### USDA/CSREES Research Projects

**Title:** Goat Nutrient Requirements, Management Practices, and Production Systems  
**Type:** CSREES project  
**Project Number:** OKLX-SAHLU  
**Period:** 2001-2006  
**Investigators:** T. Sahlu, A. L. Goetsch, R. Puchala, and S. P. Hart  
**Institution:** Langston University  
**Objective:**  
- Study goat nutrient requirements, management practices, and production systems in order to increase the level and efficiency of goat productivity for increased profitability from goat production and lower costs to consumers of goat products.

**Title:** Nutrient Requirements of Goats: Composition of Tissue Gain and Loss  
**Type:** USDA 1890 Institution Research Capacity Building  
**Project Number:** 2003-38814-13923  
**Period:** 2003-2006  
**Investigators:** T. Sahlu¹, A. L. Goetsch¹, C. L. Ferrell², and C. R. Krehbiel³  
**Institutions:** ¹Langston University, ²USDA ARS Meat Animal Research Center, and ³Oklahoma State University  
**Objective:**  
- Determine the composition of tissue gain by growing Boer crossbred and Spanish meat goats consuming different quality diets from weaning to 1 year of age.  
- Determine the composition of tissue loss and gain by mature meat goats.  
- Determine the composition of tissue loss and gain by lactating dairy goats.  
- Develop equations to predict body composition of growing and mature meat goats and lactating dairy goats based on shrunk body weight and urea space.

**Title:** Tethering for Detailed Study of Grazing Ruminants  
**Type:** USDA-CSREES-NRI 03-03289  
**Project Number:** OKLX-GOETSCH  
**Period:** 2003-2005  
**Investigators:** A. L. Goetsch¹, R. Puchala¹, T. Sahlu¹, and C. R. Krehbiel²  
**Institutions:** ¹Langston University and ²Oklahoma State University  
**Objective:**  
- Validate use of tethering to study responses of meat goats to grazing conditions by investigating effects of grazing unrestrained versus tethered on grazing behavior, energy expenditure, forage intake, and composition of forage selected by meat goats on pastures with low and high forage quality and available mass.
Title: Enhanced Goat Production Systems for the Southern United States
Type: USDA Initiative for Future Agriculture and Food Systems
Project Number: 2011-52101-11430
Period: 2001-2006
Investigators: T. A. Gipson¹, A. L. Goetsch¹, S. P. Hart¹, L. J. Dawson², Harvey Blackburn³, Stephan Wildeus⁴, Joseph Tritschler⁴, Jean-Marie Luginbuhl⁵, Matt Poore⁵, Marcos Fernandez⁶, Will Getz⁷, Tom Terrill⁷, Mack C. Nelson⁸, and Ken Turner⁸
Institutions: ¹Langston University, ²Oklahoma State University, ³National Seed Storage Lab Animal Germplasm, ⁴Virginia State University, ⁵North Carolina State University, ⁶Louisiana State University, ⁷Fort Valley State University, and ⁸USDA ARS Appalachian Farming Systems Research Center
Objectives: • Develop a vehicle to appraise use of available resources and production conditions with goat production systems.
• Project most appropriate production systems for goat-producing regions based on compatibility with presently available resources and production conditions, and evaluate changes in resources or production conditions necessary for employment of alternative, preferred systems.
• Disseminate and provide training in use of the developed-decision support vehicle.

Title: Use of Goats for Sustainable Vegetation Management in US Grazing Lands
Type: USDA Sustainable Agriculture Research and Education
Project Number: LS01-119
Period: 2001-2004
Investigators: A. L. Goetsch, S. P. Hart, T. A. Gipson, and R. C. Merkel
Institution: Langston University
Collaborators: Caddo Nation, Cherokee Nation, Choctaw Nation, Greater Seminole Nation, Osage Nation, and Sac and Fox Nation
Objectives: • Increase appropriate employment of goats in sustainable vegetation management in grazing lands of the south-central US, with particular emphasis on Native American Nation tribal lands or lands of tribal members.
  ▶ Investigate effects of various goat management methods for vegetation rehabilitation/control in different grazing land settings in the south-central US.
  ▶ Demonstrate and display appropriate means of vegetation management with goats, as well as to provide education in other related management areas.
  ▶ Develop an information package on optimal use of goats for grazing land vegetation management to ensure long-term, sustainable, and widespread project impact.
Title: Energy for the Productive Caprine
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-38814-9500
Period: 2000-2004
Investigators: T. Sahlu1, A. L. Goetsch1, H. C. Freely2, and G. E. Carstens3
Institutions: 1Langston University, 2USDA ARS Meat Animal Research Center, and 3Texas A&M University
Objective: Determine key energy requirements for different classes of goats reared in the US (maintenance energy requirements; energy costs for live weight gain or growth; energy use in gestation with different litter sizes; energy required for lactation; energy demands for mohair fiber growth).

Title: Diet Selection and Performance by Sheep and Goats Grazing Mixed Pastures
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-0003832
Period: 2000-2004
Investigators: A. L. Goetsch1, G. E. Aiken2, T. Sahlu1, and M. Powell3
Institutions: 1Langston University, 2USDA ARS Dale Bumpers Small Farms Research Center, and 3Winrock International
Objectives: Evaluate stocking rate effects on pastures that contain various forbs and grasses being co-grazed by goats and sheep.
- Measure growth performance of kids and lambs on pastures containing a complex mixture of grasses and forbs, and pastures that are alley cropped with mimosa.
- Determine the quality and productivity of mimosa as browse in pastures co-grazed with goats and sheep.
- Study the interaction between stocking rate and time in affecting the quantity and quality of major botanical components, animal weight gain, and diet selectivity.
- Determine the most suitable stocking rate that provides the highest gain per unit land area with the least amount of change in botanical composition.

Title: Metabolic Changes Affecting Utilization of Poor Quality Diets by Goats
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-1999-04159
Period: 1999-2003
Investigators: R. Puchala1, A. L. Goetsch1, S. W. Coleman2, and T. Sahlu1
Institutions: 1Langston University and 2USDA ARS Grazinglands Research Laboratory
Objective: Determine influences of supplementation of poor-quality forage diets with rumen-protected betaine on energy and nitrogen metabolism in goats.
Title: Quality Characteristics and Yield Predictive Models of Goat Milk Cheeses
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-1999-04114
Period: 1999-2003
Investigators: S. S. Zeng\textsuperscript{1}, E. N. Escobar\textsuperscript{1}, D. L. Van Hekken\textsuperscript{2}, and S. E. Gilliland\textsuperscript{3}
Institutions: Langston University, USDA ARS Dairy Products Research Unit, and Oklahoma State University

Objectives:
\begin{itemize}
  \item Determine the effects of milk composition and somatic cell counts on the quality and yield of goat cheese and develop yield predictive models for goat cheeses.
  \item Characterize different goat cheeses in terms of composition, microstructure, rheological properties, protein profiles, and sensory characteristics as affected by seasonal variations of milk composition and property changes during cheese storage.
\end{itemize}

Title: Sustainable Dairy Goat Milk Production from Forages
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-1999-04146
Period: 1999-2003
Investigators: S. P. Hart\textsuperscript{1}, T. Sahlu\textsuperscript{1}, and L. D. Satter\textsuperscript{2}
Institutions: \textsuperscript{1}Langston University and \textsuperscript{2}Dairy Forage Research Center

Objectives:
\begin{itemize}
  \item Study milk production, composition, animal health, and inputs for a grass-based dairy system as compared with a conventional confinement dairy.
  \item Determine the response in milk production of grass-based dairy goats to different levels of concentration supplementation.
  \item Model the effect of forage intake and concentrate supplementation on milk production and changes in body weight.
\end{itemize}

Title: Nutrient Requirements of Goats: An Update and Reevaluation
Type: USDA 1890 Institution Research Capacity Building
Project Number: OKLX-9803092
Period: 1998-2004
Investigators: A. L. Goetsch\textsuperscript{1}, T. Sahlu\textsuperscript{1}, M. L. Galyean\textsuperscript{2}, C. L. Ferrell\textsuperscript{3}, F. N. Owens\textsuperscript{4}, and Z. B. Johnson\textsuperscript{5}
Institutions: \textsuperscript{1}Langston University, \textsuperscript{2}Texas Tech University, USDA ARS Meat Animal Research Center, \textsuperscript{4}Pioneer Hi-Bred International, and \textsuperscript{5}University of Arkansas

Objective:
\begin{itemize}
  \item Develop a database of available data from publications on goat feeding and nutrition to develop accurate expressions of energy and protein requirements of goats.
\end{itemize}
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