Sperm Odyssey

Methods, Seasons, and Extenders

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ERFP

Objectives - Outline

- Share experiences

    1. Male Selection
    2. Collection Methods
    3. Seasonal Variation
    4. Use of Commercial Dilutants
    5. AI/Embryos
    6. Cyprus Case

- Collective input

- Gather regional insights.

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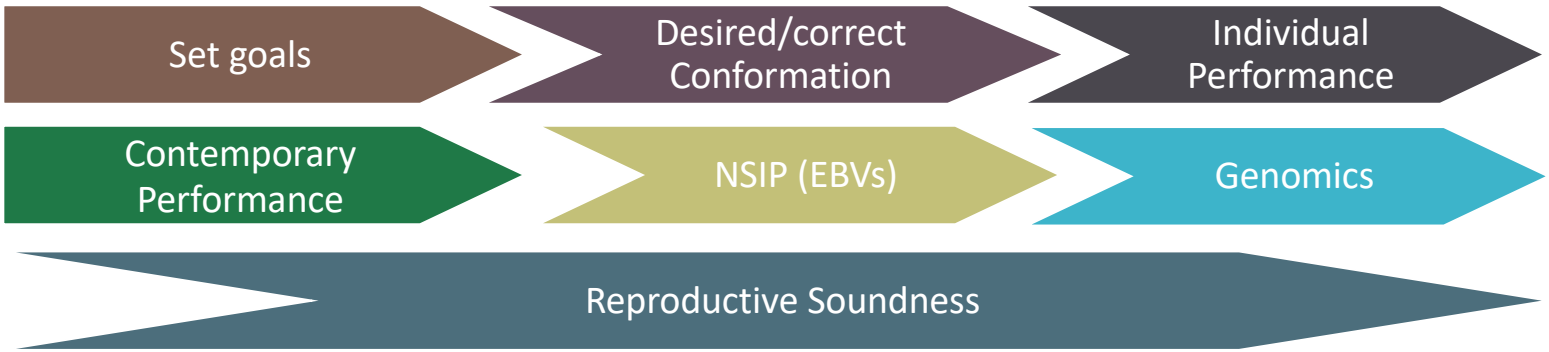
1. Male Selection

A single male can affect genetics of a herd in a greater proportion than a female.

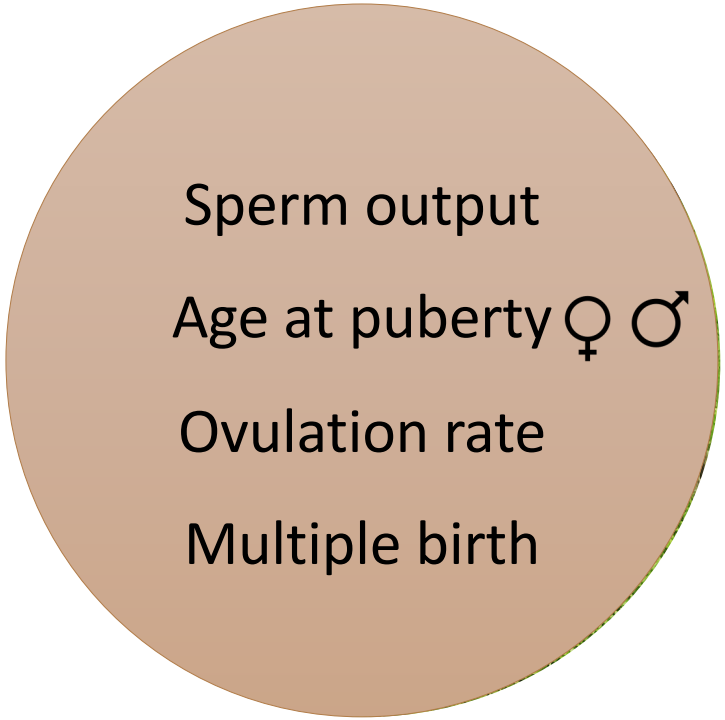
- 50 % of genetic make-up in the crop will come from the male
- Breeds several females (50 per year)
- A male stays in average for 4 years in the flock/herd



1. Male Selection

Heritability Estimates

TRAIT	HERITABILITY %
Reproductive	
Ewe Fertility	5
Prolificacy	10
Scrotal Circumference	35
Age at puberty	25
Carcass and growth rates	
Feed efficiency	26
Mature Weight	50
Loin eye area	35
Carcass weight	35
Fleece	
Grease fleece weight	35
Clean fleece weight	25
Percent yield	40
Fiber diameter	40



Sheep Production Handbook, 1996

1. Male Selection

Heritability Estimates

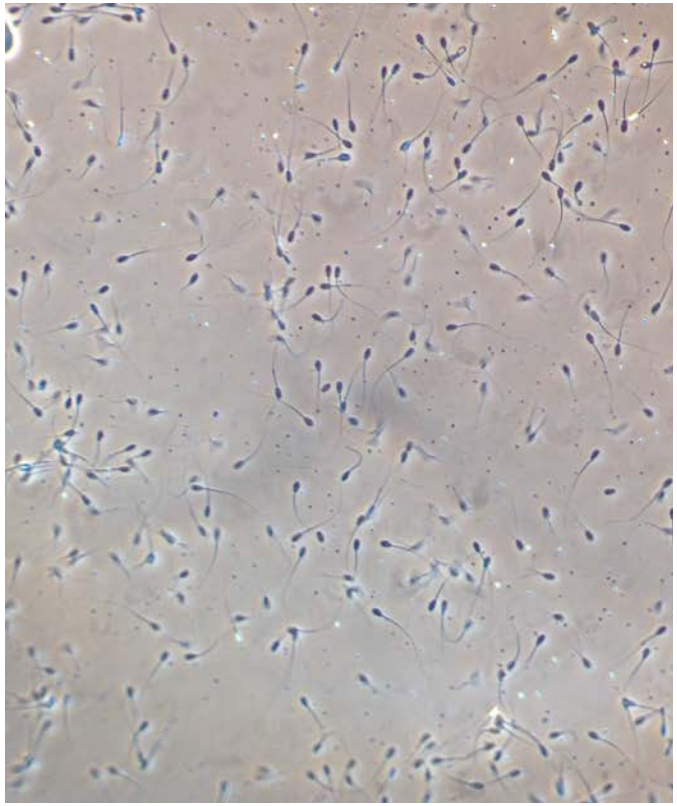
TRAIT	HERITABILITY %
Disease	
Parasite resistance (FEC)	45
Parasite resilience (FAMACHA, PCV)	10
Foot rot	20 -30
Mastitis	10-20
Defects	
Cryptorchidism	High ?
Entropion	15
Face cover	56
Hernia	High ?
Conformation and type	
Heigh and length	High ?
Conformation (legs, depth, etc)	High ?

Sheep Production Handbook, 1996

1. Male Selection

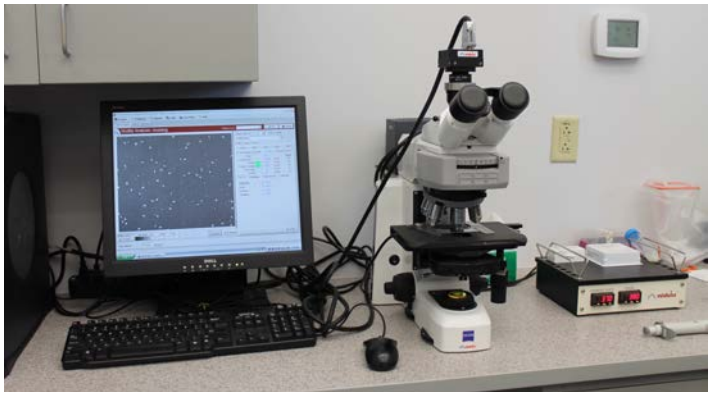
Breeding Soundness Evaluation

- Physical Exam
  - BCS
  - Feet
  - Eyes
  - Conformation/congenital defects
- Reproductive Exam
  - Scrotal Palpation
  - Scrotal circumference
  - Prepuce and penis evaluation
- Semen Evaluation


Lab Set-up

- Slide warmer
- Microtubes, pipettes
- Slides and coverslips
- Microscopes
- Saline or 2.9% Sodium citrate
- Stain
- +/- cell counter



2. Collection Methods

Teaser Animal/Artificial Vagina

Pros

- High quality semen
- Lower welfare concern

Cons

- Need of a female in heat
  - Hormones
    - Synchronizing
    - Estradiol
- Training
- Cooperation/Seasonality

2. Collection Methods

Electroejaculation

Pros

- Versatility
- Quick and efficient
- No teaser needed
- Wider application

Cons

- Welfare concerns
- Variable semen quality
- Ethical and legal issues
- Requires sedation/anesthesia
- Operator skill and Equipment

2. Collection Methods

Electroejaculation

Sedation protocols:

- Ketamine + Butorphanol + Xylazine
  - Yohimbine reverse

Region	EE for Livestock	Sedation Required
Canada	Only as veterinary procedure	Requires vet oversight, sedation/analgesia
U.S.	⚠ Unclear federal regs	No clear federal guidance; AVMA doesn't forbid but welfare flagged
EU (main)	⚠ No direct EE regs; general welfare laws apply	Must avoid procedures causing suffering; vet & anaesthetic needed per animal welfare directives
UK	Similar to EU: anesthesia must precede invasive procedures	General welfare code requires vet/anaesthetic supervision

2. Collection Methods

Factor	AV Collection	EE Collection
Animal Welfare	Less invasive	Potentially painful/stressful
Semen Quality	High	Lower on average
Training Needed	Yes	No
Season/Libido Dependency	Yes	No
Regulatory Oversight	Minimal	Often stricter
Ease of Use	Moderate	High
Equipment	AV, mount/teaser required	Electroejaculator required

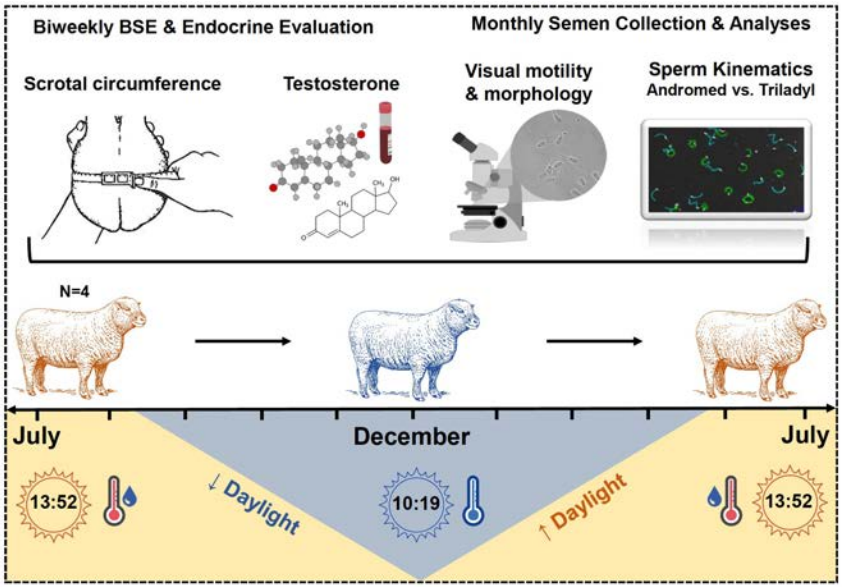
3. Seasonal Variation

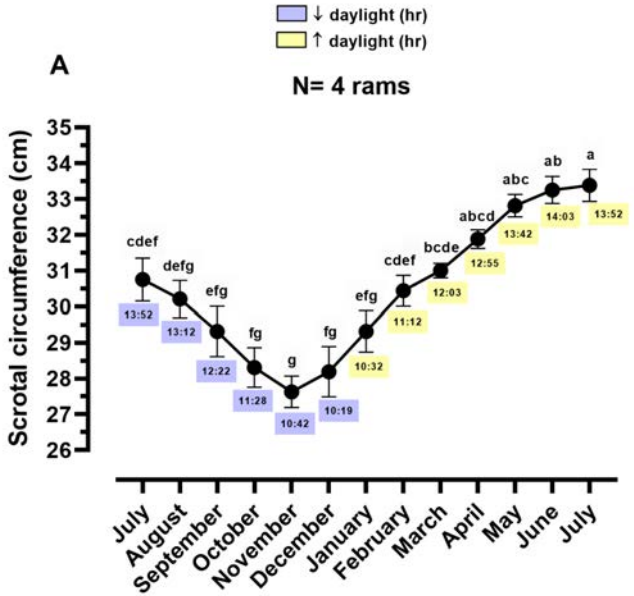
Photoperiod and Temperature

- **Impact on Semen Quality**:
  - Motility, Concentration, and morphology.
  - Libido/Hormonal changes
- **Breed variability**
- **Regional Variability**:
  - Data from different climates and breeds.

Florida Cracker Sheep

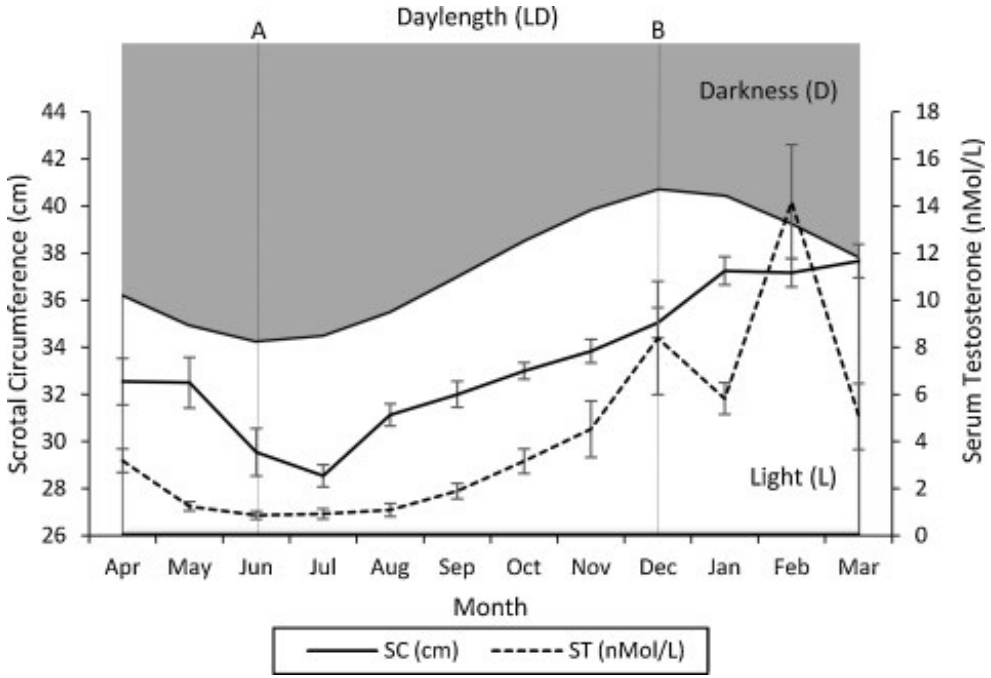
3. Seasonal Variation





Cabrera et all. Unpublished data

3. Seasonal Variation



- Suffolk rams lower at latitude
- Associated with
  - SC
  - Testosterone
  - Seminal parameters

Milczewski, et all 2015

3. Seasonal Variation

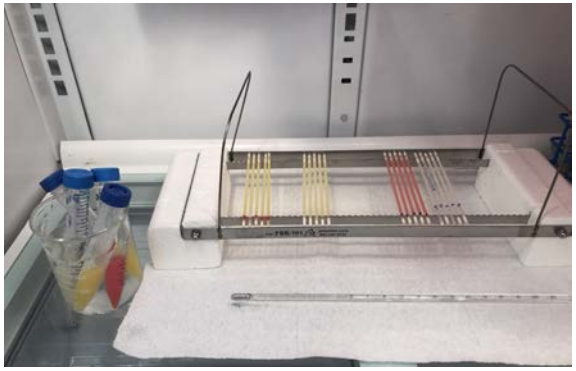
Strategies to overcome seasonality and temperature challenges

- Photoperiod Management
- Hormonal Treatments
- Nutritional Management
- Thermal Stress Mitigation
- Behavioral and Management Practices
- Genetic Selection
- Environmental and Management Strategies

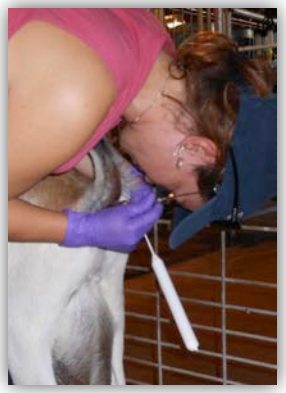
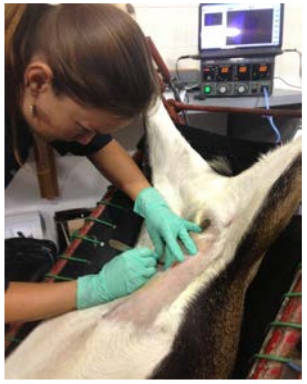
4. Commercial Diluents

- **Types of Extenders**:
  - Egg-yolk-based, soy-based, coconut water, and others.
  - Focus on cryoprotectants and antibiotics.
- **Performance Comparisons**:
  - Sperm motility, viability, and fertility outcomes.
  - Challenges in standardizing protocols globally.

4. Commercial Diluents



5. Advanced Reproductive Technologies



5. Advanced Reproductive Technologies

6. Cyprus case Opportunities and Challenges

Damascus Goat

Chios Sheep

Cyprus Mouflon

6. Cyprus case Opportunities and Challenges

- Space for improvement

- Specie, breed, location, season

- Funding
- Regulations genebank
- Male Selection
- Collection Methods
- Seasonal Variation
- Semen Freezing
- AI/Embryos

AGRICULTURAL RESEARCH INSTITUTE

Dr. Georgia Hadjipavlou

Key Discussion Points

- **Collection Techniques**: Regulations, welfare, and efficiency of AV vs. EE.
- **Seasonality**: Effective strategies for overcoming reproductive seasonality.
- **Thermal Stress**: Innovations and regional adaptations for heat management.
- **Semen Quality**: Impact of methods and choice of diluents.
- **Future Directions**: Advancing techniques, genetic selection, and biotechnology.