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Virginia Tech and Virginia State

Virginia's Land-grant Universities

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**PREGNANCY DIAGNOSIS IN THE BITCH:
THEORY AND PRACTICE**

Pregnancy diagnosis in the bitch is important for a number of reasons. Early detection of pregnancy will give the breeder time to prepare for the birth process and arrival of puppies. You will also know when the birth process is complete if you know the exact number of puppies beforehand. Finally, if you are planning on your bitch having a litter of puppies, you can plan the preventative medicine care, e.g., vaccinations, deworming, removal of external parasites and testing for Brucellosis. To better understand the different protocols for pregnancy diagnosis, the breeder must be familiar with the basic cycle of the dog.

Ultrasonography is demonstrating that the bred bitch often does not become pregnant. This is primarily a management problem rather than an infertile bitch. In addition, the early pregnancy (15 to 21 days) may be resorbed prior to determination by conventional pregnancy detection methods.

The least expensive and most commonly used method of pregnancy determination is abdominal palpation. The abdominal palpation of pregnancy between days 21 and 35 may confirm pregnancy. However, to the inexperienced palpator or with the extremely apprehensive bitch, abdominal palpation may give erroneous results. Ultrasonography is the most accurate early method of determining the stage and viability of pregnancy (fetal heart beat), but one of the least accurate in determining fetal number. An ultrasound machine is expensive and many not be available to all breeders. Radiology allows the precise determination of the number of puppies. At this stage, fetuses have finished the majority of the developmental divisions and the chance of birth defects (teratogenicity) is minimal.

Two experimental techniques are the relaxin hormone assay and the acute phase protein test. The relaxin hormone assay is a hormone that is only present in the pregnant bitch, which is in contrast to progesterone which occurs in the pregnant and non-pregnant bitches. A visual color test is being developed and will hopefully soon be available. The acute phase protein test is being offered by a British company. The dog's serum must be collected and then sent to the company. This test is only effective from days 35 or 40 (day number varies with the information source) and gives no assessment of puppy number. It is evident that ultrasonography is a far superior technique to the acute phase protein test.

#	Method of determining pregnancy	First Day	Last Day
1	Ultrasonography	18	Birth
	Ultrasonography (fetal heart beat)	24	Birth
2	Palpation	21	35
3	Radiology (X-ray)	45	Birth
4	Acute phase protein assay (experimental)	40 (35)	Birth
5	Relaxin Assay (experimental)	25 (30)	Birth

To compare pregnancy diagnostic protocols, the two primary criteria used are: 1) how early can an accurate diagnosis be made and 2) can the number of puppies be accurately determined? In summary, the best method of determining pregnancy is an ultrasound at day 18 to 22 and a radiograph at day 45 to 50. The more economic method is palpation on day 22 to 26 and a radiograph at day 45 to 50. --Dr. Richard A. Fayrer-Hosken, U of Georgia, Vet Newsletter, December 1990 as reported in Penn State Veterinary News, August 1991, Penn State University, University Park, PA.

ANIMAL RIGHTS ACTIVISTS

What do we as veterinarians know about the Animal Rights movement and its members? To be honest, not a great deal. We must realize that this high profile movement consists of something like 7,000 groups and organizations, and 15,000,000 members with 75 million dollars in assets. They generate the third largest volume of letters to their elected representatives of all activist causes in this country. They are predominately mainstream Americans, educated, informed and capable of influencing public opinion.

They use the standard activist pressure techniques:

- Medica exploitation, particularly television, which brings the problem into the homes of viewers.
- Direct mail, which can often profit from a 2% return.
- Lobbying to keep pressure on legislators.
- Setting the agenda to determine where and when the battles are fought.
- Building coalitions to multiply numbers and effectiveness.

A professional survey of Animal Rights activists was taken on June 10, 1990 at the March for Animals in Washington, DC, which attracted approximately 30,000 participants. The survey indicated these activists hoped to achieve publicity, influence legislation, and have fellowship with other activists as a result of the march. Other survey results:

Mean participant age:	30
Gender:	68% Female
Race:	93% White
Education:	
Some College:	79%
College Graduate:	22%
Graduate or Professional Degree:	18%
Employment:	68% Employed (government, education, health care)
Income Median:	\$33,000
Politics:	Predominately moderate liberals
Background:	Overwhelmingly urban (childhood also)
Opinion of Veterinarians:	73% Approval of the profession
Scientific Research:	Over 50% - "does more harm than good"
Strong pet connection in becoming an activist.	

Interest/activist groups are usually made up of four groupings; the influential members with a strong ideological base, the active members who are "joiners", the attentive members who read and listen to information on the group's cause, and the general members who tend to be somewhat vague and passive. This breakdown certainly applies to the Animal Rights movement.

We must remember that special interest groups are at the very core of the American political system. Many of us are active members of such groups and value our right to participate in our country's political process this way.

Summary of a presentation at the American Association of Extension Veterinarians annual meeting in Seattle, Washington, July 28, 1991 by Dr. William Lurch and Mr. Wes Jamison, Oregon State University, Corvallis, OR as reported by Kent Roberts, DVM, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, Virginia.

FELINE LEUKEMIA DETERMINANTS

There is a remarkable age-related susceptibility to FeLV. Kittens less than 12 weeks of age are highly susceptible and easily infectable, but after 16 weeks of age become difficult to infect.

The influence of dose is displayed by the observation that more FeLV-related disease is generated from infection in multiple households and catteries than in free-roaming cats from single cat households. Serologic studies have suggested that transmission of FeLV in the latter community is relatively high, since antibodies to virus-associated antigen can be found in 50% of urban and suburban cats. This suggests that the frequent, but intermittent, nature of the transmission at lower doses and among weaning cats tends to immunize rather than overwhelm the immune systems of these cats.

In the past, the prevalence of infection was related to the incidence of FeLV-related disease. This has changed. With the control of infection in pedigree (multiple cat) households, most FeLV diseases are now seen in domestic short-haired cats kept as individual pets.

Virus type is also important. There are 3 different FeLV subgroups - A, B and C. FeLV-A is mildly antigenic and is efficiently transmitted. It causes minimal disease symptoms. When mixed with FeLV-A, the B and C FeLV subgroups are more efficiently transmitted, undergo genetic recombination and mutation within infected cells, and produce more pathogenic virus effects. FeLV-C is associated with non-regenerative anemia and FeLV-A recombinant, with cellular myc oncogenes, induces rapid leukemogenesis. --As reported in *Animal Health Beat*, Vol. 7, No.6, August, 1991, University of Nevada - Reno.

DIAGNOSIS OF CLINICAL LYME DISEASE

Due to media coverage, the attention given to Lyme borreliosis in man and animals is increasing, along with confusion about its diagnosis and treatment. The Centers for Disease Control (CDC) is attempting to (re)assess the case definition of human Lyme borreliosis, and there also seems to be a need for such a definition in animal medicine. Our experience with Lyme disease in animals indicates that the following diagnostic criteria are important: (1) The animal is carrying or has been exposed to *Ixodes dammini* ticks (for instance, the animal is often outdoors in an area common to deer). (2) The animal has signs of (shifting) lameness or joint swellings, sometimes preceded by a febrile period and/or anorexia. (3) Anti-*Borrelia burgdorferi* antibodies are detected in the animal's blood. (4) The animal responds well to chemotherapy (although it may relapse once treatment is stopped). An animal strongly suspected of having Lyme disease should have at least 3 of the 4 listed criteria. Early treatment is important (tetracycline, Amoxicillin or related compounds for at least 3 to 4 weeks). A canine vaccine is now available and other vaccines may become available in the near future. Vaccinated animals do sero-convert, which will further reduce the specificity of presently used antibody detection tests. Culturing the spirochetes from animal materials is not a reliable diagnostic alternative. Consequently, diagnosis of Lyme disease will remain tentative until, in the far future, better diagnostic tests (including the polymerase chain reaction detecting *Borrelia* DNA strands) become available, specific and economical. --*Veterinary Diagnostic Newsletter*, College of Veterinary Medicine, Michigan State University, Vol. 7, No. 3, 1990.

NORTH AMERICAN VETERINARY CONFERENCE

The 9th annual North American Veterinary Conference (formerly Eastern States) is scheduled for January 11-16, 1992 at the Marriott World Center in Orlando, Florida.

KENNEL COUGH

In an epidemiologic study of the incubation period and clinical signs of kennel cough, agent-specific incubation periods were inferred from the vaccinal status of affected dogs. The incubation period for *Bordetella bronchiseptica* infection was 6.5 days (2 to 14 days) and 4.5 days (1 to 8 days) for canine parainfluenza virus (CPIV) infection. Local clinical signs (cough, nasal discharge and gagging/retching) were present in animals in all vaccinal categories. One or more systemic clinical signs (pyrexia and anorexia) were identified in 32 percent of cases. No association was detected between vaccinal status against *B. bronchiseptica* and CPIV, and clinical signs.

Kennel cough (infectious tracheobronchitis) is a syndrome associated with contagious canine respiratory disease occurring commonly, though not exclusively, when dogs are kept in groups. Its etiology is multifactorial: several types of bacterium and virus are involved, both alone and in combination. *Bordetella bronchiseptica* has been isolated from natural outbreaks of kennel cough and is considered to be the principal cause of the disease. CPIV has frequently been recovered from outbreaks and an increase in the monthly average titer of CPIV hemagglutination-inhibiting antibodies reported during summer months, when kennel cough usually "peaks", is a circumstantial indication of the virus' relevance. Indirect evidence for the greater importance of *B. bronchiseptica* relative to CPIV was demonstrated by a larger reduction in risk of developing kennel cough in *B. bronchiseptica*-vaccinated dogs than in CPIV-vaccinated animals, when these vaccines were combined with routine ones against canine distemper virus (CDV) and canine adenovirus (CAV) infection.

Natural infection with *B. bronchiseptica* has been associated with a paroxysmal, moist, sometimes productive cough, lasting one to three weeks, additionally induces an acute purulent tracheobronchitis and rhinitis. The incubation period ranges from three to 10 days and coughing lasts for up to two weeks. However, there are different strains of *B. bronchiseptica* displaying a spectrum of virulence, and inapparent infections can occur.

Natural canine parainfluenza virus infection is associated with pyrexia, and coughing, lasting a few days to a few weeks, and serous to mucopurulent nasal discharge. Experimental infection with CPIV results in either inapparent infection or mild disease with an incubation period of 7 to 9 days. A mild cough, sometimes induced only after laryngeal palpation, and slight nasal discharge may be present, and there is usually no fever. Most "pure" CPIV infections are therefore considered to be inapparent.

Canine adenovirus, type 2 (CAV-2), also has been identified in natural outbreaks where signs included fever, slight anorexia and a harsh dry cough lasting up to 12 days; pneumonia and conjunctivitis occurred in some dogs. Respiratory disease characterized by coughing also has been associated with infection of young dogs with CAV type 1. Experimental infection with CAV-1 or CAV-2 is associated with mild clinical signs, namely transient cough, nasal discharge and anorexia.

However, the effect of infection with specific bacteria and viruses per se cannot be readily identified in natural outbreaks because many infections are mixed and experimentally-induced mixed infections involving CPIV, CAV and *B. bronchiseptica* may show more severe clinical signs, including anorexia and lethargy, than uncomplicated infections. It is thus difficult to associate a particular microbe with a particular syndrome.

It has been concluded that there are two main forms of kennel cough, each with an incubation period of three to 10 days. One is common in autumn and is found in animals that are vaccinated against CDV and CAV infections, where coughing may be followed by retching and vomiting. The syndrome is usually mild and pyrexia is absent, although some cases may develop a bronchopneumonia. This

is consistent with *B. bronchiseptica* and CPIV infections uncomplicated by CDV and CAV infections.

The second form commonly occurs in dogs with an unclear routine vaccinal history, is not seasonal, and demonstrates a wide range of clinical signs than the first. The cough may be productive; rhinitis, conjunctivitis and pyrexia may be present and animals may be dull and anorexic. This more serious syndrome represents a condition with a potentially more complex etiology than the first, including infection with CDV and CAV, and which may be mixed with infections with other organisms also.

Recent work suggests that the clinical manifestations of kennel cough may be changing, with an increase in the frequency of systemic disease. --As reported in *Animal Health Beat*, Vol. 7, No. 6, August 1991, University of Nevada - Reno.

COLLEGE NEWS

Robert Scott Pleasant, VMRCVM, Class of 1984, has joined the faculty as an equine field service clinician. Scott is from Abingdon, received a BS in biology from VPI & SU in 1980, and practiced in Smithfield, Ashland and Virginia Beach, Virginia following graduation. In 1988, he entered a residency in equine surgery at the University of Illinois, receiving his MS in June 1991. Scott and his wife, Kelly have a son.

Dr. Jeff Wilcke recently passed his board examinations to become a Diplomate of the American College of Veterinary Clinical Pharmacology. This was the first time this competitive exam was offered.

CONTINUING EDUCATION OPPORTUNITIES VMRCVM CE PROGRAMS - FALL 1991

<u>Date</u>	<u>Program</u>	<u>Location</u>	<u>Hours</u>
**November 1-2	Gastrointestinal Endoscopy	Blacksburg	10 hours
**November 22-23	Practical Eye Surgery	Blacksburg	10 hours
*December 6-7	Wound Management & Reconstructive Surgery	Blacksburg	10 hours
*December 13-14	Small Animal Dentistry	Blacksburg	10 hours

**Sold out/limited enrollment
*Limited enrollment

Note: Program brochures are mailed six-eight weeks prior to the course dates. Course reservations cannot be accepted until the brochures are mailed.

For CE course information, please contact: Kent Robert, DVM, VA-MD Regional College of Veterinary Medicine, Blacksburg, VA, (703) 231-7181.

THOUGHT FOR THE MONTH

There ain't hardly no business been got here that ain't been went after.

--Sign in a farm implement business showroom.

MAILING LIST UPDATE

We need your help in our continuing efforts to update our mailing list of veterinarians in Maryland, Virginia and neighboring states. This list provides the labels for mailing Virginia Veterinary Notes and our continuing education program brochures.

Please assist us by making any of the following additions or corrections:

- 1. New addition (not receiving mailings at present)
- 2. Change of address
- 3. Delete from mailing list

Preferred Address

Practice Type:

- Small Animal
- Mixed
- Food Animal
- Equine
- Specialty

Old Address

Questions/Comments on newsletter or CE programs

Please mail to:

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 Blacksburg, VA 24061-0442

Thank you,

Kent C. Roberts, D.V.M.

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