



**EXTENSION**

# Basic Principles to Start a Sheep and Goat Enterprise



**MISSISSIPPI STATE UNIVERSITY™**  
DEPARTMENT OF ANIMAL  
AND DAIRY SCIENCES

*Extending knowledge.  
Changing lives.*

**Sheep and Goat Production Webinar Series  
September 21<sup>st</sup>, 2021**

# SHEEP AND GOAT PRODUCTION WEBINAR SERIES

Mississippi State University Extension Service



MISSISSIPPI STATE UNIVERSITY™  
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## Time

6:00 PM— 7:00 PM

Central Standard Time (CST)

Stay tuned for  
registration  
information!

## Upcoming Topics

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February 15, 2022: *Hands in Carcass: Cooking Lamb and Goat* (Dr. Derris Burnett, MSU ADS).

Dr. Erdogan Memili

[em149@ads.msstate.edu](mailto:em149@ads.msstate.edu)

Reproduction of Small Ruminants

Dept. of Animal and Dairy Sciences

Dr. Leyla Ríos

[leyla.rios@msstate.edu](mailto:leyla.rios@msstate.edu)

Small Ruminant Specialist

Dept. of Animal and Dairy Sciences

Dr. Rocky Lemus

[Rocky.Lemus@msstate.edu](mailto:Rocky.Lemus@msstate.edu)

Extension Forage Specialist

Dept. of Plant Sciences

Dr. Michael Pesato

[mep323@msstate.edu](mailto:mep323@msstate.edu)

DVM, DABVP (Food Animal Practice)

MSU College of Veterinary Medicine



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# **Converting Performance: Improving Productivity through Sheep and Goat Selection for a Successful Operation**

**Erdoğan (Erdo1) Memili, DVM, Ph.D.**

Professor

Laboratory of Animal Functional Genomics

Department of Animal and Dairy Sciences

Mississippi State University



# Career Path



Istanbul University-Cerrahpaşa  
Faculty of Veterinary Medicine



**DVM**



College of  
Agricultural & Life Sciences  
UNIVERSITY OF WISCONSIN-MADISON  
*Growing the future*



Department of  
**Bacteriology**  
University of Wisconsin-Madison



ENDOCRINOLOGY AND REPRODUCTIVE PHYSIOLOGY PROGRAM



**MS &  
Ph.D.**

Prof. Neal First



Harvard University

**HARVARD**  
MEDICAL SCHOOL

**Postdoctoral**

genzyme  
*transgenics*

**GTC**  
Biotherapeutics



**ATRYN**  
Antithrombin  
(Recombinant)

Recombinant. Reliable. Ready.

**Industry**



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UNIVERSITY



COLLEGE OF  
**AGRICULTURE  
& LIFE SCIENCES**

**Animal and Dairy**  
SCIENCES

**Academic**

- ❖ Teaching
- ❖ Research
- ❖ Service



Cornell University

Cornell University  
College of Veterinary Medicine

Biomedical Sciences



**Sabbatical**



# Genome to Phenome: Research, Education & Outreach

Mammals

Physiology

Genetics

**Epigenetics**

**Fertility, growth & development**

Nutrition

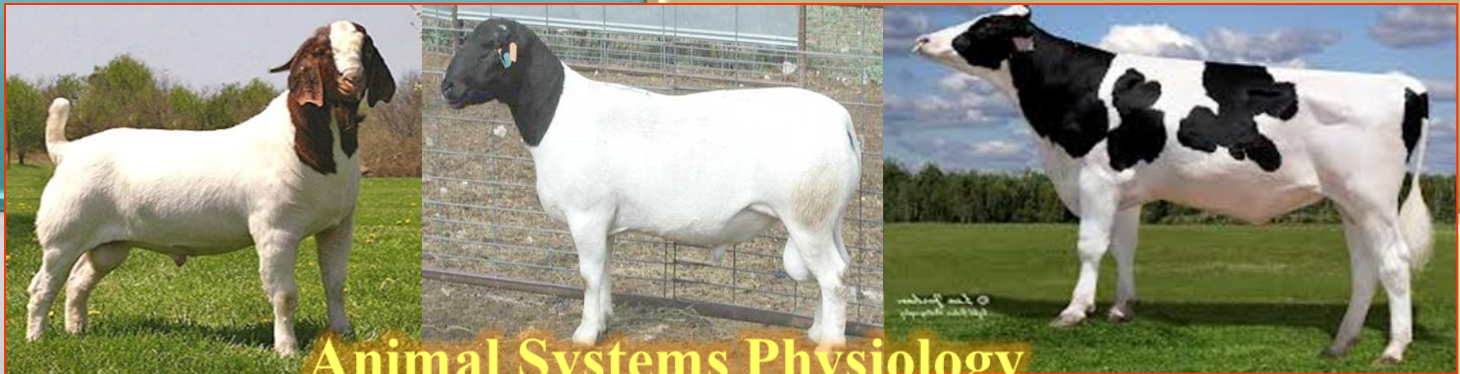
Health

Resilience

Research

Education

Extension and Outreach



**Animal Systems Physiology**

Functional genomics

Epigenomics

Systems biology

Bioinformatics

Discovery of markers and mechanisms for genomic evaluation

Advances in fundamental animal and biotechnology

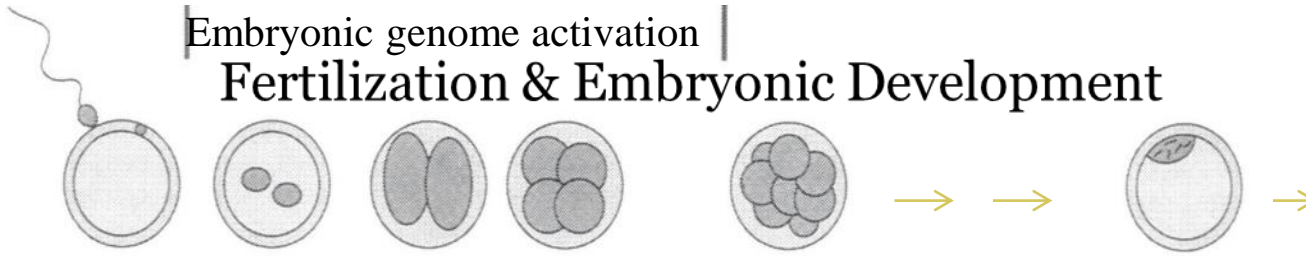
Production of ruminants with economically important traits

Enhancing animal and human health

# Fertility is the essential factor controlling mammalian reproduction

Embryonic genome activation |

Fertilization & Embryonic Development



Objective: Determine sperm markers associated with bull fertility and sperm freezability.

Approaches: Systems biology, multi-omics, single cell.

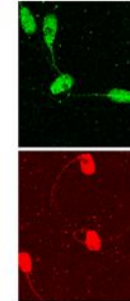
Expected outcomes: Advances in fundamental & applied sci.



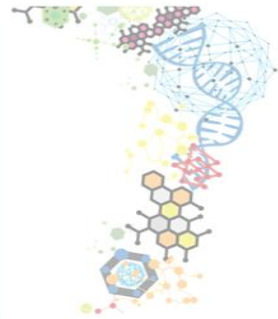
**Lipidomics**



**Sperm parameters  
& Computational biology**



**Proteomics**



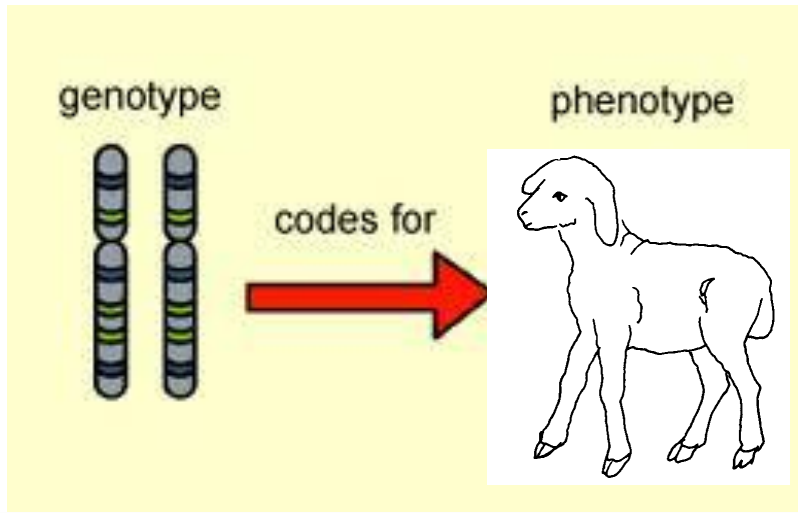
# What types of sheep or goats should I raise?

- Animals that fit to your system, match your resources, and make you the most money.
- The best animals are the ones that perform the best, not necessarily look the best.
- Meat goats or hair sheep, or dairy goats
- Purebred or commercial operations



# GENOTYPE (G)

- The genetic make-up of a cell, organism, or animal.
- Determines hereditary potential and limitations of the individual.



# PHENOTYPE (P)

- The observable or measurable traits or characteristics of an organism: What we can see or measure.
- Determined by genetics, plus environmental influences (E).

$$P = G + E$$





# Goals for Goat and Sheep Selection

- Improve the frequency of desirable traits
- Reduce frequency of undesirable traits
- Eliminate deleterious/lethal genes
- Lifetime productivity
  - Survival
  - Fertility
  - Udder characteristics
  - Milk production
  - Growth rate
- Economically important traits



# Economically Important Traits

## ***Reproduction***

- Age at first lambing
- Fertility
- Lambing
- Lambs raised to weaning
- Survival

## ***Resilience to stress***

- Adaptation
- Tolerance to heat and drought

## ***Health***

- Resistance to disease
- Adaptation

## ***Milk***

- Udder characteristics
- Milk yield
- Fat content
- Protein content
- Lactation length

## ***Growth***

- Birth weight
- Weaning weight
- Adult weight
- Feed efficiency
- Sustained good body condition



# Selection tools

- General visual appraisal
- Breeder records
- Performance data for sires
- Expected Progeny Differences (EPDs)
- Show records
- Pedigree data
- Industry standards
- Breed standards

# Selection requires

- Recording reliable phenotypic data
- Selection of females
- Fertility
- Prolificacy
- Milk production
- Genetic merit in growth
- Seasonality on fertility and health
- Selection of males



# Single trait selection

- Individual selection; own performance
- Family selection: Based on bloodlines
- Pedigree selection: Performance of closely related ancestors
- Progeny test
  - Performance of the offspring
  - Must be mated to several ewes/does and then look at offspring
  - Works best for carcass traits
- Combined selection
  - Uses more than one of the above





# ***Multi-trait selection***

- Tandem selection
  - Focuses on multi-traits-one at a time after performance evaluation for each trait
- Independent culling
  - Minimum standards for more than one trait at a time



# Leyla Rios

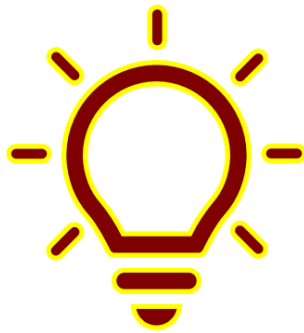
- **Animal Scientist** (Venezuela) ♥
- **Master Science** (Venezuela) ♥
- **PhD** (Scotland UK) ♥
- **University Professor >20y** (Venezuela)
- **Researcher 5y** (Colombia) ♥
- **Assistant Professor MSSTATE** ♥



## My Research lines in the last years have been:

- Use of bioactive forages and plant extracts for sheep and goat parasite control
- Welfare of foraging animals





**Sheep or goats ?**

**Different species**

**Different behavior**

**Different management**

**Purpose of the farm ?**

**Breed ?**

**Size of the farm?**

**Time available ?**

**Market ?**

- Meat
- Milk
- Breeding animals
- Club animals



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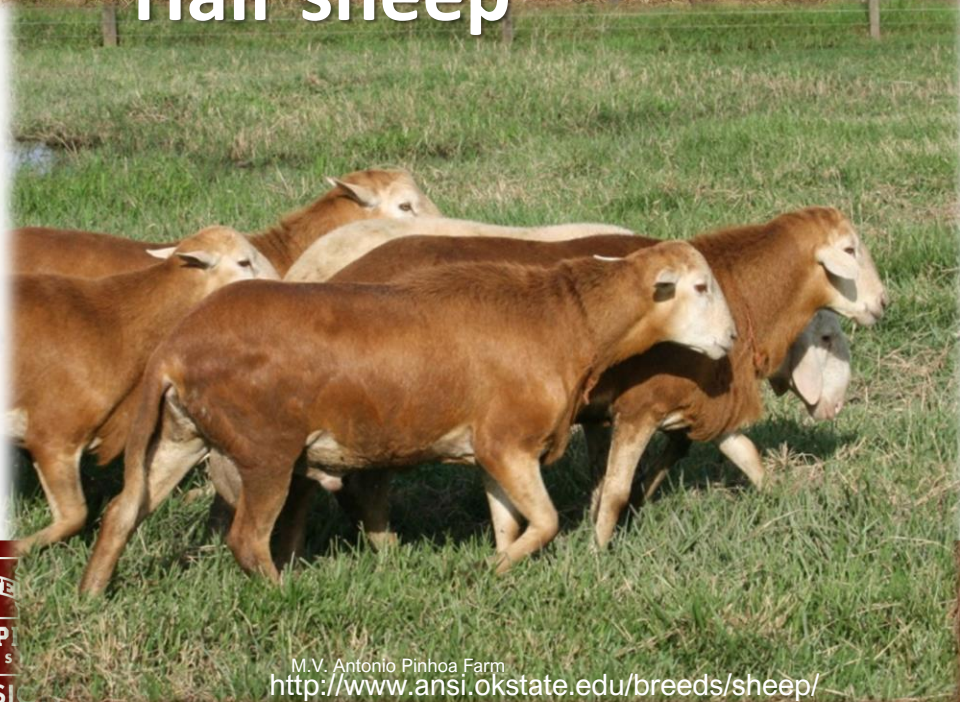
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# Sheep breeds



Wool sheep  
Hair sheep

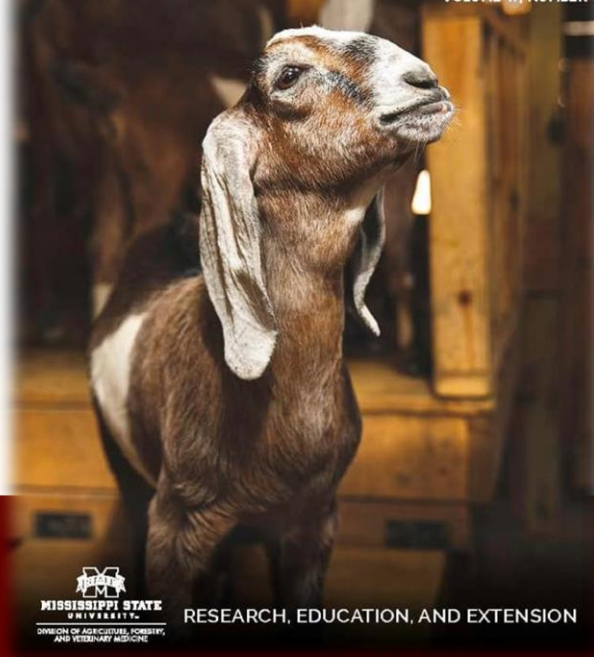


# Goat breeds



Meat goats  
Milk goats

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**LANDMARKS**  
VOLUME 17, NUMBER 1





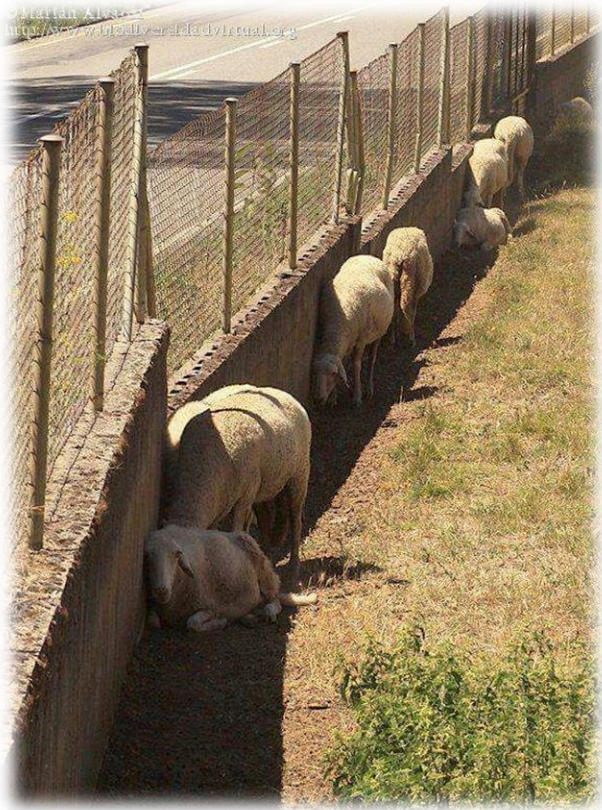


*Old animals*



# ***Facilities***

***Design thinking in the welfare of the operator  
and the animals***



***Animals need shade***



# *Facilities*





# ***Facilities***



***Please keep records!!***



# *Facilities*



## Recommended Floor and Trough Space for Sheep/ Goats in intensive Production Related to Live Weight

	Weight	Floor Space			Trough Space
		Solid Floor	Slatted Floor	Open Yard	
Animal	lbs	ft <sup>2</sup> /animal	ft <sup>2</sup> /animal	ft	ft/animal
Ewe/ Doe	77	8.6	7.5	21.5	3.8
Ewe/ Doe	110	11.8	9.7	27.0	4.3
Ewe/ Doe	154	15.0	11.8	32.3	4.8
Lamb/ Kid		4.3 – 5.4	3.2 – 4.3	-	2.7 – 3.2
Ram/ Buck		32.3	27.0	-	5.4



# Next!



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# *Rocky Lemus*

- Extension/Research Professor and Extension Forage Specialist.
- Leader, Center for Forage Management and Environmental Stewardship
- Evaluation and development of grazing systems to extend grazing season among different livestock systems (beef, dairy, sheep, goat, and horses).
- Raise Nubian dairy goats for breeding stock and performance programs.



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## **EXTENSION**

Center for Forage Management  
and Environmental Stewardship



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# Importance of Forage

- Goats are ruminant animals
  - Efficient at converting high fiber diets to high quality protein.
- Cost of production
  - Grazing cost less per pound of gain than concentrate.
- Marketing opportunities
  - Markets for grass or forage fed meat products on the increase.



# ***Forage Diversity***

- It increases opportunities for better biomass production and distribution across the growing season.
  - It allows extending the grazing season.
  - Pastures with different forage species mix or pasture with different forage species that can be used at different times of the year.
- There **about 39 forage species** that will fit into an integrated forage production system to extend the grazing season and reduce supplementation practices.

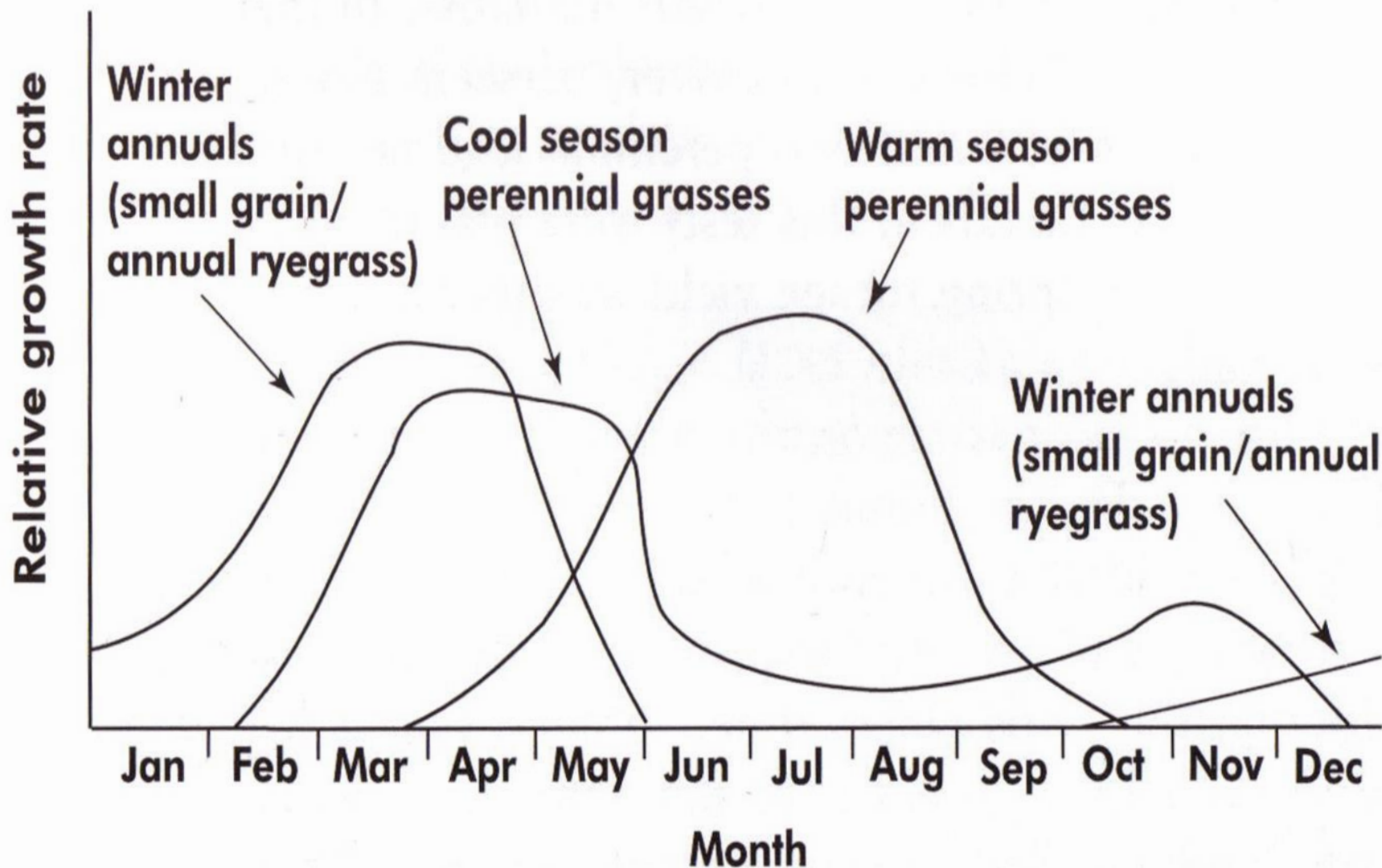


# ***Types of Forages for Sheep and Goats***

- ***Cool-season Forages***
  - Fescue
  - Annual ryegrass
- ***Forage Legumes***
  - Clovers
  - Alfalfa
  - Lespedeza
- ***Warm-season Forages***
  - Bahia and bermudagrass
  - Sorghum-Sudan
  - Millet
  - Brassicas
- ***Forbs***
  - *Brassicas*
  - *Chicory*







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# ***Optimal Rest Period for Forage Species***

	<b><i>Weather</i></b>	
<b><i>Forage Species</i></b>	<b><i>Cool</i></b>	<b><i>Hot</i></b>
	----- days -----	
<b>Cool-season grasses</b>	10-14	35-50
<b>Warm-season grasses</b>	35-40	14-21
<b>Legumes</b>	21-28	30-40



# Dry Matter Intake

- Sheep and goats can spend up to 6 to 12 hours grazing per day.
- Yield, forage density and quality must be adequate for animals to meet dry matter intake requirements from pastures.

		Daily dry matter intake (% of body weight)
Species	Stage of Production	
Sheep	Lactating ewe	4
	Dry ewe	2
	Growing lamb	3-4
	Ram, mature	2
Goat	Lactating dairy doe	5
	Lactating nondairy doe	4
	Dry doe	3
	Growing kid	3-4
	Buck, mature	2

Nutrient Requirements of Small Ruminants (2007)





# Michael Pesato, DVM, DABVP (Food Animal Practice)

*Assistant Clinical Professor, Food Animal  
Medicine and Surgery*

*Mississippi State University College of Veterinary  
Medicine*

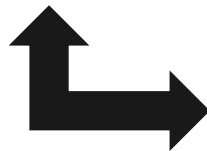


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# Who Is This Guy?



# ***Just a Quick Look at Your Veterinarian!***



- How many years does it take to become a veterinarian?
  - 4 years of college then 4 years of veterinary school
- How much small ruminant education does a veterinarian receive?
  - Depends...
- Why aren't there more veterinarians doing small ruminant work?
  - Loaded question!
- How do I establish a relationship with my veterinarian?



# ***The Veterinarian-Client-Patient Relationship***

- **V**eterinarian takes responsibility, **C**lient agrees to follow the veterinarian's instructions.
- The **V**eterinarian has knowledge of the patient; veterinarian has examined the **P**atient and/or made timely and medically necessary visits
- **V**eterinarian is readily available for follow-up
- **V**eterinarian provides oversight.
- **P**atient records are maintained.





# *Things Are Changing...*

- Right now, there are many antimicrobials available over the counter



- Food and Drug Administration (FDA) plans for all over-the-counter medications to be prescription only by 2023



# ***Your Veterinarian...***

## ***SHOULD:***

- Develop Preventative Medicine Plans
  - Vaccination Protocols
  - Deworming Strategies
  - Disease Surveillance
- Develop Treatment Protocols
- Perform Sick Animal Examinations
- Hold Husbandry Discussions
- Perform Regulatory Work
  - Health Certificates



## ***SHOULD NOT:***

- Be Emergency Only
- Solely Act as a Source of Medication
- Ignore Your Experience and Knowledge Base
- Be Utilized Only When it's Too Late ☹️
- Be Used **ONLY** for Euthanasia



# SHEEP AND GOAT PRODUCTION WEBINAR SERIES

Mississippi State University Extension Service



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United States  
Department of  
Agriculture



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Natural Resource Conservation Service



2021-2022 Sheep and Goat Production Webinar Series

## CHOOSING THE RIGHT FORAGES: UNDERSTANDING FORAGES FOR SHEEP AND GOAT PRODUCTION

LIVE WEBINAR



October 5, 2021

6:00 PM—7:00 PM (Central)

Online (ZOOM)



Free

Pre-registration is required!



Scan the QR code or visit the web-  
site to register

[https://bit.ly/2021\\_Oct5SGPW](https://bit.ly/2021_Oct5SGPW)



This webinar will focus on forage selection and adaptation for grazing small ruminants and decreasing grain supplementation. Learn how to introduce forage diversity in your pastures to extend the grazing season and utilize proper rotations.

Dr. Rocky Lemus is the Extension Forage Specialist with Mississippi State University. His program focus in grazing management systems for livestock production. He also raises Nubian dairy goats and focused on forage systems that can help reduce supplementation while maintaining forage yield, and nutritive value.



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United States  
Department of  
Agriculture

Natural Resource Conservation Service



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# Contact and Follow US

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*Leyla Rios (662) 325-0123*

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*Michael Pesato (662) 325- 9247*



***Mississippi Forages***



***@msuextsheepandgoats***



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# *Questions?*