is sensitive enough to distinguish reproductive status, and determine fetal age and number before day 40 of gestation.

Materials and Methods

To test our hypothesis, 99 Western Whiteface ewes were exposed to 1 of 4 genetically related rams. The day a ewe was marked by a ram was considered day 0 of gestation. Ewes were ultrasounded trans-abdominally (Easi-Scan, BCF Technology, Rochester, MN) 3 times/week with a 5 MHz rectal transducer in the right non-haired abdominal region of the ewe until day 45. Open ewes were re-exposed to the rams and reevaluated if remarked. Due to the large population, ewes were blocked by their initial ultrasound scan at day 20 to 25 (n=52), day 26 to 29 (n=44) or day 30 to 33 (n=17). During each ultrasound, first observation of fetal landmarks, prediction of fetal number, and measurement of fetal length were recorded.

Results

Correct identification of reproductive status was achieved by day 25.7 ± 0.5, day 28.7 ± 0.4 or day 32.4 ± 0.5, when scanning was initiated between day 20 to 25, day 26 to 29 or day 30 to 33, respectively. This included 85 pregnant ewes, with the remaining correctly identified as non-pregnant (n=28). Within the pregnant flock, 94% of pregnancies were correctly detected by day 33. In the pregnant ewes, 3 early embryonic losses were identified by day 40. During pregnancy, fluid-filled uterine cross-sections were observed from day 27.9 ± 0.4 onward. Pregnancy was confirmed by the presence of a fetus with a heartbeat on day 28.5 ± 0.4, with placentomes emerging from the uterine wall beginning on day 33.8 ± 0.4. Fetal characteristics, such as limb bud separation, fetal genitalia, and the umbilical cord were first observed at day 35.2 ± 0.7, day 37.9 ± 0.7 and day 38.4 ± 0.7, respectively. Additionally, fetal length increased from 10.6 ± 1.2 mm to 35.3 ± 1.6 mm. Placentome maturation was observed starting on day 40.6 ± 0.4 and ribs were visualized at day 42.2 ± 0.7. Evidence of pregnancy, including an enlarged uterus (P=0.04), fetus with a heartbeat (P=0.03) and placentome evagination (P=0.02), was observed earlier when multiple offspring were developing. Accuracy of detecting singletons, twins and triplets was 100, 87, and 31%, respectively. Detection of 80% of the multiple pregnancies was achieved by day 35, with fetal number always underestimated.

Significance

The scanning window between days 28 to 34 for trans-abdominal ultrasound provides useful and diverse information for reproductive efficiency in flock management. This includes visualization, monitoring development, and identification of the number of fetuses. Thus, trans-abdominal ultrasound is sensitive enough to detect reproductive status of a ewe as early as day 25, and specific enough to detect fetal landmarks indicative of fetal age before day 45 of gestation.

Nebulization therapy in small ruminants, 21 cases

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Introduction

Nebulization therapies are commonly used in humans and small animals. Currently there are published reports on nebulization therapy in horses and calves, but no studies describing this therapy have been reported in small ruminants.

The objectives of this study were to identify the agents and dosages utilized for nebulization therapy in small ruminants at a university teaching hospital. Additional objectives were to describe outcomes vs non-nebulized cases and report any complications arising from therapy.

Materials and Methods

Medical records of small ruminants presented to the University of California-Davis Veterinary Medical Teaching Hospital (VMTH) between January 1, 2000 and March 1, 2015 were evaluated for this study. Cases that had undergone nebulization therapy were selected.

A group of control cases of small ruminants that were not nebulized with a diagnosis of pneumonia were collected from the same search period. A logistic regression was used to compare outcome between groups.

Results

Fourteen goats and 7 sheep that underwent nebulization were identified for this study. All were treated for some form of respiratory disease. Nebulized drugs included antimicrobials, mucolytics, and bronchodilators. In goats, the most commonly nebulized drug was ceftiofur (n=7). Dosages ranged from 0.45 to 6.6 mg/lb (1 to 14.5 mg/kg) (mean 3.1 mg/lb or 6.8 mg/kg). In sheep, the most commonly nebulized drug was ceftiofur (n=4). Dosages ranged from 3 to 4.5 mg/lb (10 mg/kg) (mean 2.6 mg/lb or 5.8 mg/kg) with 1 sheep identified only as "lamb" (no body weight listed) and administered a 25 mg total dose. Two goats exhibited respiratory distress during nebulization. Distress abated following adjustment of the aperture on the nebulizer. Nebulization therapy was discontinued for the second goat.

Among the patients undergoing nebulization, 6 were euthanized due to lack of improvement in their respiratory disease and an additional patient was euthanized due to musculoskeletal injury. Two patients died as a result of progressing respiratory disease. Twelve small ruminant patients that underwent nebulization survived to discharge from the VMTH. Preliminary regression analysis demonstrated a negative outcome for patients that did not undergo nebulization.

Significance

Nebulization therapy appears to be a minimally invasive adjunct for treatment of small ruminant respiratory disease. Practitioners should be aware of non-antimicrobial therapies for treating respiratory disease in small ruminants such as mucolytics and bronchodilators. Dosages higher than previously reported for calves (ceftiofur, 1 mg/kg) may be clinically useful for small ruminants with respiratory disease. Extralabel drug use should be considered when utilizing nebulization therapy. More research in a controlled setting is needed to further evaluate efficacy of nebulization therapies in the treatment of small ruminants with respiratory disease.

An assessment of the potential for transfer of *Staphylococcus aureus* between humans and dairy goats in NC

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Introduction

Staphylococcus aureus is a major pathogen frequently diagnosed in dairy goat intramammary infections (IMI). *S. aureus* also has human health significance as a zoonotic pathogen.[1,3] Control of *S. aureus* infections is difficult because infection is easily transmitted in a herd, and because there are multiple sources of infection.[1,3] In addition to the mammary gland, *S. aureus* has been isolated from other body sites and the environment. Mørk et al compared isolates from body sites using pulsed-field gel electrophoresis (PFGE) and found isolates in 6% of goat milk samples and approximately 70% of nasal swabs.[4] In this study, we identified *S. aureus* isolates from goat milk and nares and from the hands and noses of people milking the goats. Our purpose was to determine the prevalence of *S. aureus* from these sites, characterize antibiotic susceptibilities, and compare genotypes of isolates from the different sites. Producer surveys were used to characterize herd management practices.

Materials and Methods

A total of 519 milk samples, 502 goat swabs, and 97 human swabs were collected from 30 NC dairy goat farms from September 2014 to July 2015. The dairy goat farms ranged from small backyard to large commercial operations. Aseptic milk samples were collected from all milking does as well as nasal swabs. Both hand and nose swab samples were collected from individuals milking the goats. General demographic and herd survey data were also collected.

In the laboratory, milk samples (0.1 mL) were plated and bacteria present identified using procedures consistent with NMC recommendations. Swab samples were macerated in 0.85% sterile saline and 1 mL plated on 3M Staph Express Petrifilm plates according to manufacturer's instructions. Antibiotic susceptibilities for the S. aureus isolates were determined using the Kirby-Bauer method according to Clinical Laboratory Standards Institute (CLSI) protocol. Genotyping was accomplished by PFGE using US Centers for Disease Control (CDC) protocols with minor modifications, and PFGE gels were analyzed and dendrograms constructed using BioNumerics software.

Results

S. aureus was uncommon in NC goat milk samples (1.2%), but was found in almost half of goat nasal samples (46.2%). One quarter of human nasal and hand swabs were