

# Research Summaries 1

## Association of floor type on health parameters of cattle fed indoors during the finishing phase

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### Introduction

The use of indoor confinement concrete slatted floor feeding facilities has grown in the US to comply with increasing environmental regulations and decreasing land availability. Rubber mats manufactured to be installed on top of concrete slats are being promoted to increase comfort and improve welfare and performance. There are limited published data on the association of rubber mats with bovine health and performance in a North American production setting. The objective of this project was to evaluate potential health differences associated with various types of slatted flooring in confined beef operations during the finishing phase of production.

### Materials and Methods

A cohort study was conducted using the following groups: Kraiburg slatted flooring mats, Animat rubber flooring, Easy Fix Slat Rubber Solutions for Beef flooring mats, and concrete-only slatted floor pens. For statistical purposes, data were grouped and assessed as mats vs concrete. Feeder calves were sourced through normal channels by the feedlot's cattle buyer. Calves were individually assessed for general health and existing lameness prior to enrollment. Cattle were

evaluated individually and then data were assessed at the pen level. Pen-level morbidity and mortality were assessed; locomotion scores were assessed at enrollment and within 7 days of slaughter. Descriptive statistics were generated for health and performance outcomes for individual animals and also on a pen basis. ANOVA statistics were used to determine differences in health and performance parameters between the 2 groups.

### Results

Twelve concrete-only pens and 23 mat pens were included. Compared to cattle on rubber mats, cattle on concrete-only tended to have higher morbidity (17.7% vs 6.6%;  $P=0.07$ ), more lameness (3.1% vs 1.1%;  $P=0.02$ ), and higher mortality (1.9% vs 0.7%;  $P=0.03$ ). This study demonstrated increased health benefits for rubber mats.

### Significance

This study demonstrated increased health benefits for rubber mats. Evaluating the impact of various slatted flooring with health and performance among confined beef cattle in a production setting is important to ensure both the well-being of fed cattle and economic viability of cattle feeders.

## Using serology to investigate reproductive failure due to *Neospora caninum* in beef herds

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### Introduction

In late November 2013, a diagnosis of abortion due to *Neospora caninum* was made in a fetus aborted from a coming

second-calf cow in a north-central South Dakota beef herd. The cow was 1 of 81 bred cows purchased at a sale earlier that month. Following the abortion, the purchased group was re-examined for pregnancy and 21/81 cows previously

confirmed pregnant were found open. Nine other South Dakota ranchers were identified as having purchased bred cows from the same sale. The sale was held on November 19, 2013 at a north-central South Dakota auction market. All cows originated from a single North Dakota ranch. The heifers were bred to calve in May 2014, and were ultrasounded to confirm pregnancy by a veterinarian on October 17, 2013.

### Materials and Methods

Because of the high rate of open cows in 1 of the purchased groups, the remaining 9 herds subsequently had their purchased bred cows re-examined for pregnancy during December 2013 or January 2014. Additionally, because of the diagnosis of *Neospora caninum* in 1 of the affected groups, the 10 herds sampled cows for the presence of *N. caninum* antibody. All herds were sampled between January 14 and January 31, 2014. Eight herds tested all purchased animals, while 2 herds tested some of the purchased animals. Serologic testing was performed at the South Dakota State University (SDSU) Animal Disease Research and Diagnostic Laboratory via an ELISA test. An inhibition of  $\geq 30\%$  was considered positive for *N. caninum* antibodies. Information regarding cow pregnancy status was provided with the submissions.

### Results

The size of the purchased groups ranged from 12 to 376 (average=87). Following re-examination for pregnancy, open cows were detected in 10 of 10 purchased groups. Open rates in these groups of previously-confirmed-pregnant cows ranged from 8 to 31% (average=22%). In all, 205 out of 866

cows (24%) were diagnosed “not pregnant” by their herd veterinarians. The overall *N. caninum* seropositive prevalence for purchased animals was 17.6%. However, there were marked differences in seropositive prevalence between open and pregnant animals. Open cows had an overall seropositivity prevalence of 78% (range=50 to 100%), while cows still pregnant had an overall prevalence of 7% (range=3 to 18%). In these animals, the odds of an open cow being *N. caninum*-positive were 46.7 times that of pregnant cows being seropositive (95% confidence interval=26.8-81.6). Pathologic diagnosis of *N. caninum* was not obtained in 8 subsequent abortion submissions to SDSU from these groups, nor was a point source of infection identified for these animals.

### Significance

Evidence pointing to *N. caninum* as a cause of reproductive loss in these animals included an extremely high association between seropositivity and non-pregnancy, a higher overall seropositivity prevalence in these herds compared to expected background levels in the Northern Plains, and the lack of other infectious agents consistently identified in serology or pathology submissions. Evidence supporting a cause of reproductive loss in these animals prior to sale includes the consistent open rates found across the 10 groups. While diagnostic pathology on fetal tissues should always be employed in cases of pregnancy loss, these materials are not always available or suitable. Serology may be a valuable tool to identify *N. caninum* exposure as a potential cause of reproductive failure, especially when there are differences in seropositive prevalence between open and pregnant animals.

## Behavior variables of feedlot cattle clinically diagnosed with bovine respiratory disease versus case control

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### Introduction

Current bovine respiratory disease (BRD) diagnostic methods in the commercial feedlot setting are limited to subjective visual assessment of clinical signs; sensitivity and specificity of this method is poor. Continuous monitoring of

step count, lying bouts, and duration of standing time via accelerometer device will provide insight into the behavior of clinically ill cattle and characterize the pattern of behavior change before clinical BRD diagnosis. Our primary objective was to elucidate behavior variable responses in relation to the timing of clinical disease observations by animal health