South Dakota State University

Department of Animal Science | SDSU Extension

Animal Science Research and Extension Report - Extension 2026

Contents

Statistics in the South Dakota State University Animal Science Report

The purpose of research at SDSU is to provide reference information that represents the various populations of livestock production. Since the researcher cannot apply treatments to every member of a population, he/she must sample the population. The use of statistics allows the researcher and readers the opportunity to evaluate separation of random occurrences and real biological effects of a treatment. The following is a brief description of the major statistics used in these proceedings.

- **Mean:** Data for individual experimental units (cows, pens of cattle, steers, steaks) exposed to the same treatment are generally averaged and reported in the text, tables, and figures. The statistical term representing the average of a group of data points is mean.
- **Variability:** The inconsistency among the individual experimental units used to calculate a mean for the item measured is the variance. For example, if the ADG for all the steers used to calculate the mean for a treatment is 3.5 lb then the variance is zero. However, if ADG for individual steers is used to calculate the mean for a treatment range from 1.0 lb to 5.0 lb, then the variance is large. The variance may be reported as standard deviation (square root of the variance) or as standard error of the mean. The standard error is the standard deviation of the mean as if we had done repeated samplings of data to calculate multiple means for a given treatment. In most cases, treatment means and their measure of variability will be expressed as follows: 3.50 ± 0.150. This would be a mean of 3.5 followed by the standard error of the mean of 0.150. A helpful step combining both the mean and the variability from an experiment to conclude whether the treatment results in a real biological effect is to calculate a 95% confidence interval. This interval would be twice the standard error added to and subtracted from the mean. In the example above, this interval is 3.20 to 3.80 lb. If in an experiment, these intervals calculated for treatments of interest overlap, the experiment does not provide satisfactory evidence to conclude that treatments effects are different.
- ***P*-value:** Probability (*P*-value) refers to the likelihood the observed differences among treatment means are due to chance. For example, if the author reports $P \leq 0.05$ as the significance level for a test of the differences between treatments as they affect ADG, the reader may conclude there is less than a 5% chance the differences observed between the means are a random occurrence (or 95% sure that the difference was not due to random chance). Due to this small probability of chance, there must be a difference between the treatments in their effect on ADG. Authors may discuss tendencies in data when P values are between 0.06 and 0.15, because they are not confident the differences among treatment means are real treatment effects. With *P*-values of 0.06 and 0.15 the chance random sampling caused the observed differences is 1 in 16.7 and 1 in 6.7, respectively.
- **Linear & Quadratic Contrasts:** Some articles contain linear (L) and quadratic (Q) responses to treatments. These parameters are used when the research involves increasing amounts of a factor as treatments. Examples are increasing amounts of a ration ingredient (corn, by- product, or feed additive) or increasing amounts of a nutrient (protein, calcium, or vitamin E). The L and Q contrasts provide information regarding the shape of the response. Linear indicates a straight-line response and quadratic indicates a curved response. P-values for these contrasts have the same interpretation as described above.
- **Correlation (r):** Correlation indicates amount of linear relationship of two measurements. The correlation coefficient can range from -1 to 1. Values near zero indicate a weak relationship, values near 1 indicate a strong positive relationship, and a value of -1 indicates a strong negative relationship.

- **Chi square (χ^2):** A statistical test used to compare observed results with expected results. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables being studied. This is a nonparametric test used for data that do not follow the assumption of a normal distribution. The null hypothesis is that there are no differences between the variables. A $\chi^2 \leq 0.05$ is considered statistically significant, thus, the null hypothesis should be rejected in favor of the alternative hypothesis.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

SDSU Extension is an equal opportunity provider and employer in accordance with the nondiscrimination policies of South Dakota State University, the South Dakota Board of Regents and the United States Department of Agriculture. Learn more at extension.sdstate.edu.

AS Report Committee

- Christina Bakker, Ph.D.
- Ana Clara Baiao Menezes, Ph.D.
- Jaelyn Whaley, M.S.
- Warren Rusche, Ph.D.
- Zach Smith, Ph.D.
- Rafe Royall, Ph.D.

SDSU Extension Calving Camp

Taylor Grussing

SDSU Extension, Animal Science, South Dakota State University

Program Objective

Record-low cow inventory is continuing to put stress on the market and, in turn, is returning more revenue for cattlemen selling calves. To secure some of this additional revenue, calves must be born and weaned successfully. Calving season can be stressful for even the most experienced cattlemen; therefore, training and education on calving practices are warranted for both beginning and experienced cattlemen to ensure successful parturition. The objective of these calving camps was to discuss calving preparations and practice delivering and processing calves.

2026 Program

To do this, calving camps were hosted at two locations in South Dakota on January 6th and January 14th in partnership with Mitchell Technical College and Lake Area Tech College. Currently licensed large-animal veterinarians were on-site to assist with training participants. A presentation was given on preparing for calving season (facilities, supplies, labor) and normal stages of labor. Two breakout sessions were conducted, including calf processing (esophageal feeding, banding, tagging, vaccinations, udder scoring) and dystocia management. All participants (32) were allowed to properly place chains on a full-size calf model, evaluate and correct fetal presentation, use calving equipment (jack or head snare), and successfully pull a calf from the cow model.

Program Outcomes

Attendees were made up of commercial cow/calf and seedstock operations, including students, beginning farmers/ranchers, part-time and full-time operators. In addition, several family members attended and participated in the camp to learn together. The main reason attendees wanted to learn more about calving season was to solve calving problems and know when to call for assistance. A quote from one attendee - “You can always pick up new tricks and tips to improve your skills. Also, we had a lot of backward- and front-foot-down calves last year. Just looking to learn how to be successful and save the most calves.” – Anonymous. Therefore, there was a lot of discussion at both locations on post-delivery calf health, vaccinations, and supplements. The comfort level of attendees assisting with dystocia increased from 44% to 89% before and after the camp, respectively, in the somewhat comfortable and very comfortable categories. Overall, attendees rated the camps 4.5 out of 5 stars, with 93% stating they will apply what they learned at the camp during the next calving season.

Future Programs

This calving camp was designed for beginning farmers and ranchers, while many experienced cattlemen still attended to brush up on their calving skills. In the future, we will extend the camp to provide more time for education in other areas of calving management (facilities, health, and recordkeeping), while maintaining sufficient time for the hands-on breakout sessions.

Animal Science Research Report 2026

SDSU Youth Beef Summit

Christina Bakker, Erin DeHaan, Jessica Drum, Madison Kovarna, Tommy Norman, Warren Rusche, Robin Salverson, Logan Vandermark, Julie Walker

Department of Animal Science, South Dakota State University

Program Objective

The objective of this program is to provide youth and young adults with hands-on learning activities involving beef reproduction, nutrition, management, health, showmanship and evaluation, and meat quality to make participants more informed beef producers and consumers. This goal promotes the positive image of the cattle industry and the consumption of beef by equipping future stakeholders with the knowledge to advocate for the industry and produce high quality beef.

2025 Program

This program was held in Brookings, SD on July 16, 2025 at the Cow Calf Education and Research Facility (CCERF). The program included presentations about livestock handling, Artificial Insemination, nutrition, managing animal stress, steak cookery and palatability, and showmanship and daily care of show animals. There were also tours of the CCERF and the Ruminant Nutrition Center. A total of 13 youth attended the program.

Program Outcomes

Participants indicated that they were most interested in the nutrition and reproduction sections of the program. All participants indicated they would attend the program again citing that it is fun to learn new things and that it was a good experience.

Future Programs

The planning team intends to hold another event during the summer of 2026 with a date to be determined. For more information on the program, visit the SDSU Extension website and contact any of the program leaders listed above.

Acknowledgement

The 2025 Youth Beef Summit was supported by South Dakota State University Extension, Beef Logic Inc., Dakotaland Feeds, LLC, and Prairie View Veterinary Clinic

Elevate Ewe

Jaelyn Whaley

SDSU Extension, Animal Science, South Dakota State University

Program Objective

Elevate Ewe is a comprehensive, year-long development program designed to equip beginning sheep producers with the knowledge, skills, and confidence needed to build successful and sustainable operations. Through an online classroom, monthly webinars, and four hands-on field days, the program provides practical, research-based education tailored to participants' needs. Instruction covers the full spectrum of sheep production—including nutrition, reproduction, financial management, marketing, lambing, and grazing—to help new producers make informed decisions, strengthen management practices, and increase long-term operational success.

2025 Program

In 2025, 15 individuals from three states (SD, MN, NE) were enrolled in Elevate Ewe. The 4 field days were also designed to expand the participants' network by hosting activities on operations across the state. Locations included Rosholt, Pierre, Newell, and Sturgis, SD. The Rosholt, Pierre, and Sturgis programs were open to anyone, not just Elevate Ewe participants, to expand networking opportunities. Field days covered biosecurity and intensive lambing, spring lambing and body condition scoring, commodity markets, and grazing management, respectively. There were 8 webinars with topics on financial management, nutrition, reproduction, marketing, and lambing. The webinars were recorded to accommodate numerous schedules. Through the Traininghouse platform, the online classroom housed additional fact sheets, video links, and other resources for participants to view as they please and download for future reference.

Program Outcomes

From the 2025 cohort, one participant mentioned, "I learned a little bit in a bunch of different areas …. I think all these factors combined will help me increase the efficiency and profit of our operation." Throughout the program, 55% of participants indicated that they intended to increase the size of their operation.

Future Programs

Applications for the 2027 Elevate Ewe course will be available on the SDSU Extension website in August 2026. For questions about the program, contact Jaelyn Whaley at jaelyn.whaley@sdstate.edu or 605-374-4177.

South Dakota State University Extension

extension.sdstate.edu