9th International Working Dog Conference

CONGRESS CENTER OF LA GRANDE MOTTE - FRANCE

MARCH 23RD TO 26TH 2015

Working dogs in challenging environment:
new uses, new problems, new solutions.

IWDBA
DOGS SERVING HUMANITY

ABOUT **IWDBA**

The International Working Dog Breeding Association (IWDBA) was organized in 2005 to support professional education and interaction regarding Applied Science, Veterinary Care and Husbandry, and Program Management challenges related to the Selective Breeding, Rearing, and Assessment of dogs involved in working occupations. The IWDBA is organized as an association of individuals and organizations involved or interested in one or more aspects of selecting, assessing, breeding, whelping, caring for, training, and managing activities related to the production of working dogs. It includes scientists, veterinarians, program managers, training and assessment personnel, handlers, end-users of trained dogs or their services, and others. The canine occupations include those related to substance detection, police and military work, guides for people with hearing, sight, or other impairments, and as assistance dogs for people with physical or other impairments.

The IWDBA and its loosely-affiliated predecessor hosted the 1999, 2001, 2003, 2005 and 2007 International Working Dog Breeding Conferences. Based upon our review of each of these we recognized that our membership and topics of conferences were far broader than breeding alone. We responded to this in 2009 (Ieper, Belgium), when our Conference was named the International Working Dog Conference, recognizing that our membership and conference subjects must include all fields related to working dogs. This explains why our congres is named IWDC since that time (2011 Sun City South Africa, 2013 San Antonio Texas USA and of course 2015 La Grande Motte France).

The International Working Dog Breeding Association (IWDBA) has two primary functions:

1. Conduct the periodic International Working Dog Conference. This is a formal meeting organized for the purpose of sharing formal papers on applied science, husbandry and management issues related to working dogs, especially the improvement of working stock through selective breeding. In addition to this, the conference serves as an open forum for the discussion of topical issues among members, and a venue for meetings of the membership and committees of the IWDBA to conduct organizational business, such as the planning of future activities and conferences. Proceedings of the conference program are published for reference use, and excerpts are made available on the association's website. This meeting is planned, and conducted by members of the IWDBA. Conferences are funded by registration and membership fees, paid by individual attendees, and by donations accepted from individuals and organizations who wish to support each conference.

2. IWDBA maintains a website for public and member use at **http://iwdba.org**.

   This website supports the dissemination of scientific, management, and husbandry information on an interpersonal level, through meetings and professional interactions between members, and through the fostering of cooperative development activities of interest to the community. It also supports the presentation and publication of scientific and related information through the IWDBA and professional journals and other publications. This website is maintained by members of the IWDBA and is available to members and interested mempbers of the general public. The website is also funded through the registration and membership fees paid by individuals.

Please visit our website **http://iwdba.org**. Our Previous Conferences Section includes information regarding our past Meetings, and our Information Section contains more information about IWDBA.


Patrick **MACISAAC**


Alan **GROSSMAN**


Dominique **GRANDJEAN**


Miguel **STEVENS**


Erik **WILSSON**


Hannes **SLABBERT**


Karen **OVERALL**


Eldin **LEIGHTON**


Paul **MUNDELL**


Walter **BRGHARDT**

WELCOME

On behalf of the International Working Dog Breeding Association Board of Directors and our valued sponsors, it gives me great pleasure to welcome you to the 9th International Working Dog Conference.

The theme, *"Working Dogs in Challenging Environments: new uses, new problems, new solutions"*, has provided the opportunity to offer exciting information on an extensive range of topics which you will find both interesting and professionally developmental.
The environments in which working dogs are being utilized are growing at a vigorous pace, as our knowledge constantly increases in relation to their extraordinary capabilities. As their number grows, so does our challenge to identify best practices in the numerous activities associated to interrelated programs e.g. breeding, whelping, assessment, selection, training, program management etc.
However, the challenge does not end there. We owe it to our canine partners to develop the networks we will establish during this conference and share the expertise we have in our specific fields. We must commit to regularly examine our best practices to ensure that they remain relevant and evolve as new discoveries are made. The primary mission of the International Working Dog Breeding Association is to facilitate this exchange of information and thereby support professional education and interaction between international working dog programs.
I would like to thank the local organizing committee and participating sponsors for their efforts in organizing this conference. I would also like to thank our presenters, many of whom have traveled a great distance, for their participation.

I sincerely hope this conference is a productive and enjoyable experience for each of you.

Patrick MACISAAC
President IWDBA

IWDC 2015
ORGANIZING COMMITEE

Dear colleagues and friends,

As co-chairman of the Organizing Committee, with Lt Col Miguel Stevens, and chairman of the Scientific Committee, it is a real honour for me to welcome you to France, in the nice city of La Grande Motte, where at least sea and sun are always present.
IWDC 2015 is the 9th edition of the IWDBA biannual conference, and as we decided since the 2009 Conference held in Ieper (Belgium), it will cover, as much as possible, all the domains that concern working dogs. Genetics, behaviour, training.... and the search for their missing link will be the theme of our first day. We will then focus on working technical advances and progress, before a one day break that will provide you the opportunity to discover the Royal Canin Campus and the magic of Camargues, the land of french cow-boys.
We will end up with a last day dedicated to hostile environments, physical and mental abilities of working dogs, and recent advances in specialized veterinary medicine.
And during the whole congress you will have the possibility to discuss with posters' authors during the breaks.
With 52 speakers coming from 16 countries, and more than 30 countries represented among congressists, there is no doubt that IWDC is a recognized international event for those of us involved in working dogs. Such a result shows that once again we have reached our goal, as an international association simply willing to develop exchanges of informations around the world for the profit of those exceptional dogs. A special thank will go to Laureline and Sophie (Royal Canin Group) for their deep dedication to the practical organization of this conference, and for their daily kindness.

It is time now to wish you a good congress and a wonderful time in Camargues !

Welcome to IWDC 2015 !

SCIENTIFIC COMMITTEE CHAIRMAN
Prof. Dominique GRANDJEAN
Alfort School of Veterinary Medicine
Colonel of the Paris Fire Brigade

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PLATINUM LEVEL

Royal Canin was created in 1967 in the south of France by veterinarian Dr Jean Cathary. He wanted to produce a dog food in order to cure recurrent eczema in dogs, which he believed was caused by food adverse reaction. Today, Royal Canin is one of the world leaders in dog and cat Health Nutrition and sells its food in more than 90 countries.
The history of Royal Canin is an integral part of breeding and the professional world. In terms of nutrition, many innovations have been obtained out in the field thanks to common observations resulting from a close and exemplary cooperation with enthusiastic and keen dog breeders worldwide. Royal Canin concentrates all its resources exclusively on constantly improving its knowledge of the brand's only real clients: the Dog and the Cat. This knowledge deepens and is enriched every day by the work carried out by the Group's Research & Development Centre, through partnerships with Veterinary Universities, and the invaluable and irreplaceable expertise of veterinarians and breeders worldwide.
Royal Canin's constant aim is to launch foods which provide the most precise nutritional solutions possible, based exclusively on the latest research and scientific knowledge.
Faithful to our philosophy "Knowledge and Respect", we have constantly strived to improve our know-how and our knowledge thanks to our close partnership with breeders and Veterinarians. Such constant improvement has enabled us to elaborate food programmes designed for Dogs that are not only precise, but contain a unique nutritional quality.

GOLD LEVEL

GOLD LEVEL

GOLD LEVEL

SILVER LEVEL

GENERAL PROGRAM

MONDAY 23 MARCH 2015

8:00 am - 12:00 pm	Registrations	Congress Center of La Grande Motte
8:00 am - 10:10 am	Plenary session	
10:10 am - 10:30 am	Coffee Break	
10:30 am - 12:30 pm	Plenary session	
12:30 pm - 2:00 pm	Lunch Break	
2:00 pm - 3:40 pm	Plenary session	
3:40 pm - 4:00 pm	Coffee Break	
4:00 pm - 6:00 pm	Plenary session	

TUESDAY 24 MARCH 2015

8:00 am - 09:30 pm	Registrations	Congress Center of La Grande Motte
8:00 am - 10:00 am	Plenary session	
10:00 am - 10:20 am	Coffee Break	
10:20 am - 12:30 pm	Plenary session	
12:30 pm - 2:00 pm	Lunch Break	
2:00 pm - 3:40 pm	Plenary session	
3:40 pm - 4:00 pm	Coffee Break	
4:00 pm - 6:00 pm	Plenary session	

WEDNESDAY 25 MARCH 2015

8:15 am - 6:00 pm	Field trip activities	Aigues Mortes / Royal Canin Campus

THURSDAY 26 MARCH 2015

8:00 am - 09:30 pm	Registrations	Congress Center of La Grande Motte
8:00 am - 10:00 am	Plenary session	
10:00 am - 10:20 am	Coffee Break	
10:20 am - 12:30 pm	Plenary session	
12:30 pm - 2:00 pm	Lunch Break	
2:00 pm - 3:40 pm	Plenary session	
3:40 pm - 4:00 pm	Coffee Break	
4:00 pm - 6:00 pm	Plenary session	

CONFERENCES PROGRAM

MONDAY 23 MARCH 2015 / MORNING

▶ Genetics, Behaviour and Training. Is there a missing link?

TIME	SPEAKER	LECTURE
8:00 am - 12:30 pm		**Registration**
8:00 am - 8:30 am	**Macisaac** (Canada)	**Opening of the 9th IWDC by President of IWDBA**
8:30 am - 9:10 am	**Leighton** (USA)	**The international working dog registry: a new service to be provided by IWDBA**
9:10 am - 9:30 am	**Evans** (UK)	**Crossbreed genetic analysis of a standardised behaviour test for potential guide dogs puppies**
9:30 am - 10:10 am	**Burghardt** (USA)	**Behavior problems in working dogs**
10:10 am - 10:30 am	**Coffee Break**	**Posters exhibition**
10:30 am - 10:50 am	**Overall** (USA)	**Problem solving behavior in dogs: is « style » information ?**
10:50 am - 11:10 am	**Pierce** (USA)	**Avoiding the surgeon : Preventing stifle disease**
11:10 am - 11:30 am	**Hare** (USA)	**Genetic linkage and fine mapping of hunt and play behavior in explosives dogs from the TSA breeding and development center**
11:30 am - 11:50 am	**Arvelius** (Sweden)	**Increased genetic improvements by cooperation among breeding programs; example from breeding of English Setter in Sweden and Norway**
11:50 am - 12:30 pm	**Otto** (USA)	**Early puppyhood education, what are the pros and cons for detection dogs ?**
12:30 pm - 2:00 pm	**Lunch Break**	**Onsite Lunch**

CHAIRMAN

MONDAY 23 MARCH 2015 / MORNING

Paul MUNDELL

Paul Mundell was appointed chief executive officer in 2014. Paul joined Canine Companions in 1989 as an instructor in the Northeast Region after studying at Ruprecht-Karls-Universitat Heidelberg in Germany. He later became the Northeast Region executive director. He's held the role as national director of canine programs for the last 17 years, making far-reaching and critically important contributions to the profile of the ideal Canine Companions assistance dog, and is today a recognized authority in the field of canine genetics and behavior. Mundell has developed partnerships with a variety of organizations that assist in the development of the canine program, including Duke University Canine Cognition Center, Eukanuba Dog Foods, The Buck Institute, Emory University, Georgia Tech and Texas A&M University. Additionally, Mundell is a consultant for the United States Marine Corps, assisting to develop specialized search dogs that will remotely detect improvised explosive devices. Recently, Mundell's leadership lead to Canine Companions being chosen as a contractor to furnish dogs for a study to be performed by the Department of Veterans Affairs to determine the potential benefits of canine support for veterans with PTSD. In 2014 was named the new North American president of Assistance Dogs International.

CONFERENCES
SPEAKERS

8:00 - 8:30 am

Opening of the 9th IWDC by Patrick Macisaac, President of IWDBA

8:30 - 9:10 am

The international working dog registry: a new service to be provided by IWDBA

Eldin LEIGHTON

Founded in 1929, The Seeing Eye, Inc. is the oldest guide dog school in the world. Since the 1940's, they have bred dogs to work as guides for blind people. In 1980, they asked Dr. Leighton to develop a breeding plan to genetically reduce the incidence of hip dysplasia, while also maintaining the ability of the dogs to be trained for work as guides. By following his plan, the organization reduced the incidence of hip dysplasia to less than 5% in young dogs over the first 10 years. Since 1995, Dr. Leighton has been fully responsible for overseeing implementation of the breeding plan, and today, he holds the endowed Jane H. Booker Chair in Canine Genetics at The Seeing Eye.

Contact: eleighton@seeingeye.org
http://www.seeingeye.org/

Co authors: Patrick MacIsaac, Paul Mundell, Karen Overall, Walt Burghardt, Miguel Stevens, Erik Wilsson, Dominique Grandjean, Hannes Slabbert, Al Grossman; IWDBA, San Antonio, USA

Working dog breeding program managers and private dog breeders would benefit from having a centralized repository for storing medical, behavioral, and work performance data on their dogs. It would aid in defining phenotypes and in clarifying terminology used to describe those phenotypes. Within a breed, these phenotypes would enable the calculation of estimated breeding values for traits where sufficient data are recorded, thus improving the accuracy of young breeder selection decisions. A centralized repository could also inform the search for suitable males to mate with a particular female by identifying potential sires that would produce lower inbred puppies. Expansion of the database could include other assessment data, allowing variation in skills to be noted and changes over time to be measured. The International Working Dog Registry should appear online in January 2016, with data held in a cloud-based relational database, accessible using only a web-browser and the Internet.

9:10 - 9:30 am

Crossbreed genetic analysis of a standardised behaviour test for potential guide dogs puppies

Katy M. EVANS
School of Veterinary Medicine and Science, University of Nottingham

Katy graduated from the University of Bristol School of Veterinary Science in 2001. After working for DEFRA during the 2001 Foot and Mouth outbreak, a 3 year Clinical Training Scholarship in Veterinary Anaesthesia at Bristol and a 3 year spell as Deputy Veterinary Surgeon at the Babraham Institute, Katy took up a Postgraduate Studentship in Small Animal Epidemiology at the Animal Health Trust (AHT) in Newmarket. She gained an MSc in Veterinary Epidemiology and Public Health via distance-learning from the Royal Veterinary College, while undertaking surveys and publishing reports for the Kennel Club Charitable Trust. Subsequently she undertook a PhD in canine quantitative genetics at the AHT as a student of the University of Nottingham, entitled "Genetic evaluation of guide dogs in the UK". Katy successfully defended her thesis in January 2015 and she is now a postdoctoral researcher in quantitative genetics at the University of Nottingham, working with Guide Dogs to turn the findings of her PhD into useable tools.

Contact: Katy.Evans@nottingham.ac.uk

Co-authors: Thomas W. Lewis, Lucy Asher, Simon Blythe, Matthew Bottomley, Lisa Tootill, Rena Roberts, Helen Whiteside, Gary C. W. England, Sarah C. Blott ; School of Veterinary Medicine and Science, University of Nottingham , Loughborough, UK

Guide Dogs use a standardised behaviour test for potential guide dog puppies at 6 weeks of age, known as the Puppy Profiling Assessment (PPA), in which responses

to a series of 11 applied stimuli are scored. A previous study has shown that scores in this test are associated with later success in guide dog training. Genetic analysis of PPA scores was undertaken, considering 704 purebred Labrador Retrievers, 119 purebred Golden Retrievers and 1304 crosses between the two breeds. Heritabilities and crossbreeding parameters were estimated for the 11 PPA components, and genetic correlation estimates between the PPA components were produced. Nine of the 11 components had low to moderate heritability estimates ranging from 0.09±0.05 to 0.24±0.09. Most of the crossbreeding parameter estimates (heterosis, recombination loss and Labrador fraction) were not detectably larger than zero, likely reflecting the relatively small size of the dataset. Genetic correlation estimates between PPA components ranged from -0.71±0.06 to 0.74±0.09. Guide Dogs may wish to incorporate estimated breeding values (EBVs) for PPA components into selection indices to assist with breeding dogs with appropriate temperaments for the guiding role. However the antagonistic genetic correlations identified will need to be managed appropriately.

9:30 - 10:10 am Behavior Problems in Working Dogs

Walter BURGHARDT
Behavioral Medicine, DoD Military Working Dog Veterinary Service, Lackland AFB

Dr Burghardt was awarded his BA and MA in Psychology from Florida Atlantic University in 1974, his DVM in 1980 from the University of Florida, and his PhD in Biopsychology from the University of Maryland College Park in 1988. He is a Diplomate of the American College of Veterinary Behaviorists. Dr Burghardt has over 10 years experience in basic behavioral research and over 30 years experience in both private veterinary practice and a referral veterinary behavioral practice. Since 1995, he has been the Chief of Behavioral Medicine and Military Working Dog Studies for the LTC Daniel E Holland Military Working Dog Hospital at Lackland Air Force Base, Texas. He is responsible for the behavioral care of over 1,500 military working dogs around the world, and for the implementation of a program of applied research and development regarding military working dogs. Dr Burghardt is also an Adjunct Professor in Biology at the University of Texas San Antonio and Director of the LTC Daniel E Holland MWD Hospital Behavior Residency Training Program. He is a retired Colonel in the US Air Force Reserve, last serving from 2008 to 2010 as Individual Mobilization Augmentee to the Medical Director, Air Force Reserve at the Pentagon.

Contact: walter.burghardt@gmail.com

Behavioral problems in working dogs may be a significant cause of lost service and compromised welfare. If recent data are any indication, they may very well be the single greatest cause of service loss in some populations of working dogs, even more than other frequent medical causes for lost service. Behavior problems may be considered in several ways. On a functional level, behavioral problems may either directly or indirectly interfere with the ability of a working dog to perform required tasks. Behavioral problems also may negatively impact the medical status and welfare of a working dog through direct or indirect means. On a causative or etiological level, behavioral problems may represent normal canine behavior expressed in an unacceptable way or setting. Unacceptable behaviors may also reflect undesired learning or may be the result of dispositional (temperament and aptitude) traits that result in problematic behavior. On some occasions, abnormal behaviors may ! Arise as the results of aberrant neurophysiology. Historically, there has been a divergence of opinion regarding the identification and management of behavior problems in working dogs. Handlers and trainers often identify behavior problems as problems of training. Veterinarians and even veterinary behavior specialists may approach a behavioral problem more from the perspective of medical pathology and underlying neurochemical processes. A more comprehensive approach is to simultaneously evaluate the contribution of a number of factors that can contribute to a behavioral problem: identifying specific behavioral problems and their context, evaluating the temperament and aptitude of a patient, identifying any medical problems that might contribute to the identified problem(s), errors in learning and communication, and environmental contributors to identified problem(s). Likewise, treatment can be considered a team effort, combining applicable changes in behavior management, rational environmental modifications, and appropriate medical management. Education is a key component of a plan, as is the identification of an acceptable outcome and behavioral tracking of progress. Several examples are presented to reinforce concepts presented.

10:30 - 10:50 am Problem solving behavior in dogs: is 'style' informative?

Karen L. OVERALL
University of Pennsylvania

Dr. Karen L. Overall has BA, MA and VMD degrees from the University of Pennsylvania and a PhD degree from the University of Wisconsin-Madison. She did her residency training in veterinary behavioral medicine at the University of Pennsylvania. Dr. Overall is a Diplomate of the American College of Veterinary Behaviorists (DACVB) and is certified by the Animal Behavior Society as an Applied Animal Behaviorist (CAAB). She has served on the faculties of both the veterinary and medical schools at the University of Pennsylvania where she has taught undergraduates, graduate students and professional students, and ran the Behavior Clinic at Penn Vet for more than a dozen years. Dr. Overall lectures at veterinary schools world-wide and is an Adjunct Associate Professor in the University of Missouri, College of Veterinary Medicine, Department of Clinical Sciences. Dr. Overall has given hundreds of national and international presentations and short courses and is the author of over 100 scholarly publications, dozens of textbook chapters and the texts Clinical Behavioral Medicine for Small Animals (1997; Elsevier) and Manual of Clinical Behavioral Medicine for Dogs and Cats (2013; Elsevier) and of the DVD, Humane Behavioral Care for Dogs: Problem Prevention and Treatment (2013; Elsevier). She is the editor-in-chief for Journal of Veterinary Behavior: Clinical Applications and Research (Elsevier). Dr. Overall has been named the North American Veterinary Conference (NAVC) Small Animal Speaker of the Year, has been awarded the Cat Writer's Association Certificate of Excellence for "The Social Cat" column in Cat Fancy Magazine, and in 2010 was named one of the The Bark's 100 Best and Brightest - Bark Magazine's list of the 100 most influential people in the dog world over the past 25 years. Dr. Overall serves and has served on numerous governmental committees focused on canine health and behavior, including the Commonwealth of Pennsylvania's Canine Health Board, to which she was appointed by former PA Governor Rendell, and the US Department of Defense's Blue Ribbon panel on canine-post-traumatic stress disorder (C-PTSD). She has served on the Board of Directors of the Chester County (PA) SPCA. Dr. Overall frequently consults with governments locally, nationally and internationally about legal and welfare issues of pet dogs and behavioral, welfare and performance issues pertaining to working dogs. Dr. Overall's research focuses on neurobehavioral genetics of dogs, the development of normal and abnormal behaviors and how we assess behavior, especially as concerns working dogs. Her favorite collaborator is still her husband, Dr. Art Dunham, who understands the importance of having a life of the mind and shares her interests in political activism, art, travel, classical music, fine food and wine, and learning about different languages and cultures. Having decided that the carrying capacity of their canine household was 4 dogs, they continue to live with 4 much loved, rescue Australian shepherds in a shifting array necessitated by the unfortunate disparities between human and canine demographics.

Contact: kloverallvmd@gmail.com

Co-author: Arthur E. Dunham, University of Pennsylvania, USA

Dogs have had a collaborative working relationship with humans for more than 15,000 years. The very characteristics that make it possible to breed, raise and train dogs to be working dogs also mean that dogs are superior genetic systems for understanding disease and cognition, and are excellent natural models of human behavioral and physical illness. Both dogs and humans learn through a variety of modalities and exhibit a variety of problem solving skills and styles. Many studies of problem solving behavior in dogs focus on outcome measures like duration to completion, but the manner in which the individual dog solves the problem may be equality important. In our video studies of detection dogs undergoing a battery of tests evaluating numerous cognitive domains, dogs who are more methodical use fewer actions in tests where manipulation is necessary. Effects of style on focus and successful completion are complex and may warrant more attention.

10:50 - 11:10 am Avoiding the Surgeon: Preventing Stifle Disease

Bess J PIERCE, Medicine and Rehabilitation, Center for Public and Corporate Veterinary Medicine, VA-MD College of Veterinary Medicine, Blacksburg

Dr. Bess J. Pierce is an Associate Professor in the Center for Public and Corporate Veterinary Medicine (CPCVM) at the Virginia-Maryland College of Veterinary Medicine (VMCVM). Dr. Pierce joined the faculty initially in 2007 to develop and lead the Community Practice service in the Veterinary Teaching Hospital, leaving active duty service in the United States Army. Since November 2011, she has also served as Director, Center for Animal Human Relationships (CENTAUR) at the VMCVM. Dr. Pierce earned a B.S. in biology from Tulane University in 1986, an M.Z.S. in wildlife biology in 1990 and a DVM from Auburn University in 1992. Serving more than 22 years on active and reserve duty in the US Army Veterinary Corps, Dr. Pierce has been stationed in a variety of assignments including California, two tours in Japan and several years at the Military Working Dog Center in San Antonio, Texas. She is currently a colonel in the US Army Reserve, assigned to the Public Health Command Region-Europe. Dr. Pierce is board certified by the American College of Veterinary Sports Medicine and Rehabilitation (Canine Specialty), the American Board of Veterinary Practitioners (Canine/Feline Practice) and the American College of Veterinary Internal Medicine (Small Animal Medicine). She has extensive experience in working and service dog health care and policy, and in promoting strong handler/canine partnerships. Her primary research interests are in canine sports medicine and rehabilitation, canine conditioning and injury prevention, and three dimensional motion capture and modeling. Her human animal bond work concentrates on the impact and utilization of animal assisted activities in military and law enforcement settings.

Contact: bpierce@vt.edu
http://www.vetmed.vt.edu/org/md/cpcvm

Cranial cruciate ligament (CCL) disease in the canine patient is a common finding in companion animal practice, and the prevalence has doubled over the past 30 years. In humans, the majority of anterior cruciate ligament tears or ruptures are trauma induced. On the other hand, trauma accounts for only approximately 20% of CCL disease in dogs. Bilateral disease occurs in approximately 50% of patients, which can lead to increased dysfunction, pain and chronic degenerative changes in the affected stifles. Although excellent progress has been made over the past 10 years in surgical correction of CCL rupture or injury, complication rates of 14-60% have been reported (depending on the technique). The best medicine is still prevention, but to date, very little research has been focused towards these preventive measures. It is clear that CCL disease in dogs is multifactorial and complex and therefore, it is critical to examine the stifle from a whole, functioning unit perspective. Factors influencing the health and maintenance of the canine CCL include genetics, conformation, muscle control, weight, exercise and loading, and joint inflammation. Each of these factors will be discussed in relation to promoting stifle health and prevention of CCL injury.

11:10 - 11:30 am Genetic Linkage and Fine Mapping of Hunt and Play Behavior in Explosives Detector Dogs from the TSA Canine Breeding and Development Center

Elizabeth HARE

Dr. Hare has a long-term interest in canine quantitative genetics, particularly in working dog behavior. She founded Dog Genetics LLC in 2009 to begin an ongoing project with the Department of Homeland Security to study the genetics and genomics of the population of dogs produced at the TSA Canine Breeding and Development Center and to implement a selective breeding program. She consults with Leader Dogs for the Blind to study the genetics of work- and health-related traits and to plan a selective breeding program. She performs statistical analyses for studies at the Penn Vet Working Dog Center. Dr. Hare taught online distance education courses in canine and feline genetics at Cornell University. She earned her PhD in Genetics from George Washington University, where her research focused on the heritability of litter size in dogs.

Contact: doggene@earthlink.net

Co-authors: Katharine Lee, Scott Thomas; Dog Genetics LLC, Sunnyside, USA

Hunt and play behavior are critical parts of a working dog's development and success. A preliminary genome-wide study of 88 dogs at the TSA Canine Breeding and Development Center identified two chromosomal regions linked to physical possession and three chromosomal regions associated with the ability to find hidden objects. An additional 258 dogs have been genotyped and the analysis is being repeated with this larger data set. To narrow down the identified regions of linkage, the 346 dogs have been genotyped on custom arrays of more closely spaced markers. The custom arrays will also provide insight in to the relationship between genes involved in learning and memory and behavior. The identification of genes involved in working dog behavior can provide insight into the biochemical pathways involved in behavior and can aid in selective breeding to enhance these traits in future generations.

11:30 - 11:50 am Increased genetic improvement by cooperation among breeding programs – example from breeding of English Setter in Sweden and Norway

Per ARVELIUS
Swedish University of Agricultural Sciences, Uppsala

Per Arvelius earned his PhD in animal science, genetics and breeding, at the Swedish University of Agricultural Sciences. He currently works as a researcher at the same university, and his main research interest is how dog behaviour can be improved by breeding. He has a background as an engineer, who after military service as dog handler became a professional working dog trainer. Later, after university studies and a master degree in animal science, he was head secretary for two governmental inquiries. The first one resulted in new legislation concerning "dangerous dogs". The second aimed at finding a cost-effective but still functional model for how to organize a Swedish breeding program for working dogs to supply national authorities with capable dog material.

Contact: Per.Arvelius@slu.se
http://www.slu.se/

Co-authors: Gunnar Klemetsdal ; Swedish University of Agricultural Sciences, Uppsala, Sweden

Genetic parameters were estimated for six hunting traits from English Setter field trials in Sweden and Norway. The aim was to study the potential for increased genetic improvement if basing selection of breeding animals on a joint Swedish–Norwegian genetic evaluation, compared to using phenotypic records alone (which is current practice) or breeding values from within-country genetic evaluations. A mixed linear animal model was used, and the analyses included 3620 Swedish records from 685 dogs and 94 414 Norwegian records from 7175 dogs. Heritabilities were 0.07-0.13 for Swedish measurements and 0.08-0.18 for Norwegian. The accuracies of breeding values were higher when including both countries in the genetic evaluation, especially for dogs with Swedish results for which the average increase was 19 %. Compared to phenotypic selection, the across-country genetic evaluation almost doubled the potential annual genetic improvement for Swedish dogs. Thus, a joint genetic evaluation is especially advantageous for the population with the most limited information. However, it will also be beneficial for the other population due to the increased number of available selection candidates; it becomes possible for all participating populations to increase selection intensity and/or decrease the inbreeding rate, potentially leading to faster genetic improvement.

11:50 - 12:30 am

Early puppyhood education, what are the pros and cons for detection dogs?

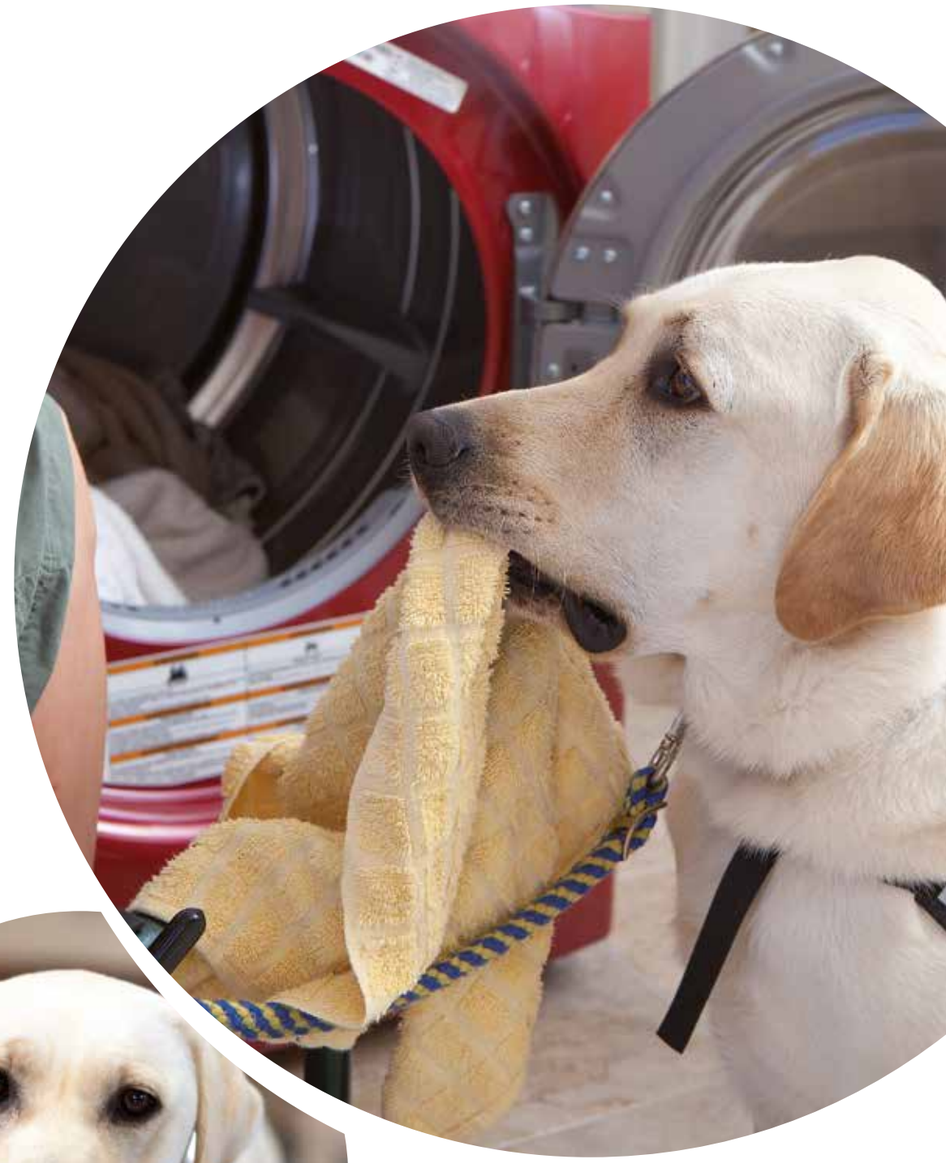
Cynthia M. OTTO, Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania

Dr. Otto is a tenured associate professor at the University of Pennsylvania, School of Veterinary Medicine in Philadelphia, PA. She is board certified in Veterinary Emergency Medicine and Critical Care (DACVECC) and Sports Medicine and Rehabilitation (DACVMR-canine) has been an attending clinician in the Emergency Service for over 20 years and the director of the Penn Vet Working Dog Center since it opened in 2012. She received a Bachelor's of Animal Science and her Doctor of Veterinary Medicine from The Ohio State University and her PhD in veterinary physiology from the University of Georgia. She has published over 60 peer reviewed articles. Her research, funded by NIH, AHA, AKC-CHF and other foundations, has included studies in sepsis, inflammation, acute lung injury, trauma, and disaster medicine. She has been monitoring the health and behavior of Urban Search and Rescue canines since October of 2001, through an AKC-CHF funded grant (now in its third renewal). She has established the AKC-Reunite Detection Dog DNA bank. She has conducted funded studies of prehydration in working dogs and the use of detection dogs in ovarian cancer detection and diabetes alert. She is an internationally recognized speaker in both emergency medicine and working dog medicine. Dr. Otto has also been involved with search and rescue dogs and disaster response as a member of the Pennsylvania Urban Search and Rescue Task Force 1 between 1994 and 2010 (including deployments to Hurricane Floyd and 9/11), and the Veterinary Medical Assistance Team-2 since 1999 (deploying to Hurricane Katrina). She is the founding director of the Penn Vet Working Dog Center (www.PennVetWDC.org). She is active in educating search dog handlers and members of the working dog community in canine first aid and fitness. She was named Pennsylvania's 2002 "Veterinarian of the Year" and received an Alumni Recognition Award in 2006 and the OSU Distinguished Alumnus Award in 2008 from the Ohio State University and a top 20 finalist in AVMF's America's Favorite Veterinarian. She has been involved in dog sports (flyball, agility, and tricks), and animal assisted interactions, with her dog, Dolce.

Contact: cmotto@vet.upenn.edu
http://pennvetwdc.org/

Co-authors: Annemarie DeAngelo, Patricia Kaynaroglu, Victoria Berkowitz ; Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania, Philadelphia, USA

The developing brain has incredible plasticity; early education in children leads to cognitive and social benefits. Effective early education programs face economic and curriculum-optimization challenges. Rigid early academically-driven programs may result in a "loss of childhood". At the Penn Vet Working Dog Center, our puppy education program aims for a balance between social, behavioral, physical and cognitive (skill specific) development. Social development is enhanced by the daily training program at the Center, coupled with foster families that provide evening and weekend care. Training techniques emphasize positive reinforcement, behavioral shaping, games, and social learning from more advanced dogs. Perceived advantages of this approach include "hard wiring" of desired behaviors (e.g. search), early interventions for behavioral problems, controlled exposure to a variety of environmental situations, and ability to capitalize on innate skills enhancing career placement! The disadvantages to this approach are the cost of early training and recruitment of foster families.



CONFERENCES PROGRAM

MONDAY 23 MARCH 2015 / AFTERNOON

▶ Genetics, Behaviour and Training. Is there a missing link?

TIME	SPEAKER	LECTURE
2:00 pm - 2:20 pm	**Hoummady** (France)	**Personality and performance of search dog-human dyads: to match or not to match ? A preliminary study**
2:20 pm - 2:40 pm	**Schalke** (Germany)	**Acquisition of dogs with previous biting incidents for police work**
2:40 pm - 3:00 pm	**Michenaud** (France)	**The wellbeing of the guide dog: social skills and practices of people with visual disabilities**
3:00 pm - 3:20 pm	**Leighton** (USA)	**Sex ratio : is it allways 1:1 ?**
3:20 pm - 3:40 pm	**Blondot** (France)	**Guide dogs in the City of Paris**
3:40 pm - 4:00 pm	**Coffee Break**	**Posters Exhibition**
4:00 pm - 4:20 pm	**Kappen** (Netherland)	**The use of frozen and chilled canine semen**
4:20 pm - 4:40 pm	**Concha** (UK)	**True or false ? Differentiating negative responses in trained detection dogs**
4:40 pm - 5:20 pm	**Edwards** (Australia)	**Giving working dogs a new start**
5:20 pm - 6:00 pm	**Russenberger** (USA)	**States of arousal are related to successfully working as guide dogs**

CHAIRMAN

MONDAY 23 MARCH 2015 / AFTERNOON

Hannes SLABBERT

Before joining the South African Police Service (SAPS) in 1985, Dr Slabbert studied at the University of Johannesburg. During 1981 and 1985 he obtained a B.S. (Biological Sciences) and a B.Sc. (Honours) Zoology. He completed his M.Sc. (Ethology) during 1990 and his Ph.D. (Veterinary Ethology) during 1998, at the University of Pretoria. Directly as a result of research carried out for his Masters-and Doctor's degrees, the success rate of dogs bred by the SAPS increased from 7 % to 60 %. International recognition was also achieved through the publication of three articles in international scientific journals. Hannes has been breeding and training working dogs for 32 years. His international travels included visits to police and military training institutions in Australia, Austria, Belgium, Benin, Croatia, Germany, Norway, Russia, Poland, Singapore, The Netherlands, United Kingdom, United States of America and Zimbabwe. Dr Slabbert therefore has a broad knowledge of working dog breeding, training and research projects in most parts of the world. After 20 years' service in the SAPS, he resigned and worked for a USA company called "Canine Associates International" (CAI), from July 2005 to December 2007. His responsibilities included detection dog breeding, socializing and training, as well as the procurement of dogs for the local and international market. On the 2nd of January 2008, he took up a position at MECHEM Pty (Ltd) as Business Unit Manager: Contraband Detection. His duties comprise of utilizing detector dogs and MEDDS (MECHEM Explosives and Drugs Detection System – commonly known as REST) to locate explosives, elicit drugs and other contraband such as cigarettes, ivory and rhino horn, DVD's and anything else that could be smuggled illegally. Dr Slabbert is an executive member of the International Working Dog Breeding Association (IWDBA) and a founder member of the South African Board for Companion Animal Professionals (SABCAP).

Contact: hannes@mechem.co.za

CONFERENCES
SPEAKERS

2:00 - 2:20 pm

Personality and performance of search dog-human dyads: to match or not to match ? A preliminary study

Sara HOUMMADY
Ecole Nationale Vétérinaire d'Alfort, UMR7179 CNRS/MNHN

Sara Hoummady is a Doctor in Veterinary Medicine (DVM), Master of Science in Ethology (MSc Ethology), PhD student at the CNRS/MNHN. Her research theme of the PhDis actually on fragility in dogs. She conducted her Master research work on working dogs' personality and performances, focusing on the search and rescue dogs ot the Paris Fire Brigade.

Contact: sara.hoummady@vet-alfort.fr

Co-authors: Franck Peron, Loic Desquilbet, Loic Jullien, Barbara Bernard, Emmanuelle Titeux, Dominique Grandjean, Delphine Clero, Caroline Gilbert ; Ecole Nationale Vétérinaire d'Alfort, UMR7179 CNRS/MNHN, France

Improving operational performances of working dog-human dyads is more and more questioned. However, the associations between human personality, dog personality, dog-human personality matching and dyads' performances have poorly been investigated. This study hence aims at exploring the links between human and dog personality traits, their matching or mismatching, the quality of the human-dog relationship, and dyads' performances (time to find a victim during search tests, number of errors, and time improvement during 3 successive tests) of 14 dyads of the Paris Fire Brigade. Several human personality traits were related with higher dyads' performances or relationship ("gregariousness", "aesthetics", "dutifulness", "activity", "modesty", "mind-openness"). Moreover, the dog's trait "human familiarity" was positively correlated with dyads' improvement capacity. Dyads' performances increased when dyads matched on the traits "dog human familiarity" and "human positive emotions" or matched on the traits "dog human familiarity/ confidence" and "human activity", while they decreased when dyads matched on the traits "dog conscientiousness" and "human autodiscipline". Finally, matching on personality traits between men and dogs was correlated with dyads' relationship.

2:20 - 2:40 pm

Acquisition of dogs with previous biting incidents for police work

Esther SCHALKE

Esther Schalke is a Doctor in veterinary medicine, graduated from the University of Hanover (Germany) in 1996. She got her PhD in 2000, is a board certified specialist in animal behavior (ECVBM-CA), and works as a postdoctoral research fellow at the Institute of Animal Behavior and Welfare, University of veterinary medicine Hanover.
In 2009 she founded the Lupologic GmbH: center of applied ethology and veterinary behavior medicine, and published numerous publications in collaboration with the police dogs school of the LAFP North Rhine Westphalia.

Contact: schalke.esther@googlemail.com

Co-author: Hans Ebbers ; Luologic GmbH, Duesseldorf Germany

In the last years we have trained dogs the owners wanted to re-home because they showed either aggressive behaviour towards strangers, their handlers or both.

Regardless of other factors all dogs had two former training ways in common:

- Triggering high level of arousal during training, and using positive punishment to keep dogs under control.
- Poorly structured impulse control training inducing a high degree of frustration

Due to Kiff et al. we developed a special training program mostly based on:

- Evaluation of the training level and the underlying emotions.
- Management
- Controlling resources.
- Avoiding positive punishment because the dogs learned to avoid punishment by showing aggressive behaviour.
- A highly structured training program based on positive reinforcement.
- Training the dog to act with an external reward, to learn a way to cope with competing motivation.

CONFERENCES
SPEAKERS

2:40 - 3:00 pm

The wellbeing of the guide dog: social skills and practices of people with visual disabilities

Stéphanie MICHENAUD
Social Psychology Research Group, University Lyon 2

Stéphanie is a Phd student in Social Psychology (GRePs - Social Psychology Research Group) at the University of Lyon 2, France. Her thesis concerns the compensation of visual disability by the guide dog based on a psychosocial perspective. Especially, this work focuses on the effects of guide dogs on people's quality of life, on social identity and on the perception (social representations/attitudes) of people concerning guide dogs. It explores too practices of disabled people about their dogs'well-being. She obtained her Master of Psychology from University of Nantes (France). During her Master, she has conducted research on social representation and attitudes of people on assistance dogs and on Coexistence between man and bear in the Pyrenees (France) : an illustration of social thought. Her main interests are dog-human relationship in working contexts, cultural influence on dog-human relationship, perceptions and practices regarding dogs welfare. She is also interested in dog-human communication, interactions and canine personality. More generally, her interests are in animal-human interactions and how they impact on all participants based on a psychosocial approach. She is also a professionnel dog trainer, specialised in positive training using clicker-training. She has worked at CESECAH (Breeding and Selection Centre of guide dogs, French Federation of Guide Dog Association) and was dog trainer at Handi'Chiens (training assistance dogs for disabled people, children with autism and for animal assisted activities). She works with dogs owners and proposes educational activities with children, teenagers and elderly people. She currently teaches future professional dog trainers (Animalin) and students who will work in Animal Assisted Activities (EFCMA).

Contact: stephanie.michenaud@gmail.com

Co-author: Marie Preau ; Social Psychology Research Group, University Lyon 2, France

People with visual impairments indicate that dogs bring comfort when walking outdoors. They acknowledge the support provided daily by their dog for compensating their disabilities, but it is also a social catalyst. Participants will also mention the intimate relationship they have built with their canine companion. If the benefits to the individual are often mentioned, guide dog trainers also inform the dog has physical and psychological needs The study aims to question the visually impaired people on knowledge and practices intended to take care of their dog. The goals of this work are to: identify the different knowledge, practices around the wellbeing of working dogs and identify the characteristics of people and relationships that trigger a care more or less towards the dog. The psychosocial approach of social representations and practices around care of guide dogs for people with disabilities is being considered from the cultural and institutional integration.

3:00 - 3:20 pm

Sex ratio : is it allways 1:1 ?

Eldin A. LEIGHTON
Ph.D., The Seeing Eye

Founded in 1929, The Seeing Eye, Inc. is the oldest guide dog school in the world. Since the 1940's, they have bred dogs to work as guides for blind people. In 1980, they asked Dr. Leighton to develop a breeding plan to genetically reduce the incidence of hip dysplasia, while also maintaining the ability of the dogs to be trained for work as guides. By following his plan, the organization reduced the incidence of hip dysplasia to less than 5% in young dogs over the first 10 years. Since 1995, Dr. Leighton has been fully responsible for overseeing implementation of the breeding plan, and today, he holds the endowed Jane H. Booker Chair in Canine Genetics at The Seeing Eye.

Contact: eleighton@seeingeye.org
http://www.seeingeye.org/

Co-authors: Morristown, NJ Gaudenz Dolf, Ph.D., University of Berne, Switzerland ; Claude Gaillard, Ph.D., University of Berne, Switzerland ; Claude Schelling, DVM, Zurich University, Switzerland

A major challenge in maintaining a canine breeding colony is finding a sufficient number of breeding-quality females. Within litters, ranges from 0% to 100% of female pups born are observed, but as litters are aggregated into increasingly larger groups, the sex ratio generally draws toward 1:1. In the shorter-term, however, an altered sex ratio increases the challenge of finding breeding-quality females. Among The Seeing Eye's German Shepherd Dogs grouped by calendar quarters since 1980, the percent of females born varied from 18% to 76%. Certainly, chance alone plays a role in creating this short-term variation, but recent studies have revealed that additional mechanisms are also operating. An altered sex ratio was observed in litters where at least one monorchid or cryptorchid (undescended testicle) puppy was born and in litters containing one or more pups born with an umbilical hernia. Cause and effect should not be ascribed to this observation.

3:20 - 3:40 pm

Guide dogs in the City of Paris

Marc BLONDOT
Guide Dog School of Paris

After a high school diploma, Marc Blondot went to Bordeaux University for two years more, in Social Careers and graduated in June 1989. After this new diploma, he joined the guide dog school of Paris as a trainer, in December 1989. He actually continues his career in Paris as Aftercare manager. During these 25 years, he trained dogs, worked with clients in classes, worked also with puppy walkers and taught new trainers, in the guide dog's work. He also could travel and visit different other schools around the world and had the opportunity to receive, with his staff, assessors from IGDF.

Contact: m.blondot@parischiensguides.fr
http://www.chien-guide-paris.asso.fr/

Guide dog school of Paris works for more than 30 years to create efficient partnerships between guide dog owners and their animals. In that direction, our breeding is the vital pillar to prepare the future. Our training must be updated regularly, explained and understood by everyone in the chain : puppy walkers, trainers, instructors, guide dog owners. Like any learning, it must be maintained and reinforced.

4:00 - 4:20 pm The use of frozen and chilled canine semen

Maarten KAPPEN
Cryolab Eersel/Companion Animal Clinic Eersel

Maarten Kappen is a doctor in veterinary medicine, graduated from the Veterinary Faculty of Utrecht (Netherland) in 1984. He studied veterinary surgery at University of Florida and laws at the University of Tilburg. After running a private veterinary practice in the Netherlands till 1995, he now works with Cryolab Eersel, the number 1 dutch company regarding semenbanking, dedicated research and distribution.

Contact: info@cryolab.nl
www.cryolab.nl

The use of extended canine semen for artificial insemination instead of natural breeding is a very common procedure in canine reproduction nowadays in our clinic. In some cases we can control the whole process from collection of the semen to delivery of the puppies but in many cases only small parts of it. The weakest point in this reproduction chain makes the final results though. The presentation will go over the different steps in this more and more internationally influenced chain from animal selection and genetics, collection of the semen, quality evaluation, extenders, chilling and freezing, stocking, shipment, sanitary (governmental) rules, quarantine problems, insemination surgical versus TCI and the results we had with the latter in our repro clinic.

4:20 - 4:40 pm True or false ? Differentiating negative responses in trained detection dogs

Astrid CONCHA
School of Life Science, University of Lincoln

Astrid Concha is currently in her final year of a PhD at the University of Lincoln focusing on the olfactory alert performance in dogs. She is a veterinarian specialized in neuroelectrophysiology and holds a Master degree in small animal behaviour of the Universitat Autonoma of Barcelona. Since 2003, she has lectured in Chile and worked in private practice in clinical animal behaviour, training dogs for people with disabilities, and also supervised welfare and training programmes in police/military working dogs. Her current research and work interests are focused on the behavioural aspects of the olfactory detection and alert performance in detection dogs.

Contact: aconcharamirez@lincoln.ac.uk

Co-authors: Daniel Mills, Alexandre Feugier, Helen Zulch, Claire Guest, Rob Harris, Tom Pike ; School of Life Science, University of Lincoln, Lincoln, UK

The absence of the trained alert response performed by a detection dogs may not necessarily mean that the target odour is absent (false negative). To address this we examined whether the sniffing duration of trained detection dogs during a single scent detection task differs in response to true positives, true negatives, false positives and false negatives. A total of 200 videos of 10 detection dogs were selected and analysed frame by frame to quantify sniffing duration and the number of sniffing episodes recorded before a choice was made. The results showed that sniffing duration of true negatives was significantly shorter than true positives, false negatives and positives ($p<0.001$). Additionally dogs only performed one sniffing episode towards true negatives, but two sniffing episodes occurred in the other responses. This study provides evidence that sniffing duration can be used to assess odour alert performance in detection dogs beyond the trained alert response.

4:40 - 5:20 pm Giving working dogs a new start

Carey EDWARDS
Australian Working Dog Rescue

Before Australian Working Dog Rescue (AWDRI), I was, and still am, a qualified carpenter & registered builder. Other skills I've picked up along the journey of life, enabling the design and functions of AWDRI, include computer programming, project & disaster management, in both the finance and building sectors, sports administration (having also founded a basketball club) as well as a love of all things Australian. This also led me to clamber over the Kokoda track in my grandfather's footsteps, taking his dog tag back to where he fought for what we call home today. A love of photography has also been something enabling even further progression of AWDRI from the promotion of the dogs to the maintenance of the online presence in social media and displays at numerous live events and shows. My ultimate aim is to change the face and profile of rescue everywhere I can reach, from something that can be depressing and sad into an uplifting event for all those involved. I am a "NO KILL" advocate, and firm believer that the often used term of "pet overpopulation" is merely an excuse used by those not willing to work harder to save those animals in need.

Animal rescue isn't just about taking a dog from an impound facility and finding it a new home. Working breed dogs were developed for specific reasons, and so Australian Working Dog Rescue Inc (AWDRI) has developed specific procedures in accordance with the abilities and instincts of Australian working and herding breeds. "A new start" is not only about a new home, and a new start in life, but also about 'starting' a dog on real stock work, or putting them to work in passive drug detection, or explosives detection work. Our driven working breed dogs thrive on constant mental and physical activity, constant commands being sent to them, and assorted challenges thrown at them along the way. How we work out what the dogs are capable of doing is another function of passionate people who involve themselves, not only in the saving of lives, but in ensuring a dog is placed into a home and environment that is best suited to its personality, whether that be in an urban back yard, a commercial enterprise, or a true working farm or station.

4:40 - 5:20 pm States of arousal are related to successfully working as guide dogs

Jane RUSSENBERGER
Guiding Eyes for the Blind

Over the past 27 years, Jane has been the Director of Genetics and Breeding at Guiding Eyes for the Blind in Yorktown Heights, New York. Using various scoring systems in collaboration with multiple specialists, Jane has studied and scored aspects of behavior on thousands of potential guide dogs. The knowledge gained has been incorporated into improving the genetic as well as environmental influences on behavior of 165 guide dogs and 10 autism support dogs annually produced by Guiding Eyes for the Blind.

Contact: jrussenberger@guidingeyes.org
www.guidingeyes.org

Using a scoring instrument called the Behavior Checklist (BCL), behavior scores and longitudinal video were collected on over 1,500 puppies and 1,200 young adult Labrador Retrievers. The BCL is a standardized instrument for characterizing aspects of a dog's behavior thought to be related to the dog's suitability for work as a guide. Estimates of heritability of each BCL item ranged from 0 to 0.36 and tended to be highest when measured at age 2 months and lower when measured upon entering training and during training. Analyses of BCL data suggest that genetic influences on BCL items related to success as guide dogs can be detected at various age points with estimates of heritability being sufficiently high to use for genetic improvement. Longitudinal video suggest that dogs were more successful as guide dogs when raised by handlers who helped them remain or return to a productive state of arousal.

CONFERENCES PROGRAM

TUESDAY 24 MARCH 2015 / MORNING

▶ Working technical advances and progress in working dogs.

TIME	SPEAKER	LECTURE
8:00 am - 9:30 am		**Registration**
8:00 am - 8:40 am	**Floyd** (USA)	**Canine performance science (CPS) program at Auburn University**
8:40 am - 9:20 am	**Fontaine** (France)	**The neonatal period: also a challenge in working dog breeding centers**
9:20 am - 9:40 am	**Vilson** (Sweden)	**The importance of microbial exposure early in life**
9:40 am - 10:00 am	**Schalke** (Germany)	**Training puppies and young dogs to become a detection dog for explosive by using a technical training aid**
10:00 am - 10:20 am	**Coffee Break**	**Posters exhibition**
10:20 am - 10:40 am	**Rooney** (UK)	**Welfare of working dogs and its impact on ability**
10:40 am - 11:00 am	**Jacob** (Belgium)	**Variability of the detection response of explosive detection dogs (EDD) faced with varying quantities of RDX-type explosives**
11:00 am - 11:20 am	**Angle** (USA)	**Real time detection of bovine viral diarrhea virus using detection dogs**
11:20 am - 11:40 am	**Foyer** (Sweden)	**Behaviour and cortisol responses in a standardised test for military working dogs**
11:40 am - 12:30 am KEYNOTE speaker	**Avital** (Israel)	**Handler-dog interface : the effects of handler's controllability on the performance of canine in an explosive detection task**
12:30 am - 2:00 pm	**Lunch Break**	**Onsite Lunch**

CHAIRMAN

TUESDAY 24 MARCH 2015 / MORNING

Erik WILSSON

Erik Wilsson is the program manager for the Swedish Armed Forces breeding program. Earlier he held a position as a director at the Swedish Dog Training Centre and the Swedish Dog Training Academy. He earned a MS degree in etology in 1976 and a PhD in 1997 at Stockholm University. His present main scientific interest is the nature of temperament in working dogs. He is a board member of the IWDBA since 2011.

Contact: tisslegarden@telia.com

8:00 - 8:40 am

Canine performance science (CPS) program at Auburn University

James FLOYD

After five years' service in the U.S. Army, Dr. Floyd graduated from veterinary school and entered private veterinary practice, first as an associate and then as a practice owner. Following an internship and residency in Theriogenology at the University of Illinois he served as Extension Veterinarian and Professor in the Dept. of Animal and Dairy Sciences at Auburn University and then as Dept. Chairman. He was named Professor and Head of the Dept. of Farm Animal Health & Resource Management at North Carolina State University. He retired in 2011 and returned to Auburn, Alabama where in 2012 he was named Interim Director of the Auburn University Canine Performance Sciences program. As a U. S. Army Veterinary Corps officer he deployed in Operations Desert Shield/Storm and Operation Enduring Freedom (Combined Joint Task Force Horn of Africa and U. S. Forces, Afghanistan).

Contact: info@cryolab.nl
www.cryolab.nl

Co-authors: Paul Waggoner, Thomas Angle, Terrence Fischer, Bart Rogers, Jeanne Brock, Pamela Haney, Holli Thompson, Karen Galik; College of Veterinary Medicine, Auburn University, Auburn, USA

The CPS mission: Through research, teaching and outreach, the Auburn University CANINE PERFORMANCE SCIENCES program continually improves animal detection science and technology to serve and defend the nation and society. CPS has four sub-components: (1) Canine Detection Research Institute; (2) Veterinary Sports Medicine; (3) ECO Dog; and (4) Detector Dog Breeding. CPS research investigates factors affecting operational performance in detector canines, including both human and canine elements: handler knowledge, skills, abilities, and canine compatibilities; canine environmental acclimatization, nutrition, physical conditioning, auditory & visual distractors, olfaction target variables, and health. Auburn has patented Vapor Wake® technology for the development and training of specialized bomb detector canines. The CPS breeding program is expanding from six breeding females to 20 with a selected cadre of ten males. The breeding program progeny tests all pups under a standard protocol developing estimated breeding values alongside molecular genomics in collaboration with the HudsonAlpha Institute for Biotechnology.

8:40 - 9:20 pm

The neonatal period: also a challenge in working dog breeding centers

Emmanuel FONTAINE
Royal Canin Canada

Emmanuel Fontaine graduated from the Toulouse Veterinary School in 2004, and continued his studies at the Alfort Veterinary School (Paris) as trainee Vet in the domestic carnivore unit of the Reproduction Department. From 2005 to 2011, he worked at the Centre d'Etude en Reproduction des Carnivores (CERCA) (Research Centre for Reproduction in Carnivores), a unit specializing in pet breeding assistance. Emmanuel Fontaine is also qualified at the European College for Animal Reproduction (ECAR) and recently completed his PhD. He joined Royal Canin Canada 's PRO team in September 2011.

Contact: emmanuel.fontaine@royalcanin.com
http://www.royalcanin.ca/

As working dog breeding programs become more and more popular, defining breeding management best practices appears as something key. Among all situations that can occur, neonatal mortality is clearly a challenging - and often frustrating- one. Any breeding program manager now needs to be aware of 1) main causes of neonatal mortality in canines and 2) what can be done in terms of prevention. Studies showed that what happens at the time of parturition clearly influences neonatal survival. Fortunately today, it is possible to detect at-risk bitches prior they give birth, and accordingly, schedule a C-section. Proper neonatal resuscitation management is also critical: many techniques "of the past" have a detrimental effect and must be banished. Proper husbandry measures need to be defined: neonates are prone to hypothermia-hypoglycaemia-dehydration, which can be prevented as well with appropriate procedures.

9:20 - 9:40 am The importance of microbial exposure early in life

Asa VILSON
Swedish University of Agricultural Sciences

Åsa Vilson graduated from Copenhagen vet school in 2008. Since then, she has been working as a small animal veterinarian in Skara, Sundsvall and Östersund (Sweden). In 2010 she started her Phd-studies at the Swedish University of Agricultural Sciences (SLU) in Uppsala, Sweden. She studies possibilities of immune stimulation early in life in German Shepherd Dogs bred at the Swedish Armed Forces kennel. Åsa lives outside Östersund in the north of Sweden. She is a dedicated bird hunter and she owns and breeds English setters used for hunting and field trials.

Contact: asa.vilson@slu.se
www.slu.se

The gastrointestinal tract is the largest immunologic organ in the body and gut mucosa represent the first contact between pathogens and the immune response. The prevalence of allergic disease has increased the past decades in humans1 as well as in dogs. This is most likely associated with changes in environmental factors. Strachan proposed the so called hygiene hypothesis in 1989, explaining that decreased microbial exposure as a result of hygienic conditions in early life may have an impact on the balance of the immune system, resulting in development of allergic diseases. The importance of microbial exposure early in life is illustrated by findings that delivery mode may have effects on the immunological function in infants. Under normal conditions of delivery there is transfer of faecal bacteria from the mother to the baby. Children born through sterile caesarean section have a different gut microbiota compared to vaginally born children2,3 , and may have increased risk of allergy4. Despite their simple gut, the canine gut microbiome is highly diverse5,6. The sterile gastrointestinal tract of neonates is rapidly colonized by bacteria in the birth canal and surrounding environment. Already 24 hours after birth, the numbers of bacteria in the GI-tract were comparable to those in adult dogs7. Exposure to a host of potentially immune regulatory bacteria colonizing the gastrointestinal tract early in life may have life-long consequences. In this respect probiotic bacteria are of particular interest. Probiotics are live microorganisms with documented beneficial effects on health. As they are safe to use, probiotics are of interest as potential modulators of immunity and, as a consequence, in prevention and treatment of immune mediated diseases, such as allergies. Exposure of puppies to probiotics during a critical time period is proposed to modulate immune function into their adult life8. In children, immune imprinting with maternal probiotic supplementation has been shown to modulate immune function and enhance gut integrity, thereby decreasing the incidence of immune mediated diseases. The first study9 aiming to prevent allergies by probiotics, showed a 50% reduction of atopy in infants treated with probiotics. In a study10 based on Swedish insurance data, we described a breed-specific pattern of diseases in 32,482 German shepherd dogs (GSD). We confirmed that this popular working dog breed is prone to immune mediated disorders. It was 2.7 times more common that a GSD searched veterinary care for immunological disorders, compared to all other breeds. This predisposition for immune mediated conditions is in agreement with other epidemiological and case studies and may be a result of inherited defects in the immune system11-14. We are now studying specific immune parameters in the growing GSD, but also the impact of early probiotic supplementation upon the immune response.

References:

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9:40 - 10:00 am Training puppies and young dogs to become a detection dog for explosive by using a technical training aid

Esther SCHALKE
Hans EBBERS ; Luologic GmbH

Esther Schalke is a Doctor in veterinary medicine, graduated from the University of Hanover (Germany) in 1996. She got her PhD in 2000, is a board certified specialist in animal behavior (ECVBM-CA), and works as a postdoctoral research fellow at the Institute of Animal Behavior and Welfare, University of veterinary medicine Hanover. In 2009 she founded the Lupologic GmbH: center of applied ethology and veterinary behavior medicine, and published numerous publications in collaboration with the police dogs school of the LAFP North Rhine Westphalia.

Contact: schalke.esther@googlemail.com

Co-authors: Hans Ebbers ; Luologic GmbH, Duesseldorf, Germany

This talk is about training puppies and young dogs to become a detection dog for explosive by using a technical training aid. Especially in detection work it is essential to get a positive emotional association with the scent. This training way using a technical training aid ensures on one hand a good timing to get a strong positive association; on the other hand it is independent on man power. It is an easy way to train young dogs during a raising program to search for and indicate a certain scent without depending on peoples ability for perfect timing. It is a possibility to save time an man power and getting a good detection dog.

10:20 - 10:40 am Welfare of working dogs and its impact on ability

Nicola ROONEY
Animal Welfare and Behaviour Group, University of Bristol

Dr Nicola Rooney (BSc PGCE PhD) is a Research Fellow in the Animal Welfare and Behaviour Group at the University of Bristol. She has a PhD in dog behaviour and for the past fourteen years has headed a team conducting research on working dogs, working collaboratively with many agencies worldwide. Her research has included:

- *examining working dog selection criteria and breed differences in ability,*
- *investigating the effects of rearing environments on search dog ability,*
- *developing ways to measuring working ability,*
- *determining optimal handler selection;*
- *developing training resources for military handlers to recognise and quantify dog behavior;*
- *assessing and examining ways of improving the welfare of kenneled dogs;*
- *exploring the value of hypoglycaemia alert dogs.*

She also works as an independent consultant to the RSPCA and has helped produce Codes of Practice for the care of both dogs and cats, the RSPCA Performing Animals Guidelines, and coordinated and co-authored the influential Independent Report entitled "Pedigree dog breeding in the UK: a major welfare concern?" .She has recently started a new large scale project on racing greyhound welfare.

Contact: Nicola.Rooney@bristol.ac.uk

Research shows us that an individual animal's ability to cope with their environment affects not only their wellbeing but also their working ability. This is relevant to all types of working dogs for example our own studies of explosives search dogs illustrate a link between the stress levels that dogs experience upon entering training kennels and their subsequent performance twelve weeks later. It is therefore important that we strive to design optimal housing, husbandry and training regimes to mitigate potential distress, as well as selecting individual dogs that are better able to cope with the lifestyle (e.g. kennelling) of a working dog. I will describe a range of research studies aimed at elucidating the best ways to improve kennelled dog welfare, prioritising those factors which are most important to the dogs. I will describe the importance of handler selection based on attitude and behaviour, and how training can improve handlers' ability to detect the early signs of fear; and hence avoid many potential welfare problems. Finally, I describe our recent, and on-going, research into greyhound welfare, where we aim to prioritise and address.

10:40 - 11:00 am Variability of the detection response of explosive detection dogs (EDD) faced with varying quantities of RDX-type explosives

Ann JACOB
4EMI-Clin Vet, Belgian Army

Canine olfaction and explosive detection can be influenced by many factors. These factors, which were determined by a retrospective literature study, can be classified as internal or external to the EDD team (handler and dog). Internal factors include anatomical variation, age, iatrogenic influence and cognitive ability. External factors include many factors that can be classified into three sub-categories following their time of occurrence: during initial training, during maintenance and in operational conditions. Amongst these external factors, the effect on detection of the variation of the quantity of explosive was further explored because of its possible impact during military operations. The study was performed on Belgian Military EDD to determine whether varying the quantities of explosives (RDX type in this case) had an influence not only on the detection capability but also on the behavior displayed by the dogs. Three quantities of RDX-type explosive were used in a hand luggage line-up situation. The result demonstrated that the use of larger quantities showed no detection variation. However, three significant behavior traits appeared during the detection of the largest quantity of explosive.

11:00 - 11:20 am Real time detection of bovine viral diarrhea virus using detection dogs

Thomas ANGLE
Canine performance sciences center, Auburn University

Dr. Angle received his Masters degrees in biomechanics and exercise physiology and his PhD in biomechanics. He is also holds dual board certifications in human athletic training and strength and conditioning. Dr. Angle is currently the Associate Director of the Canine Performance Sciences Program at Auburn University. Dr. Angle is the author or co-author on several refereed scientific publications and has 2 patents. He has also been co-investigator on more than 11.8 million dollars in research funding. The majority of Dr. Angle's funding has been from US and foreign governments focused on performance evaluation and enhancement of detection dogs. Dr. Angle's general research interests are to develop new dog team operational capabilities to counter present and future threats; innovate new technologies to increase safety, efficiency, and mission success; increase the physical, physiological, and psychological function of our K9 partners; and problem solve mission critical issues.

Contact: angletc@auburn.edu
http://www.vetmed.auburn.edu/cps

Co-authors: Thomas Passler, Paul Waggoner ; Canine performance sciences center, Auburn University, USA

Military and police working dogs are often exposed to stressful or threatening events, and an improper response i.e. fear may implicate both reduced working efficiency and welfare. Therefore finding individuals that display a favourable response to potentially threatening situations is of great interest. In this on-going study we investigate the dogs responses in the standardised temperament test used to select prospective military working dogs for the Swedish Armed Forces, trying to discriminate behaviours seen in dogs rated as suitable from those rated as non-suitable, using both behavioural rating and behaviour coding. To further improve the interpretation of the recorded behaviour in regard to stress, we will also measure cortisol. Behavioural coding and behavioural rating were equally good at judging the dogs' suitability even though they were not measuring the same characteristics of the displayed behaviour. Some differences in behaviour could be seen between approved and non-approved dogs. Results from the saliva cortisol levels are yet to be analysed.

11:20 - 11:40 am Behaviour and cortisol responses in a standardised test for military working dogs

Pernilla FOYER
Swedish Defense University

Pernilla Foyer was born in Växjö, Sweden in 1971. She graduated from the Swedish Armed Forces Academy in 1994 and has worked as an officer in the Swedish Armed Forces till 2010. She holds an MSc in Biology/ethology since 2005. In 2010 she started her current employment as a Doctoral Candidate at the Swedish Defence University in Stockholm and Linköping University. Her PhD project is a co-operation project with the Swedish Armed Forces K9 Centre and focuses on early experiences in dogs, and how the mother-offspring interaction relates to the offspring's later temperament profile and suitability to become an MWD.

Contact: Pernilla.Foyer@fhs.se

Co-authors: Anna-Maria Svedberg, Emma Nilsson, Erik Wilsson, Åshild Olsen-Faresjö, Per Jensen ; Swedish Defense University, Stockholm, Sweden

Military and police working dogs are often exposed to stressful or threatening events, and an improper response i.e. fear may implicate both reduced working efficiency and welfare. Therefore finding individuals that display a favourable response to potentially threatening situations is of great interest. In this on-going study we investigate the dogs responses in the standardised temperament test used to select prospective military working dogs for the Swedish Armed Forces, trying to discriminate behaviours seen in dogs rated as suitable from those rated as non-suitable, using both behavioural rating and behaviour coding. To further improve the interpretation of the recorded behaviour in regard to stress, we will also measure cortisol. Behavioural coding and behavioural rating were equally good at judging the dogs' suitability even though they were not measuring the same characteristics of the displayed behaviour. Some differences in behaviour could be seen between approved and non-approved dogs. Results from the saliva cortisol levels are yet to be analysed.

11:40 - 12:30 pm Handler-dog interface : the effects of handler's controllability on the performance of canine in an explosive detection task

Avraham AVITAL, Behavioral Neuroscience Laboratory, Faculty of Medicine and Emek Center

Avraham Avital is actually Head of the Behavioral Neuroscience Laboratory at the Bruce Rappaport Faculty of Medicine in Technion (Israel). He got a PhD in Psychobiology and is a board member of the Israeli Society for Biological Psychiatry, and a member of the european college of Neuropsychopharmacology education committee. Avi's research interest are related to animal behavior (rodents models for attention and social cooperation), working dogs (long term effects of life circumstances), neural plasticity and animal-human and animal-machine interfaces.

Contact: Avitalavi@hotmail.com

The handler-dog interaction is significantly important for the canine performance. The handler error may mislead the dog into false identification, and the probability to commit such an error is altered often by the handlers' ability to control the canine. Objectively evaluating the canine detection performance, we first have examined on- or off-leash operation mode. Secondly, translated from a rat-model study, we examined the effects of the handler's stress characteristics (relevant or/and irrelevant to the detection task). In the first experiment, the dogs were videotaped during explosive detection task in two conditions: on- or off-leash. The latency of detection as well as activity and velocity were measured using a custom-made computerized algorithm. Wind velocity, temperature and humidity were monitored during the two conditions. In the second experiment, the handlers evaluated their dogs' behavior using a modified C-BARQ questionnaire. For baseline evaluation, the handlers were tested for attention performance and anxiety level utilizing pre-pulse inhibition and startle response tests, respectively. Following this, the handlers were randomly assigned into 3 stress conditions (relevant or/and irrelevant to the detection task) and to a control condition. The dogs performance was evaluated as aforementioned. Finally, post detection task, the handlers were re-tested for attention performance and anxiety level. Our results revealed that the performance in an explosive detection task was better in the off- versus the on-leash condition. We also found that all stress conditions decreased the handlers' attention and elevated their anxiety level. However, stress improved the canines' latency to detect the explosive, and likewise, increased the canines' locomotor activity. Specifically, when exposing the handlers to stress that is irrelevant to the detection task, the dogs showed a superior performance, across all measures. Focusing on the handler-dog interface, we found that when the handlers' anxiety level is elevated, the dog performance is improved. We postulate that since the handlers' exposure to stress elevated anxiety level and impaired their attention, it may have led to less control over the dog. Consequently, it allowed the dogs to 'take control' and manifest their training outcomes. This alleged locus of control transfer, shown in the two experiments, may explain the improved performance of the canines, and further emphasizes the importance of the handler-dog interface.

UMES

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Mrs Emeline **LEBLOND**
Mrs Christine **VORNIERE**

EnvA
École nationale vétérinaire d'Alfort

CONTACT
+33 1 43 96 71 76 / dgrandjean@vet-alfort.fr

ChuvA
Centre hospitalier universitaire vétérinaire d'Alfort
École nationale vétérinaire d'Alfort

CONFERENCES PROGRAM
TUESDAY 24 MARCH 2015 / AFTERNOON

▶ Working technical advances and progress in working dogs.

TIME	SPEAKER	LECTURE
2:00 pm - 2:20 pm	**Waggoner** (France)	**Functional MRI of conscious dogs: relationship between brain activity and measures of working dog performance**
2:20 pm - 2:40 pm	**Alcaidinho** (USA)	**Quantitative analysis of the relationship between restfullness and dog training outcomes**
2:40 pm - 3:00 pm	**Broach** (USA)	**Evaluation of the use of pheromone collars during transition from foster homes to the JBSA-Lackland training kennel to decrease stress in young military working dogs**
3:00 pm - 3:40 pm	**Otto** (USA)	**Incorporation of the « fit to work » fitness program into a canine detection training program**
3:40 pm - 4:00 pm	**Coffee Break**	**Posters Exhibition**
4:00 pm - 4:20 pm	**Sales** (France)	**The remote explosive scent tracing for air cargo security**
4:20 pm - 5:00 pm KEYNOTE speaker	**Rooney** (UK)	**Measuring and investigating factors which affect the performance of working dogs, their handlers and the teams**
5:00 pm - 6:00 pm	**Poster discussion**	**Brief presentation and discussion of posters**

CHAIRMAN

TUESDAY 24 MARCH 2015 / AFTERNOON

Walter BURGHARDT

Dr Burghardt was awarded his BA and MA in Psychology from Florida Atlantic University in 1974, his DVM in 1980 from the University of Florida, and his PhD in Biopsychology from the University of Maryland College Park in 1988. He is a Diplomate of the American College of Veterinary Behaviorists. Dr Burghardt has over 10 years experience in basic behavioral research and over 30 years experience in both private veterinary practice and a referral veterinary behavioral practice. Since 1995, he has been the Chief of Behavioral Medicine and Military Working Dog Studies for the LTC Daniel E Holland Military Working Dog Hospital at Lackland Air Force Base, Texas. He is responsible for the behavioral care of over 1,500 military working dogs around the world, and for the implementation of a program of applied research and development regarding military working dogs. Dr Burghardt is also an Adjunct Professor in Biology at the University of Texas San Antonio and Director of the LTC Daniel E Holland MWD Hospital Behavior Residency Training Program. He is a retired Colonel in the US Air Force Reserve, last serving from 2008 to 2010 as Individual Mobilization Augmentee to the Medical Director, Air Force Reserve at the Pentagon.

Contact: walter.burghardt@gmail.com

2:00 - 2:20 pm

Functional MRI of conscious dogs: relationship between brain activity and measures of working dog performance

Paul WAGGONER

Canine Performance Sciences, College of Veterinary Medicine, Auburn University

Paul Waggoner, Ph.D., is an experimental psychologist / behavior analyst. He serves as Senior Scientist and Assistant Director at Auburn University's Canine Detection Research Institute within the Canine Performance Sciences Program of the College of Veterinary Medicine. His research and development is focused on the use of dogs for detection of hazardous substances. Dr. Waggoner has over 20 years of experience at Auburn performing laboratory studies of canine olfaction and field research of applied canine detection issues such as canine training, handler training, and operational deployment of canine detection teams. Current R&D topics include: Use of fMRI to investigate olfaction and other cognitive characteristics of dogs; odor detection signatures and response generalization; automated training and command of detector dogs; canine handler instruction; breeding and raising of dogs for specific working functions, and; the operational performance of detector dogs in detecting person-borne IEDs (PBIED).

Contact: waggolp@auburn.edu
http://www.vetmed.auburn.edu/cps

Co-authors: Gopikrishna Deshpande, Thomas Denney, Ronald Beyers, Hao Jia, Oleg Pustovyy, Vitaly Vodyanoy, Edward Morrison ; Canine Performance Sciences, College of Veterinary Medicine, Auburn University, Auburn, USA

Relationships between brain activity during functional magnetic resonance imaging (fMRI) of awake dogs and measures of detector dog performance were investigated. Differences were found in neural response to discriminative and non-discriminative odors and evidence of "top-down" regulation of olfactory bulb activity. Neural activation in response to odors and during resting state appears to be positively correlated with rankings in typical detector dog evaluations (e.g., reward focus, retrieve, hunt, environmental soundness etc.) and with ease of acquisition of the imaging task. Higher evaluation scores and ease of learning the imaging task was associated with higher neural activation to discriminative odors and connectivity between areas of the brain important in learning, memory, and decision making. Results suggest that fMRI has promise for understanding the neural mechanisms underlying odor recognition and cognitive characteristics of dogs that may that may allow for enhancements to breeding, selection and training of dogs for particular working tasks.

2:20 - 2:40 pm

Quantitative analysis of the relationship between restfullness and dog training outcomes

Joelle ALCAIDINHO

Georgia Institute of Technology

Joelle Alcaidinho is a graduate student and a founding member of the Animal-Computer Interaction Lab at Georgia Institute of Technology and a research scientist at Whistle Labs. Her research is focused on the early prediction of working dog outcomes through quantimetric data by integrating approaches from the fields of animal behavior and computer science.

Contact: joelle@gatech.edu
www.joelle-a.com

Co-authors: Nate Yoder, Stephanie Tai, Kerinne Levy, Paul Mundell, Melody Jackson

We propose a new approach for the assessment and potential outcome prediction of working dogs in advanced training through the use of continuously-recording technology that does not rely on constant human observation. To explore the use of such technology, specifically collar mounted accelerometers, a pilot study was conducted with Canine Companions for Independence and Whistle Labs. For this study, a total of 45 dogs at two different CCI training centers were outfitted with Whistle Activity Monitors and monitored through a portion of advanced training. The results from this study emphasize the possible correlation of working dogs' performance with restfulness at night, when the dogs are away from trainers and otherwise unobserved. This study suggests that quantitative information from wearable devices like the Whistle Activity Monitor may be useful in tailoring the training environment and demonstrates the possibilities of utilizing quantitative measurements to assist in the training of working dogs.

2:40 - 3:00 pm — Evaluation of the use of pheromone collars during transition from foster homes to the JBSA-Lackland training kennel to decrease stress in young military working dogs

Desiree BROACH
LTC Daniel E Holland MWD Hospital

Desirée Broach is a DVM, Major of the US Army Veterinary Corps, graduated from the College of Veterinary Medicine of the University of Georgia (USA). She served as section chief of Moody Air Force Base (Georgia) from 2008 to 2010, became Deputy Branch Chief of the Department of veterinary services at Fort Sam Houston (Texas) from 2010 to 2012, and is currently assigned to long term health education training at Fort Sam Houston.

Contact: desiree.broach@us.af.mil

The objective of this study is to investigate the effectiveness of a pheromone collar in reducing the stress of transitioning young Military Working Dogs from foster homes to a kennel environment. The stressors present throughout a Military Working Dog's (MWD) lifecycle are more intensive than those of a typical companion canine. MWDs are exposed to environmental stressors, rigorous training, and combat-related events. Although breeding selection, training, and performance evaluations aim to produce a robust and resilient working dog, reduction or mitigation of potentially controllable stressors serves to increase the welfare of the canines as well as to reduce the potential for detrimental sequelae due to chronic stress. The MWD Breeding Program at JBSA-Lackland is fortunate to provide rearing of purpose-bred Belgian Malinois puppies through a Home Foster Program. The puppies are placed in foster at 6 weeks of age and cared for in private homes until 7 months of age. When the puppies are turned-in to prepare for training, they are entering into a new living situation, and the transition from a home to a kennel may be quite stressful. The use of pheromone therapy is becoming more and more prevalent in the U.S. and veterinary behavior treatment plans, with the indications for utilization including the adoption period in stray dogs, during puppy socialization, for separation issues, during fireworks or storms, lifestyle transitions, etc. I propose that the use of a pheromone collar that is embedded with the intermammary "appeasing" pheromone for 4 weeks from the time of MWD turn-in will ease the stress of the transition from a foster home environment. Reduced stress can have beneficial effects on learning and memory, as well as overall health and behavior. I hypothesize that young MWDs that enter the kennel wearing a pheromone-embedded collar will have better performance scores and less undesirable behaviors than those who wear a placebo collar. Also, they will show more favorable behaviors characterized by less distress-related signs, aggression, distractibility, and over-activity as compared to the subjects with placebo collars. Behavior assessments will be performed at turn-in (Time: Week 1), during the performance evaluation (Week 3), and 1 week after the collars have been removed (Week 5).

3:00 - 3:40 pm — Incorporation of the « fit to work » fitness program into a canine detection training program

Cynthia M. OTTO, Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania

Dr. Otto is a tenured associate professor at the University of Pennsylvania, School of Veterinary Medicine in Philadelphia, PA. She is board certified in Veterinary Emergency Medicine and Critical Care (DACVECC) and Sports Medicine and Rehabilitation (DACVMR-canine) has been an attending clinician in the Emergency Service for over 20 years and the director of the Penn Vet Working Dog Center since it opened in 2012. She received a Bachelor's of Animal Science and her Doctor of Veterinary Medicine from The Ohio State University and her PhD in veterinary physiology from the University of Georgia. She has published over 60 peer reviewed articles. Her research, funded by NIH, AHA, AKC-CHF and other foundations, has included studies in sepsis, inflammation, acute lung injury, trauma, and disaster medicine. She has been monitoring the health and behavior of Urban Search and Rescue canines since October of 2001, through an AKC-CHF funded grant (now in its third renewal). She has established the AKC-Reunite Detection Dog DNA bank. She has conducted funded studies of prehydration in working dogs and the use of detection dogs in ovarian cancer detection and diabetes alert. She is an internationally recognized speaker in both emergency medicine and working dog medicine. Dr. Otto has also been involved with search and rescue dogs and disaster response as a member of the Pennsylvania Urban Search and Rescue Task Force 1 between 1994 and 2010 (including deployments to Hurricane Floyd and 9/11), and the Veterinary Medical Assistance Team-2 since 1999 (deploying to Hurricane Katrina). She is the founding director of the Penn Vet Working Dog Center (www.PennVetWDC.org). She is active in educating search dog handlers and members of the working dog community in canine first aid and fitness. She was named Pennsylvania's 2002 "Veterinarian of the Year" and received an Alumni Recognition Award in 2006 and the OSU Distinguished Alumnus Award in 2008 from the Ohio State University and a top 20 finalist in AVMF's America's Favorite Veterinarian. She has been involved in dog sports (flyball, agility, and tricks), and animal assisted interactions, with her dog, Dolce.

Contact: cmotto@vet.upenn.edu
http://pennvetwdc.org/

Co-authors: Tracy Darling, Annemarie DeAngelo, Patricia Kaynaroglu, Victoria Berkowitz ; Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania, Philadelphia, USA

Professional athletes require more than skill specific training. Incorporation of exercises to improve balance, core strength, body awareness (proprioception), flexibility and stamina are incorporated to enhance performance and minimize injuries. Most canine training programs focus on skill specific training and assume that dogs are natural athletes. At the Penn Vet Working Dog Center, we have developed a "Fit to Work" curriculum for all dogs. This program incorporates balance, core strength, body awareness (proprioception), flexibility and stamina into the training program for all detection dogs regardless of their career. Benefits of a fitness program include increased agility, confidence and a potential reduction in injuries. In addition, incorporation of warm-up exercises prior to work and cool down after work has the potential to enhance working safety.

4:00 - 4:20 pm — The remote explosive scent tracing for air cargo security

Alain SALES, General direction for civilian aviation, Technical service of civilian aviation, Biscarosse

Alain Sales is the actual chief of the test laboratory for the Civilian Aviation Technical Services (French Ministry of Transportation) based in Biscarosse. He is a certified expert in cynotechnics, and has been a member of the french National Gendarmerie till 2002, in charge of the national evaluation of K9 teams. Apart of his french qualifications, he is also certified in K9 drugs search by the hungarian police academy.

Contact: alain.sales@aviation-civile.gouv.fr
http://www.stac.aviation-civile.gouv.fr/

Co-author: Frederic fuso ; General direction for civilian aviation, Technical service of civilian aviation, biscarosse, France

Several private companies operate explosive detection dogs in France for civil aviation security. Regarding Cargo, the free running technique under handler supervision is used, and the Remote Explosive Scent Tracing is also used for nearly 10 years. The French civil aviation technical center (STAC) has been studying this concept with the companies involved, then allowed it and now certifies dogs from two companies.

4:20 - 5:00 pm

Measuring and investigating factors which affect the performance of working dogs, their handlers and the teams

Nicola ROONEY, Animal Welfare and Behaviour Group
University of Bristol

Dr Nicola Rooney (BSc PGCE PhD) is a Research Fellow in the Animal Welfare and Behaviour Group at the University of Bristol. She has a PhD in dog behaviour and for the past fourteen years has headed a team conducting research on working dogs, working collaboratively with many agencies worldwide. Her research has included:

- *examining working dog selection criteria and breed differences in ability,*
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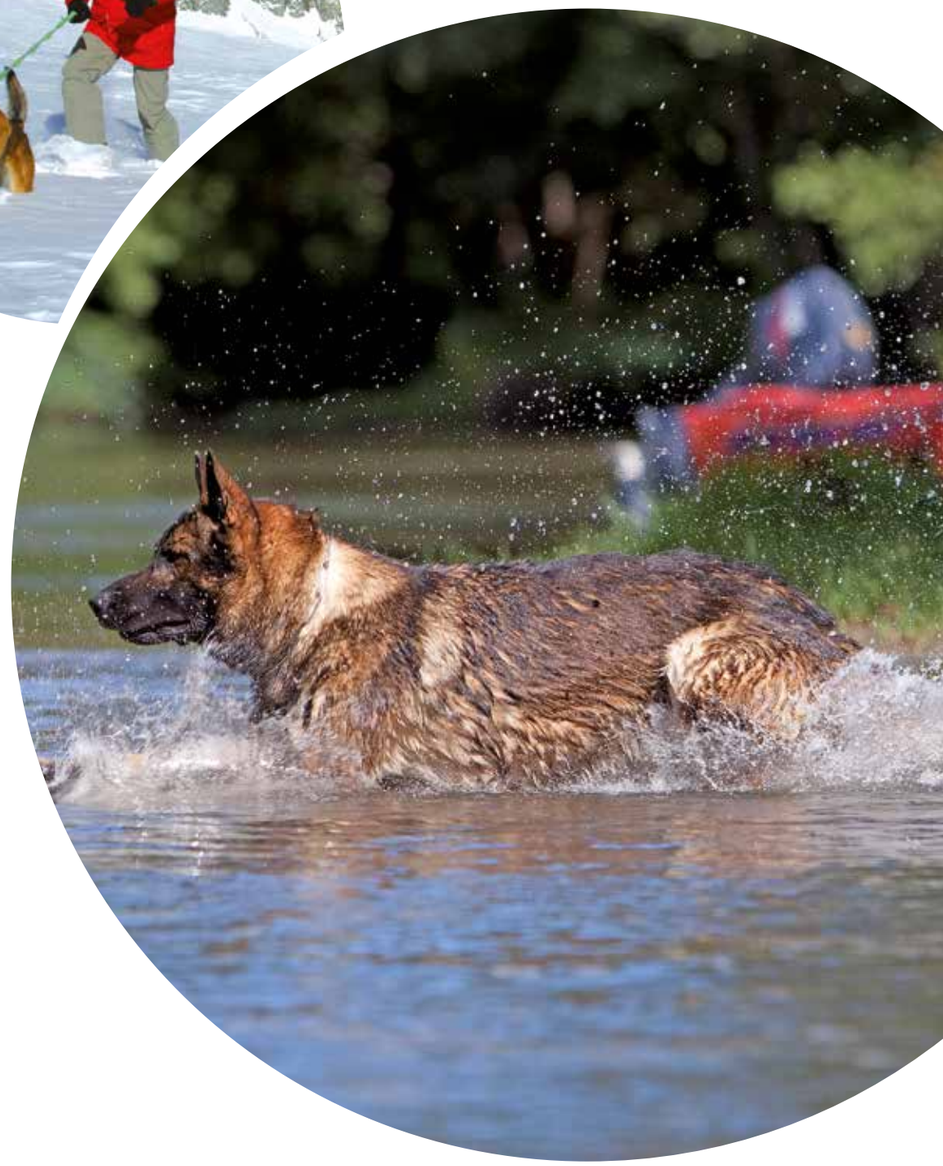
- *developing training resources for military handlers to recognise and quantify dog behavior;*
- *assessing and examining ways of improving the welfare of kenneled dogs;*
- *exploring the value of hypoglycaemia alert dogs.*

She also works as an independent consultant to the RSPCA and has helped produce Codes of Practice for the care of both dogs and cats, the RSPCA Performing Animals Guidelines, and coordinated and co-authored the influential Independent Report entitled "Pedigree dog breeding in the UK: a major welfare concern?". She has recently started a new large scale project on racing greyhound welfare.

Contact: Nicola.Rooney@bristol.ac.uk

The working dog community encompasses practitioners with a great deal of expertise, but also very strong and conflicting opinions as to what constitutes best practice. In order to optimise working dog ability, it is important that we monitor day to day performance and investigate, analytically, those factors which may impact upon it. To do this, we need valid and reliable methods of recording performance, which take into account the numerous different aspects of working ability which are essential to specific working dog roles. I will describe the rigorous scientific process we have employed to derive performance measures for search dogs, both during day to day work tasks and during controlled training and calibration searches. I will describe a range of studies exploring the challenges faced by handlers rating their own dog's performance and behaviour, such as inherent biases, and how we can overcome these via training. I will then describe how measures can be adapted to measure team, and handler performance, and once we have meaningful data, how we can investigate those factors which most affect performance. I will use examples from our own work on explosives search dogs, and more recently on hypoglycaemia alert dogs.



Visit of Aigues Mortes

Royal Canin **Kennel & Cattery Tour**

Visit of a typical Mas and demonstration of handling a herd of bulls with horses.

Gala dinner - Mas St Gabriel

CONFERENCES PROGRAM

WEDNESDAY 25 MARCH 2015

▶ Field trip activities and gala dinner

TIME	GROUP 1
8:15 am	**Shuttle to Royal Canin Campus,** Royal Canin Campus
9:00 am - 11:30 am	**Royal Canin Campus visit**, Royal Canin Campus
11:30 am - 1:45 pm	**Lunch buffet,** Royal Canin Campus
1:45 pm - 2:00 pm	**Shuttles to Aigues Mortes**
2:00 pm - 5:00 pm	**Boat cruise – demonstration of bulls handling with horses,** Aigues-Mortes
5:00 pm	**Shuttles to hotels**

TIME	GROUP 2
9:15 am	**Shuttles to Aigues Mortes**
10:00 am - 12:30 pm	**Boat cruise – demonstration of bulls handling with horses,** Aigues Mortes
12:30 pm - 13:45 pm	**Lunch** - Mas de la Comptesse, Aigues Mortes
13:45 pm	**Shuttle to Royal Canin Campus,** Royal Canin Campus
2:15 pm - 5:00 pm	**Royal Canin Campus visit,** Royal Canin Campus
5:00 pm	**Shuttles to hotels**

Royal Canin is specialised in the production of high quality food for dogs and cats. We are certified ISO 9001 (quality) and 14001 (environment). You'll find hereafter important guidelines for your visit of the Campus.

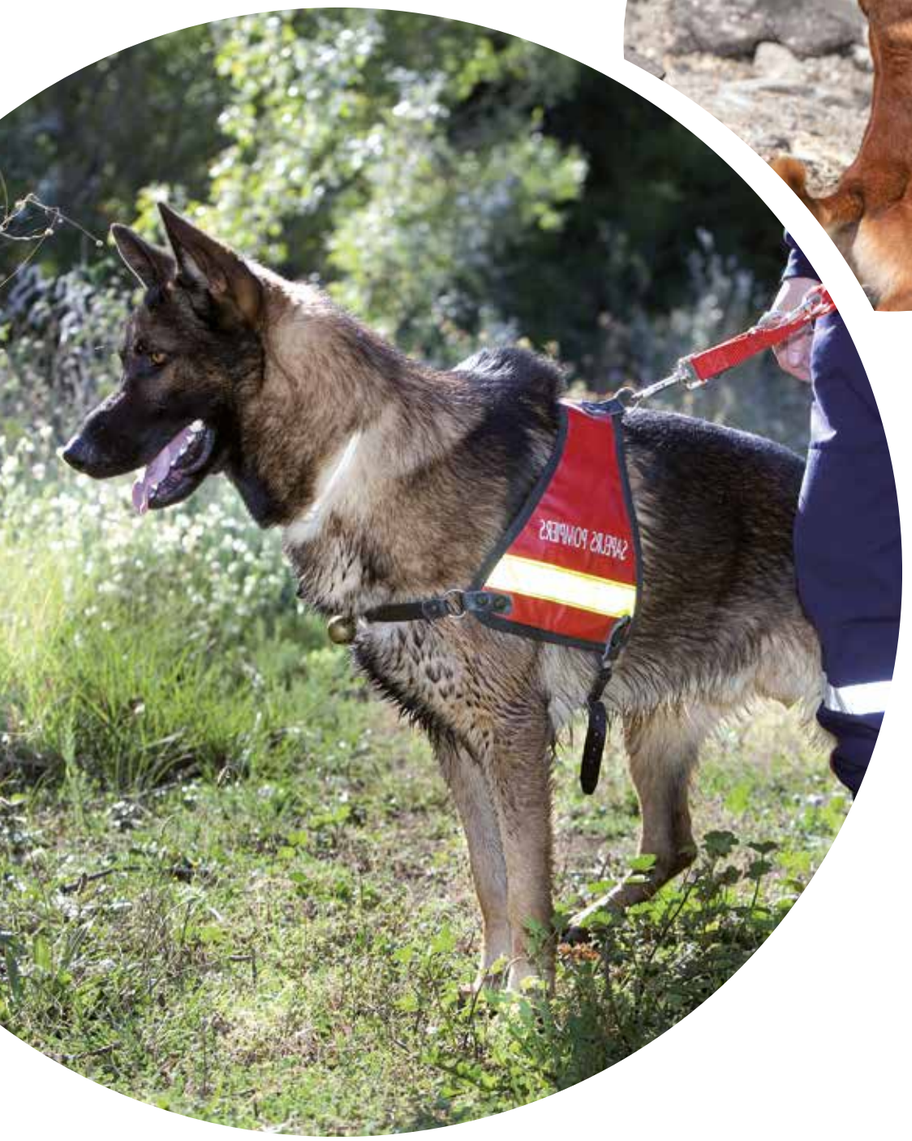
Thank you so much for your understanding.

Very important notices:

You must wear flat shoes, no skirt. If you are wearing heels you won't be allowed on the visit.

You will have to remove all jewelery and watches before the visit.

No cameras or telephones are permitted during the visit and it's forbidden to take pictures of any kind.



CONFERENCES PROGRAM

THURSDAY 26 MARCH 2015 / MORNING

▶ Maintaining physical/mental ability in hostile environments.

TIME	SPEAKER	LECTURE
8:00 am - 10:00 am		**Registration**
8:00 am - 8:40 am	**Van der Merwe** (South Africa)	**Working dogs: friend or foe ?**
8:40 am - 9:20 am	**Goldblatt** (Israel)	**Inconsistencies in olfactory training**
9:20 am - 10:00 am	**Otto** (USA)	**Effects of hydration strategies on vehicle-screening or tracking canines in hot environments**
10:00 am - 10:30 am	**Coffee Break**	**Posters exhibition**
10:30 am - 11:10 am	**Riviere** (France)	**The use of search and rescue dog in the context of flash floods: learning and consequences for training**
11:10 am - 11:50 am	**Cabano** (USA)	**Common military working dog surgical procedures and rehabilitation**
11:50 am - 12:30 am	**Mann** (USA)	**Diagnostic imaging of canine sports medicine and rehabilitation patients for program managers and practitioners**
12:30 am - 2:00 pm	**Lunch Break**	**Onsite Lunch**

CHAIRMAN

THURSDAY 26 MARCH 2015 / MORNING

Eldin LEIGHTON

Founded in 1929, The Seeing Eye, Inc. is the oldest guide dog school in the world. Since the 1940's, they have bred dogs to work as guides for blind people. In 1980, they asked Dr. Leighton to develop a breeding plan to genetically reduce the incidence of hip dysplasia, while also maintaining the ability of the dogs to be trained for work as guides. By following his plan, the organization reduced the incidence of hip dysplasia to less than 5% in young dogs over the first 10 years. Since 1995, Dr. Leighton has been fully responsible for overseeing implementation of the breeding plan, and today, he holds the endowed Jane H. Booker Chair in Canine Genetics at The Seeing Eye.

Contact: eleighton@seeingeye.org
http://www.seeingeye.org/

8:00 - 8:40 am

Working dogs: friend or foe ?

Paul VAN DER MERWE
South Africa National Defense Force

Paul van der Merwe is a Colonel, veterinarian, in the Medical Health Service for south Africa Defense Force. He is graduated from the University of Pretoria and followed a senior management program at the University Stellenboch (South Africa). Joining the army, he first was appointed as Veterinary Officer responsible for the management and delivery of veterinary services to all military animals in the former South West Africa. The service was delivered from one central veterinary clinic at Otavi with three satellite clinics at Ruacana, Rundu and Tsumkwe. Five veterinarians and 25 support personnel delivered the service to 300 horses and 50 dogs.In1988, he was tasked to plan and institutionalise a Mounted Infantry Battalion for the former Transkei Defence Force, and then to re-establish sound veterinary management practices at the former South African Defence Force Equestrian Centre where 800 horses were kept. Transferred in 1989 to the South African Medical Service HQ he was in charge to plan and institutionalise a post for a wildlife veterinarian to oversee all wildlife for the SADF. Paul was then appointed as the Deputy Director Animal Health for the SA Defence Force in November 1995 and in 1998 as the secretariat/nodal point for transformation of the SA Military Health Service. In november 2005 he was appointed as Director Animal Health and Acting Officer Commanding Military Veterinary Institute. Since 2013, Dr van de Merwe serves as Director of Animal Health and is appointed as member of the Rhino Action Fund of the SAVA. He is a vivid proponent/supporter of the "One Health" concept and the implementation of the concept through Conservation Medicine and believes that the concept is the only workable option for the health challenges of the world, but more specifically South Africa. Being involved in wildlife medicine grants him the opportunity to better understand the wildlife, animal, human environment interface and so deliver evidence based inputs as to the optimal management of diseases, especially zoonotic diseases.

Contact: milvetinst@vodamail.co.za

Working dogs are defined as a canine working animal, which learns and performs tasks to assist/entertain its human companions. Working dogs assisted their human companions with such velour that they were bestowed various accolades, ranging from bravery awards to military awards. An emerging infectious disease is an infectious disease that has newly appeared in a population or has existed but is rapidly increasing in incidence/geographic range. 75 to 80 % of all emerging diseases are of animal origin with dogs playing a major role. However, dogs are still classified as low risk animals when it comes to zoonotic diseases. The risk might, however, increase under certain disabling conditions. The most common zoonotic diseases of dogs are ringworm, worm infestations, salmonellosis, leptospirosis, lyme disease, giardiasis and rabies, surely all diseases that can be/are well managed by the animal's human counterparts BUT what about a disease such as Ebola? So what can we do as the human counterpart of our working dogs to mitigate the risk of disease transfer?

8:40 - 9:20 am

Inconsistencies in olfactory training

Allen GOLDBLATT
University of Tel Aviv

Allen Goldblatt received his Ph.D. from the department of Biology at the University of Oregon. His thesis was focused on some effects of early olfactory experience on later behavior in rodents. Since that time he has been involved in research on olfaction. Since moving to Israel in 1974 he has been doing research on olfaction and animal behavior including experiments on variables influencing explosives detection by dogs.

Contact: allen.goldblatt@gmail.com

A review of the published research on olfactory detection by dogs of cancer, explosives, and explosive surrogates reveals wildly divergent results. It is the opinion of the author that much of this variability is due to differences in training and testing. It is suggested that there be more standardization across facilities in terms of training methodologies.

9:20 -10:00 am Effects of hydration strategies on vehicle-screening or tracking canines in hot environments

Cynthia M. OTTO, Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania

Dr. Otto is a tenured associate professor at the University of Pennsylvania, School of Veterinary Medicine in Philadelphia, PA. She is board certified in Veterinary Emergency Medicine and Critical Care (DACVECC) and Sports Medicine and Rehabilitation (DACVMR-canine) has been an attending clinician in the Emergency Service for over 20 years and the director of the Penn Vet Working Dog Center since it opened in 2012. She received a Bachelor's of Animal Science and her Doctor of Veterinary Medicine from The Ohio State University and her PhD in veterinary physiology from the University of Georgia. She has published over 60 peer reviewed articles. Her research, funded by NIH, AHA, AKC-CHF and other foundations, has included studies in sepsis, inflammation, acute lung injury, trauma, and disaster medicine. She has been monitoring the health and behavior of Urban Search and Rescue canines since October of 2001, through an AKC-CHF funded grant (now in its third renewal). She has established the AKC-Reunite Detection Dog DNA bank. She has conducted funded studies of prehydration in working dogs and the use of detection dogs in ovarian cancer detection and diabetes alert. She is an internationally recognized speaker in both emergency medicine and working dog medicine. Dr. Otto has also been involved with search and rescue dogs and disaster response as a member of the Pennsylvania Urban Search and Rescue Task Force 1 between 1994 and 2010 (including deployments to Hurricane Floyd and 9/11), and the Veterinary Medical Assistance Team-2 since 1999 (deploying to Hurricane Katrina). She is the founding director of the Penn Vet Working Dog Center (www.PennVetWDC.org). She is active in educating search dog handlers and members of the working dog community in canine first aid and fitness. She was named Pennsylvania's 2002 "Veterinarian of the Year" and received an Alumni Recognition Award in 2006 and the OSU Distinguished Alumnus Award in 2008 from the Ohio State University and a top 20 finalist in AVMF's America's Favorite Veterinarian. She has been involved in dog sports (flyball, agility, and tricks), and animal assisted interactions, with her dog, Dolce.

Contact: cmotto@vet.upenn.edu
http://pennvetwdc.org/

Co-authors: Elizabeth Hare, Kathleen Kelsey, Jess Nord, Tracy Darling, Kasey Schmidt, Lesley Brunker; Penn Vet Working Dog Center, College of Veterinary Medicine, University of Pennsylvania, Philadelphia, USA

Dehydration is a major hazard for working dogs. Of several common strategies (water, oral electrolyte solutions or subcutaneous electrolyte pretreatment) to prevent dehydration, none have been tested for safety or efficacy. Seven vehicle-screening dogs and seven tracking dogs from US Border Patrol were randomly assigned to water, chicken-flavored oral electrolyte solution, or subcutaneous fluid pretreatment on each of three working days during July in Texas. Chicken-flavored water was also tested in the tracking dogs. Body weight, core temperature, blood values, and urine specific gravity were collected at the beginning, middle, and the end of each study day. Linear mixed effects models were fitted to the change in outcome. All hydration strategies were safe. The electrolyte solution was highly palatable. No significant differences in peak body temperature or weight loss could be detected in either setting. Hydration method did not have a large effect on objective parameters in these dogs.

10:30 - 11:10 am The use of search and rescue dog in the context of flash floods: learning and consequences for training

Sarah RIVIERE
Fire Department of Gard

Dr Sarah Riviere, graduated from the Veterinary School of Lyon (France) in 2000. Then she joined the Breeding and Sport Medicine Unit (UMES) in the Veterinary School of Alfort, in Paris, to develop and manage the physical rehabilitation and physiotherapy centre, the canine sports medicine consultation and some cat & dog breeding management projects. Thanks to her 25 years of personal experience in training dogs for different sporting and working activities, Sarah also conducted studies in the ethology of detection dogs, as well as holding the position of Veterinarian and Captain of the Paris Fire Department.
Sarah joined Royal Canin in 2005.
As Technical K9 Adviser for the French civilian security, Sarah trains and manages a Search and Rescue Dog Unit for a French Fire Department (Gard).

Contact: sarah.riviere@royalcanin.com
http://www.sdis30.fr/

Co-author: Sebastien Rouquette; Fire Department of Gard, France

The South of France enjoys a dry climate for the most of the year, but it can occasionally be the scene of intense rainfalls. Known as Cevenol phenomena, these storms cause major flash flooding of rivers leading to damages to properties, infrastructures and environment. Characterized by large quantities of water poured down in a very short space of time, the suddenness of these events surprises the populations and it is not uncommon that the emergency services are called in to locate victims or missing people: SAR Dogs are valuable components of the rescue teams. Illustrated with events that occurred in the Gard Department last October, this speech will present the diversity of the situations and the difficulties the dogs have to face during such events and the consequences in term of dog selection and training.

11:10 - 11:50 am Common military working dog surgical procedures and rehabilitation

Nicholas CABANO
US Army, Lackland AFB

Nicholas Cabano is a DVM, graduated from University of California Davis (USA) in 2003. He then joined the Department of Defense, Military Working Dog Center, and made a residency in small animal surgery at Colorado State University. His current position is, as Major, Chief of the surgery and rehabilitation services at the DOD Military Working Dog Service, Lackland Air Force Base, Texas.

Dr Cabano published several papers on dog surgery.

Contact: nicholas.cabano@us.af.mil

"The capability they (Military Working Dogs) bring to the fight cannot be replaced by man or machine. By all measures of performance their yield outperforms any asset we have in our inventory. Our Army (and military) would be remiss if we failed to invest more in this incredibly valuable resource." – General (Ret.) David Petraeus. Military Working Dogs (MWDs), now more than ever, play a crucial role in the war on terror. Their keen sense of smell enables them to outperform any man made device used to detect explosives on the battlefield. Their deployments over the past 13 years alongside their human handlers have led them into danger every step of the way. From procurement, through training, and after deployment these dogs require preventive and corrective surgery as well as rehabilitation in order to do their jobs. This presentation will touch on key procedures utilized at the only Role 4 military veterinary specialty facility in the world to preserve the fighting strength of the military working dog population.

11:50 - 12:30 pm

Diagnostic imaging of canine sports medicine and rehabilitation patients for program managers and practitioners

Kelly MANN
College of Veterinary Medicine, Colorado State University.

In recent years, there have been numerous advances in the scientific disciplines of canine sports medicine and rehabilitation. Working Dog Program Managers and their Veterinarians are also faced with an unprecedented number of standard and advanced imaging options along the continuum of care which includes: initial selection/ evaluation, disease or injury prevention and diagnosis, surgical and medical therapies, rehabilitation and return to duty. This presentation will use case examples of musculoskeletal injuries to highlight recent therapeutic and rehabilitation advances alongside recommended imaging techniques which support practical decision-making in the management of working dog care.

Co-author: Felix Duerr ; College of Veterinary Medicine, Colorado State University, Fort Collins, USA

In recent years, there have been numerous advances in the scientific disciplines of canine sports medicine and rehabilitation. Working Dog Program Managers and their Veterinarians are also faced with an unprecedented number of standard and advanced imaging options along the continuum of care which includes: initial selection/evaluation, disease or injury prevention and diagnosis, surgical and medical therapies, rehabilitation and return to duty. This presentation will use case examples of musculoskeletal injuries to highlight recent therapeutic and rehabilitation advances alongside recommended imaging techniques which support practical decision-making in the management of working dog care.

CONFERENCES PROGRAM

THURSDAY 26 MARCH 2015 / AFTERNOON

▶ Maintaining physical/mental ability in hostile environments.

TIME	SPEAKER	LECTURE
2:00 pm - 2:20 pm	**Mann** (USA)	**FAST ultrasound techniques – Simple skills can save lives**
2:20 pm - 2:40 pm	**Benito** (Spain)	**Prevention of heatstroke in dogs of the Battalion of Military Police Number 1 (Spain): comparison of different models of cooling vests**
2:40 pm - 3:00 pm	**Fontaine** (France)	**Updates in canine reproduction**
3:00 pm - 3:40 pm	**Henderson** (USA)	**Effect of a core conditioning program on lumbar pain, function and paraspinal muscle area in military working dogs**
3:40 pm - 4:00 pm	**Coffee Break**	**Posters Exhibition**
4:00 pm - 4:20 pm	**Pierce** (USA)	**Prevention failed: Rehabilitation of the CCL Post-op Stifle**
4:20 pm - 4:40 pm	**Hartman** (Germany)	**Effect of masking substances on the performance of explosive sniffer dogs**
4:40 pm - 5:00 pm	**Girardet** (France)	**Biochemical shifts induced by exercise and interest of high quality food supplemented in antioxidant and omega-3 fatty acid in working dogs**
5:00 pm - 5:20 pm	**Clero** (France)	**Validation for localizing drowning victims by search and rescue dogs ; experience of the Paris Fire Brigade**
5:20 pm - 5:40 pm	**Grandjean** (France)	**Closing remarks : what did we learn, where is the future for working dogs ?**
5:40 pm - 6:00 pm	**MacIsaac** (Canada)	**Closing of the conference**

CHAIRMAN

THURSDAY 26 MARCH 2015 / AFTERNOON

Alan GROSSMAN

Alan Grossman is a member of the Royal Australian Air Force, and has 35 years experience with Police and Military Working Dogs. 15 of those years as Manager of the Royal Australian Air Force Puppy and Juvenile Canine development program and Supervising the Air Force Puppy Foster Care Program. Alan now Coordinates and plans Australian Military Canine export and import protocols to and from Combat operations. He is IWDBA Board member since 2012.

Contact: alan.grossman@defence.gov.au

CONFERENCES
SPEAKERS

2:00 - 2:20 pm

FAST ultrasound techniques – Simple skills can save lives

Kelly MANN

College of Veterinary Medicine, Colorado State University

Dr. Mann received his Bachelor of Science in 1986 from Georgia College and graduated from the University of Georgia, College of Veterinary Medicine in 1990. After one year in private practice, Dr. Mann returned to the University of Georgia and completed a Master of Science in Veterinary Parasitology. He joined the US Army Veterinary Corps in 1992 and retired at the rank of Colonel in 2013. During his military career, Dr. Mann was the Director of the LTC Daniel E. Holland Military Working Dog Hospital and served in specialized training and leadership positions focused on military working dog medical care in DoD and allied programs. He is a Diplomate of the American College of Veterinary Radiology and earned a Master of Strategic Studies from the US Army War College. Dr. Mann is a member of the Order of Military Medical Merit and recipient of the Army Surgeon General's «A» Proficiency Designator, the highest recognition for professional excellence in the Army Medical Department. Currently, Dr. Mann is pursuing a PhD in advanced imaging and cancer biology at Colorado State University and serves as the Nuclear Medicine Service Chief for the Veterinary Teaching Hospital and Animal Cancer Center.

Contact: kelly.mann@colostate.edu

Co-authors: Mike Lagutchik, Greg Lisciandro ; College of Veterinary Medicine, Colorado State University, Fort Collins, USA

Access to ultrasound equipment and training in diagnostic ultrasound techniques are becoming commonplace in the practice of veterinary medicine. Portable ultrasound equipment has revolutionized the emergency medical care of humans and animals in the hospital setting and on the battlefield. This short presentation will introduce Program Managers, Working Dog Handlers and their Veterinarians to the basic principles and recent advances in Focused Assessment with Sonography in Trauma (FAST) techniques for the emergency medical care of working dog patients.

8:40 - 9:20 am

Prevention of heatstroke in dogs of the Battalion of Military Police Number 1 (Spain): comparison of different models of cooling vests

Milagros BENITO

Facultad de veterinaria, Universidad CEU Cardenal Herrera

Milagros Benito Hernadez is a Professor at the Veterinary College of the University Cardinal Herrera in Valencia (Spain), where she develops canine sport medicine. She graduated as a DVM from University of Extremadura (Spain) in 1995 and gother PhD in 1999. She currently is director of medical service « sport medicine » at Valencia CEU University, and Head of the cardiology department. At the present, the functions of the SPORTS CANINE MEDICINE SERVICE at the University CEU Cardenal Herrera include: Training of students of the Faculty of Veterinary Medicine, University CEU Cardenal Herrera Collaboration and participation of canine sporting events with veterinary students at the University. Technical advice veterinarian specializing in sports medicine canine (1.Anthropometry and body composition assessment; 2.-Assessment of health and fitness degree for each practice; 3.-Prevention of musculoskeletal injuries; 4.-Training programs). Field test for assessment of athletic performance Advice undergoing rehabilitation Prescribing exercise in dogs with chronic diseases risk factors, injured and in special situations.

Contact: mbenito@uch.ceu.es
www.uchceu.es

Co-authors: Delphine Cléro, Diego Lozano, Dominique Grandjean ; Facultad de veterinaria, Universidad CEU Cardenal Herrera, Valencia, Spain

Main objective:
The main objective of this research was thermoregulation of the dogs capacities, recognize those dogs with special susceptibility to heat stress, and compare the utility of different cooling vests.

Methodology:
We carried out in thirteen dogs coming from the section Cinological of the Military Police Battalion No. 1, a test of basic effort in four consecutive days at an average speed of 10 km/h, 20 minutes with determination of systemic blood pressure and rectal temperature at different times pre and post race. IBM SPSS Statistics 20 software was used for the statistical study.

Main results:

- Since the beginning of the effort test, there was a heterogeneous response in systemic blood pressure and rectal temperature values.
- In three dogs, the recorded highest internal temperature was 43 degrees. This temperature exceeds the limit of hyperthermia and indicates a high risk of heat stroke.
- Between the different kits in study, cooling vest for dogs which uses natural evaporation the cooling is significantly more useful.

Main conclusion:

Training, the learning effect, stress control and the use of an optimal refrigerant kit, are the fundamental tools to achieve a better adaptation to high temperatures, especially in those sensitive dogs to the heat stress.

2:40 -3:00 pm Updates in canine reproduction

Emmanuel FONTAINE
Royal Canin Canada

Emmanuel Fontaine graduated from the Toulouse Veterinary School in 2004, and continued his studies at the Alfort Veterinary School (Paris) as trainee Vet in the domestic carnivore unit of the Reproduction Department. From 2005 to 2011, he worked at the Centre d'Etude en Reproduction des Carnivores (CERCA) [Research Centre for Reproduction in Carnivores], a unit specializing in pet breeding assistance. Emmanuel Fontaine is also qualified at the European College for Animal Reproduction (ECAR) and recently completed his PhD. He joined Royal Canin Canada 's PRO team in September 2011.

Contact: emmanuel.fontaine@royalcanin.com
http://www.royalcanin.ca/

Small animal reproduction is an area of speciality in veterinary medicine which has obviously lots of direct applications for working dogs organizations running genetic selection programs. It is also a very dynamic field in terms of clinical research. With their unique ability to both stimulate and shut down the pituitary secretions that govern the reproductive cycle, GnRH agonist implants now offer alternative in terms of chemical sterilization, as well as estrus induction. Ovarian/uterine ultrasounds help assess the health of the genital tract, as well as increase the precision when it comes to timing of ovulation. Ultrasound-guided aspiration techniques also provide options worth considering when it comes to ovarian cysts treatment. The development of genital endoscopy has also completely changed the way we approach many reproductive disorders. If it is now widely used for intra-uterine inseminations, it is also a great tool for diagnostic and even therapeutic purposes when it comes to vaginal and uterine diseases in the bitch. Today, those techniques can help working dogs breeding centers to face the fertility challenges they may encounter in their everyday activities.

3:00 - 3:40 pm Effect of a core conditioning program on lumbar pain, function and paraspinal muscle area in military working dogs

HENDERSON AL
Department of Defense Military Working Dog Center, US Army

Dr. Andrea Henderson grew up in Virginia, and graduated with distinction with a Bachelor of Arts in Biology at the University of Virginia in 2000. Dr. Henderson was accepted into veterinary school and received her Doctorate of Veterinary Medicine from the Virginia-Maryland Regional College of Veterinary Medicine in 2005. She participated in a Summer Fellowship Program in 2002 in which she conducted a research project involving working dog and handler interactions. Her passion for working dogs led her to join the U.S. Army Veterinary Corps in 2003, swearing in to active duty in May 2005. She has been an active duty officer for 9.5 years and currently holds the rank of Major. Her first assignment was an internship at the Department of Defense Military Working Dog Veterinary Services in San Antonio, Texas. She has since held leadership positions overseeing the Mine Detector Dog program at Fort Leonard Wood, Missouri and the Kaiserslautern Branch Veterinary Services in Germany. In July 2011, Dr. Henderson began a residency in canine sports medicine and rehabilitation at the University of Tennessee in Knoxville, and has completed all requirements of her residency in good standing. She also received a Masters of Science with a focus in Kinesiology from the University of Tennessee Graduate School in December 2014. In August 2014, she returned to the DoD Military Working Dog Center in San Antonio to oversee and expand the sports medicine and conditioning programs for the military working dogs. MAJ Henderson has specific interests in therapeutic laser applications in healing and nerve regeneration, canine exercise physiology and injury prevention, and conservative management of degenerative lumbosacral stenosis in Military Working Dogs. When MAJ Henderson is away from her working dogs, she enjoys kayaking, hiking with her two Cocker Spaniels, and playing the flute and piano.

Contact: andrea.henderson.2@us.af.mil

Co-authors: Millis DL, Hecht S, Drum MS ; Department of Defense Military Working Dog Center, US Army, Lackland, USA

This study investigated whether Military Working Dogs with mild lumbosacral pain have decreased lumbar paraspinal muscle area, symmetry, and density, as well as increased pain and dysfunction compared to control dogs. Additionally, response of pain and dysfunction to an exercise program was assessed. Visual Analog Scale (VAS) scores for lumbosacral pain, functional questionnaire scores for search and detection tasks, and mean cross-sectional area (CSA)-to-vertebral ratio, asymmetry and density were determined for five lumbar paraspinal muscles in 8 working dogs with and 8 dogs without lumbosacral pain. Subsequently, four dogs with lumbosacral pain rested and four dogs completed an eight-week core stabilizing exercise program, then all initially evaluated parameters were repeated. Military Working Dogs with mild lumbosacral pain and dysfunction had significantly smaller area, symmetry and density for the lumbar multifidus muscle. An 8-week core strengthening program was associated with significantly improved multifidus area and working dog performance at evaluated tasks.

4:00 - 4:20 pm Prevention failed: Rehabilitation of the CCL Post-op Stifle

Bess J. PIERCE, Medicine and Rehabilitation, Center for Public and Corporate Veterinary Medicine, VA-MD College of Veterinary Medicine.

Dr. Bess J. Pierce is an Associate Professor in the Center for Public and Corporate Veterinary Medicine (CPCVM) at the Virginia-Maryland College of Veterinary Medicine (VMCVM). Dr. Pierce joined the faculty initially in 2007 to develop and lead the Community Practice service in the Veterinary Teaching Hospital, leaving active duty service in the United States Army. Since November 2011, she has also served as Director, Center for Animal Human Relationships (CENTAUR) at the VMCVM. Dr. Pierce earned a B.S. in biology from Tulane University in 1986, an M.Z.S. in wildlife biology in 1990 and a DVM from Auburn University in 1992. Serving more than 22 years on active and reserve duty in the US Army Veterinary Corps, Dr. Pierce has been stationed in a variety of assignments including California, two tours in Japan and several years at the Military Working Dog Center in San Antonio, Texas. She is currently a colonel in the US Army Reserve, assigned to the Public Health Command Region-Europe. Dr. Pierce is board certified by the American College.

In the ideal world of veterinary medicine, we would be able to largely prevent CCL disease and the debilitating consequences of CCL rupture. Unfortunately, a majority of our canine patients will still require surgical intervention for stifle disease. Post-operative physical therapy in human patients has long been the standard of care, resulting in improved function and faster return to athletic function. But the question still remains for veterinarians: how do we best rehabilitate the canine stifle following surgery for CCL disease?

Older studies showed that outcomes were similar between post op dogs undergoing rehabilitation with a therapist and those undergoing a post op home exercise program (walking). More recent work indicates that rehabilitation of the post op CCL patient improves range of motion, reduces muscle spasms and improves weight bearing and overall joint function. Additionally, remember that approximately 50% of canine patients will experience rupture of the contralateral CCL at an average interval of 58 weeks from the first incident. Perhaps the strongest argument for professional rehabilitation is to address not only the post-op stifle but also the remaining stifle with the goal of decreasing the likelihood of a second procedure.

The general goals of CCL rehabilitation post operatively are as follows:

1 • Control post-op inflammation and pain that contribute to maladaptive movement patterns. Rehab modalities may include cryotherapy, neuromuscular electrostimulation (NMES), transcutaneous electrical nerve stimulation (TENS), acupuncture, therapeutic ultrasound and laser, and manual tissue therapy. Pharmaceutical interventions include NSAIDS, analgesics and nutraceuticals.

2 • Promote range of motion and joint healing with passive and active range of motion exercises. Examples include post op PROM, ground and underwater treadmill walking, soft surface and cavaletti walking, and targeted exercises.

3 • Increase muscular strength, normalize gait patterns and promote proprioception with targeted exercises such as sit-to-stand and balance work on pads, balls and soft surfaces.

4:20 - 4:40 pm

Effect of masking substances on the performance of explosive sniffer dogs

Susanne HARTMANN
Schule für Diensthundewesen der Bundeswehr

Major Dr. Susanne Hartmann is a Veterinarian graduated in 1995 from the Veterinary School of Hannover (Germany). She works as a veterinarian in the german army and is currently (since 2008) Chief of the veterinarian clinic for military working dogs in Ulmen.

Contact: susanne3hartmann@bundeswehr.org

Military Working Dogs contribute significantly to C-IED efforts. Explosive detection dogs can provide capabilitiy against IEDs and explosive ordnance devices, commercial, military and homemade explosives and weapons. In the past masking substances have been placed close to explosive devices in order to disturb the work of explosive detection dogs. The aim of the study **« Effect of masking substances on the performance of explosive detection dogs »** was to research the effect of masking substances on the exploration capacity of explosive detection dogs. The study was conducted as a double-blind study with standardized test conditions. TNT was placed inside specially designed smell boxes, petroleum and n-decan in two different concentrations were used as masking substances. In the study the olfactory sensitivity of the trained dogs was not affected by the masking substances.

5:20 -5:40 pm

Biochemical shifts induced by exercise and interest of high quality food supplemented in antioxidant and omega-3 fatty acid in working dogs

Caroline GIRARDET
French Army - Military Veterinary Dept.

1. Veterinary Department of the French Army Health Service, Antenne vétérinaire de Châlons-en-Champagne, Site de Suippes, Suippes, France
2. Research and development, Royal Canin, Aimargues, France

Caroline GIRARDET is a veterinary lieutenant colonel of the French Army Health Service. She was awarded his veterinary medical doctor (DVM) in 1996 at Toulouse national School of Veterinary Medicine. She was a private practitioner from 1994 to 1999. She joined the French Army Health Service in 1999 and served in different units:

• Military Health Service practical School in 1999.

• Military veterinary departments :
- Bordeaux, 2000 to 2002
- Palaiseau, 2002 to 2004
- Paris, Régiment de cavalerie, Garde Républicaine, 2004 to 2006
- Paris, Ecole militaire, 2004 to 2010

• Veterinary advisor for French Armed Forces in South Area of Indian Ocean, 2010 to 2012.

• Military veterinary department :
- Suippes, located at the 132th Cynophilic Bataillon of Infantry, since 2012.

She obtained the certificate of Internal Medicine (CEAV) in 2006. She is the national referent in canine medicine for the defence ministry and a member of the working group on "animal health and care" for the French army health service. Dr Girardet is also responsible for the support of the defense ministry for medical research against human cancer with use of trained detection dogs.

Contact: carogirardet@hotmail.com

Co-authors: Magnan S1, Andréo V1, Trombini G1, Dubois S2, Boehringer CA2, Grellet A2.

1. Veterinary Department of the French Army Health Service, Antenne vétérinaire de Châlons-en-Champagne, Site de Suippes, Suippes, France
2. Research and development, Royal Canin, Aimargues, France

Introduction
Numerous studies and clinical investigations have been conducted on the nutrients requirements of working dogs. The omega-3 fatty acids, most notably EPA and DHA, have been found to have important health benefits, including reduction and prevention of the inflammatory response. To date no study has evaluated the effect of these omega-3 fatty acids on systemic inflammation associated with exercise in utility dogs. The first aim of this study was to assess the benefit effects of high quality food (Royal Canin® TRAIL 4300) associated with a regular training on health of working dogs living in hard environmental conditions. The second purpose was to determine the biochemicals shifts with blood markers of systemic inflammation and oxidative stress induced by a moderate-intensity short-duration activity and the effect of EPA/DHA.

Materials and methods
Forty military working dogs (39 males, 1 female, mean age = 4 years [1-8]) were included in this double-blind study. Dogs were divided in two homogeneous groups: after one week of food transition, one group fed during two months exclusively with Royal Canin® TRAIL 4300 and the second group fed with the same diet except the 0.4% of EPA/DHA. These dogs were subjected to regular training during the eight weeks, at the end of this period, a standardized effort, bikejoring during thirty minutes at a speed of 16 kilometers per hour was performed. The following parameters were studied: body weight, body condition score (from 1=very thin to 9=obese), fecal score (from 1=liquid to 5=hard and dry feces), body temperature and markers of systemic inflammation (C reactive protein), muscular activity (creatine kinase) and oxidative stress (glutathione peroxidase). Stools and blood samples were obtained at the beginning of the study, just before bikejoring and immediately after. Temperature was recorded before and after exercise (immediately after, thirty minutes and one hour post exercise). The others parameters (body weight, body condition and fecal scores) were measured before and after food transition and every two weeks during the study. External temperature was recorded during the two months. Dog behavior during training and exercise was registered by handler's evaluation. Mean values and range of the different parameters will be presented.

Results
Out of forty dogs, thirty nine finished the study because one of them was sent on mission. Body condition score significantly increased between the beginning and the end of the study (4.1 [1-7] vs 5.4 [2-

8] respectively, p<0.001). Fecal score was significantly higher in the two groups of dogs at the end of the study compare to the beginning of the study (3,2 [2-4] vs 3,7 [3-4]; p<0,001). C reactive protein, creatine kinase and glutathione peroxidase concentrations were significantly higher after exercise than just before (C reactive protein: 5.3 mg/L [2-12] vs 6.1 mg/L [5-12], p=0.005; creatine kinase 212.1 UI/L [103-378] vs 252.4 UI/L [115-405], p<0.001 ; glutathione peroxidase: 425.3 U/g [310-603] vs 478.6 U/g [335-645], p<0.001). Fecal score was not significantly different after effort compare to before effort (3.67 [2.5-4.5] vs 3.66 [2.5-4.5] respectively; p=0.225). For all the military dog handlers, dog motivation to work was improved with Royal Canin® 4300 TRAIL with better performance and endurance.

Conclusion

Our study demonstrates that a moderate-intensity, short-duration activity performed by healthy army dogs causes significant increases of inflammatory and oxidative stress markers but within the established normal reference ranges. This low increase of these markers could be explained by an exercise too short to induce an important inflammation or by presence in both diets of specific nutrients with an antioxidative effect (vitamine E, lutein, betacaroten). These nutrients present in both diets could also explain the lake of differences observed between dogs fed with or without EPA DHA. No effect of exercise on feces quality was observed. This can be explained by the diet given to these dogs (Royal Canin® TRAIL 4300). Indeed this diet contain several components (prebiotics (mannan-oligoasaccharides), sugar beet pulp, psyllium, vitamin E, C, A and lutein) which help to protect the digestive mucosa, to reduce intestinal and systemic inflammation and oxidative stress. This study shows that feeding a high quality dietary supplemented in antioxidants and omega-3 fatty acids helps in preventing digestive problem. Nutrition and physical training association helps to maintain working dogs health and so improves stamina and performance.

5:00 - 5:20 pm Validation for localizing drowning victims by search and rescue dogs ; experience of the Paris Fire Brigade

Delphine CLERO
National Veterinary School of Alfort, UMES

Delphine CLERO is aDVM, MSc, assistant professor in the K9 Breeding and Sport Medicine Unit at Alfort National School of Veterinary Medicine (Paris East University), also Captain in the Paris Fire Brigade. Since 2008 she works on sporting and working dogs medicine, which has quickly become her passion. She has been working as head-veterinarian on a sled dog race, "La Grande Odyssee" from 2012 to 2014, and will be in the vet team of the Femundlopet and chief veterinarian for the Lekkarod in 2015. She actually finishes a PhD in working dogs nutrition management. With Dominique Grandjean, she works on the relation between stamina, oxidative stress, inflammation and performance. As fire brigade veterinarian, she has specialized in search and rescue dogs, is graduated in disaster veterinary medecine, and is Technical Cynotechnic Advisor. With her colleges, they try to improve the efficiency of search and rescue teams by the prevention of stamina related pathologies.

Contact: dclero@vet-alfort.fr
www.vet-alfort.fr

Co-authors: Margaux COSTE, Laurent SIINO, Sebastien VILLERS, Dominique GRANDJEAN ; Brigade de Sapeurs-Pompiers de Paris, France

Accidental drowning represents 7% of death by "trauma" in the world, and in France an average of 500 cases is reported each year. In drowning cases, it is sometimes difficult to find the victim's body because it can be moved by current or immobilized and hidden to divers at the bottom of the water. Very often, divers and sonar uses are not sufficient enough to find the victim, specifically when the searching zone is wide. The drowned people search dogs are utilized in several countries in order to help the research and make it easier and faster. Up to now, France has been very "shy" in the development of such canine technics, But the Paris Fire Brigade did set up a long term protocole in order to validate the concept and make it operational, as a fast action tool in support of diving teams. The presented studies, developed within the Paris Fire Brigade K9 search and rescue and the divers units, kept all testing conditions as close as possible to reality. A diver with a closed circuit rebreather system always plays the role of the victim. Dogs are tested in several conditions: with or without current, static or moving diver, search from a boat or from the shore,... In all exercises, results show that dogs are capable of detecting the diver's presence. Dogs' marking provides to divers a more limited research area where the victim could be, and help gaining time and efforts. Since these studies were made, between 2012 and 2014, search and rescue dogs have been officially introduced in the drowned bodies search organization for BSPP (Paris Fire Brigade). New studies are still to come in 2015 and 2016.

5:20 - 5:40 pm Closing remarks : what did we learn, where is the future for working dogs ? by Dominique Grandjean

5:40 - 6:00 pm Closing of the conference by Patrick Macisaac

POSTER
PROGRAM

AUTHOR	COUNTRY	POSTER
Aalders		Influences on behavioural responses of sheep to working dogs in the herding environment
Soares Brioschi		Reorganization and evolution of military working dogs activities in Brazilian army
Salmelin		A different view for water rescue dogs
Clero		Effects of dehydrated yeast supplementation on army dogs muscle lesions induced by exercise: a pilot study
Trombini		Canine post-traumatic stress disorder : what about french military working dogs ?
D'Aniello		Gazing towards humans: a comparison between water rescue and pet dogs in the impossible task paradigm
Scandurra		From training to working: a study of guide dogs in the impossible task paradigm
Broach		Salivary cortisol in military working dogs
Cole		Increasing litter sizes by using genetic tools to maximize breed diversity and decrease individual homozygosity
Freund		Assesment of a novel digital and smartphone goniometers for joint angle measurement of the canine stiffle
Martin		Canine stride length assesment using inertial measurement units during outdoor and treadmill activity
Wendland		Evolution of gait patterns in dogs: the Pace
Roth, Jensen		Hair cortisol in german shepherd dogs
Zapata		Management of the working dogs of the Ministry of National Security, Republic of Argentina
Holl		Concepts of New Sampling Techniques for Canine Olfaction

Influences on behavioural responses of sheep to working dogs in the herding environment

Jessica AALDERS, Sidney University

Jessica Aalders graduated from Sydney University in December 2014 with a Bachelor of Animal and Veterinary Bioscience. She completed her honours project in the final year of this degree and achieved a first class honours grade. She gained great experience working with animals, both interstate and overseas. Jessica has a strong passion and affinity for canines in particular and wish to pursue a career in this field. Her research on working dogs and their interactions with sheep in a herding environment will be published online in February 2015.

jaal7395@uni.sydney.edu.au

The primary objective of this work was to investigate links between the frequency of defense behaviours (foot stamping and escape) and the posture and skill level (indicated by trial score) of working dogs. This will facilitate breeders in selecting dogs of an ideal temperament and herding ability and ultimately improve current herding practice. Behavioural coding (sheep and dogs) was undertaken using video recordings of West Wyalong yard championships across two competition levels: open and improver. Statistical analysis revealed trial score and competition level to have a significant influence on the frequency of sheep behaviours (escape, foot stamping, splitting, start/stop) ($P<0.01$). In particular, dog stalking and crouching behaviour was correlated with escape , with higher scoring dogs triggering fewer escape attempts throughout the trial ($P=0.024$). Foot stamping in sheep was also positively correlated with escape (1.0), which may be useful as a potential predictor of flight responses.

Reorganization and evolution of military working dogs activities in Brazilian army

Otavio Augusto SOARES BRIOSCHI, Brazilian Army Canine reproduction center

Otavio Augusto Brioschi Soares is a Doctor in veterinary medicine and PhD in animal physiology at São Paulo State University. He acts as a Captain of the Brazilian Army and head of the War Dogs Section and Canine Reproduction Centre, located on the 2nd Battalion of Army Police, in São Paulo city. He dedicated his career to the study of military veterinary medicine and military working dogs for several years and published the book Medicina Veterinária Militar: biossegurança e defesa (Military Veterinary Medicine: biosecurity and defense) and nowadays edits the websites Medicina Veterinária Militar (Military Veterinary Medicine) and Cinotecnia Militar (Military Cinology). He is a member of the organization committee of Brazilian Congress of Military Veterinary Medicine, which in 2015 will achieve its 15th edition.

capvetaugusto@gmail.com
https://medicinaveterinariamilitar.wordpress.com/

Co-authors: Nivea de Mattos Goes Vieira, Edivaldo Santos Ferreira, Marcelo Rodrigues dos Santos, Carlos Henrique Wegner ; Brazilian Army Canine reproduction center, Brasil

The Brazilian Army (BA) MWD utilization had intermittent complexity over its decades of existence. After the 2nd World War, the use of MWD started in mainly in elite units. In the 1960s-70s, promoted by the Army School of Veterinary, the MWD education, breeding and utilization were regulated. During the decline of BA Veterinary Service (VS) (1970s-80s), MWD activities suffered heavy losses, such as the deregulation of its educational program. After the start of the reorganization of VS (1990s), the MWD activity began to be restructured. Augmentation in MWD units and animals, and the creation of Army Canine Reproduction Centers were landmarks, such as the operational integration among units in the major sporting events hosted recently in Brazil. Some points are still to be improved: the creation of a national MWD program with education and certification standards, the continuous experience exchange, and improved integration between MWD and defense and security activities.

A different view for water rescue dogs

Bettina SALMELIN, Watercubs

Since starting with Newfoundlands in 2003 and breeding them since 2005, Bettina Salmelin successfully competed in 14 countries in conformation, water rescue, obedience, rally obedience and draft work. She has also trained helicopter and sinking car water rescues with her dogs. She instructed at 18 international water rescue dog camps in Finland, Estonia, New Zealand and USA and judged obedience tests in the UK. She is also a rally obedience and CGC judge, and was an active member of the Finnish Newfoundland Club's health committee between 2008-2013. In 2011 she completed the Belgian Lifesaving Federation K-9 lifeguard team certification with her two Newfoundlands and became the first ILS recognised K9 lifeguard team instructor in autumn 2012. She was a co-creator of the International Lifesaving Federation's (ILS) International K9-lifeguard regulations during spring 2012. Her dogs and herself have been filmed for TV, had features in newspapers and I have actively written articles in Finnish and English in dog magazines since 2005, contributed to writing 5 books, as well as co-written 4 books; of which three specifically focusing on training dogs for water rescue work. Most recently Bettina has been working with her Newfoundlands in the UK whilst pursuing veterinary studies at the R(D)SVS, Edinburgh.

bettinasalmelin@hotmail.com
www.watercubs.com

Using dogs for water rescue is an emerging field all around the world. It is still currently in the expansion phase with most frequently recognition sought locally from working together with lifeguards and fire and rescue services. A collaboration between an international team of K9 water rescue experts and the International Lifesaving Federation (ILS) has resulted in the formation of a set of minimum standards all water rescue dogs must achieve before being classed as "ready for work" in ILS member states. This should improve homogeneity and reliability within the water rescue dogs.

Effects of dehydrated yeast supplementation on army dogs muscle lesions induced by exercise: a pilot study

Delphine CLERO, ENVA, UMES

Delphine CLERO is aDVM, MSc, assistant professor in the K9 Breeding and Sport Medicine Unit at Alfort National School of Veterinary Medicine (Paris East University), also Captain in the Paris Fire Brigade. Since 2008 she works on sporting and working dogs medicine, which has quickly become her passion. She has been working as head-veterinarian on a sled dog race, "La Grande Odyssee" from 2012 to 2014, and will be in the vet team of the Femundlopet and chief veterinarian for the Lekkarod in 2015. She actually finishes a PhD in working dogs nutrition management. With Dominique Grandjean, she works on the relation between stamina, oxidative stress, inflammation and performance. As fire brigade veterinarian, she has specialized in search and rescue dogs, is graduated in disaster veterinary medecine, and is Technical Cynotechnic Advisor. With her colleges, they try to improve the efficiency of search and rescue teams by the prevention of stamina related pathologies.

dclero@vet-alfort.fr
www.vet-alfort.fr

Co-authors: T.Lamour, D.Grandjean ; Unité de médecine de l'élevage et du sport-Ecole Nationale Vétérinaire d'Alfort, et Service de Santé des Armées-Antenne vétérinaire 132ème BCAT, France

During exercise, muscle work induces inflammation and oxidative stress, added to a mechanical stress that leads to muscle cells damages. Prevention of muscle microinjuries during work is essential to limit the incidence of musculo-squelettal pathologies, which increase the recovery time, and reduce the ability of working dogs to perform their task at best. To limit the injuries, the nutritionnal balance between proteins and energy in the diet is essential, and the add of anti-oxidants, and ω3 fatty acids has proven its efficiency. In human sport medecine, an increasing interest regarding branched-chain amino-acids (BCAA) exists. The goal of this pilot study was to evaluate the interest of providing a daily supplementation of yeast in order to reduce muscle damages during exercise, and to increase the physiological tolerance to exercise. Twelve Belgium Shepherd aged 2 and 5 years old, in an athletic body condition (BCS= 4 to 5 on a 9 points scale) were included in the present study. They were daily trained by their handlers taking into account operationnal missions goals. The food used herein was the usual diet of the french army at that time (Profine® adult). Dogs were divided in two groups (randomisation table) to allow a cross-over study. The two group supplementation protocol is presented in table 1. The supplementation consist in dehydrated Saccharomyces yeast supplementation in a liquid form; 0,5mL/ kgPV/day of dehydrated yeast (Biodox JEFO®) mixed with the meal one time per day was given. The exercise protocol consists in three « send away » and « back » at maximal speed, followed by a 20 minutes run at 14 km/hour (with the dog running near the bike), followed by three « send away » and « back » at maximal speed. Physiological parameters (temperature, respiratory rate, heart rate) were recorded 5 minutes before the exercise (T0) , immediatly after the exercise (T1), and 20 minutes after the exercise (T2). Blood samples were performed at T0 and T2 to measure urea, glycemia, lactatemia, creatine kinase, on dry tubes and a full blood cell counts on EDTA tube. Statistical analysis were performed using parametric tests. All statistical tests were performed at the $p<0,05$ level of significance. No significant differences were observed on heart rate and respiratory rate, with a significant increase with time in both parameters. The increase in core body temperature (figure 3) was smaller in the supplemented group, with an average body temperature of 40°C in S (vs. 40,4°C in NS). Both groups were back to basic values at T2. Biochemistry revealed an increased production of lactates in both group between T0 and T1 (figure 4), but the production is higher in NS group at T1 compare to S group (S: 3,7mmol/L vs. NS: 5,4mmol/L). Creatine kinase (figure 5) were higher at T1 compare to T0 in NS group, but not in the S group. At T1, creatine kinase were higher in NS compare to S group (S: 141,3 UI/L vs. NS: 208,6 UI/L). No significant differences exist in urea, glycemia, total proteins evolution between S and NS groups, with no evolution of those parameters during the exercise protocol. No significant differences exist in haematocrit, red blood cells count, haemoglobin concentration, white blood cells count at T1 or T2. Time has no effect on blood formula in this trial. Saccharomyces yeasts contain a high amount of fructo-oligosaccahrides (FOS), essential amino-acids (lysine, threonine, and leucine), B-complex vitamins (B3), minerals (iron, selenium), and RNA (1). According to bibliography, no test regarding dry yeasts supplementation effect on working dogs have been done in the past. Results on body temperature regulation improvement, and decreased lactates production during exercise suggest an impact on the exercise metabolism. The high contain in B-group vitamins may be in relation with this (2), even if further study are required to understand precise mechanisms. The decreased muscle lesions observed after exercise in the supplemented group suggest an impact of essential amino-acids provided by dehydrated yeast on muscle anabolism, or a decreased muscle catabolism during exercise related to a better energetic yield. Those preliminary results suggest that dehydrated yeast are an interessant source of nutrients in the working dog, and require further investigations to fully understand the process. Moreover, this test was not performed on dogs fed with a premium quality daily diet, and the impact of yeast supplementation on such dogs fed a high quality specialised complete diet remains unknown.

Canine post-traumatic stress disorder : what about french military working dogs ?

Gregory TROMBINI
Antenne Vétérinaire 132ème BCAT, Suippes, et Vetagrosup

Dr. TROMBINI received his DMV in 2008 from the National Veterinary School of Lyon, France. He is graduated in veterinary public health (CEAV-SPV) from the National School of Veterinary Services, in internal medicine (CEAV-MIAC) from the National Veterinary School of Alfort and in epidemiological and clinical research (Master) from the University Claude-Bernard of Lyon 1. Officer coming from the french defense health service school of Bron and of the School of Val-de-Grace, he works for the french army in an exclusive canine clinic since 2009 with military working dog at the 132ème BCAT (Suippes, France). He has especially worked on visceral surgery, teeth prostheses, internal medicine, sport medicine and behavioral disorders. He is an assistant for the Head Veterinarian of the Suippes veterinary antena.

gregory.trombini@intradef.gouv.fr

Co-authors: MichelA., Fontaine E., Andreo V., Magnan S., Girardet C., Ginesta J., Escriou C; Antenne Vétérinaire 132ème BCAT, Suippes, et Vetagrosup Lyon, France

According to the National Institute of Mental Health, post-traumatic stress disorder (PTSD) is defined as "an anxiety disorder that can develop after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Traumatic events that may trigger PTSD include violent personal assaults, natural or human-caused disasters, accidents, or military combat." PTSD is well known in soldiers and accurately detected and treated but still unrecognized in dogs. Although, it has been estimated that about 5% of the 650 million military dogs being used today suffer from PTSD. But to the author knowledge no prospective or retrospective studies have been performed to evaluate its real incidence and clinical presentation in French military working dogs (MWD). Only sparse clinical cases have been described in American dogs came back from Afghanistan. Some MWD, returning from country where French forces are involved, have shown behavioral troubles. A retrospective study on 84 dogs returning from operation around the world has been conduced on French MWD in order to describe the behavioral and clinical signs, evolution and prognosis of canine PSTD. The dog handler was asked to describe all behavioral changes observed in his dog. Behavioral disorders consistent with PTSD have been identified in 8 dogs. The signs could be observed during (n=3) or after the return (n=5). Behavioral disorders have been reported for a long time for all cases (26 month in average). The main behavioral signs reported are noise fearfulness or avoidance to working exercises, lack of motivation and hyper attachment to the dog handler, increased anxiety, sleep disorders. In some cases traumatic events are induced by the French forces themselves (artillery firing near the dog's kennel for example). Operational prognosis seems to be poor as few dogs improved and two affected dogs have been discharged from active military working. This first study highlights that behavioral disorders consistent with Canine PTSD can occur in French MWD. Further prospective studies are mandatory to better describe this disease and propose appropriate measures for early detection and treatment of canine PTSD. Moreover identification of PTSD in a military dog could be an early indicator of possible PTSD in associated soldiers.

Gazing towards humans: a comparison between water rescue and pet dogs in the impossible task paradigm

Biagio D'ANIELLO, University of Naples Fererico II

Biagio D'Aniello graduated in «Natural Sciences» at the University of Naples in 1990. In 1994 he received his Ph.D. in Evolutionary Biology. Right after he got a Postdoctoral fellow and during that time a teaching assistant position in zoology. From 2000 to 2008 he was assistant professor at the University of Naples «Federico II» and since 2008 he is an associate Professor of zoology at the same University. During all the above period, teaching duties has mainly covered general and applied zoology as well as some general biology. His research topics are mainly related to the field of brain evolution, with emphasis in the evolution of neuropeptide systems, the biodiversity of butterflies and, recently, the ethology aspects of the dog cognitive processes.

biagio.daniello@unina.it
Publications in: http://scholar.google.it/citations?user=rLESWcwAAAAJ&hl=it

Co-authors: Anna Scandurra, Paola Valsecchi, Emanuela Prato-Previde ; University of Naples Fererico II, Naples, Italy

The current study investigates how and to what extent training affects the behaviour of dogs and the communication of dogs with humans by comparing dogs trained for a water rescue service and untrained pet dogs in the impossible task paradigm. Twenty-three certified water rescue dogs and 17 dogs with no training experience were tested. In three «solvable» tasks the dogs could retrieve food from a container, whereas in an «unsolvable» task, the container was hermetically sealed. Water rescue dogs directed their first gaze significantly more often towards the owner and spent more time gazing toward people. There was no difference between the dogs of the two groups as far as in the amount of time spent gazing at the owner or the stranger; neither in the interaction with the apparatus attempting to obtain food. The specific training regime could account for the longer gazing behaviour shown toward people.

From training to working: a study of guide dogs in the impossible task paradigm

Anna SCANDURRA, University of Naples Fererico II

Dr Anna Scandurra graduated from University Federico II of Naples, Italy, with a Master degree in Biology focussed on « Human-dog relationship in water rescue dogs ». She now runs a PhD at the University of Naples-Caserta under the supervision of Professors Pinelli and D'Aniello. She already published several papers on water rescue dogs and on her other field of interest : Lepidopteras.

annascan@hotmail.it

Co-authors: Emanuela Prato-Previde, Paola Valsecchi, Massimo Aria, Biagio D'Aniello ; University of Naples Fererico II, Naples, Italy

We studied behavioral differences between guide dogs at the end of training and those living with a blind person and assess whether they show gazing preferences for their reference figure over a stranger in the unsolvable task paradigm. Fifty-two Labrador retrievers were tested: 13 Trained guide and 11 Working guide dogs; 14 Young and 14 Old Untrained dogs as a double age control. In three «solvable» tasks the dogs could retrieve food from a container, whereas in an «unsolvable» task, the container was hermetically sealed. Trained dogs gazed toward the people for less time and with a higher latency, and spent more time interacting with the experimental apparatus. None of the groups had significant preferences in gazing toward the stranger or the owner. These findings demonstrate that after the training phase, guide dogs display less human-directed gazing behavior and are more likely to act independently on the apparatus

Salivary cortisol in military working dogs

Desiree BROACH, LTC Daniel E Holland MWD Hospital

Desirée Broach is a DVM, Major of the US Army Veterinary Corps, graduated from the College of Veterinary Medicine of the University of Georgia (USA). She served as section chief of Moody Air Force Base (Georgia) from 2008 to 2010, became Deputy Branch Chief of the Department of veterinary services at Fort Sam Houston (Texas) from 2010 to 2012, and is currently assigned to long term health education training at Fort Sam Houston.

desiree.broach@us.af.mil

The use of salivary cortisol as a measure of stress may be altered in MWDs with behavioral/training issues, chronic illnesses such as colitis, and in suspected cases of Canine-Posttraumatic Stress Disorder (C-PTSD). To establish baseline values in a population of Military Working Dogs (MWDs), a pilot sample of 30 male Belgian Malinois were tested. Ten MWDs at each of 3 stages of the working lifecycle participated: MWDs that had not yet begun training (Pre-training), those that were currently in training for certification (Initial Training), and those that were previously trained and being used in Handler training courses (Training Aid). Samples were taken via daily buccal mucosal swabs for 5 days, and analyzed by ELISA/EIA immunoassay for salivary cortisol enzyme. Collection was performed between 0500-0700, prior to the start of training and at least five hours after the last meal, and the swabs were allowed to saturate for a minimum of 1 minute per subject. The overall Grand Mean for 150 samples was 0.157 µg/dL, with a 95% Confidence Interval of 0.125-0.190, and a Standard Error of 0.16. There was no statistical difference in baseline cortisol data among the three groups evaluated. This suggests that these values are typical of salivary cortisol baseline in the MWDs at Lackland. Future research is needed to determine whether there is a relationship between cortisol level and subjective behavior assessments that could indicate overall MWD stress.

Increasing litter sizes by using genetic tools to maximize breed diversity and decrease individual homozygosity

Cynthia COLE, Mars Veterinary

Cynthia Cole is a DVM graduated from the College of Veterinary Medicine og University of Florida (Gainesville, USA)in 1989 and goth er PhD in the same university in 1994. After working as associate professor at University of Florida for 5 years, she moved to private companies and is currently Director of Research and Development for Mars Veterinary. She also is a diplomate of the American College of Veterinary Clinical Pharmacology.

Cynthia.Cole@mss.effem.com
http://www.marssymbioscience.com/

Co-authors: Angela Hughes, Jonas Donner, Katja Jauni, Mark Dibley, Stephen Davison; Mars Veterinary, Portland, USA

Many purebred dog populations have limited gene pools similar to endangered species where it is critical to consider the entire population and the individuals involved in each breeding. To make breeding decisions, breeders are incorporating family history, phenotype assessments, and utilizing limited genetic information including inbreeding coefficients and specific disease or trait DNA tests. Unfortunately, these resources may not provide a complete overview of a dog's potential genetic contribution. We have used two different SNP marker sets to evaluate genomic diversity within dogs and breeds. In both, initial litters have shown decreased offspring homozygosity compared to their parents and in one intensively monitored breed, Dandie Dinmont Terriers, mate selection incorporating genetic diversity resulted in increased litter sizes. While genetic diversity should not be the only means of determining a desirable breeding, individual diversity should be an included factor in order to maintain the genetic health of the entire breeding population.

Assesment of a novel digital and smartphone goniometers for joint angle measurement of the canine stiffle

Kristin A FREUND, College of Veterinary Medicine, Colorado State University

Kristin Freund is a DVM to graduate from Colorado State University in 2015. As a veterinary student researcher she developed and directed an experimental study to evaluate the reliability and validity of smartphone applications as goniometers in the canine stifle and was awarded grant for this work in the Center for Companion Animal Studies.

kfreund@rams.colostate.edu

Co-authors: Nina R Kieves, Juliette L Hart, Sasha A Foster, Unity Jeffery, Felix M Duerr ; College of Veterinary Medicine, Colorado State University, Fort Collins, USA

Introduction:

Handheld digital and smartphone-based goniometers offer accessible novel methodologies but have yet to be validated in veterinary medicine. This study's objective was to evaluate three novel goniometers in comparison to the universal goniometer (UG) in the canine stifle. We hypothesized that the HALO digital goniometer would be the most accurate.

Materials & Methods:

iHandy Carpenter (iHandy), DrGoniometer (DrG), HALO, and the UG were measured against the gold standard of radiographic measurements for correlation (coefficient of variation, CV), and reliability (R2).

Results:

The UG had a mean CV of 4.88 and R2 of 0.94. DrG, iHandy, and HALO had a mean CV of 7.37, 7.57, and 12.71 with R2 of 0.87, 0.81, and 0.61 respectively.

Discussion/Conclusion:

The UG was the most accurate and reliable device. Subjectively, iHandy was the easiest to learn to use and most efficient. Future studies are needed to determine a valid alternative goniometer.

Canine stride length assesment using inertial measurement units during outdoor and treadmill activity

Kyle MARTIN, College of Veterinary Medicine, Colorado State University

Kyle Martin is actually finishing his cursus of doctor in veterinary medicine at Colorado State University, College of Veterinary Medicine, where he is a member of Professor Duerr research team, focussing his interest on canine gait analysis and its use as a diagnostic tool for musculoskeletal pathology. He was awarded 2014 James C.Beckley DVM scholarship recipient and 2014 Morris Animal Foundation Veterinary Summer Scholar.

kmartin@rams.colostate.edu

Co-authors: Theresa Wendland, Molly Vitt, Wayne Board, Colleen Duncan, Felix Duerr ; College of Veterinary Medicine, Colorado State University, Fort Collins, USA

Conventional gait analysis systems are limited to the unnatural environment of a gait lab. Inertial measurement units (IMUs) have the potential to address this and other issues. We assessed stride length using wireless IMUs in normal dogs outdoors and on a treadmill. We hypothesized that there would be no difference between stride outdoors and on a treadmill. Data was collected outdoors and on a treadmill at a consistent trotting velocity. The mean stride length for each dog was compared using correlation coefficients and a Paired T-test stratified by thoracic vs. pelvic limbs. The stride length obtained outdoors and on the treadmill was highly correlated. However, it was significantly longer on the treadmill than outdoors. IMUs can be used to acquire stride length for dogs in a natural outdoor setting. This may provide a rapid method of objective outcome measurement that is highly correlated with stride length under controlled velocity.

Evolution of gait patterns in dogs: the Pace

Theresa M. WENDLAND, Colorado State University

Theresa Wendland is a third year veterinary student at Colorado State University who is looking forward to a career in small animal sports medicine and rehabilitation. She is currently researching canine gait analysis with the small animal sports medicine department at CSU, participating in a canine rehabilitation practitioners certification program, and taking animal chiropractic certification courses. Theresa's fascination with biomechanics, movement, and functional structure originally developed from her background in martial arts and dressage. These interests led her to find her niche in veterinary school and she is very excited about finding herself as a part of this emerging field – helping to develop it by conducting clinical research and by learning to practice high quality medicine.

theresa.wendland@gmail.com

Co-authors: Kyle W. Martin, Molly A. Vitt, Colleen G. Duncan, Felix M. Duerr ; Colorado State University, Fort Collins, USA

It is unknown whether the pacing gait is normal or abnormal in dogs. This study investigates whether pacing in dogs is a normal gait pattern or associated with orthopedic disease. Healthy, medium-large breed dogs were included in the study. Each dog was evaluated for orthopedic abnormalities and lameness by exam and radiography, then separated into non-lame (NL) and mildly-lame (ML) groups. Gait was assessed using digital video under 3 conditions: off-leash unrestricted movement (UM); leash-controlled (LEAD), and on a land treadmill (TREAD). Pacing was observed in 17/20 NL and 10/19 ML dogs. Comparison of pacing frequency between groups showed no significant difference under TREAD and UM conditions. NL dogs were significantly more likely to pace than ML dogs under LEAD conditions. Pacing was demonstrated in orthopedically normal and abnormal dogs and may therefore be considered a normal gait variation observed in dogs regardless of musculoskeletal health.

Hair cortisol in german shepherd dogs

Lina ROTH, IFM Biology, Linkoping University

Lina Roth is a Doctor in Zoology graduated from Lund University (Sweden) in 2008, where she also got a Master degree in biology. She actually works as an assistant senior lecturer at IFM Biology, division of zoology, at Linkoping University (Sweden), and published several papers and posters on the subject of vision in animals.

linaroth@ifm.liu.se

Co-author: Per Jensen ; IFM Biology, Linkoping University, Linkoping, Sweden

Cortisol is a valid measurement for activity and stress in both dogs and other mammals. In contrast to blood and saliva samples, which reflect instant cortisol secretion, the cortisol levels in hair samples provide us with a retrospective measurement over a longer period of time. Cortisol levels in 46 German Shepherd dogs (GSD) were measured using a competitive radioimmunoassay in methanol extracts of hair frozen in liquid nitrogen and mechanically pulverized. The GSDs were grouped according to their main usage reported by the owners and there was a significant effect of main usage on hair cortisol ($F_{2,45}=5.3$, $P<0.01$; companion, N=17, mean=16.0pg/mg, SE=2.0; competing, N=16, mean=45.6 pg/mg, SE=13.9; working i.e. used by the police or the armed forces, N=13, mean=15.3 pg/mg, SE=2.2). However, neither the dog's age nor sex affected its cortisol level. We therefore suggest the hair cortisol to be a promising marker for measuring long-term biological stress in dogs.

Management of the working dogs of the Ministry of National Security

Ariel Alonso ZAPATA, Argentina Ministry of National Security, Buenos Aires CF

- *National Director of the Dog Support Unit, Ministry of National Security of Argentina*
- *Head of trainers at the Dog Training Division, School of Veterinary Sciences, Universidad de Buenos Aires (UBA)*
- *Professional Dog Trainer License No. 002, Consejo Profesional de Médicos Veterinarios [Professional Council of Veterinary Physicians]*

Main Professional achievements:

- *Quality Assurance System certified to ISO 9001: 2000, Police Dog Unit, Policía Buenos Aires 2 [Buenos Aires Police 2] (2007-2010)*
- *Leadership award at the National Quality Prize 2011 – Public Management – Police Dog Unit, Policía Buenos Aires 2*

zapataariel@gmail.com

This poster shows the dog support ma The Dog Support Unit is a technical unit at the third hierarchical level of the Ministry of National Security. Its mission is to coordinate and plan dog activities, assign trained dogs and instruct and train police officers on the use of trained dogs. It is also in charge of coordinating dog-related activities with agencies at a municipal, provincial and national level. These activities reflect the role of dog trainers (university graduates) within the State system.

Concepts of New Sampling Techniques for Canine Olfaction

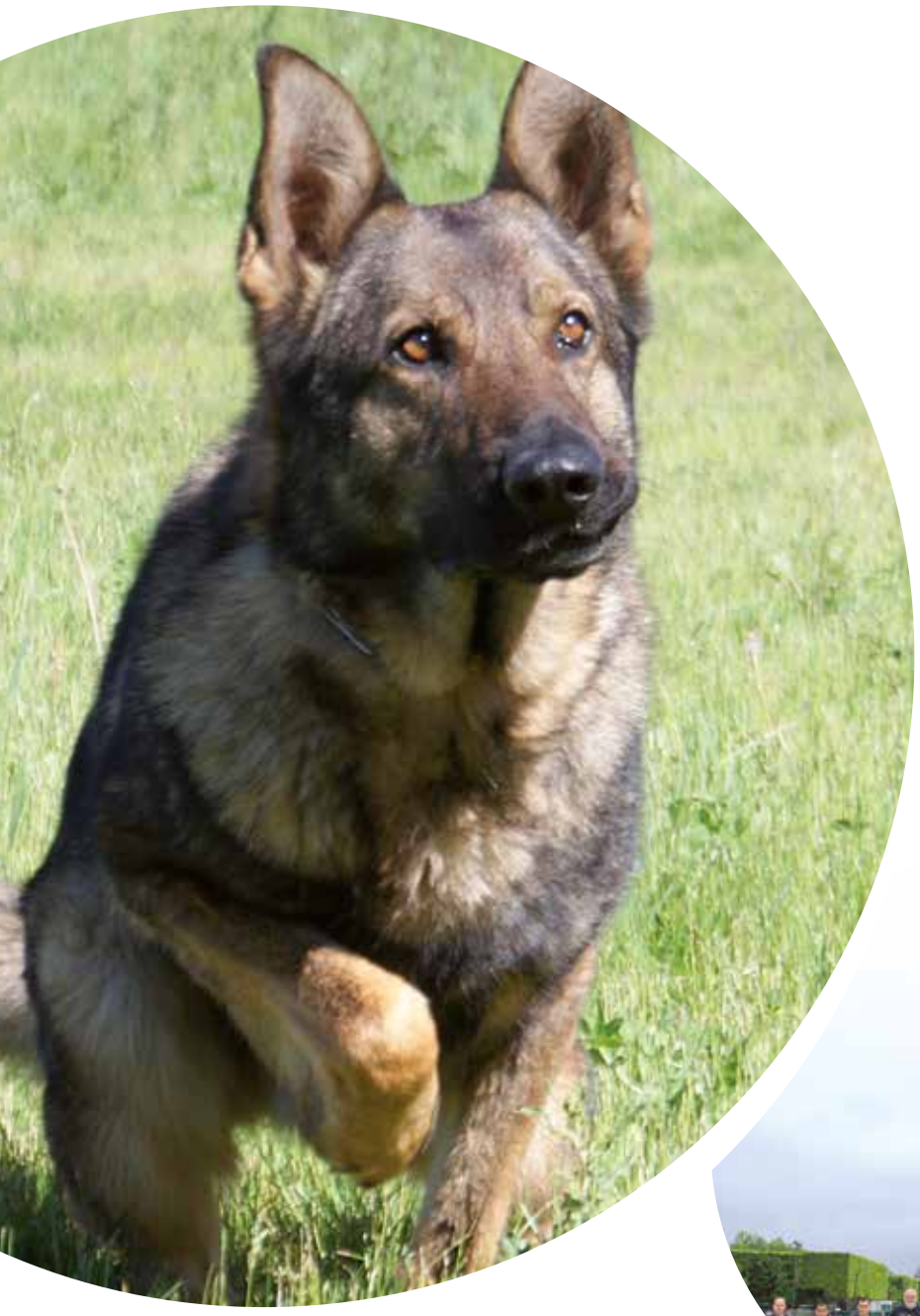
Gerhard HOLL, Institute for Detection Technologies (IDT), Bonn-Rhein-Sieg University of Applied Sciences.

Professor Dr Gerhard Holl is Head of Institute for Detection Technologies (IDT) at Bonn-Rhein-Sieg University of Applied Sciences (Germany). With a strong background in chemistry, he focusses his work on the chemistry of explosives, environmental and occupational safety. HE also is since 2010 EADS Stiftungprofesseur at Bonn University.

Gerhard.Holl@H-BRS.de

The objectives of this work were to develop new sampling techniques and methods to train and maintain explosives detector dogs (EDDs) to serve the mass-screening cargo market like the innovative cargo screening system RASCargO™. The science of trace explosive signatures can be used to guide the development of new sensing capabilities and concepts of using canines for remote sampling techniques (air filter and swab samples). The key point within this matter is to produce training aids and real samples with characteristic scent of the target with different backgrounds like improvised explosive devices emit when they were investigated in different scenarios (screening high volumes of dense cargo). To achieve this goal small quantities of explosives have been placed on defined surfaces of filter materials without changing the chemical compositions neither of the bulb materials nor the characteristic compositions of the vapour phase. Real samples and trainer aids should have the same odor expected to be encountered during operational searches. The use of new sampling techniques are critical to successful training von EDDs. The main problem is the cross-contamination of the training area with explosives and/or the trainer aid with odorants from the environment due to handling, storage and weathering. To minimize these problems and to produce air filter and swab samples with authentic odor like real explosives we have made some investigations and the results we want to present on this conference.

NOTES



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