



AMERICAN KENNEL CLUB
CANINE HEALTH FOUNDATION

**Inaugural North Carolina State
Breeders' Symposium
July 17, 2004**

ABC's of Breeding

Claudia Orlandi, PhD
Essex Junction, Vermont

The *ABC's of Breeding Home Study Program* is based on Dr. Orlandi's belief that anyone can and should understand the basic and important rules of canine genetics in his quest to breed better, healthier dogs. The *ABC's of Breeding's* unique, step-by-step approach to better breeding includes easy-to-answer workbook exercises along with an innovative set of flash cards, which makes learning new material fun and easy. Attendees who complete the *ABC's of Breeding* workbook exercises and send them in to AKC will receive a certificate of completion.

The *ABC's* takes a practical approach to teaching the art and science of dog breeding and focuses on six key tools and concepts. This include 1) genetics, 2) breeding systems, 3) the pedigree, 4) the selection process and the concepts of 5) genetic defects and 6) kennel blindness. Understanding each of these components can help breeders put together the pieces for a more successful breeding program.

Along with reviewing the basics of heredity, some of the common misconceptions that have been passed down from dog breeder to dog breeder are also discussed. A few of these include: What is the definition of linebreeding? Why can linebreeding beyond the fourth generation have relatively little genetic impact on a litter? Should you breed an inferior dog with an excellent pedigree? Is the pedigree more important than the dog itself?

Throughout the *ABC's of Breeding* program the focus is on "need-to-know," practical information, with an emphasis on making it all easy to understand and fun to learn.

Biographical Profile

Dr. Claudia Orlandi's involvement with showing dogs began as a Junior Handler. She and her husband currently have a kennel of 40 to 50 Basset Hounds under the Topsfield prefix on 200 acres in northern Vermont. They have bred over 60 champions, including record holding Bassets in several areas. A teacher by profession, Claudia has been actively involved in education within the Basset Hound Club of America and as a lecturer. She has served on the BHCA Health & Research Committee, the Judges' Education committee and is currently Chairman of Member Education for which she is designing an innovative concept called "Basset Hound University". She authors a column called "Breeder's Toolbox" in the BHCA newsletter and has designed "The Pedi-Score Tool Kit: A Recording System for Basset Hound Breeders." She has also written "Discover the Basset Hound: A Guide To This Fascinating Breed and presented the following workshops: "Tips on using the Pedi-Score Tool Kit to Evaluate a Litter," "Evaluating Forequarters in the Basset Hound" and "Evaluating Hindquarters and Balance in the Basset Hound." She has recently developed "The ABC's of Breeding: What Every Dog Breeder Should Know," which is a home study program for dog breeders. She judges Basset Hounds, Dachshunds and Junior Showmanship.

Canine Reproduction

Katherine Settle, DVM
Sanford Animal Hospital
Sanford, NC

INTRODUCTION

TOPICS OF DISCUSSION

- I. Getting ready for breeding
- II. The right time to breed
- III. Breeding
 - A. Natural
 - B. AI with stud present
 - C. Chilled/Extended
 - D. Frozen
- IV. Gestation
- V. Whelping
- VI. What's NEW

- I. Getting Ready for Breeding
 - A. Your breed's medical problems

 - B. Finding the stud

 - C. Brucellosis
 1. Types of tests

 2. False "positives"

 - D. Physical condition

 - E. Vaginal Culture and Sensitivities
 1. NORMAL BACTERIA

 2. "Strom and Linde Forsberg showed detrimental effects of placing normal bitches on antibiotics"

 - F. Physical exam for breeding

II. The Right Time to Breed

A. History

B. Timing

1. Timing by day of cycle

2. Timing by blood tinge

3. Timing by flagging

4. Timing by vaginal smears

a. Anestrus

b. Estrus cycle

1. ProEstrus

2. Estrus

3. Diestrus

5. Timing by hormones

a. LH tests

In house test kit (Synbiotics..Canine Ovulation Timing Test .."ICG Status LH")

b. progesterones

1) in house test kit (Synbiotics..Canine Ovulation Timing Test.."ICG Status Pro")

2) EIA

3) Chem illuminescence

4) RadioImmune Assay (RIA)

6. THREE WAYS TO TELL OVULATION

a. **VAGINAL SMEARS**

b. **WHELPING DATE**

c. **HORMONES**

III. BREEDING

- A. ALL MY DAYS ARE COUNTED FROM OVULATION
- B. bitch's eggs are not ready to be fertilized until 1-5 days AFTER ovulation
- C. Natural
- D. Artificial Insemination with male present
 - 1. Collection
 - 2. Three fractions of ejaculate
 - a. Presperm
 - b. Sperm
 - c. Prostatic (the most)
 - 3. WHEN TO "PUT IT IN"
 - 4. AKC form
- E. Chilled semen or extended semen
 - 1. DNA
 - 2. BE PREPARED
 - 3. WHEN TO "PUT IT IN"
 - 4. AKC form
- F. Frozen semen
 - 1. Advantages
 - 2. Frozen semen collected
 - a. ampules
 - b. pellets
 - c. straws
 - 3. DNA

4. BREEDING UNIT!!!!!!!!!!!!!!

5. Insemination

a. Surgical

b. TransCervical Insemination (TCI)

6. WHEN TO “PUT IT IN”

7. AKC form

IV. GESTATION

A. Pregnancy diagnosis

1. Pregnancy test kit
in house ..Synbiotics..Canine Pregnancy test..“Witness Relaxin”

2. Ultrasound

3. Radiograph

B. Problems conceiving or carrying?

V. WHELPING

A. ***63 DAYS FROM OVULATION...NOT BREEDING***

B. WhelpWise

VI. What's NEW

Biographical Profile

Dr. Katherine Settle has worked with animals since she was five years old, helping her father, who practiced veterinary medicine in North Carolina. She received a B.S. in Zoology from the University of North Carolina and graduated from the College of Veterinary Medicine at The Ohio State University in 1978. She and her husband own and operate two veterinary hospitals in Sanford, NC.

Dr. Settle has greyhounds and Black and Tan Coonhounds. She has participated and put titles on her dogs in conformation, obedience, and performance events. She has trained Utility, CDX, and CD dogs, boasting the number one greyhound in obedience for five years. She has had several greyhound field champions and a top Lure Courser of Merit. Her own personal breeding program has produced two Black and Tan #1 Breed point dogs, National Specialty and Regional Specialty winners, and a Best In Show.

Her interest in canine reproduction began about 16 years ago. She is a member of the Society of Theriogenology and attends their annual meetings and workshops. Her success using frozen semen for insemination saved the National Greyhound Association frozen semen program from being discarded. For her contributions, she received the National Greyhound Woman of the Year in 1991.

Complementary and Alternative Medicine

Robert G. Schaeffer, Jr., D.V.M., Ph.D.
St. Louis Hills Veterinary Clinic
St. Louis, MO

Complementary and Alternative Medicine (CAM);
What does it mean?

Are there better terms we could use?

What modalities does CAM include?

- Acupuncture
- Spinal Manipulative Therapy
- Herbal Medicine
- Homeopathy
- Nutritional Therapy
- Massage Therapy

Other modalities:

- Aroma Therapy
- Magnetic Field Therapy
- Bach Flower Therapy
- Orthomolecular Medicine
- Reiki
- Light/Laser Therapy

Resources:

- International Veterinary Acupuncture Society
www.IVAS.org
- American Association of Veterinary Acupuncture
www.AAVA.org
- American Holistic Veterinary Medical Association
www.AHVMA.org

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Biographical Profile

Dr. Robert Schaeffer graduated with a DVM and PhD from the University of Missouri in 1972. He was certified in acupuncture in 1992, chiropractice in 1995 and completed three years of training in traditional Chinese herbal medicine in 1996. Dr. Schaeffer began lecturing for the International veterinary Acupuncture Society in 1997. He regularly lectures in the US and internationally.

Dr. Schaeffer has been in small animal/exotic practice for thirty years and has spent the last ten years in equine chiropractice and acupuncture. He runs a full service practice in St. Louis with his daughter and son-in-law.

Canine Cancer Genomics

Matthew Breen PhD, C.Biol, M.I.Biol
Natasha Olby, VetMB, PhD
North Carolina State University
Raleigh, N.C.

Domestic dogs are organized into more than 350 phenotypically distinct genetic isolates, termed breeds, which are characterized by unique constellations of morphology, behavior, and susceptibility to naturally occurring diseases, including cancers. Many breeds of dog have been developed by generations of tightly controlled breeding over a relatively short time (100-400 years), during which the restricted gene flow, combined with moderate to high levels of inbreeding, has resulted in modern dog breeds with considerably reduced genetic heterogeneity. Genetic investigations of canine diseases may thus be conducted amongst a reduced level of the background 'noise' that is usually associated with investigations of more heterogeneous genomes such as our own. Identifying disease-associated genes (or even gene expression patterns) in dog breeds is therefore likely to be simpler than in human populations.

Humans and dogs share a remarkably high level of genetic similarity and both species are exposed to identical environments. It is therefore not surprising that both human and canine cancers are spontaneous and present with very similar clinical and pathological features, which is not evident with induced rodent tumors. This allows the dog to be considered as an ideal second species for comparative and translational research, providing genetic resources and clinical data to fill gaps between fundamental research in rodents and human clinical studies.

The recognition by the National Human Genome Research Institute of the potential of canine genomics in biomedical research is implicit in their commitment to generate a high quality canine genome sequence by the end of 2004. This genome sequence, due for public release in July 2004 will cover >95% of the genome of a Boxer as well as >500,000 single nucleotide polymorphisms (SNPs) common to many breeds. The dog genome will be aligned to the human and mouse genomes and automated gene annotation will be performed by summer 2004.

The availability of a high quality genome sequence for the dog will provide a tremendous resource to both veterinary and medical research. For over a century we have bred dogs to meet stringent breed standards and this level of intense breeding has brought a number of serious genetic problems to the surface in a large number of breeds. These genetic problems now require more than traditional veterinary intervention to resolve. The dogs that have been our companions for generations will now benefit from the genomics era.

Biographical Profile

Dr. Matthew Breen graduated with honors in Genetics from the University of Liverpool, U.K. in 1987. He completed his PhD in cytogenetics, also at Liverpool, in 1990. Dr. Breen completed a two year Post Doc in Molecular Genetics at the Medical Research Council's Human Genetics Unit in Edinburgh, where he was responsible for developing improved fluorescence *in situ* hybridization techniques as part of the human genome mapping project. Dr. Breen then spent

four years as a Senior Research Officer at the University of Queensland, Brisbane Australia, developing gene-mapping techniques for domestic animals. In 1996 Dr. Breen moved to the Animal Health Trust, U.K. where his laboratory developed molecular cytogenetics reagents, resources and techniques for application to canine genome mapping, comparative cytogenetics and cancer studies. In 2002 Dr. Breen relocated his laboratory to NCSU's College of Veterinary Medicine as part of their Genomics initiative. His research interests continue to focus on the genomics and comparative aspects of canine cancer.

Natasha Olby earned a B.A. in Medical Sciences, VetMB and PhD in Neurosciences from the University of Cambridge, UK. She received board certification in the American College of Veterinary Internal Medicine, specializing in neurology, in 1999, and is currently an Assistant professor of neurology and neurosurgery at North Carolina State University.

Dr. Olby is committed to researching clinically relevant problems and so bases her research program on the type of cases seen in the clinics. Currently she is working on the chromosomal aberrations that are associated with the development of canine brain tumors, in collaboration with Dr Matthew Breen. Also under investigation are studies on how different types of brain tumor respond to different types of treatment. She also has a strong interest in inherited neurodegenerative diseases, and is working on identifying the mutation that causes one particular type of disease (cerebellar degeneration) in four different breeds of dog. Finally, Dr. Olby's research training is in spinal cord injury, and she has spent a lot of time characterizing how dogs recover from common spinal cord injuries (such as disc herniations) so that they are able to test the efficacy of different drugs on recovery.

ATOPIC DERMATITIS: A GROWING PROBLEM OF ENVIRONMENTAL EXACERBATION OF GENETIC PREDISPOSITION

Bruce Hammerberg, DVM, PhD.
North Carolina State University
Raleigh, NC

The essential cause of the itching skin that starts atopic dermatitis reactions, has been well known for decades, yet we do not know why there is an alarming increase in the number of dogs afflicted with this disease and we do not know why some dogs suffer much more than others living in the same environment. The cause of the itching skin is histamine and other mast cell products that are released when mast cells coated with the immunoglobulin IgE binds allergens such as house dust mite or pollen proteins. All dogs have mast cells in their skin and many without the disease have IgE that specifically bind allergens. The ever increasing numbers and complexity of genetic factors being discovered that predispose humans to allergic diseases are likely to be found as similarly daunting obstacles to fully understanding the genetic basis for canine atopic dermatitis.

Even though a full understanding of the complex interactions between environmental factors and genetic predisposition that lead to atopic dermatitis may be a some way off, there is much that can be done by focused research on how to improve therapies and to identify criteria for selecting individual dogs for breeding that have a lower risk of developing atopic dermatitis. One of these areas of research concerns mast cell function, but there are several other areas; including, the role of microbial flora in reducing the risk of allergic disease, and comparative genetics between humans and dogs in identifying genes associated with allergic disease.

Biographical Profile

Bruce Hammerberg is a professor of immunology and parasitology in the Department of Public Health and Pathobiology at the College of Veterinary Medicine, North Carolina State University. He received a DVM degree in 1970, a Master of Science in Biochemistry in 1974 and a PhD in Microbiology in 1977 all from Michigan State University. He was an assistant professor at the Virginia Maryland Regional College of Veterinary Medicine at Virginia Tech in Blacksburg, VA from 1977 to 1982 before joining the faculty of the College of Veterinary Medicine at NCSU where he was made professor in 1987. Early research on the interactions between helminth parasites, primarily filarial nematodes, and their mammalian hosts lead to his current research interests in the function of mast cells and IgE in allergic diseases.

Neurological Disease and the Effect of Breeding

Natasha Olby, VetMB, PhD
North Carolina State University
Raleigh, NC

Veterinary neurologists encounter many different, often life-threatening diseases affecting the central nervous system (the brain and spinal cord) or the peripheral nervous system. The diseases can belong to one of roughly 10 different categories such as infectious, neoplastic (cancerous), traumatic, degenerative, toxic or vascular. It is well known that different breeds of dog, as a result of breeding for certain traits in physical appearance or behavior, have inherited mutations that cause degenerative diseases of the nervous system and the skeletal structures surrounding it. A good example would be globoid cell leukodystrophy of West Highland White and Cairn terriers. What is less well known is that there are breed predispositions to almost every disease that we see, including toxicities (e.g. Collies are susceptible to ivermectin toxicity), cancer (e.g. Boxers, Golden retrievers and Boston Terriers are predisposed to brain tumors) and trauma (e.g. toy breeds are susceptible to head trauma). Indeed, an experienced neurologist will be able to form an accurate list of possible diagnoses for a case simply on learning the breed, age, history and a report of the clinical signs. This presentation will review some of the more common breed related neurological disorders, and will discuss in more detail late onset diseases that have a heritable component such as degenerative myelopathy in German Shepherd dogs and cerebellar cortical degeneration in American Staffordshire Terriers. It will also cover some of the diagnostic tools that are used by neurologists to reach a definitive diagnosis with the hope of informing owners and breeders in how a diagnosis is reached.

Biographical Profile

Natasha Olby earned a B.A. in Medical Sciences, VetMB and PhD in Neurosciences from the University of Cambridge, UK. She received board certification in the American College of Veterinary Internal Medicine, specializing in neurology, in 1999, and is currently an Assistant professor of neurology and neurosurgery at North Carolina State University.

Dr. Olby is committed to researching clinically relevant problems and so bases her research program on the type of cases seen in the clinics. Currently she is working on the chromosomal aberrations that are associated with the development of canine brain tumors, in collaboration with Dr Matthew Breen. Also under investigation are studies on how different types of brain tumor respond to different types of treatment. She also has a strong interest in inherited neurodegenerative diseases, and is working on identifying the mutation that causes one particular type of disease (cerebellar degeneration) in four different breeds of dog. Finally, Dr. Olby's research training is in spinal cord injury, and she has spent a lot of time characterizing how dogs recover from common spinal cord injuries (such as disc herniations) so that they are able to test the efficacy of different drugs on recovery.

Canine Vaccines and Vaccination

Richard Ford, DVM, MS
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In the March-April 2003 issue of the Journal of the American Animal Hospital Association, the Canine Vaccination Guidelines were published that challenged paradigms and conventional thinking about how we vaccinate, which vaccines we select...and when we give them. Are we vaccinating dogs too often? Without question, we are. This presentation addresses the issues and controversies behind the current canine vaccination guidelines.

Biographical Profile

Dr. Richard Ford is currently a professor of medicine in the Department of Clinical Sciences, College of Veterinary Medicine at North Carolina State University.

Following graduation from The Ohio State University, Dr. Ford practiced small animal and equine medicine for 3 years. Subsequently, he completed an internal medicine residency at Michigan State University then accepted a position on the faculty at Purdue University, School of Veterinary Medicine. In 1982, Dr. Ford accepted a position at North Carolina State University.

His clinical interests are in the field of companion animal infectious diseases, vaccines, and vaccination. He has published numerous articles in the scientific literature on infectious disease diagnosis, treatment, and prevention. He is the author/editor of 4 books, including the *Handbook of Veterinary Procedures and Emergency Treatment*, now in its 7th Edition. He is currently a member of the American Association of Feline Practitioners (AAFP) Advisory Panel on Feline Vaccination and a co-author of the Feline Vaccination Guidelines (US). He is also a co-author on the American Animal Hospital Association Canine Vaccine Guidelines. He is currently the executive editor of the *Standards of Care* monthly newsletter, published by Veterinary Learning Systems. Dr. Ford is the Past President of the North American Veterinary Conference.