 year) \$28,460 (Budgeted)

### **Undergraduate students:**

1 Undergraduate student (2 years) \$3,220 (Budgeted)