Table 1. LSM for body weights and hip heights

	Body Weight (kg)			Hip Height (cm)		
Month	3	12	18	3	12	18
Breed						
HH[a]	103	318	475	98	129	139
HJ	93	304	420	93	123	132
JH	93	302	424	95	125	134
JJ	79	258	323	82	116	124

[a]Sire breed first followed by dam breed; H=Holstein; J=Jersey

Key Words: Crossbreeding, Body weight, Hip height

259 Genetic evaluation of milking speed for Brown Swiss dairy cattle. G. R. Wiggans*[1], L. L. M. Thornton[1], and R. R. Neitzel[2], [1]*Animal Improvement Programs Laboratory, Agricultural Research Service*, *Beltsville, MD*, [2]*Brown Swiss Association*, *Beloit, WI*.

Genetic parameters and breeding values (EBV) were estimated for milking speed in Brown Swiss cattle. Owner recorded milking speed scores on a 1 to 8 scale (low to high) were collected by the Brown Swiss Association as part of its linear type appraisal program starting in 2004. Data were 6,483 records on 6,017 cows in 352 herds. A total of 13,192 ancestors and seven unknown parent groups, each including four years of birth, also were included. The model included fixed effects for herd appraisal date, parity-stage of lactation, and random effects for permanent environment, animal and error. Four 90-day stages of lactation were defined. An Average Information REML variance estimation procedure produced heritability of 0.22 and repeatability of 0.41. The residual variance was 1.13. There was little trend in EBV of cows born 1999 through 2002. The 109 bulls with 10 or more daughters had a range in EBV of 2.7. Speed increased with stage of lactation for first parity cows by 0.37. There was not a clear trend in second parity, and in third and later parities, there was a drop of 0.20 from the first to the third 90-day period, then an increase of 0.10 in the last period. For the 109 bulls with 10 or more daughters, significant correlations between evaluations for milking speed and other traits were 0.22 for milk, 0.53 for productive life and -0.37 for somatic cell score. The association of faster milking speed with lower somatic cell score was not expected. The milking speed information can provide useful EBV given the moderate heritability. Similar data is being collected for Holsteins, so this evaluation system could be extended to that breed.

Key Words: Milking speed, Brown Swiss, Variance components

Companion Animals: Companion Animal Research: Contributions and Conflicts

260 Marrying science to society — hurdles for the use of companion animals in research. G. Golab*, *American Veterinary Medical Association*, *Schaumburg, IL*.

Scientists and veterinarians are most comfortable when decisions about when and how to use animals in research involve a careful balance between the expected benefits of the knowledge gained and the potential costs to the animals and other stakeholders involved. This logical analysis is consistent with the methodical approach that scientists most often take when studying any complex problem. Not surprisingly, frustration results when carefully considered advice about what constitutes appropriate use and care appears to go unheeded. But why does such advice go unheeded? Because, rightly or wrongly, decisions about animal use always have been and are likely to continue to be decisions of public policy. Public policy has as much or more to do with attitudes, ethics, morals, perception and cultural norms as it has to do with scientific truth. The impact that science and scientists have on public policy depends on the degree of public trust that can be achieved. Establishing trust and dialog becomes even more critical when the species used are those with which large numbers of the public have special relationships in their own homes (i.e., companion animals). This presentation will focus on the factors influencing public understanding and trust of science and scientists. Scientific literacy and public engagement will be discussed as strategies to maximize the influence of science on animal welfare decision-making.

Key Words: Animal welfare, Public trust, Companion animal research

261 Conserving endangered wild felids – the invaluable domestic cat connection. W. F. Swanson*, *Cincinnati Zoo's Center for Conservation and Research of Endangered Wildlife*, *Cincinnati, OH*.

Most of the world's 36 wild cat species are facing escalating threats to their future survival, primarily due to habitat loss and persistent poaching. America's most popular companion animal, the domestic cat, is playing a key role in ongoing efforts to conserve these endangered felid populations. Laboratory research with domestic cats has provided us with a broader understanding of general felid physiology, including reproduction, disease and stress susceptibility, and nutrition, which has contributed to improved exhibitry, diets and reproductive management of nondomestic felids. For example, basic studies with domestic cats have permitted the validation of urinary and fecal hormone analysis for assessment of reproductive cyclicity, seasonality, pregnancy and adrenocortical activity in nondomestic cats. Findings from fecal hormone monitoring have lead to modifications in exhibitry and husbandry that serve to enhance captive propagation while minimizing captive stress. Similarly, systematic studies of in vivo embryogenesis and embryo metabolism in naturally–bred domestic cats have provided a normative database of early pregnancy that forms the basis for improving culture of in vitro–generated embryos and creation of offspring after embryo transfer in endangered felids. Applied studies in domestic cats also have investigated immune responses to exogenous gonadotropins and the cross–species fertilization of domestic cat oocytes in efforts to optimize the success of assisted reproductive procedures in nondomestic cats. Other ongoing studies are assessing the suitability of diets, formulated based on domestic cat requirements, for meeting the nutritional needs of nondomestic cats and conducting comparative assessments of the nutritional status of free–living animals consuming natural prey. In conclusion, the domestic cat continues to represent an invaluable research model and ally in our efforts to maintain, manage and conserve their nondomestic relatives – the wild felids. (NIH grant RR 15388)

Key Words: Conservation, Reproduction, Nutrition

262 Working Dog Challenges: The interplay between genetics, environment and training. P. Mundell*, *Canine Companions for Independence*, *Santa Rosa, CA*.

While dogs do not fall within the traditional agricultural focus of animal science, their ever growing role in modern life offers unique challenges and opportunities for the discipline. The rapid increase in ecomonmic importance of the pet industry in recent decades has obvious and well-understood significance. A more recent phenomenon, and one that is perhaps not as well appreciated, is the proliferation of both the number of dogs that are trained and placed into working roles and the types of tasks that these dogs are being asked to perform. In addition to the functions of livestock herding and guarding, finding game, and the other purposes for which dog breeds were originally developed, dogs are currently working with blind, deaf and physically disabled people, serving as narcotic and explosive detectors, patrolling with the police and military and detecting the presence of certain medical disorders such as cancer and diabetes. The many programs worldwide that employ dogs in these and other capacities face a wide variety of challenges to meet the demand for suitable and well-trained animals. After presenting an overview of some of the ways in which dogs are currently employed, the types of challenges common to working dog programs are explored, as are the approaches being adopted to address these challenges.

Key Words: Working dogs

263 Companion Animal Science: State of the discipline. G. Aldrich*[1], N. A. Irlbeck[2], and R. L. Kelley[3], [1]*Pet Food & Ingredient Technology, Inc*, *Topeka, KS*, [2]*Colorado State University*, *Fort Collins*, [3]*The Iams Company*, *Lewisburg, OH*.

The U.S. pet industry has seen steady growth with sales of companion animal products of $35.9 billion, $14 billion from food alone, and more than 140 million dogs, cats, and other pets. From an economic prospective, this segment is larger than the revenues of the more traditional animal science segments like sheep, goats, and horses combined. The demographics at the academic level have also changed from rural, male students interested in food animals to a majority of suburban, female students interested in small (companion) animals with aspirations for veterinary medicine. In response, some animal science departments have developed companion animal coursework. Companion animal research has made substantial advancements in the past decade. On the broader social level, research has begun to demonstrate the direct value of companion animals on human health by such things as stress reduction, human socialization, and even cancer detection. At the animal level, completion of the canine genome map, dedicated pet imaging centers, improved diagnostic tools, joint replacement, better therapeutic nutrition, species specific cell lines and molecular kits have all become a reality. While this truly marks great strides within the discipline, it is not without challenges. Each year there are over 330,000 dog bite incidents, with a loss of life for more than 300 people between 1979 and 1996. Each year more than 4.3 million pets are relinquished to animal shelters with most euthanized (63%). The scientific community within the discipline stands at a crossroads. Since there is very little direct public funding, most scientific advancements have occurred within closed industrial communities (food and pharmaceuticals), veterinary schools, breed associations, and service dog programs. Examples of collaboration are available, but not prevalent, and far too much research goes unpublished. To fill the gaps and remain relevant, Companion Animal Sciences must demonstrate the value of the discipline to the economy, its importance to society and public health, and demonstrate to prospective students that careers in companion animal science are worthy of pursuit.

Key Words: Companion Animals, Academia, Industry

Extension Education: Profitability of Dairy Farming in a Global Economy

264 Financial records for dairy farms from across the USA. W. T. Cunningham*, *Genske, Mulder & Company, LLP*, *Rancho Cucamongo, CA*.

Benchmarking within dairy production financial records is an important management tool. Information within and between states, regions, genetics, and herd size can be used to improve dairy profitability. Income and expense information will be provided for dairies that average over 1500 head milking that are located in the following states and geographic regions of the United States: Arizona, California (Southern, Central, and Northern), Idaho, Midwest, New Mexico, Texas (Central and Panhandle), and Washington. Information and analysis will also be provided separately for certain 'top 25%' performers and for Jersey cow operations. Key financial areas that will be discussed include sources of income, feed expenses, herd maintenance and replacement costs, and various other operating expenses such as financing, labor and veterinary. Limited production data will also be disclosed, with discussion of the correlation of production and profitability. The data presented is from the client records of Genske, Mulder & Co., and is from financial statements, prepared in accordance with Generally Accepted Accounting Principles, from approximately 250 dairies.

Key Words: Dairy production, Financial management

265 Determinants of regional profitability on dairy farms. J. Miller*[1,2], [1]*USDA Economic Research Service*, *Washington, DC*, [2]*Retired*, *Harrisonburg, VA*.

Relative profitability of dairy farms across regions depends on a number of natural and market factors, as well as the managerial ability of dairy farmers. Some of these factors are truly regional in nature, such as climate, forage production and markets, taxes, local fluid markets, and environmental sensitivity. Other factors are not really regional, although large regional differences may exist. These factors include farm size, dairy infrastructure, availability of human capital for dairy production, and a dairy friendly business climate. In all of these factors, local differences may be greater than regional differences.

Key Words: Dairy, Profitability, Region

266 Northeast Dairy Profitability. D. Rogers*, *First Pioneer Farm Credit*, *Enfield, CT*.

The Northeast Farm Credit ACA's publish an annual report on the Dairy Industry. For short, it is called the Book Book or Dairy Farm Summary. In 2004, 549 Dairy Farm financial records were compiled