portray scientific knowledge as nothing more than personal preferences that don't matter. However, other varieties view science as a value-laden social practice, but recognize that scientific methods can provide useful ways for coping with nature; especially when they take into account multiple perspectives. It is this latter view that offers insight into how the animal science profession can address policy issues in morally responsible ways. Currently, the animal science community advocates the modern view that public policy should be based only on sound science. This view conceives the animal science community as one that is segrated from and holds authority over a greater human community. A perspective which seems more compatible with addressing the diverse interests of a greater community is one which views animal scientists as part of such a community, and who provide only some of the perspectives that should be considered when addressing policy issues.

Key Words: Ethics, Policy, Philosophy of Science

Mechanisms of Hormonal Signal Transduction

737 Progesterone regulates reproductive function through two functionally distinct receptor isoforms. OM Conneely*[1], B Mulac-Jericevic[1], and F DeMayo[1], [1]*Baylor College of Medicine*.

Progesterone regulates reproductive function by interaction with two intracellular receptors, PR-A and PR-B, that arise from a single gene. To establish the selective physiological roles of PR isoforms in vivo, we have selectively ablated PR-A (PRAKO) or PR-B (PRBKO) expression in mice. Ablation of PR-A results in severe abnormalities in ovarian and uterine function but does not affect responses of the mammary gland or thymus to progesterone. Analysis of uterine function of PRAKO mice reveals an unexpected progesterone-dependent proliferative activity of PR-B in the epithelium and provides evidence that the tissue specific functions of this isoform are due to specificity of target gene transactivation rather than differences in spatiotemporal expression relative to PR A. Contrary to PRAKO mice, PRBKO mice are fertile and have successful pregnancies that result in normal litter sizes. Histological studies of uteri isolated from PRBKO mice revealed normal sensitivity to estrogen and progesterone. Specifically, progesterone acting through PR-A alone antagonizes estrogen-induced proliferation of the uterine epithelium in PRBKO mice. Progesterone receptors are critical for mammary gland development and morphogenesis. We have analyzed mammary glands response to estrogen and progesterone in PRBKO animals ovariectomized at 6 or 10 weeks of age. Whole mounts analysis of mammary glands obtained from ovariectomized 6 week old PRBKO mice treated with estrogen and progesterone for 3 weeks showed significantly reduced side branching when compared to wild type and PRAKO mice. Interestingly this phenotype is reverted in 10 week old PRBKO mice treated under identical hormonal regime. These results further demonstrate tissue specific functions of progesterone receptor isoforms.

Key Words: progesterone receptor isoforms, female reproduction

738 Role of Neurotrophic Factors in Ovarian Development. S.R. Ojeda*, G.A. Dissen, C. Romero, and A. Paredes, *Oregon Regional Primate Research Center/Oregon Health Sciences University, Beaverton, OR*.

The neurotrophins nerve growth factor (NGF), neurotrophin-4/5 (NT-4/5), and brain derived neurotrophic factor (BDNF), and their high-affinity tyrosine kinase membrane-anchored receptors (trkA for NGF and trkB for NT-4/5 and BDNF) are expressed in the mammalian ovary before the initiation of follicular assembly. Mice carrying a null mutation of the NGF gene had a reduced number of primary follicles and a nomal population of primordial follicles, suggesting that NGF is not required for follicular formation, but is necessary for the initiation of follicular growth. The fewer primary follicles seen in NGF KO mice appear to result from a deficiency in somatic ovarian cell proliferation. After formation of primary follicles, NGF facilitates early follicle growth by inducing the synthesis of biologically active FSH receptors. Concomitant deletion of the NT-4 and BDNF genes, or deletion of the gene encoding their trkB receptor, resulted in reduced granulosa cell proliferation and decreased formation of secondary follicles at the onset of follicular growth. Thus, activation of trkA receptors during early follicle development appears to sustain the conversion of primordial into primary follicles, whereas activation of trkB receptors facilitates the acquisition of additional layers of granulosa cells by the primary follicles. Thecal cells of antral follicles continue to express NGF and respond to the neurotrophin with proliferation and prostaglandin release. While an increase in thecal trkA expression occurs at the time of the preovulatory surge of gonadotropins, blockade of trkA receptors inhibits ovulation, suggesting a role for NGF in ovulatory rupture. Thus, neurotrophins contribute to regulating two key phases of ovarian development: the initiation of follicular growth, and follicular rupture at ovulation. Together, these results identify a novel function for the neurotrophins in the development of a nonneural organ, and demonstrate that they act in the ovary to facilitate the proliferation and differentiation of specific cellular subsets involved in follicular growth. (Supported by NIH grants HD-24870, RR-00163 and U54-HD18185)

Key Words: Ovarian Development, Neurotrophic Factors, Follicular Growth

739 Growth hormone signaling to the nucleus. Jessica Schwartz* and Graciela Piwien-Pilipuk, *Dept. Physiology, University of Michigan*.

Effective use of growth hormone (GH) depends on understanding its mechanism of action. The diverse actions of GH are mediated by multiple signaling mechanisms. When GH binds, the GH receptor associates with the tyrosine kinase JAK2, initiating multiple signaling events. Analysis of GH-regulated gene expression indicates that multiple signaling cascades triggered by GH regulate the function of multiple transcription factors. The proto-oncogene c-fos is a target for several GH-initiated signaling pathways. One pathway, mediated by GH-promoted tyrosine phosphorylation of Signal Transducers and Activators of Transcription (STATs), regulates the Sis-Inducible Element. Transcriptional activation mediated by the Serum Response Element in response to GH depends on the phosphorylation and activation of the transcription factor Elk-1 by MAP kinases. The dephosphorylation of the transcription factor C/EBP beta promoted by GH appears to reflect inhibition of Glycogen Synthase Kinase 3 (GSK3) via GH-stimulated PI-3 kinase/Akt, leading to changes in the binding and function of C/EBP beta. It is likely that signaling networks involving multiple pathways initiated by GH-GH receptor-JAK2 interactions contribute to the coordinated regulation of gene expression in response to GH. Such changes in gene expression underlie the physiological actions of GH.

Key Words: Gene expression, GH signal transduction, Transcription factors

Profitable Meat Goat Production: The Interaction of Genotype and Management

740 Rheological characteristics of uncooked goat meat. Eric Risch* and Jackson M. Dzakuma, *Prairie View A&M University, Prairie View, TX. USA*.

After weaning, 48 kids of Spanish (SP) and Tennessee Stiff-Legged (TS) breeds were individually penned and fed an 18% CP and 65% TDN ration for six months during which time their weights were taken on a bi-weekly basis. These breeds represent goats with small (TS) and intermediate (SP) mature sizes. They were slaughtered at six months of age. Four replicates of rectangular slabs (approximately 2.54 cm x 2.54 cm x 1.77 cm) of samples were taken from the fore-quarter, hind-quarter and breast regions of the carcasses. An Instron Universal Testing Machine (Model 4201) was used to apply 80 % compression deformation at a strain rate of 2.54 cm/min to each sample in the axial direction. The strength or ultimate stress (as determined by the ultimate load applied to the sample till failure), the elastic modulus (as determined by the ratio of ultimate stress over strain) and the toughness of the sample (derived from the area under the force-deformation curve and giving an indication of the energy required to propagate failure) were determined

by measurement or calculation. For the three properties measured (*Ultimate Stress (ULTSTRESS), Elastic Modulus* and *Toughness*) these assumptions were made: Samples were homogeneous and isometric. Results indicated that no differences (P>.05) were observed in the three properties measured for main effects of breeds. For sex main effects, statistically significant differences (P<.01) were observed in all three properties: ULTSTRESS (67.7 vs 46.5 kg/m^2); Modulus (422.7 vs 286.1 kg/m^2); Toughness (9.9 vs 7.1 kg-m/m^3) for females and males, respectively. Between the two breeds at the same dietary levels, statistically significant differences (P<.05) were observed. For example, between SP and TS, respectively: ULTSTRESS at 70% level (72.8 vs 34.7 kg/m^2) and at 85% level (40.5 vs 77.2 kg/m^2); Modulus at 70% level (429.6 vs 192.1 kg/m^2) and at 85% level (274.5 vs 481.9 kg/m^2); and for Toughness at 70% level (11.7 vs 5.12 kg-m/m^3) and at 85% level (5.2 vs 12.2 kg-m/m^3). The results would seem to indicate that the level of the feed intake affects the rheological characteristics of goat meat. This would tend to influence consumer acceptance of goat meat and meat products which depends on perceived textural properties of the product.

Key Words: Goat, Rheological , Modulus, Toughness, Ultimate Stress

741 The impact of breed and management on market and carcass value. Louis Nuti*[1], Frank Pinkerton[2], and Ken McMillin[3], [1]*Prairie View A&M University,* [2]*The Goat Works,* [3]*Louisiana State University Agricultural Center.*

Meat producers are faced with many management decisions and necessarily choose among several options concerning breeding, feeding, health and marketing programs. Historically, Spanish and Angora goats have been the breeds of choice, primarily due to the numbers available. Year round grazing on brush and perennial grasses with minimal protein and energy supplementation have long been the norm. Slaughter goats have usually been marketed via auctions, traders and private treaty, with producers typically having little recourse and even less knowledge of marketing channels, supply and demand. The recent advent of Boer goats from South Africa and other meat goat breed types pose a number of questions for traditional meat goat producers. Such questions as, will Boer and other crosses grow more efficiently, grow faster and be more readily accepted and be more valuable than currently available slaughter animals? The objectives of this project were to: 1) determine production responses of meat goat breeds to different feeding regimes; 2) determine auction barn responses as influenced by breed, grade and management; 3) compare relative 'profitability' of breeds as influenced by management; and, 4) compare carcass qualities. Previous confinement feeding trials have shown that feed conversions (kg feed/kg gain) at current levels of feed cost ($0.10-$0.12/pound) and current market prices for goats ($0.70-$0.80 per cwt) were not practical. Trials using native or improved pastures, with or without supplementation did show a significant positive growth response (P<0.05) when cross bred Boer wethers were supplemented with 0.45 kg corn/hd/day. This group of wethers also graded higher live and yielded a higher auction barn price per pound. The net effect was to show an improvement in income-over-supplemental feed cost by Boer crosses. This advantage over Spanish wethers was apparently due to: 1) larger A.D.G.; 2) better live grades; 3) increased price/lb of sale weight. The carcass data suggests that the real advantage to breed and supplementation was that the heavier carcasses yielded higher (P<0.05) weights of total cuts for the same age animals.

Key Words: Meat goats, Management, Economics

742 The economic implications of genotype by nutrition interactions in goats raised for meat. Will R. Getz*, *Georgia Small Ruminant Research & Extension Center, Fort Valley State University, GA.*

Resources used for goats in meat production systems are numerous and varied. Among the most costly are nutrient resources. Costs of energy and protein are associated with land value, agronomic practices, and purchased supplements. Animal genotype determines potential growth rate, milk yield, muscle development, and mature size. Growth, milk yield, reproduction and mature size determine nutrient requirements for maintenance and production. As genotype changes so do nutrient requirements. Systems of goat meat production are dynamic and diverse. They are impacted by biological, economic, and social factors. The combination of these factors is best analyzed holistically. Although some useful and interesting work has occurred with sheep, the literature for goats is relatively thin. With this in mind we have undertaken to give due consideration to the interactions to be factored in optimizing systems when reviewing existing frameworks and testing new configurations. This paper seeks to highlight several of the factors which suggest existing interactions. Product output per unit of nutrient input involves a complex of relationships. Improvements in productivity may not result in improvement in efficiency or profitability. Resources used and production level attained can best be expressed in terms of value added to the final product, and returns to labor, land and capital. Those which are site specific tend to be less diverse but the impact of interactions suggests that what we know about main effects must be tempered by knowledge of the nutritional environment. Recent availability of genotypes with suggested higher production and more desirable product form, require that cost-benefit relationships be revisited. Maintenance requirements, prolificacy and fecundity, weight gain and competition from internal parasites are all factors that enter the productivity equation and impact on profit conscious breeders and meat producers. Where changes in genotype bring about different results under two or more nutrition environments then interactions are real and must be considered in any economic analysis.

Key Words: Goat, Economic implications, Genotype nutrition interactions

743 Goat growth in relation to feed intake. H. Blackburn*[1], J. Dzakuma[2], and A. Goetsch[3], [1]*USDA-ARS,* [2]*Prairie View A&M University,* [3]*Langston University.*

Growth and growth efficiency are complex functions mediated by genetics, nutrient quality, intake level, maturing patterns and environmental factors. Using Tennessee Stiff-legged (TS) and Spanish (SP) breeds growth, body composition, feed intake and feed efficiency were evaluated from weaning to 1 yr of age when fed ad libitum or at 85 or 70% of ad libitum intake. Twenty-four animals of each breed, with equal numbers of different genders, were individually penned and fed a diet consisting of 18% CP and 65% TDN. Feed intake was measured daily and body weight was determined every 14 d. At 6 mo of age, cumulative feed intake for TS and SP breeds, respectively, was 50.5 and 51.3 kg; and growth weights was 18.6 and 19.1 kg. From 10 to 13 mo of age, cumulative feed intake for the same breeds, respectively, was 66.6 and 67.7 kg, and 13-mo growth weight was 25.9 and 26.1 kg. No differences (P > 0.01) existed in feed intake and growth weights despite the differences in mature sizes (TS = 36.8 and SP = 47.5 kg), implying that the TS were more efficient (P < 0.05) in converting feed into weight gain. The TS gained 0.167 kg per kilogram of feed consumed, compared with 0.122 for SP. The Brody growth equation was fitted to growth data of the TS and SP populations. Analysis yielded the same maturing rate (0.00268) for the two breeds. Maturing rate describes the rate at which an animal achieves its mature size. Animals with different mature sizes (e.g., TS and SP) should have different maturing rates. These results demonstrate TS had the same maturing rate as SP, a larger breed. Such a result implies TS is growing more efficiently than SP, confirmed by feed efficiency and average daily gain calculated on these goats. To more fully evaluate the above data a simulation model was used to compare our understanding of the integration of growth, nutrient partitioning, and feed intake. There were deviations between live animal and simulated data for portions of growth, feed intake, and body composition. These deviations represent an incomplete understanding of the growth process and provide a basis for designing focused experiments to better elucidate our understanding.

Key Words: Goats, Growth, Feed efficiency