



**EUROPEAN SECTION**  
**WILDLIFE DISEASE ASSOCIATION**  
**1:ST EUROPEAN CONFERENCE**

**November 22 - 24, 1994**  
**Paris, FRANCE**

**ABSTRACTS**



## WILDLIFE DISEASE STUDIES ON A STATE LEVEL IN USA

William J. Adrian, Mike Miller, Colorado Division of Wildlife, 317 W. Prospect, Fort Collins, Colorado, USA.

Beth Williams, E. Tom Thorne, Wyoming Game and Fish.

Randy Davidson, Victor Nettles, Southeastern Cooperative Wildlife Disease Study, Department of Parasitology, College of Veterinary Medicine, The University of Georgia.

Wildlife disease studies on a state level in the United States will be discussed.

Examples of what studies are undertaken and why include:

Serological surveys for Brucellosis and Leptospirosis in Colorado.

*Leptospira hardjo* in antelope in Colorado.

Lungworm and the pneumonia complex in BHS.

Contagious ethyema in BHS.

Effects of brucellosis in elk and bison in the greater yellowstone area.

Brucellosis vaccinations in elk in Wyoming.

Rabies introductions in southeast USA via transplanted animals.

*Myoplasma* in wild turkeys in Colorado.

Ingested lead poisoning in waterfowl in Colorado.

Stress in bighorn sheep.

Scabies in bighorn sheep and elk in Wyoming.

Diseases of black footed ferrets in Wyoming.

Epizootic hemorrhagic disease/bluetongue.

Johnes disease in Colorado.

Chronic wasting disease in Colorado and Wyoming.





## PAPERS

<u>Name</u>	<u>Title</u>
Adrian, Dr William, et al, USA	Wildlife disease studies on a state level in USA
Aguirre, Dr Alonso, et al, USA	Long-term Monitoring of global biodiversity: The SI/MAB approach
Artois, Dr Marc, FRANCE	The ecology of infections and diseases: The example of carnivores and their viruses
Aubert, Dr Michel, FRANCE	Towards eradication of hog cholera in wild boars by oral vaccination?
Barrat, Dr Jacques, FRANCE	
Baumgartner, Dr Ruth, et al, SWITZERLAND	Fractures in birds of prey - Diagnosis, manage- ment and prognosis
Berntsen, Finn, NORWAY	Medical immobilisation of Svalbard reindeer
Chastel, Dr Claude, et al, FRANCE	Direct pathogenicity and vector role of <u>Ixodes</u> <u>pari</u> (= <u>I. frontalis</u> ) for wild birds in France
Courchamp, Franck, et al, FRANCE	Factors influencing the transmission of Feline immunodeficiency virus between domestic cats
Dietz, Dr Hans Henrik, et al, DENMARK	Wildlife Disease research in Denmark for more than 50 years
Friend, Dr Milton, USA	National level wildlife disease investigations within The United States
Frölich, Dr Kai, GERMANY	Bovine virus diarrhoea/ Mucosal disease (BVD/MD) in deer and rabbits in Germany: Seroepizootiological investigations and virus isolation
Gauthier, Dr Dominique, et al, FRANCE	Sanitary relationships between domestic cattle and wild ungulates in Alps
Gavier-Widén, Dr Dolores, et al, SWEDEN	Fatal hepatitis caused by herpesvirus infection in a hedgehog ( <u>Erinaceus europaeus</u> )
	Outbreak of encephalitis in blackbuck ( <u>Antilope cervicapra</u> ) caused by equine herpesvirus 1 infection in Sweden

Godfroid, Dr Jacques, et al, BELGIUM	Enzootic brucellosis ( <i>Brucella suis</i> biotype 2) in wild swine ( <i>Sus scrofa</i> ) in Belgium
Gortazar, Christian, et al, SPAIN	Outbreak of septicemic pasteurellosis in red deer ( <i>Cervus elaphus</i> ) in montes universales (Spain)
Gunnarsson, Dr Eggert, ICELAND	Diseases and parasites of the wild arctic fox ( <i>Alopex lagopus</i> ) in Iceland
Jessup, Dr David A., USA	California's office of oil spill prevention and response (OSPR) veterinary services unit programs
Kirkwood, Dr James K., et al, ENGLAND UK	Patterns of incidence of spongiform encephalopathy in captive wild animals in the British isles
	Seabird mortality incident, North sea, February 1994
Korbel, Dr Rüdiger, GERMANY	Ophthalmological Examination as a precondition for the rehabilitation of Feral birds
Kuiken, Dr Thijs, et al, CANADA	Pathology and toxicology of marine mammals from British waters
Kuznetsov, Dr Eugeny, RUSSIA	Wildlife diseases in Russia and wildlife disease work
Lamarque, Dr Francois, et al, FRANCE	The sagir network: Presentation and prospects
Laurenson, Dr Karen, et al, SCOTLAND UK	The epizootiology of louping ill in upland Britain
Lavazza, Dr Antonio, et al, ITALY	Control of the health status of brown hare ( <i>Lepus europaeus pallas</i> ) in Ravenna province, North Italy
de Luco, Dr Daniel Fernandez, et al, SPAIN	Contagious ecthyma in muflon ( <i>Ovis musimon</i> )
Lumeij, Dr J.T., NETHERLANDS	Spirochaetal infections in hares in the Netherlands
Lutz, Dr Walburga, GERMANY	Game health under the influence of environmental pollutants and pesticides
Masson, Dr Eric, FRANCE	Towards eradication of fox rabies in France by oral vaccination
McOrist, Dr Steven, UK	Wildlife disease in the United Kingdom
Munro, Dr Ranald, SCOTLAND UK	Liver tumours in roe deer in Britain

Müller, Dr Thomas, et al, GERMANY	Occurrence of selected viral pathogens in cervides and wild boar in some areas of Germany
Mörner, Dr Torsten, SWEDEN	A national program for wildlife disease investigations in Sweden
Peracino, Dr Vittorio, et al, ITALY	Brain lesion associated with infectious keratoconjunctivitis in Chamois and Alpine ibex
Poli, Dr Alessandro, et al, ITALY	Chronic and proliferative pneumonia in roe-deer
Poli, Dr Alessandro, ITALY	Wildlife diseases in Italy
Reichard, Dr Robert, FRANCE	The role of the Office International des Epizooties (OIE) in wildlife diseases
Simpson, Victor R., ENGLAND UK	Pathological conditions in British bats
Sleeman, Dr Patrick, IRELAND	Historic rabies in Ireland and Britain
Steineck, Dr Theodora, AUSTRIA	Wildlife diseases and surveillance in Austria
Stuve, Dr Gudbrand, NORWAY	Wildlife diseases in Norway
Tataruch, Prof Dr Frieda, AUSTRIA	Contamination of wildlife by environmental pollutants in Austria
Thorel, Dr Marie Francoise, FRANCE	<u>Mycobacterium bovis</u> infection in zoo animals
Zakharov, Dr Valery, RUSSIA	Epizootic situation on some wildlife diseases in Russia
Zwart, Prof Dr Peernel, NETHERLANDS	Surveillance of wild animal disease in the Netherlands





## LONG-TERM MONITORING OF GLOBAL BIODIVERSITY: THE SI/MAB APPROACH

**Alonso Aguirre<sup>1\*</sup>, Francisco Dallmeier, James Comiskey,**  
Smithsonian Institution, SI/MAB Biodiversity Program, 1100 Jefferson Drive SW Suite 3123,  
Washington D.C. 20560. <sup>1</sup>Current Address: P.O. Box 1522, Fort Collins, CO 80522.

It is estimated that over the next 25 years more than one million species of plants and animals will become extinct. Most of these extinctions will occur in the tropics where the pressure of overpopulation, poverty, and a lack of technical and scientific infrastructure make conservation efforts extremely difficult. The loss of species diversity and the reduction of genetic diversity in crops and wild species may lead to loss of ecosystem stability and function. Latin American forest resources are especially threatened because of their biological and medicinal value. The drastic accelerated transformation of natural tropical landscapes in most instances has not been quantified. Adequate measuring and long-term monitoring programs are necessary on a global scale to assess the present and future health of ecosystems. These programs should serve to diagnose abnormal conditions and develop effective mitigation measures. Mitigation includes treatment for ecological dysfunction and reduction of ecological risk by preventing exposure to dangerous agents (e.g., pollutants and parasites). An inventory of all the biotic and abiotic resources and a description of their relationships is the first step in the design of a long-term monitoring program. Measures of population dynamics and biodiversity, and assessments of pollutant and natural constituents can provide a rapid and safe ecological evaluation of a natural area. Baseline data for all taxa, including flora and fauna, are key to successful research, conservation, and management of ecosystems.

The Smithsonian's Man and Biosphere Biological Diversity Program (SI/MAB) focuses on problems associated with maintaining global biodiversity, emphasizing the practical application of research to achieve sustainable resource management. SI/MAB systematic methodology for designing and implementing long-term measuring and monitoring projects has been tested and refined at eight research sites -primarily biosphere reserves and conservation units in developing countries of Latin America. SI/MAB methodology is based on the establishment and maintenance of permanent inventory plots in tropical forests. Monitoring these forests for plants, invertebrates, and vertebrates is necessary before deciphering the effects of losses and changes caused by rampant deforestation. SI/MAB provides training for professionals to ensure that teams are in place to conduct on-going inventories and monitoring, disseminate information, and participate in the decision-making process. As part of its international courses, SI/MAB has recently incorporated monitoring of parasites and diseases. As forests are cleared for crop production and cattle ranching, wildlife concentrate in smaller forest stands being more susceptible to epidemics, malnutrition, and environmental pollutants. In addition, veterinary support is utilized in the application of humane and safe chemical immobilization techniques to assist inventorying and monitoring wildlife. Other challenges for veterinary research in the conservation of biodiversity include the development of integrated actions to stabilize animal populations within their habitats. When optimal population densities exceed carrying capacity, these will require of population or fertility control, or in some instances, removal of exotic introduced species.

SI/MAB will be expanding its monitoring and training projects, attempting to increase its global network to 300 plots by the turn of the century, focussing on Latin America, Africa, and Asia. This effort will represent the world's largest grouping of biological diversity monitoring plots in a diverse range of forest habitats. This network will be linked by the SI/MAB protocol following consistent methodology, data management, and dissemination of information through workshops and publications. SI/MAB attempts to increase our knowledge of basic ecological functions for practical field applications. The sustainable use of natural resources is possible if reliable data about changes in ecosystems and their impacts on biological diversity are linked to conservation programs and integrated resource management.

## THE ECOLOGY OF INFECTIONS AND DISEASES : THE EXAMPLE OF CARNIVORES AND THEIR VIRUSES.

**Marc Artois**, CNEVA Nancy - Laboratoire d'études sur la rage  
et la pathologie des animaux sauvages - B.P. 9 - 54220  
MALZEVILLE, FRANCE.

If infections and diseases can threaten the survival of an individual animal, does this also mean that they have an impact at a population or community level? Such questions are still subjects for discussion. Here we will explore some field data and also some more theoretical considerations related to Carnivores and their interactions with pathogens.

To adapt to the constraint that they must be transmitted or will vanish Carnivore viruses have developed a wide range of strategies for transmission. Some, such as feline calicivirus infection make use of chance occurrences, spreading among young naive individuals. Others use more sophisticated strategies, surviving for a long time in the infected hosts. Such strategies are at least superficially convergent with those known in metazoan populations as r- or K-selected strategies. The short term coexistence of viruses and their hosts in a population can be classified as epidemic, endemic or sporadic, depending on the combination of virus virulence and rate of transmission. Studies of rabies in foxes (epidemic) and in dogs (endemic) offer good data to compare the conditions necessary for such short-term host population/virus relationships.

Several examples of viral disease outbreaks demonstrate important aspects of their demography. The most numerous examples of dramatic mortality resulting from virus invasions share some common characteristics which can be used to estimate or predict when a disease will have a significant demographic impact.

But infections can also change other parameters of host populations, notably genetic structures; a long-term effect can be co-evolutionary processes. The consequences of viral diseases to the conservation biology of Carnivores are still uncertain, but in some instances (distemper in the Black-footed ferret) they are obviously a serious threat for the survival of small isolated populations, at least when these are surrounded by domestic or wild Carnivores acting as reservoirs.

### TOWARDS AN ELIMINATION OF SWINE FEVER IN WILD BOARS BY ORAL VACCINATION ?

**Michel AUBERT**, CNEVA Nancy - Laboratoire d'études sur la rage et la pathologie des animaux sauvages - B.P. 9 - 54220 Malzéville, FRANCE

So far wild boar has not been considered as a significant potential reservoir of swine fever (SF) : after its eradication in domestic pigs - or even when artificially introduced in wild boar or feral pig populations, the disease spontaneously extinguished itself in wild populations.

However recent data obtained in Sardinia, in Germany and in the North-east of France demonstrate that artificially maintained high densities of wild boars could sustain the disease for several years.

In such a context, oral vaccination of wild boar against SF could be addressed to reach extinction more rapidly. However the epidemiology of SF is not as simple as those of rabies : SF virus can more readily survive in carcasses of dead animals, it is highly adaptable and produces low virulence strains that can be transmitted in utero.

Thus vaccinating wild boars against SF might not be as successful as was the vaccination of foxes against rabies.

Nevertheless, considering the risk for humans and for wildlife, any candidate vaccine against SF will have to fulfil the same requirements as those recommended by WHO experts for wildlife immunisation against rabies.



## **THE SAGIR NETWORK : RESULTS OF WILDLIFE DISEASE SURVEILLANCE IN FRANCE**

**Jacques BARRAT<sup>1</sup>, François LAMARQUE<sup>2</sup>, Yves GERARD<sup>1</sup>  
and Cécile EICHENLAUB<sup>3</sup>**

SAGIR collects yearly data on 2500 wild animals. These animals correspond to cases where a pathological problem is suspected, i.e. the 4000 declared (or 20000 suspected) roe deers killed annually on roads are excluded from the sample.

This information is centralized in a database. The architecture of that database was adapted to fit the precision of results collected and to optimize mass memory management and data treatment. Data have been divided into several files corresponding to units that are either completely filled or completely ignored:

1. description of the animal, its population, its origin, ...
2. cause of death
3. necropsy observations
4. pathogenic agents
5. additional post mortem findings likely to have been of significance for the health of the animal.

Most laboratory results are coded. In order to compensate for variation in the details of organs, lesions and pathogenic agents, the codes always correspond to results of maximum specificity. Other fields linked to the code provide less precise information.

### **RESULTS - DISCUSSION**

Sampling effort is not constant throughout the year. It is affected by the presence of man in the field, for example there are more specimens collected during hunting season.

In 1993, as in the other years, two species are numerically important, the roe deer (300 - 350 cases a year) and the brown hare (1100 - 1500 cases a year). The general study of causes of death shows that trauma is the most important cause of death for both species. An association between parasitic and bacterial infections is detected in 60% of roe deer. The most frequent causes of mortality in brown hares are pseudotuberculosis, European Brown Hare Hemorrhagic Syndrome and pasteurellosis. Among the 100 rabbits collected, Rabbit Viral Hemorrhagic Disease was detected in 35 out of the 73 analysed animals.

Some complementary studies have been carried out using data collected for surveillance purposes. For example, roe deers living at densities above 10-20/km<sup>2</sup> are in significantly poorer condition than those at lower densities. The effect of rodent control measures on non-target species was seen both in animals that had eaten baits (e.g. hares) and in animals that had eaten dying or dead rodents (e.g. foxes, badgers, birds of prey).

### **CONCLUSION**

The SAGIR network of wildlife pathology survey was initiated to provide rapid detection of major disease outbreaks. For this purpose the network fulfills its role effectively. However, the use of the network for more detailed epidemiological studies of wild animal disease is problematic because of the heterogeneity in the data collected.

---

1. CNEVA Nancy, Laboratoire d'Etudes sur la Rage et la Pathologie des Animaux Sauvages, Domaine de Pixérécourt, BP 9, F-54220 Malzéville, FRANCE

2. ONC, Ferme de Saint Benoist, 5 rue de Saint Thibault, 78610 Auffargis, FRANCE

3. Clinique Vétérinaire, Quai Philippe Bouley, 21500 Montbard, FRANCE



## BRAIN LESION ASSOCIATED WITH INFECTIOUS KERATO- CONJUNCTIVITIS IN CHAMOIS AND ALPINE IBEX

B. Bassano\*, E. Bollo\*\*, A. Caramelli \*\*\* & V. Peracino\*

\*Centro Studi Veterinari della Fauna Alpina - P.N. Gran Paradiso, Via della Rocca, 47 - I-10123, Torino

\*\* Dip. di Patologia Animale, Università di Torino, Via Nizza 52, I-10126, Torino

\*\*\* Ist. Zooprofilattico Sperimentale Piemonte, Liguria e Valle d'Aosta, Via Bologna 148, I-10100, Torino

Infectious keratoconjunctivitis in Chamois (*Rupicapra rupicapra*) and Alpine ibex (*Capra ibex*) appeared in the protected area of the Gran Paradiso National Park in May 1981.

One of the most interesting clinical aspects of this pathology is the profound changes in behavior noted in many subjects: both in relation to the space use and to the social behaviour. These symptomatologies have only occasionally been correlated with an inflammatory process affecting the central nervous system.

This work shows how these processes occur frequently even in subjects which do not show evident neurological signs.

Twenty-five chamois and 8 alpine ibex with infectious keratoconjunctivitis were captured in the Gran Paradiso National Park. Seven chamois and 3 alpine ibex showed signs of nervousness.

The histopathological findings showed that approximately 50% of the animals (*i.e.* 12 chamois and 4 ibex) were affected by inflammatory alterations of the brain, represented by: foci of non-purulent leptomeningitis as small accumulations of mononuclear cells; perivascular cuffings in the cerebral hemispheres; severe infiltration of lymphocytes in the choroid plexus of the cerebral ventricles.

These observations raise a few questions regarding the brain lesions:

- Whether the nervous symptoms can be attributed to the brain lesions. Five chamois and one alpine ibex showed lesions of the central nervous system without showing any symptomatology (functional compensation?);

- Whether the alterations can be considered as primitive, *i.e.* induced by the infectious agent, or subsequent to secondary complications: the non-purulent morphology of the inflammation would be a consequence of the action of the primary pathogenic agent (*Mycoplasma* or *Chlamydia*).

## FRACTURES IN BIRDS OF PREY - DIAGNOSIS, MANAGEMENT AND PROGNOSIS

**Ruth Baumgartner, Jean-Michel Hatt, Ewald Isenbügel**, Abteilung für Zoo- und Heimtiere der Universität Zürich, Winterthurerstrasse 260, 8057 ZÜRICH, SWITZERLAND

The ultimate goal in the veterinary treatment of birds of prey with fractures must be to restore them so they can be released to the wild population in well enough condition that they will hunt for themselves and will reintegrate into the breeding population. This is a legal condition in many countries and yet it is often extremely difficult to achieve.

In Switzerland large numbers of wild raptors are found and tended each year by public people or veterinarians. In our clinic for exotic pets and zoo animals the first approach is to separate injured raptors which have a chance for being released again from those cases where euthanasia is indicated. The decision is made on the basis of the following informations:

- 1) general health status of the raptor
- 2) fracture - localisation, lesions, age, open or closed wound
- 3) species (very common, endangered ect.)

Depending on the site of the fracture different symptoms will be shown.

### Head

Sx: bird sitting on the ground, not able to fly

Dx: no fracture or luxation can be diagnosed, but the pupils are wide open and the bird reacts slowly, cannot eat by itself, wounds on head, X-ray

Tx: fluid therapy, keeping in a dark box, forcefeeding, (Glukocorticoids)

Px: good if the bird recovers within a few days

### Pectoral girdle -> Fracture of the coracoid is very often diagnosed!

Sx: the bird is able to fly for a few meters, it will not be able to gain a higher altitude

Dx: X-ray

Tx: surgical therapy is seldom successful, because the coracoid doesn't heal correctly and often there has been a too big muscle trauma; keep in darkness

Px: usually very poor

### Wings -> depending on the localisation of the fracture or luxation different symptoms are shown

Sx: Shoulder - Humerus      total drooping of the wing

Elbow - Carpus            1/2 of the wing is drooping

Distal from Carpus      only the distal part of the wing is drooping

Dx: palpation and/or X-ray

Tx: fractures of the long bones will preferably be treated surgically. The method being chosen depending of the type of fracture (intramedullary pin, plate, external fixation ect.). Keep the bird in darkness for a few (1-2) weeks

Simple fractures have a better prognosis than compound comminuted fractures

### Spine

Sx: paralysis of the legs

Dx: X-ray (DDx: poisoning !)

Tx: none

Px: bad

### Legs

Sx: total or partial inability to take weight on a leg.

Dx: palpation, X-ray

Tx: intramedullary pin, plate, external fixation

Px: usually good

### Foot

Fractures of the foot are rare in raptors. Conservatory treatment is usually sufficient.



## MEDICAL IMMOBILISATION OF SVALBARD REINDEER

Finn Berntsen, NINA·NIKU - Foundation for nature research and cultural heritage research, Tungasletta 2, 7005 Trondheim, Norway.

The Svalbard reindeer (*Rangifer tarandus platyrhynchus*) is regarded to be slightly different from the reindeer on the mainland of Norway. The svalbard species have shorter legs, more subcutaneous fat and appears more bellylike than the mainland reindeer.

An investigation program on a three year basis has been set into production this year, bringing up the need to immobilize reindeers on a larger scale. The research group will try to explain the relation between makroparasites as functional predators and the effects on reindeers, especially concerning mortality ratios and reproduction. Telemetry is vital for locating animals during the research period.

Initially the plan was to immobilize animals from the ground, as the svalbard reindeer is a rather curious animal with a tendency to investigate new objects in the landscape. This enables personell to come within shooting range of a darting gun, but it turned out be the males who did the investigating while the females and the calves remained mostly out of reach for the gun. As the research had to be carried out with females and calves as well the immobilisation had to be carried out from helicopter.

The drug of choice for reindeer is medetomidin combined with ketamin. Several different doses were tried. The most efficient dose turned out to be 0,15 mg medetomidin pr.kg combined with 0,8 mg ketamin pr.kg. Adult animals had weights between approx. 65 and 75 kgs. Standard doses of 12 mg medetomidin and 60 mg ketamin was used. Calves were given half the dose, weights beeing around 40 kg. Increasing doses did not seem to be of advantage. The darting gun was of Danish fabricate, Dan-arms industry.

The main reaction after darting was slow running for 10 to 15 minutes, often the animals stopped after a few minutes. Then they lay quietly down, head upright or on the ground. Prosessing time was normally 25-30 minutes. During this time the following procedure took place: Blood sampling, ear tagging, DNA-sampling, feces sampling, radio collaring, teeth impresions and weighing. The body temperature ranged between 39.4°C and 40.4°C, the lower values beeing the most common. During the prosessing time the animal was well anesthized with calm respiration and no signs of spasms. The animals were given 10 mg atipamezol i.v. after processing, which brought them on their feet in 45 to 60 sec. The highest temperatures were measured when the animal was chased more than a few minutes by the helikopter.

The svalbard reindeer seems to have a more vulnerable skin than mainland reindeers. This led to the perforation of the skin initially. The needle and 1 to 2 cm of the dart would penetrate into fat or muscle if the animal was hit from the side or on the back. After trial and error, the optimal site to place the dart turned out to be in the regio perinei (around the anus). Here the impact seemed to be the most wanted, only the needle entered the animal. All animals were controlled during the following days, all presenting themselves normally. Later following up in the middle of september showed the same picture.

DIRECT PATHOGENICITY AND VECTOR ROLE OF IXODES PARI (= I. FRONTALIS)  
FOR WILD BIRDS IN FRANCE.

**Claude CHASTEL (1), Claude GUIGUEN (2), Olivier CHASTEL (3),  
Jean-Claude BEAUCOURNU (2),** (1) Virology, University of Brest,  
(2) Parasitology, University of Rennes, and (3) C.E.B.C./C.N.R.S., Chizé, France.

Ixodes (Scaphixodes) pari Leach 1815 (= Ixodes (S.) frontalis Panzer 1795) is a strictly ornithophilic tick rarely found free in the wild, parasitizing mainly Passeriformes (Morel, 1959 ; Gilot, 1984). The biology of this tick is poorly documented and its role in the transmission and the dissemination of viruses or other pathogens remains to be clarified.

From 1980 to 1993, 101 specimens of I. pari infesting 25 species of birds of western and southern France, including Corsica, have been collected. Pathological effects for wild birds of the infestation per se and eventual presence of arboviruses have been investigated.

I. pari is in fact responsible for severe pathological disorders associated with hemorrhages and vascular thrombosis sometimes leading to the death of the bird. Paralysis and convulsions were also observed (Chastel et al., 1981). These pathological events apparently occur only under peculiar conditions (unusual bird host and/or the fixation of one or more ovipositing females).

We have recently isolated an arbovirus provisionally named "Chizé virus" from I. pari parasitizing a Wren (Troglodytes troglodytes) found dead on the road near Chizé, south western France. Preliminary serological screening suggests that it is a new tick-borne Phlebovirus of the Uukuniemi group, Bunyaviridae family. Russian works have previously established that I. pari harbours Coxiella burnetii, a rickettsia.

In addition, six new hosts species have been listed during the survey :  
Sylvia melanocephala, Alectoris rufa, Asio otus, Larus ridibundus, Alcedo atthis  
and Parus coeruleus.

Infestation of wild birds by I. pari probably represents an excellent model for the understanding of complex factors interacting during tick feeding on vertebrates :  
1 - Stage, sex and physiological condition of the tick, 2 - The life-history of the host, and the degree of adaptation to tick parasitism, and 3 - The eventual concomitant transmission of pathogens such viruses or rickettsias.

## **Factors influencing the transmission of Feline Immunodeficiency Virus between domestic cats**

Courchamp F., Pontier D. & Artois M.

Feline Immunodeficiency Virus (FIV) is a newly identified virus inducing AIDS in cats (*Felis catus*). For this reason, FIV is of particular interest for domestic cats' health. Indeed, infection with FIV gives rise to a wide range of clinical signs, secondary infections being common. FIV belongs to the family of retroviruses, and has the characteristics of the non-oncogenic retroviruses that are associated with chronic progressive infections: the lentiviruses. FIV has been found worldwide in pet cats, feral cats and non-domestic felids, and except for the transmission modes (that seems to be mostly by bites, and not reproduction) and the fact that it is antigenically distinct, FIV is very similar to HIV: genetically, morphologically, biochemically and pathologically. Both lentiviruses have similar biological properties, namely magnesium dependent Reverse Transcriptase activity, prolonged latency, and persistence of infection despite humoral responses. The clinical staging of feline AIDS also is very similar to human AIDS. Hence, FIV could be a good model of HIV studies on numerous fields.

From a long term study, we dispose of epidemiological data for four natural populations, three located in rural habitats and one in urban habitat. A representative sample of each of these populations is monitored every year, providing results for nearly 200 cats. We looked for potential effects of intrinsic or extrinsic factors, such as sex, age, phenotype, weight, neutering, breed, way of life, group size and origin. We conclude that intrinsic factors are more strongly linked to FIV infection than extrinsic factors.

Wildlife research in Denmark for more than 50 years

Hans DIETZ





# National Veterinary Laboratory

Ministry of Agriculture



Wildlife Disease Survey in Denmark, 1934-1994.

**H.H. Dietz**

Danish Veterinary Laboratory, 2 Hangoevej, DK-8200 Aarhus N, Denmark

**B. Clausen**

National Environmental Research Institute, Box 399, DK-4000 Roskilde, Denmark.

**E. Rattenborg**

Danish Veterinary Laboratory, 2 Hangoevej, DK-8200 Aarhus N, Denmark

Since 1932 wild mammals and birds found dead or killed in a diseased condition have been necropsied at the Danish Veterinary Laboratory. Anyone in Denmark may submit wild animal specimens to the laboratory. Hunters play an important role in the surveillance of wildlife diseases, but biologists and naturalists also supply a considerable number of animals.

More than 16,000 mammals and 17,000 birds have been examined since 1931. During the last few years the annual number of animals submitted for post mortem analyses has ranged from 350 to over 1,000.

The necropsies are performed free of charge as a service to the public. Furthermore the necropsy results give possibility for continuous evaluation of the health situation of the Danish fauna and implicitly to evaluate the risk of domestic animals being infected with contagious diseases propagated in the wildlife and vice versa.

Wildlife disease surveillance in Denmark was initiated in 1932 and since then

Diagnostic records are filed by accession number and include history, species, weight, sex, standard laboratory diagnostic information, and geographical location. Unfortunately records are currently kept on paper which makes it very time consuming to analyze the data.

The uninterrupted long term studies of wildlife diseases provide a very good indication of the development of the various diseases. This has recently been exemplified with the European brown hare of which more than 8,000 were necropsied from 1932 - 1985. A meticulous epidemiologic study including all records on hare necropsies made it possible to discern complicated patterns in disease fluctuation within this species (Rattenborg, 1994).

## Reference

**Rattenborg, E.:** Diseases in the hare (*Lepus europaeus*) population in Denmark. Epidemiological description and analyses of post-mortem data 1932 - 1985. PhD-thesis, Royal Veterinary and Agricultural University, Copenhagen, 1994.



## NATIONAL LEVEL WILDLIFE DISEASE INVESTIGATIONS WITHIN THE UNITED STATES

Milton Friend, National Wildlife Health Center, 6006 Schroeder Road,  
MADISON, WISCONSIN 53711, USA

Organized wildlife disease investigations within the United States can be traced to the formative years of the Bureau of Biological Survey during the 1890's. In 1939 the Survey was transferred from the U.S. Department of Agriculture to the U.S. Department of Interior where it became the foundation for development of the Bureau of Sport Fisheries and Wildlife, an agency that later became the Fish and Wildlife Service (FWS). Wildlife disease stature and investigations being carried out changed significantly along with these organizational changes within the federal government. In November 1993, the National Biological Survey (NBS) became a new agency within the U.S. Department of Interior. Creation of the NBS resulted in transfer of the National Wildlife Health Center (NWHC) from the FWS to the NBS. The latest organizational change also has significant implications for national level wildlife disease investigations within the United States. A brief evaluation of the changes of the past relative to their influence on wildlife disease investigations within the United States followed by a focus on the current change relative to the future for national level wildlife disease programs is provided by this presentation. Major changes in current program emphasis are likely to include: (1) structured wildlife disease monitoring programs as a component of ecosystem health assessments; (2) greater emphasis on evaluations of disease impacts on the population dynamics of wildlife species; and (3) greater emphasis on the development of predictive models for disease impacts associated with alternative land management decisions.

## BOVINE VIRUS DIARRHOEA/ MUCOSAL DISEASE (BVD/MD) IN DEER AND RABBITS IN GERMANY; SEROEPIZOOTIOLOGICAL INVESTIGATIONS AND VIRUS ISOLATION.

**Kai Frölich**, Institute for Zoo Biology and Wildlife Research Berlin, IZW,  
Alfred-Kowalke-Str. 17 , P. O. Box 1103, 10252 BERLIN, GERMANY

Bovine virus diarrhoea/ mucosal disease (BVD/MD) is a recurrent generalised virus-caused infection affecting a broad range of hosts. The major symptoms are haemorrhagic mucosal inflammation and impairment of the general condition. The ways of infection for free-ranging ungulates are not clear yet. This investigation may help to find out with regard to BVD/MD, whether cattle are a danger potential for cervids and whether cervids represent a virus reservoir for domestic animals. From 1990 until 1992, 355 blood samples and 203 spleen samples of roe deer (Capreolus capreolus), red deer (Cervus elaphus), fallow deer (Dama dama) and other cervid species from three different habitats and 11 wildlife parks or zoos in Germany were tested. We found no significant difference in antibody prevalence among deer between habitats with high, intermediate and low density of cattle. Thus there seems to be no need for epizootiological contact with cattle. There were significantly more seropositive individuals in roe deer in comparison to fallow deer. It might be possible that roe deer is more susceptible to the BVD virus than fallow deer. Significantly more seropositive individuals were found among juvenile animals than among adults. Antibody prevalence in free-ranging cervids was significantly higher compared with that of deer in enclosures. Possibly there was a natural source of infection for the deer populations on free range. It seems, that rabbits are involved, because 10% of the rabbits (n=57) in the northern habitat were seropositive for BVD virus and even 50% have antibodies against the pestivirus we found in roe deer. Cytopathogenic pestiviruses were isolated from two samples from seronegative roe deer. Pestiviruses were detected by four criteria:

1. Both samples were positive when applying direct immunofluorescence.
2. Electron microscopic images.
3. A BVD/MD positive serum of cattle neutralised the respective isolates.
4. The morphology of the cytopathic effect of the isolates resembled that of pestiviruses.

Moreover the two isolates were identified without doubt as being positive to pestiviruses when applying pesti primers in the PCR. However, they were negative, when specific BVD or swine pesti primers were used. This suggests that the two isolates had other genome sections than those of BVD or classical swine fever virus strains. First results of the genome sequence analyses seem to confirm this suggestion. Microneutralization test titers ranged from 1:5 to 1: 125. More seropositive animals were detected when using Grub 313/83 strain BVDV in the same neutralization test. This might suggest that the BVDV strain that infects wild ruminants is closer to the Grub 313/83 strain in its antigenic structure than to NADL strain. Probably there is a pestivirus strain similar to the BVD virus that circulates in wild ruminants.

Sanitary relationships between domestic cattle  
and wild ungulates in Alps.

Dominique GAUTHIER et al.

**FATAL HEPATITIS CAUSED BY HERPESVIRUS INFECTION IN A HEDGEHOG  
(*Erinaceus europaeus*)**

Dolores Gavier-Widén, Ann Pettersson, Frederik Widén and Tapio Nikkilä, National Veterinary Institute, P.O. Box 7073, S-75007 Uppsala, Sweden.

A litter of four 3-months-old hedgehogs (*Erinaceus europaeus*) died acutely without showing signs of disease. One of these animals was necropsied. The main findings at the post mortem examination consisted of a fatty and enlarged liver and enlarged spleen. Histologically, the liver showed a severe hepatitis, characterized by extensive areas of coagulation necrosis of hepatocytes and portal infiltration of inflammatory cells. Liver cells in the borders of the necrotic areas showed varying stages of eosinophilic degeneration and nuclear changes, many contained intranuclear inclusion bodies. Fatty degeneration and hemorrhages also occurred. Small foci of necrosis were also observed in the spleen and adrenal glands. Electron microscopy of liver sections showed the presence of abundant herpesvirus-like particles in the nuclei and cytoplasm of hepatocytes. The virus was isolated in primary bovine fetal skin cells causing cytopathic changes characteristic for Herpesvirus within 48 hours. It was tentatively classified as a herpesvirus on the bases of its characteristic morphology. Herpesvirus had not been previously isolated from hedgehogs.



**OUTBREAK OF ENCEPHALITIS IN BLACKBUCK (ANTILOPE CERVICAPRA)  
CAUSED BY EQUINE HERPESVIRUS 1 INFECTION IN SWEDEN**

Dolores Gavier-Widén<sup>1)</sup>, Bengt Ole Röken<sup>2)</sup>, Frederik Widén<sup>3)</sup>,  
Berndt Klingeborn<sup>3)</sup>, Torsten Mörner<sup>1)</sup>, Gunnar Rockborn<sup>3)</sup>

1) The National Veterinary Institute, Division of Wildlife  
Diseases, P.O. Box 7073, S-75007 Uppsala, Sweden

2) Kolmårdens Zoo, S-618 92 Kolmården, Sweden

3) The National Veterinary Institute, Department of Virology,  
P.O. Box 585, S-75123 Uppsala, Sweden.

Repeated outbreaks of encephalitis causing mortality occurred in a herd of blackbucks (Antilope cervicapra) in a zoo in Sweden. Some of the affected animals died acutely without showing clinical signs, other animals were apathic or manifested signs of central nervous system disturbance and died after a short course. Histologically, all the animals that died had an encephalitis characterized by neuronal changes with corresponding inflammatory components and severe infiltration of mononuclear cells in the wall of blood vessels. The lesions varied in extension, they were often limited to small areas of the brain but were sometimes generalized in the whole central nervous system.

Equine herpesvirus 1 (EHV-1) was isolated from affected animals from the herd and identified for the first time in 1988. It was detected again in later outbreaks in 1992 and 1994, by polymerase chain reaction and by viral isolation in primary bovine fetal skin cells.

EHV-1 is exceptional among herpesviruses in that it has the ability to infect species non-related to their original host, the horse. EHV-1 causes disease in cattle and it has been isolated from llamas, alpacas and fallow deer. Infection of blackbuck has not been previously reported.

ENZOOTIC BRUCELLOSIS (BRUCELLA SUIIS BIOTYPE 2) IN  
WILD SWINE (SUS SCROFA) IN BELGIUM

**J. Godfroid<sup>a</sup>, P. Michel<sup>a</sup>, L. Uytterhaegen<sup>a</sup>, C. De Smedt<sup>a</sup>, F. Rasseneur<sup>a</sup>, F. Boelaert<sup>a</sup>, C. Saegerman<sup>b</sup>, X. Patigny<sup>c</sup>.** <sup>a</sup>Institut National de Recherches Vétérinaires, Groeselenberg, 99, B-1180 BRUXELLES, BELGIUM, <sup>b</sup>Inspection Vétérinaire, rue des Champs Elysées, 4, B-5590 CINEY, BELGIUM, <sup>c</sup>Inspection Vétérinaire, av. Victor Libert, 32, B-6900 MARCHE-EN-FAMENNE, BELGIUM

We describe the first case of enzootic Brucella suis biotype 2 brucellosis in wild swine (Sus scrofa) in Europe, where the disease seems to be enzootic in hares (Lepus capensis). 13 B. suis biotype 2 strains were isolated from 141 animals (9,2 %). The serological diagnosis of brucellosis is still problematic in swine. In our study the slow agglutination test (SAW) was found to be unsatisfactory. The plate agglutination test (RB) and the complement fixation test (CFT) were found to be satisfactory at the population level, if used in parallel and if the sample size is sufficient. We have developed an indirect ELISA for the detection of serum antibodies directed against the "smooth" Brucella lipopolysaccharide (S-LPS). The threshold value and the specificity (99,7%) of this test were calculated in brucellosis-free domestic pigs. In our study, the ELISA detected antibodies in all bacteriological positive wild swine and was used on poor quality sera that could not be analyzed by classical tests. 56 sera (39 %) were classified positive by the ELISA. According to the biology of the B. suis biotype 2 infection in swine (self-limiting disease) and to the excellent specificity of the ELISA in domestic pigs, our results suggest that there is a heavy circulation of B. suis biotype 2 in wild swine. The value of classical brucellosis serological tests should be evaluated in the context of swine B. suis biotype 2 infection. The contamination of cattle and domestic pigs by direct or indirect contact with infected wild swine or hares might be possible. Therefore, the implication of B. suis biotype 2 beside Yersinia enterocolitica 0:9 in the occurrence of (false?) positive serological reactions in brucellosis screening tests in cattle and domestic pigs is discussed.

OUTBREAK OF SEPTICEMIC PASTERELOSIS IN RED DEER  
(Cervus elaphus) IN MONTES UNIVERSALES (SPAIN)

**C. Gortazar, D.F. Luco, J. Marco, C. Calvete, J. Plana & J.I. Badiola**, Dept. Animal Pathology, Veterinary Faculty, Miguel Servet 177, 50.013 ZARAGOZA, SPAIN.

The Montes Universales National Hunting Area (Teruel and Guadalajara Provinces, Spain; 1°47' -2°15' E, 40°18' -40°35' N) covers a surface of 59,500 ha, and an altitude range of 1,000 - 1,700 m. From June to October, 40,000 sheep and 500 cattle share the pastures of the hunting area with the deer. The deer population is estimated to be 950 animals (1.58/100 ha).

In 1991, an increased mortality due to unknown causes occurred. The first dead animals were found in July. During a 50-day period 85 dead deer were found in the study area. In December the total number of losses was 111 (54 stags, 44 hinds and 13 fawns). Considering the census results and the characteristics of the area, the number of deaths can be estimated as 200 (21% of the population).

Most of the carcasses showed autolysis due to the heat. Dead animals were in good body condition and sometimes showed opisthotonus and tumefaction of one leg.

One animal, found shortly after death, had a tumefacted left foreleg. The subcutaneous tissue was congested, crepitated and the epithelium was easy to remove. The meninges were also congested, the lung showed congestion, oedema and subpleural petechiae, and in the heart subepicardic petechiae in the coronary sulci were found.

Lung, lymphatic, and spleen tissues were analyzed microbiologically. Virological results were negative, and bacteriological cultures showed growth of Pasteurella multocida colonies, belonging to B:2,5 with  $DL_{50\%}$  of 2 c.f.u's.

The identification of capsular antigen B, and somatic antigen 2 of P. multocida with implication of other somatic antigens, evolves the diagnosis of septicemic pasteurelosis, which is closely related with outbreaks in wild animals.

We wish to thank E. Tre. This study was financed by the Fish and Game Service of Diputación General de Aragón.

Diseases and parasites of the wild arctic fox (*Alopex lagopus*)  
in Iceland

Eggert GUNNARSSON



CALIFORNIA'S OFFICE OF OIL SPILL PREVENTION AND RESPONSE  
(OSPR) VETERINARY SERVICES UNIT PROGRAMS

David A. Jessup DVM MPVM Dipl. ACZM  
Veterinary Services Unit, CDFG-OSPR  
1701 Nimbus Road, Suite D  
Rancho Cordova, CA. 95670

**Abstract:** Catastrophic oil spills cause considerable environmental damage and immediate loss of wildlife. To meet the response mandates of SB 2040 the Office of Oil Spill Prevention and Response (OSPR) has built a pair of mobile wildlife veterinary laboratories and wildlife care and washing trailers, obtained a Mobile Oily Bird Care and Rehabilitation Trailer (MOBCART), and deployed supplies in strategic locations. These equipment and supplies are capable of reaching any location in California in 24 hours.

OSPR is building a facility at University of California Santa Cruz (UCSC) for veterinary care, rehabilitation and research on oiled marine wildlife. When completed in the winter of 1995 the facility will have cost approximately \$5 million dollars and will be capable of caring for at least 125 sea otters and be flexible enough to care for other species of marine animals and house ongoing research projects. From 1994-1997 a total of approximately \$6.5 million dollars will be used to establish an Oiled Wildlife Care Network for the entire California coast in conjunction with existing scientific, educational and wildlife rehabilitation facilities. Current plans call for centers to be developed in San Diego, Los Angeles, the Central Coast, the San Francisco Bay area and Arcata/Eureka. Minimum veterinary care standards, facility standards, and training required for all persons working on oiled wildlife in California will be proscribed. Members of the Network will share pertinent biomedical information, improve and standardize treatment protocols and cooperate in research.

Currently OSPR is funding research at several California Universities and at Hubbs/Sea World Research Institute. Research programs address the effects of oil on various organ systems in sea otters (using mink as a model), immediate detection of trace amounts of oil in the fur of live animals, characterizing the potential effects of oil on the immune response of sea otters and harbor seals including differentiating the effects of the rehabilitation process from exposure to oil, establishing baseline health data for pinnipeds and delineating populations at greatest risk of exposure to oil, and establishing baseline health information on key marine bird species. This research is designed to improve our ability to care for oiled marine wildlife, and to improve our ability to determine the long term impacts and synergistic effects of oil pollution on marine animal populations.

## PATTERNS OF INCIDENCE OF SPONGIFORM ENCEPHALOPATHY IN CAPTIVE WILD ANIMALS IN THE BRITISH ISLES

**James K Kirkwood, Andrew A Cunningham**, Veterinary Science Group, Institute of Zoology, Regent's Park, London NW1 4RY.

Concurrent with the bovine spongiform encephalopathy (BSE) epidemic, scrapie-like spongiform encephalopathies have been diagnosed in 21 captive wild animals of 9 species at or from 9 zoological collections in the British Isles between 1986 and the time of writing, October 1994. The animals in which the disease has been diagnosed have all been from the families Bovidae and Felidae, and comprise: 1 Nyala *Tragelaphus angasi*, 5 Eland *Taurotragus oryx*, 6 Greater kudu *Tragelaphus strepsiceros*, 1 Gemsbok *Oryx gazella*, 1 Arabian oryx *Oryx leucoryx*, 1 Scimitar-horned oryx *Oryx dammah*, 4 Cheetah *Acinonyx jubatus*, 1 Puma *Felis concolor* and 1 Ocelot *Felis pardalis*. For reasons presented in detail elsewhere, it is thought likely that at least some of these cases were caused by the BSE agent. The affected bovids were all from herds that were exposed to feeds that were likely to have contained contaminated ruminant-derived protein and the felids had, if only occasionally, been exposed to tissues from cattle unfit for human consumption. Features of the pattern of incidence in the kudu (all 6 cases were in one small herd) have prompted speculation that natural transmission may have occurred between individuals. Almost certainly, a wider range of species were exposed than have so far been affected, but it is not possible to infer variation in susceptibility between species at this stage because incubation period varies between species and other cases may yet emerge. It has been recommended that, pending further information, animals that may have been exposed to contaminated feeds or to other individuals that may have been, should not be used for reintroductions and that careful consideration should be given to movements of animals to other collections that are unlikely to have been exposed. We are grateful to our many colleagues who have provided information about the cases described.



## SEABIRD MORTALITY INCIDENT, NORTH SEA, FEBRUARY 1994

**James K Kirkwood, Susan M Thornton**, Veterinary Science Group, Institute of Zoology, Regent's Park, London NW1 4RY

In February 1994 large numbers of seabirds were found dead or dying along the east coasts of Britain from Shetland to Kent. Although firm data on numbers are lacking it was estimated that > 50,000 birds had died. The incident mainly involved Guillemots *Uria aalge* but other fish-eating birds including Razorbills *Alca torda*, shags *Phalacrocorax aristotelis* and little auks *Alle alle* were also found. A sample of 50 guillemots was collected from various sites for post mortem examination. One bird, a female from Shetland was in good body condition, weighing 980g, but all the others were in poor body condition with no, or almost no, body fat, wasted muscles, and very little or no food or digesta in their alimentary tracts. The mean bodyweight was 661g (SD 79.4, n = 49) and there was no significant difference between the sexes. Both subadult and mature birds were involved. The bird that died in good condition had a severe internal haemorrhage due to ruptured liver which may have been caused by trauma. In 3 cases oil may have caused or contributed to loss of condition and death (2 had oiled plumage and one had tar-like materia in its gizzard and duodenum) and in 2 other cases aspergillosis was diagnosed. Apart from emaciation, rather few pathological changes were found in the other 45 birds. Infestations of the proventriculus and gizzard with the nematodes *Contracaecum rudolphii* and/or *Streptocara crassicauda* were seen in several of the birds but it was considered that these were unlikely to have had a marked impact on health. Attempts to isolate viruses (at the MAFF Central Veterinary Laboratory) and bacteria that might have been responsible for large-scale mortality were unsuccessful and there was no evidence of unusual tissue levels of PCBs, pesticides or heavy metals (Heath Malcolm, ITE, personal communication). It appeared therefore that the majority of the birds had died from starvation as a result of reduced food availability. This conclusion is supported by the observation that debilitated birds taken to a wildlife hospital rapidly regained weight and recovered on feeding (Sandra Bonar, SSPCA, personal communication). It has been suggested that changes in food availability may have been related to unusually severe and persistent easterly winds associated with this incident.

We are grateful to the Royal Society for the Protection of Birds for supporting this work.

Institut for Avian Diseases  
Ludwig-Maximilians-University Munich  
(Director: Prof. Dr. J. Kösters)  
Veterinärstraße 3, D - 85764 Oberschleissheim  
Tel.: ..89 - 31561970; Fax: ..89 - 31561982

## **Ophthalmological Examination as a Precondition for the Rehabilitation of Feral Birds**

Rüdiger Korbelt

Perfect physical health is an essential precondition for returning feral birds to the wild. However, our understanding of the importance of diseases of the eye, the main sensory organ in birds, has hitherto been negligible since no appropriate ophthalmological examination techniques have been available for routine use. Inspection of the fundus in particular has been difficult to date due to a number of physiological and anatomical peculiarities of avian eyes (transverse striation of the internal ocular musculature and associated difficulties with the induction of mydriasis, a necessary preliminary for ophthalmoscopy; the absence of a tapetum lucidum).

Between January 1990 and July 1993, a total of 2,063 feral birds (132 species from 15 orders) from the Munich region underwent routine ophthalmological examination especially adapted for birds. This included ophthalmoscopy of the fundus using an indirect binocular ophthalmoscope in connection with so-called airsac perfusion anaesthesia. This technique, which has been specifically developed for ornitho-ophthalmology, permits detailed examination of the avian fundus. Ocular diseases were diagnosed in 11.7% (n = 239) of all feral patients. While 5.9% (n = 14) of the conditions were of infectious or unclear origins, the majority (88.2%; n = 210) were trauma-related lesions. Of 204 accident patients, most of whom were raptors, 30.9% (n = 164) demonstrated traumatic ocular lesions. It is conspicuous that in 84.1% (n = 53) of these cases massive traumatic lesions of the posterior segment were diagnosed while the anterior chamber remained unaffected. The lesions of the ocular fundus were mostly intravitreal haemorrhage which originated exclusively from the pecten in 59.5% (n = 97) of cases but less frequently from the choroid.

The results of the study showed that routine ophthalmological examination is an indispensable condition for rehabilitating feral birds. Ophthalmological diagnoses are a vital criterion in deciding whether to release birds, keep them in captivity (breeding programmes) or to euthanise them.

### **References:**

1. KORBEL R. Zur Problematik von Augenerkrankungen bei Wildvögeln. Kleintierprax 1991; 36: 152 - 5.
2. KORBEL R. Okulare Manifestationen systemischer Erkrankungen beim Vogelpatienten. Teil 1 und 2. Tierärztl Prax 1992; 20: 385 - 94 und 483 - 91.
3. KORBEL R. Augenkrankheiten bei Vögeln: Ätiologie und Klinik von Augenkrankheiten, Luftsack-Perfusionsanästhesie und ophthalmologische Photographie. Vet Habil, München 1994.
4. KORBEL R, MILOVANOVIC A, ERHARDT W, BURIKE S, HENKE Julia. The Aerosaccular Perfusion with Isofluran in Birds - An Anaesthetical Measure for Surgery in the Head Region. Proc 2nd Conf Europ Ass Avian Vet, Utrecht/NL 1993; 9 - 42.



#### PATHOLOGY AND TOXICOLOGY OF MARINE MAMMALS FROM BRITISH WATERS

**Thijs Kuiken**, Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada; **Peter M. Bennett**, **James K. Kirkwood**, Veterinary Science Group, Institute of Zoology, The Zoological Society of London, Regent's Park, London NW1 4RY, England.

Little is known about diseases in marine mammals around the coast of the United Kingdom, or of the possible effects of contaminants on marine mammal mortality. Therefore, a project was started in 1990 to carry out postmortem examinations on marine mammal carcasses from around the coast of England and Wales and collect tissue samples for toxicological examination. This project is coordinated by the Institute of Zoology, and funded in part by the U.K. Department of the Environment as a contribution to its coordinated programme of research on the North Sea.

Between 1990 and 1993, postmortem examinations were carried out on 338 carcasses according to a standard protocol. In addition, information was obtained on 52 carcasses examined before the project began. These carcasses were of the following species: 164 harbour porpoises (*Phocoena phocoena*), 96 common dolphins (*Delphinus delphis*), 70 grey seals (*Halichoerus grypus*), 19 harbour seals (*Phoca vitulina*), 13 striped dolphins (*Stenella coeruleoalba*), 7 bottle-nosed dolphins (*Tursiops truncatus*), 7 white-beaked dolphins (*Lagenorhynchus albirostris*), 5 long-finned pilot whales (*Globicephala melas*), 4 Atlantic white-sided dolphins (*Lagenorhynchus acutus*), 2 Risso's dolphins (*Grampus griseus*), 1 minke whale (*Balaenoptera acutorostrata*), 1 fin whale (*Balaenoptera physalus*), and 1 sperm whale (*Physeter macrocephalus*).

Incidental capture in fishing gear, which was found in 118 of the 390 carcasses (30%) was the most common apparent cause of death. The main species affected were the common dolphin (*Delphinus delphis*) (59 individuals), the harbour porpoise (*Phocoena phocoena*) (47 individuals), the white-beaked dolphin (*Lagenorhynchus albirostris*) (4 individuals), and the grey seal (*Halichoerus grypus*) (6 individuals). Criteria were established for diagnosing this cause of death: traumatic lesions associated with entrapment in fishing gear, lesions associated with suffocation, and evidence of recent feeding. It is recommended to obtain more information about the population status of marine mammals, the fisheries activity, and the interaction between marine mammals and fisheries in the waters around England and Wales.

To test the hypothesis that chlorinated hydrocarbons induce adrenocortical hyperplasia in harbour porpoises, we compared the size of the adrenal cortex in 28 harbour porpoises with the levels of chlorinated hydrocarbons (HCB, alpha-HCH, gamma-HCH, *p,p'*-DDE, *p,p'*-DDT, *p,p'*-TDE, dieldrin, and 25 individual chlorobiphenyls) in their blubber. There were no significant correlations, so that we found no evidence that the chlorinated hydrocarbons measured cause adrenocortical hyperplasia in harbour porpoises. However, harbour porpoises that died from a chronic cause of death (N=14) had a significantly higher adrenocortical volume ( $F_{1,23}=13.15$ ,  $P<0.01$ ), due to hyperplasia, than harbour porpoises that died from an acute cause of death (N=11). Therefore, adrenocortical hyperplasia probably resulted from chronic stressors associated with their cause of death, rather than exposure to chlorinated hydrocarbons.

We also examined the hypothesis that chlorinated hydrocarbons cause immunosuppression in harbour porpoises and increase their chance of dying from an infectious or parasitic cause of death. We compared the levels of chlorinated hydrocarbons in the blubber of harbour porpoises that had died from acute physical trauma (N=45) with those that had died of an infectious or parasitic cause of death (N=25). After correction for regional differences, we found no significant differences in the levels of chlorinated hydrocarbons measured between the two groups, and therefore no support for the hypothesis. It is recommended to repeat this study with a larger sample size. We did find that the body condition between harbour porpoises that died from acute physical trauma, an infectious or parasitic disease, and starvation, differed significantly.

Wildlife diseases in Russia and wildlife disease work.

**Eugeny KUZNETSOV**

## THE SAGIR NETWORK : PRESENTATION AND PROSPECTS

**François LAMARQUE**, Office National de la Chasse, Ferme de Saint Benoist, 5 rue de Saint-Thibault, 78610 AUFFARGIS, France.

**Jacques BARRAT**, CNEVA-Nancy - Laboratoire d'études sur la rage et la pathologie des animaux sauvages - B.P. 9 - 54220 MALZEVILLE, France.

Created in 1986 by the Office National de la Chasse (ONC), a governmental agency, to take over the national survey on abnormal mortality in game species initiated in 1972, the SAGIR network is a national system of surveillance of wildlife diseases. Its main goal is to bring to the fore the principal causes of wildlife mortality in order to propose adequate actions in the field (management and/or research). SAGIR is organized as a cooperative venture among ONC, the "Centre National d'Etudes Vétérinaires et Alimentaires" (CNEVA) in Nancy, the toxicology laboratory of the National Veterinary School in Lyon (ENVL), the "Départemental" Veterinary Laboratories (LVD) and the "Départemental" Federations of Hunters (FDC), the latter two forming the basic unit of the whole system. ONC grants a special financial aid to CNEVA Nancy and ENVL for their participation in SAGIR. These partners may intervene at various stages of the functioning of the network. Usually, hunters, members of FDC, are those who detect the abnormal mortalities of game in the field. In every Federation, a SAGIR representative is in charge of transmitting samples of dead animals to the LVD. Each corpse must be identified and accompanied by a special voucher. The "Départemental" laboratory performs the adequate tests (paid by the FDC) and communicate the first results to the FDC submitter and to CNEVA Nancy which is the national laboratory responsible for all data on wildlife pathology. (When intoxication is suspected, the LVD sends the appropriate samples to the toxicology laboratory at ENVL for further investigation). CNEVA Nancy gathers and handles all data from the "départemental" laboratories and synthesizes the information. This information then is communicated on a regular basis to ONC which sends it to the "Départemental" Hunters Federations. CNEVA is responsible for informing other partners as LVD, DSV (Direction des Services Vétérinaires). In case of high mortality occurrences, an emergency procedure is implemented by calling directly the Head of the "Division Preservation de la Faune" at ONC which is supposed to take the appropriate measures. As a warning system, SAGIR worked perfectly for the last eight years. It showed, for instance, the existence of VHD and EBHS in France as well as the effect of some pesticides (e.g. chlorophacinone) on game species. It has contributed efficiently to the monitoring of the 1992 hog cholera outbreak in the east of France. By the numerous laboratory tests made in this framework, SAGIR also obtained some reliable data on wildlife pathology. However, limiting factors occurring at each stage of the network, are preventing SAGIR from becoming a real epidemiologic-surveillance system. The main difficulty to reach this goal is the insufficient quantity and diversity of data collected. This scarcity has several causes that have been recently appraised. Some proposals to improve the functioning and efficiency of SAGIR are being studied by the management committee of this network and should be implemented at the very beginning of 1995.



### The epizootiology of louping ill in upland Britain.

Karen Laurenson, Peter Hudson, Hugh Reid, Upland Research Group, The Game Conservancy, Crubenmore Lodge, Newtonmore, Inverness-shire, PH20 1BE, and The Moredun Research Institute, 408 Gilmerton Road, Edinburgh, EH17 7JH.

Louping ill, a disease of sheep and red grouse, is caused by a flavivirus and transmitted by the tick, *Ixodes ricinus*. The virus causes a viraemia and leads to an encephalomyelitis, followed by death in some 10-60% of infected sheep and approximately 80% red grouse. Other species which act as hosts to the tick in upland areas, in particular mountain hares, red and roe deer, do not demonstrate a sufficiently high viraemia for feeding ticks to become infected and are not considered to be amplifying hosts for the virus.

The persistence of the disease is dependent of the presence of sheep, the most important host for both ticks and the virus. Our research has shown that the disease is distributed throughout upland Britain. The prevalence of infection in red grouse varies both spatially and temporally, with apparent endemicity in some areas and possibly epidemicity in others. Prevalence of infection in red grouse depends on host density, tick biting rate, but also the prevalence of virus in ticks. The removal, or effective removal by vaccination, of sheep as hosts should lead to the extinction of louping ill. In some areas, however, this had not occurred. We are currently exploring several hypotheses to explain this observation. Preliminary results suggest that a proportion of lambs are being infected in their first summer on moorland, before vaccination at 1 year of age. In addition, high densities of mountain hares and red deer are found on some moors and these can carry large numbers of ticks. Moreover, the role of these species in amplifying vector populations and the virus, by alternative transmission mechanisms, will be discussed.



CONTROL OF THE HEALTH STATUS OF BROWN HARE (*LEPUS EUROPAEUS* PALLAS ) IN RAVENNA PROVINCE, NORTH ITALY

**Lavazza A., Zanni M.L., Poglayen G., Marzadori F., Benassi M.C., Capucci L., Carpené E., Fabbi M., Magnino S., Tagliabue S., Roda R., Tasselli A.,**  
Istituto Zooprofilattico sperimentale della Lombardia e dell'Emilia - Via Bianchi 7  
25124 Brescia (ITALY)

Between July 1992 and July 1993 a survey has been conducted in the Ravenna province, North Italy, with the aim to assess the sanitary conditions of the European Brown hares (*Lepus europaeus* Pallas) living in that area, including both wild and captive reared animals as well as those imported from abroad for repopulation. The incidence of epidemic and zoonotic diseases such as European Brown Hare Syndrome (EBHS), Tularemia, Leptospirosis, Brucellosis and Lyme Borreliosis has been investigated.

A total of 398 hare sera, taken from animals imported from Poland and Czech Republic (150), from two hare farm (32) and from six different repopulating areas (216), were examined by serological methods. 93% of the samples tested positive for specific anti-EBHSV antibodies by ELISA, 6.8% for anti-*Leptospira* spp. by microscopic agglutination test (MAT), 0.35% for anti-*Brucella* spp. by agglutination test and 3.54% for anti-*Borrelia burgdorferi* by indirect immunofluorescence test whilst all the sera resulted negative for *Francisella tularensis*.

The organs of hunted hares or the carcasses of animals found dead (61) were submitted to the anatomo-pathological examination and to routine bacteriological investigations. *Yersinia pseudotuberculosis* was isolated from 22.95% of the animals; *E. coli*, *Pasteurella* spp., and *Streptococcus* spp. were also identified in a lower number of cases. Virological examination for EBHSV were conducted by ELISA and Immuno Electron Microscopy on the liver homogenates of 53 hares; 3 wild hares and 3 captive hares originating from one farm resulted positive.

The presence of heavy metal residual products in the liver, kidney and heart of 25 hares (19 wild and 6 captive) was also verified. Physiological levels of zinc in the liver and kidney, variable amounts of cadmium, levels of copper lower than the threshold of toxicity and different levels of iron according to the type of life of the animals (wild or captive) were found.

The degree of parasitic infestations was determined by coprological examination of the faeces of 105 hares (32 wild, 6 captive and 55 imported from Czech Republic or 12 from Poland) and by necroscopic examination of 18 carcasses (6 wild, 6 captive and 6 six imported from Czech Republic). Coccidia prevalence (*Eimeria* spp.) was 33.3%, 100% and 51.7% for respectively captive, imported and wild hares. Trichocephala were detected mainly among imported animals (74.5% from Poland and 100% from Czech Republic) as well as Strongyles (67.3% from Czech Republic and 100% from Poland). At necropsy 50% of the hares imported from Czech republic and 18.8% of the wild ones resulted positive for *Trichuris leporis*.

Moreover, samples of hair from 270 hares were taken and examined by cultural methods for the presence of dermatophytic fungi. 4.1% of the samples resulted positive for four different species of dermatophytes (*Trichophyton mentagrophytes*, *T. terrestre*, *Scopulariopsis* spp. and *Crysosporium* spp.).

### CONTAGIOUS ECTHYMA IN MUFLON (*Ovis musimon*)

**D.F. Luco, C. Gortazar, J. Marco, J. Lucientes, F. García-Marín; J.A. García de Jalón & M. de las Heras, Dept. Animal Pathology, Veterinary Faculty, Miguel Servet 177, 50.013 ZARAGOZA, SPAIN.**

In spring 1991 an outbreak of contagious ecthyma, affecting muflon only, of all age classes, occurred in a private hunting enclosure in Zaragoza Province (Northeastern Spain), devoted to production and intensive hunting of several big game species. The hunting enclosure, of a surface of 400 ha, is situated on a hillside with open evergreen-oak woodland and stony ground, poor in natural trophic resources. Animals present in the enclosure were 160 muflon, 180 red deer (*Cervus elaphus*), 320 fallow deer (*Dama dama*) and 50 wild boar (*Sus scrofa*). Food was provided in feeding troughs.

About 75% of the muflon died due to ecthyma. Sick individuals were cachectic, tame, and showed abundant ptyalism. Macroscopic lesions mainly were located on the lips and in the oral cavity. Sick muflons showed a proliferative cheilitis affecting the whole epithelial surface of the lips. Gingivitis, stomatitis and dipthero-necrotic palatitis were observed also, especially surrounding the incisives and the bony palate. The tongue showed dipthero-necrotic glossitis and ulcerations.

Histologically, the lip epithelium showed vacuolar degeneration of the stratum spinosum, with eosinophilic intracytoplasmatic inclusion bodies, vesicles and papules with neutrophilic infiltrations. Extensive areas of the epithelium were necrotic, infiltrated by neutrophils, fibrin and bacteria.

The high mortality in the population and the lesions observed support the diagnosis of contagious ecthyma. Outbreaks in wild animals usually are related with contact to domestic livestock (sheep or goat). In this case, no direct contact with livestock exists, but the causative agent may have been introduced into the enclosure with the food or by sheep grazing close to the fence. We ignore whether any of the other species present in the same enclosure has developed some mild and inapparent form of the disease or not.



## SPIROCHAETAL INFECTIONS IN HARES IN THE NETHERLANDS

J.T. (Sjeng) Lumeij. Division of Avian and Exotic Animal Medicine, Utrecht University, Yalelaan 8, 3584 CM Utrecht, NETHERLANDS

A treponemal infection in two wild European brown hares (Lepus europaeus) from the province Flevoland in The Netherlands was diagnosed by means of serology and histological demonstration of spirochetes in skin lesions in December 1992.

T. pallidum hemagglutination assay titers (TPHA; Fujirebio, Tokyo, Japan) were 1:20,480 and 1: 40,960, while Venereal Disease Research Laboratory (VDRL) test titers were 1:64 and 1:8 respectively (Wellcome Diagnostics, Dartford, England). Both sera were positive (2+) in the fluorescent treponemal antibody absorption (FTA-ABS) test. In an immobilization assay with Percoll-purified treponemes of the Nichols strain of T. pallidum that was propagated in rabbits the two hares showed a significantly lower prevalence of surviving treponemes in comparison with the prevalence in negative control hares (50 versus 70% after 5.5 h;  $P < 0.01$ , one sided t-test for unpaired observations)

On histological examination both hares showed an inflammatory reaction in the prepuce, consisting of plasma cells, lymphocytes and segmented neutrophilic leukocytes. Many black spirochaetes, which were morphologically similar to Treponema pallidum and T. paraluiscuniculi, could be demonstrated against a light yellow background in the superficial epithelial layer of the prepuce using the Bosma-Steiner staining method.

To fulfill Koch's postulates the organisms was harvested from lesions in hares and injected intratesticularly in rabbits. Artificially infected rabbits showed seroconversion and clinical disease. Clinically healthy and seronegative hares were in turn infected with material from lesions in these rabbits and showed also seroconversion and histological lesions which confirmed the infection.

Serological examination revealed that the infection is widespread in the wild hare population, since about 60% was of a representative sample of the hare population (n=100) of an area of 100,000 ha (province Flevoland) was seropositive in TPHA.

16S rRNA of the spirochaete which was classified as 'Treponema paraluisleporis' was compared by DNA probe technology with Treponema paraluiscuniculi, T. pallidum subsp. pallidum and T. pallidum subs. pertenue. The antigenic cross reactivity between these spirochaetes was investigated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and Western blotting (immunoblotting) techniques. No differences between the various spirochaetes were discovered with these two techniques.

## ***Game Health under the Influence of Environmental Pollutants and Pesticides***

Walburga Lutz, Forschungsstelle für Jagdkunde und Wildschadenverhütung, Forsthaus Hardt, D53229 BONN, GERMANY

The health of game in general as well as of individual game species reflects to a high degree external conditions which influence decisively the physical development and natural resistance. During the course of this century, wildlife habitats have been reduced considerably; what remains, has been disjointed, spoiled by uncontrolled (urban) development, used for recreational activities and is under intensive cultivation.

In habitats that have been reduced and impaired in this manner, environmental hazards come from ozone, ultraviolet radiation and environmental pollutants (ecotoxines) from air, water and soil which work through the food chain.

Acute and chronic effects of heavy metals, pesticides, ozone, acid rain etc as well as of natural toxins influence individuals and populations.

Examples of the heavy metal contamination of roe deer and hare, fluoride intoxication of roe deer, assessment of primary and secondary pesticide poisoning as well as the irritating and caustic effects of pesticides in experiments will be given.

For the protection of wildlife and game health ecotoxicological studies on wildlife as well as monitoring of the effects of pesticide use are vital.



## **WILDLIFE DISEASE IN THE UNITED KINGDOM**

Steven McOrist, University of Edinburgh, Veterinary Field Station, Easter Bush, Midlothian EH25 9RG, UNITED KINGDOM

As with many other communities, there is now a growing awareness and interest in wildlife management and diseases in the U.K. In the U.K. however, most wildlife are usually under the control of the landowner upon whose land they live. There is no tradition of National Parks or other Governmental body with responsibility for wildlife management. Partly as a result of this, Treasury funds derived from hunting activities are generally not targeted for wildlife management or research. Into this void has sprung a large number of small and large charitable and private organisations in the area of wildlife management and disease. These organisations are generally involved in certain areas of wildlife, such as wildlife rehabilitation groups or zoo veterinary work. The people involved in wildlife disease in the U.K. therefore greatly welcome the formation of the European Chapter of the WDA, hoping that it will broaden horizons, improve research funding potential and increase the number of effective cooperative programmes into wildlife disease.

Game animals in the U.K., such as red deer, grouse and hares have been relatively well studied, with several organizations and projects studying the impact of diseases on their populations.

Marine mammals and seabirds also have organized projects examining their disease status, with an aim to develop management strategies to reduce the effects of pollution and infectious diseases.

Other wildlife, including non-game birds and mammals are generally poorly studied. One reason is the fragmented nature of the availability of proper disease investigation facilities and expertise in the U.K. The major priority for WDA involvement in the U.K. would probably be assisting the gradual path towards the recognition of the need for a user-friendly, well funded wildlife disease centre.

### TOWARDS AN ELIMINATION OF FOX RABIES IN FRANCE BY ORAL VACCINATION

**Eric MASSON**, CNEVA Nancy - Laboratoire d'études sur la rage et la pathologie des animaux sauvages - B.P. 9 - 54220 Malzéville, FRANCE

The vulpine rabies epizootic made its appearance in France in 1968 and gradually spread over the entire north eastern quarter of the country, despite disease prevention measures. The research initiated from the 1970's onwards concerning fox immunisation found concrete form from 1986 through the realisation of campaigns distributing baits containing a living virus vaccine which worked when consumed by the animal.

These campaigns were progressively spread over the entire infected territory and the results obtained proved to be very satisfactory. After three campaigns, roughly 70% of the foxes were protected through vaccination and the number of rabies cases had decreased by 90%.

Between 1989 and 1993, the disease had been eradicated over more than 90,000 km<sup>2</sup> and the annual total of diagnosed animal rabies cases in France went down from 4212 to 218.

However, the attainment of this elimination could at all times be jeopardised by the reappearance of endogenous and exogenous sources. Such an attainment also necessitates perfect international collaboration for concerted planning and execution.

## A NATIONAL PROGRAM FOR WILDLIFE DISEASE INVESTIGATIONS IN SWEDEN

Torsten Mörner, Division of Wildlife, National Veterinary Institute, PO Box 7073, 750 07 Uppsala, Sweden

Diseases of wildlife in Sweden have been monitored in a regular program since 1945 at the National Veterinary Institute. This program is to a large extent realized through cooperation with the Swedish Hunters Association, and also to some parts financed by money originating from hunters. The majority of the investigated animals is game, including farmed game, but almost all wild animal species are also investigated.

The populations of moose (Alces alces) and roe deer (Capreolus capreolus) in Sweden are among the most dense in the world. In moose, meningeal worm (Elaphostrongylus) occasionally causes mortality in moose calfs. A newly discovered disease, named "Älvsborgssjukan", mainly characterized by chronic diarrhea, mucosal ulcerations and loss of weight, occurs in moose in all ages from all parts of Sweden. The etiology of the disease is so far unknown. A similar disease is also observed in roe deer.

High mortality is observed some winters in the roe deer population due to starvation. Other common causes of death in roe deer are predation, traumatic injuries, bacterial infections and lung worms in fawns.

In farmed deer the most important disease today is bovine tuberculosis, which has been discovered in some farms starting in 1991.

Diseases in hares (Lepus timidus, L. europaeus) are dominated by infectious diseases like the viral disease - "European brown hare syndrome" and by bacterial infections caused by Francisella tularensis, Yersinia spp, Escherichia coli, Listeria monocytogenes, Erysipelothrix, and Staphylococcus spp.

In red fox (Vulpes vulpes) the most common disease is mange, caused by Sarcoptes scabiei. This disease is also found in arctic fox (Alopex lagopus), wolf (Canis lupus), lynx (Felis lynx) and pine marten (Martes martes). Sarcoptic mange has not been observed in the badger (Meles meles).

In ducks, geese and swans the most common diseases found are parasitic infections. Starvation during winter, as well as oil pollution are also important causes of death. Lead poisoning from ingested lead pellets are observed occasionally.

In Galliform birds parasitic diseases are quite common. In capercaillie (Tetrao urogallus) a common disease is nonpurulent meningoencephalitis. The etiology of this disease is unknown.

In other birds parasitic and bacterial infections are observed regularly. Infections with Salmonella typhi-murium are frequently observed in bull-finches (Pyrrhula pyrrhula), finches (Chloris chloris, Carduelis spp.) and black-headed gulls (Larus ridibundus).

The program also includes monitoring of environmental pollutants such as lead, cadmium and mercury in wild animals.



## LIVER TUMOURS IN ROE DEER IN BRITAIN

**Ranald Munro**, Lasswade Veterinary Laboratory, Bush Estate,  
Penicuik, Midlothian EH26 0SA, Scotland

Hepatocellular tumours appear to be considerably more common in roe deer in northern mainland Britain than in other species of deer. However, the distribution of affected deer is uneven. Of 40 hepatocellular tumours in roe deer submitted for examination between January 1992 and March 1994, only a single case originated south of 55°N. Additionally, more tumours were detected on the east side of the country than on the west. Prevalence rates were calculated on the basis of the number of tumours detected divided by the number of adult deer culled during the period of study. These rates ranged from 5 per 1000 in north eastern England and one area of eastern Scotland to 1.5 per 1000 in north Scotland and 0.6 in west Scotland. Equivalent rates for cattle and sheep in Britain are 0.028 and 0.007 per 1000. No relationship could be established between tumour occurrence and concurrent liver disease. A dietary factor is suspected of being the underlying cause of the hepatomagenesis and work is continuing on this aspect.



## OCCURRENCE OF SELECTED VIRAL PATHOGENS IN CERVIDES AND WILD BOAR IN SOME AREAS OF GERMANY.

**Thomas Müller, Matthias Kramer, Jürgen Teuffert, Dagmar Beier,** Institute for Epidemiological Diagnostics and Institute for Epidemiology, Federal Research Centre for Virus Diseases of Animals, Seestraße 55, 16868 WUSTERHAUSEN/Dosse, GERMANY

From an epidemiological stand point the knowledge of the health status in indigenous wildlife is very important. On the one hand, wildlife can be a potential reservoir for economically important diseases in domestic animals. On the other hand, the health status has an influence on wildlife management and on the commercialization of the venison. Because of its ecological and agricultural peculiarities East Germany is known for its high population densities in wildlife, especially in wild cervides and wild boar.

In former times investigation in wildlife had been only of sporadic character. In 1991 until 1994 a wildlife disease monitoring project was initiated in the German Federal State Brandenburg in cooperation with local veterinary authorities under new agricultural conditions. Blood samples were obtained during the yearly hunting season by special veterinarians. Animal specific data like sex, age, area code, the date of hunting also the date of sending to the laboratory were exactly registered. Serological investigations were carried out in view of the occurrence of Infectious Bovine Rhinotracheitis (BHV1), Bovine Virus Diarrhea (BVD), Enzootic Bovine Leucosis (EBL) and Maedi/Visna (MV) in wild cervides and ovides. Serum samples of wild boar (Sus scrofa) were investigated concerning the antibody prevalence to Aujeszky's Disease Virus (ADV), Classical Swine Fever Virus (CSFV) as well as to Porcine Reproductive and Respiratory Syndrom Virus (PRRSV).

During the last four years a total of 427 blood serum samples from fallow-buck (Dama dama), 682 from Red-deer (Cervus elaphus), 1,229 from Roe-deer (Capreolus capreolus), 53 from muffle (Ovis ammon) and 3,574 from wild boar (Sus scrofa) were screened in different serum neutralization tests or ELISA's for specific antibodies.

There is evidence for the occurrence of BVD and BHV1-cross reactions in Red-deer (Cervus elaphus) and Roe-deer (Capreolus capreolus). In some limited areas comparable high prevalences of anti-ADV-antibodies in wild boar (Sus scrofa) were observed.

## CHRONIC AND PROLIFERATIVE PNEUMONIA IN ROE-DEER

**Alessandro Poli<sup>1</sup>, Roberta Di Martino<sup>1</sup>, Carla Testa<sup>1</sup>, Domenico Cerri<sup>1</sup> and Mauro Pistello<sup>3</sup>**, Departments of <sup>1</sup> Animal Pathology and <sup>2</sup> Biomedicine, University of Pisa, Viale delle Piagge, 2 I-56124 PISA, ITALY

Since August 1993 to September 1994 samples from forty roe-deer, killed in different areas of Tuscany in the Central Italy, were examined. Liver, kidney, spleen, visceral and massal lymph nodes, heart and lung were routinely processed for paraffin embedding. Sections were stained with haematoxylin and eosin for histopathological studies. Parasitological examinations were carried out on lung and intestine samples and sera were used to detect antibodies to Brucella, Chlamydia and different serovars of Leptospira interrogans. Pulmonary alterations were frequently observed in examined animals. Chronic pneumonia characterized by the presence of small areas of consolidation especially of the cranial lobes was observed in 36 out of 40 examined roe-deer. Histologically, the main types of lesions observed were: a catarrhal bronchopneumonia with an exudate rich in neutrophils and presence of peribronchiolar and perivascular infiltrates of lymphocytes, plasma cells and macrophages in 12 of examined roe-deer; a chronic proliferative pneumonia with different degrees of peribronchiolar lymphoid hyperplasia, presence of nodules of mononuclear cells, with marked smooth muscle hyperplasia and fibrosis in 22 animals; a verminous pneumonia, histologically characterized by eosinophilic infiltration, presence of giant cells and larval debris in 16 subjects. Serologically, all the animals were negative for the presence of Brucella, Leptospira and Chlamydia specific antibodies. Since the chronic proliferative lesions were reminiscent of lentivirus induced pneumonia nested PCR analysis using primers deduced from a region of Pol conserved in all lentiviruses, was carried out on lung tissues from the subjects with chronic progressive pneumonia, but all the samples gave negative results. In spite of the results of serological investigations immunohistochemical studies to localize Chlamydia and Mycoplasma antigens in formalin fixed paraffin embedded material are in progress.