



In Utero Development of Nigerian Dwarf Dairy Goats

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Definitions

Caddaledons- "C" shaped structures which line the uterus beginning at 28 days post conception

CAE- Caprine Arthritis Encephalitis, a debilitating disease in goats which causes immense joint pain and eventually death

CL- A disease present in both sheep and goats which causes internal and external abscesses filled with smooth white puss

Surgical Clipping- clipping with a device similar to what is used on men's hair, this leaves the hair 1/32 of an inch long and provides better ultrasound transmission.

CRL-Crown to rump length, a measurement taken in mm or cm where appropriate that spans from the back of the fetal head in a straight line to the base of the tail, used to estimate fetal age.

Fetal Heartbeat-first visible at 30-35 post conception this is the first sign of a potentially viable fetus

Background

Nigerian Dwarf Dairy Goats are the only miniature breed of dairy goats recognized by the American Dairy Goat Association. They are 18-22" tall at the shoulder when they reach adult size. Pregnancy length for all breeds of goats is 145-155 days. Diagnoses of pregnancy in the larger breeds of goats can be performed by ultrasound.

In general, it is known that the gestational period for a goat is 145-155 days, or about five months. We also know that certain markers of pregnancy appear at certain day counts and are not visible beyond a certain day count due to a variety of factors. These structures include caddaledons, fetal bone structure, the amniotic sac, and fetal heartbeat. Features appearing for a short window in the pregnancy include fetal sex, and number of fetuses present. For the larger dairy goat breeds and for those goats such as Boers used for meat we can estimate gestational age using such measurements as CRL (crown rump length), CL (crown length) and a general area taken up by a single fetus in its sac. However, these studies do not address the in utero growth for the dwarf breed of Nigerian goats which are vastly different in other areas of medical importance and are increasing in popularity. This warrants closer, more specific study on this breed as the results will be of increasing use in the years to come, particularly with relation to urban agriculture settings and the farm to table movement.

Introduction:

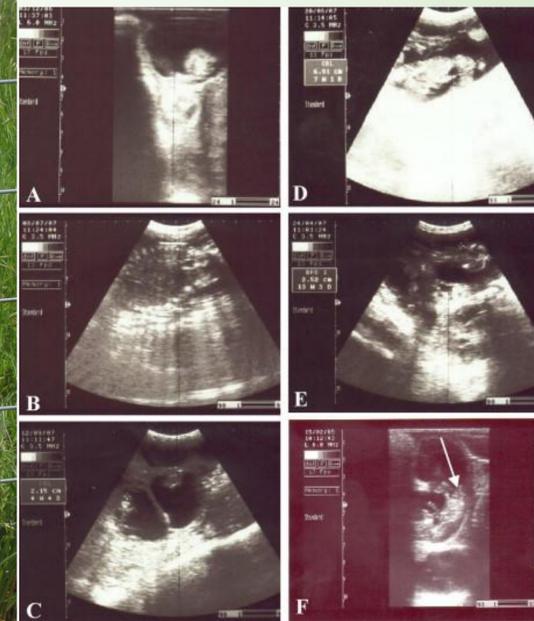
The issue at hand is to determine the growth rate of Nigerian dwarf goats while in utero so that fetal measurements can be used to diagnose fetal age for purposes of pregnancy detection, care of dam and accurate treatment regimens dependent on fetal age. This is an important area for the goat industry/veterinary medicine as nothing is known of the growth rates for this particular breed, which is becoming more widespread in the dairy goat show community and as backyard/urban agriculture settings. The ability to determine gestational age of fetuses via fetal measurements is an excellent aid to veterinarians when advising clients on how best to care for does and the fetuses they carry.

Methods:

Five Nigerian Dwarf Dairy Goats will be bred at the same time and then scanned with ultrasound every 2 weeks.

Data will be collected by use of a transabdominal probe style ultrasound using human grade lubricant via the surgically clipped right flank/under flank area of buck exposed Nigerian dwarf dairy goats on a biweekly basis. This method is chosen to reduce animal stress, time needed to obtain measurements, and ease of use for personnel. A selection of does which have had their ovulation cycles synchronized will be used, they will be from the same herd, receiving the same feeds in the same conditions over the course of the study. After the study they will be returned to their lives as show goats and family milkers, where they will be treated according to industry best practices for the remainder of their natural lives, barring such an instance as they are sold to another appropriate home or must be euthanized to illness, disease or injury which cannot be reasonably treated with the help of a veterinarian.

Results will be analyzed with the use of graphs, data tables, standard deviation and normal distribution. An extreme outlier would disconfirm my hypothesis as the growth rate would be shown to be inconsistent among does in study group. All other options would confirm my hypothesis.



Results

The expected results are a linear growth of the fetuses while in utero in several different areas such as crown rump length and amount of area covered by body.

Discussion

These results can be used to predict how many days pregnant each doe is and give her proper care to ensure the health of her kids. This will also be useful when you need to have a human present at the birth. This will lead to lower doe and kid mortality and better disease prevention.

Significance

This study will lead to better medical care and management of the Nigerian dwarf goat, allowing them to be more productive over their lifespan and produce a higher yield of viable kids per doe at a lower cost per head. It will also lead to higher quality of life for does (known pregnant does are not stressed by unnecessary rebreeds) and a lower kid mortality as known days bred gives a due date, thereby allowing a human to be present at parturition at a higher frequency than if due date is not known. This leads to better disease prevention, namely CAE and CL prevention protocols where kids must be removed from dams at time of birth to decrease the risk of transmission via infected colostrum.

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