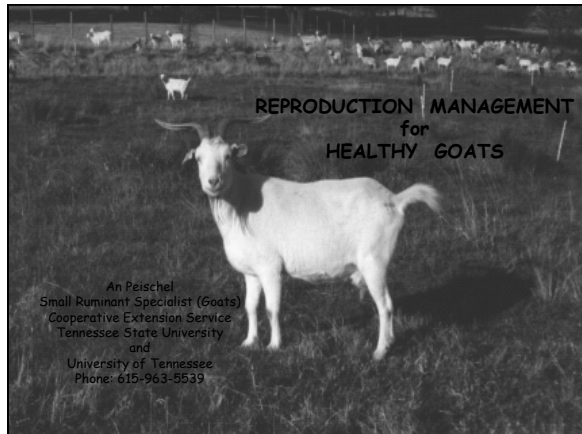
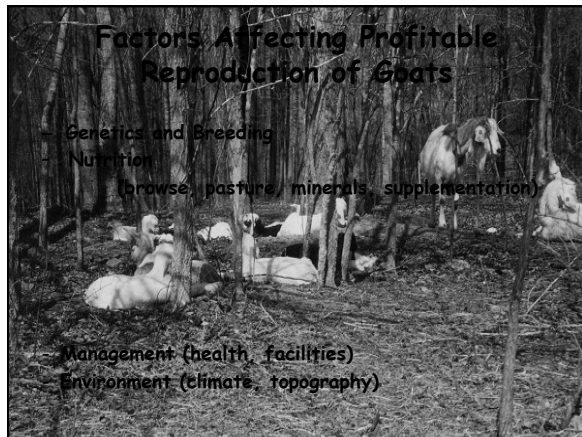






\$\$ REPRODUCTIVE EFFICIENCY \$\$

- Fertility and prolificacy
- Motherability and milkability
- Maintain body condition score
- Longevity
- Free from dystocia
- Disposition



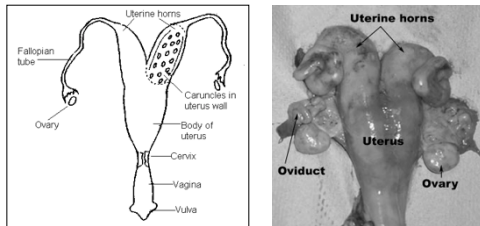
Reproduction

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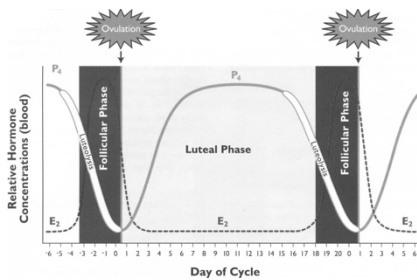
Offspring
rate of kids
condition score maintenance

Longevity

Female Reproductive Tract



Estrous Cycle



Dr. Stephan Wildeus – Virginia State University

Reproductive Characteristics (DOE)

	<u>Average</u>	<u>Range</u>
• Cycle (estrus) length (days)	20 - 21	17 - 24
• Duration of (heat) estrus (hours)	30	16 - 50
• Ovulation after (heat) estrus (hours)	33	30 - 36
• Gestation length (days)	150	144 - 155
• Ovulated egg viability (hours)		12 - 24
• Off spring	2	1 - 4

Fertilization

- Fertilization occurs in the oviduct and requires the proper timing of insemination and ovulation
 -
 -
- Fusion of the sperm cell with the egg will prevent penetration of other spermatozoa
- Fertilized eggs move towards the uterus and initiate cell divisions within 24 hours

Pregnancy

- Uterus requires priming with progesterone for attachment of the embryo and membrane development to occur
- In goats the corpus luteum is the primary source of progesterone throughout gestation

Pregnancy

Placenta - exchange between the maternal and fetal circulation (rapid growth between 90 to 100 days)

Last trimester - exponential fetal growth

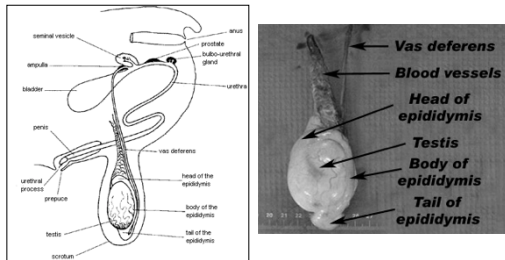
Length of pregnancy influenced by breed and sex of fetus

- Increases with doe age
- Decreases with litter size

Parturition

- Initiated by regression of the CL about 24 hours before delivery and an increase in estrogen
- Physical changes in the doe
 - Pelvic ligaments begin to relax - tailhead
 - Vulva becomes swollen and pink
 - Uterine contractions - oxytocin
 - Placental membranes rupture
- Kids are born within 2 to 3 hours

Male Reproductive Tract



Spermatogenesis:

- Takes place in the testis

Sperm maturation:

- Spermatozoa released from testis germinal epithelium and passes to the epididymis
- Fluid removed and sperm suspension is concentrated in head of epididymis
- Sperm stored in dormant state prior to ejaculation in tail of epididymis

Reproductive Characteristics (BUCK)

	<u>Average</u>	<u>Range</u>
• Daily sperm production (billions/	6.0	4.8 - 7.2
• Ejaculate volume (ml)	1.0	0.5 - 1.5
• Ejaculate concentration (billion/ml)	3.0	1.5 - 5.0
• Spermatozoa viability in the doe (hours)	12	
• Scrotal circumference (cm)	24	20 - 28

Reproductive Considerations

- Puberty - stage of sexual maturity
- Onset of Puberty
 - Influenced by breed / nutrition / season
- Seasonal Breeding - breed on photoperiodic cues
- Effect of season on pregnancy rate
- Record keeping - records you can use

Reproduction Health Maintenance

- **Strategic Vaccinations**
 - Leptospirosis - (3 weeks pre-breeding)
 - Clostridium perfringens C&D with tetanus (3 weeks pre-kidding)
- **Fecal Analysis**
 -
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Causes of Reproductive Failure

- Nutrition and Environmental
- Reproductive Diseases
- Stress and Trauma
- Toxic plants (estrogenic compounds)
- Dewormers - levamisole, valbazen
- Drugs - dexamethasone, prostaglandin
- Immunological factors
- Heritable factors

Causes of Reproductive Failure

- Vibriosis - embryonic mortality, early abortion
- Leptospirosis - abortion last trimester, weak kids, infertility
- Brucellosis (melitensis) - abortion
- Listeriosis - late abortion, retained placenta, metritis
- Toxoplasmosis - late abortions, weak young, stillbirths, retained placenta

Causes of Reproductive Failure

- Akabane virus - abortion, stillborns, death soon after birth
- Chlamydiosis - abortion 2 days to 2 months of pregnancy
- Q-fever - brought on by stress, poor nutrition and then the doe aborts
- Border disease - (BVD) - abortion, abnormal fetus

Causes of Reproductive Failure (the male)



- Epididymitis - infection / trauma
- Urolithiasis - calcium phosphorus imbalance

Breeding Soundness Evaluation

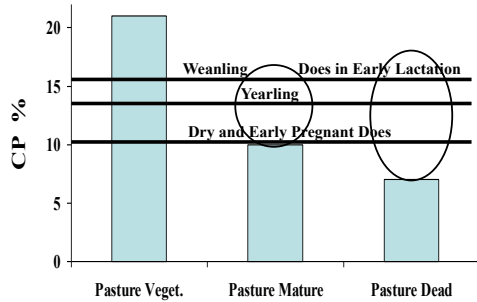
- Evaluate 3-4 weeks before breeding
- Conformation / Stature
- Testis (scrotal circumference) and firm
- Artificial vagina collection / hand ejaculate or doe in estrus to check semen quality

Nutrition

- Energy and protein levels in balance to reflect stage
- Vitamin and mineral requirements are being met

- Environment / Weather
- Breed
- Stage of production
- Quality of diet
- Age and Sex of goats
- Body weight and Body condition
- Activity and exercise

Forage Quality & Goat Requirements (PROTEIN)



J-M Luginbuhl

Stage of Production Nutrition

• Pregnant

1) First trimester

- Nutrition levels can be lower but maintain a BCS 4-5
- Mineral / vitamin mix and kelp meal

2) Second trimester

- Moderate energy & protein levels to elevate BCS to 5
- Fetal development progressing
- Mineral / vitamin mix and kelp meal

Stage of Production Nutrition

3) Third trimester

- 80% of fetal growth occurs
- Positive weight gain to a BCS 6
- Maintain a low level of stress
 - Low milk production
 - Low birth weight of kids
 - Abortion
 - Immune system suppressed
- Mineral and vitamin mix / kelp meal

Stage of Production Nutrition

- Post-kidding
 - High energy and protein level requirements
 -
 -
 -
- Dry does
 - Lowest nutrient requirements
 - Mineral and vitamin mix / kelp meal

Nutrition Management Tips

- Shorten kidding season (natural hot-synchronization)
- Manage bred doelings separate
- Timely care of gestating does (first/second/third trimester, post-kidding, dry does)
- Mineral / vitamin balance and kelp meal
- Maintain body condition score



Breeding Plan

- Shorten the breeding season
- Grow out young replacements
- Extend the time after parturition
- Increase and maintain body weight
- Elevate body condition score
- Cull before the breeding season
- Ultrasound does / Semen test bucks
- Correct buck:doe ratio (based on age)

ENVIRONMENTAL STRESS

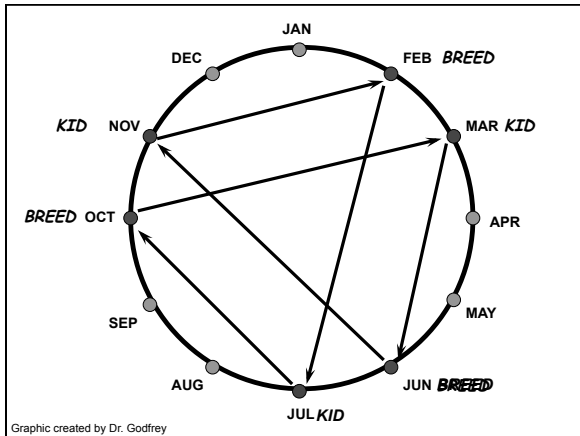
- Heat and Cold
- Weather (precipitation and humidity)
 - Nutrient density
- Quality of feed on offer
 - Predation
- Travel (activity)
 - Topography



BEHAVIOR
(lambsquarters)

Mating System Options

- Annual fall breeding
 - optimum reproductive performance
- Annual spring breeding
 - improved lamb/kid marketing options
- Continuous mating
- Accelerated mating - 3X's in 2 years
 - increased efficiency of production







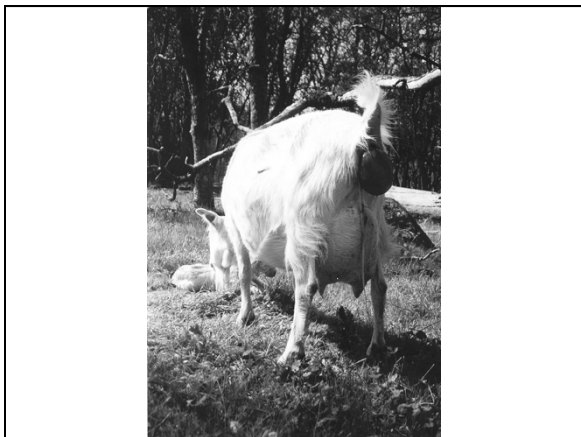
















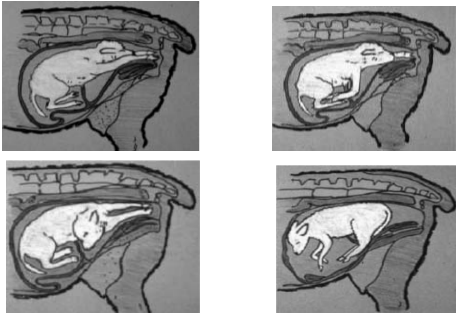








Presentation at Birth



(source: Clell Bagley, Utah State University)



- Disease prevention
- Biosecurity
- Fecal analysis
- Strategic vaccinations
- Hoof care

Health

Body Condition Score (BCS)

BCS 2



- Extremely thin
- Spine and ribs visible
- Sternum protruding
- Skin on bone
- "V" cavity at tailhead

BCS 7



- Spinous processes not visible
- Frame not visible
- Sternum covered
- Hooks and pins rounded
- Flat between hooks

MAN AGE MENT

- Genetics and Breeding
- Reproduction
- Nutrition - browse/pasture/supplementation
- Fencing / Facilities
- Health (disease prevention, biosecurity, internal parasites)
- Environment
- Dogs - guardian / herding
- Behavior / Stress



CULL - RUTHLESSLY

- Browse and graze native vegetation
- Navigate long distances across rugged topography
- Body capacity
 - Rumen (cellulose and lignin)
 - Fetuses (twins)
 - Chest capacity (lungs)
- Poor motherability
- Poor milkability
- Unsound udder conformation
- Hard to regain body condition score



**KEEP
AGRICULTURE
SUSTAINABLE**