The primary mission of the Kansas State Veterinary Diagnostic Laboratory (KSVDL) is to develop and deliver accurate, innovative and timely diagnostic and consultative services to the veterinary and animal health community in Kansas and the nation. The KSVDL is a full-service, AAVLD-accredited laboratory, offering a complete range of diagnostic services for all species.

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Visit our website at: Web: http://www.ksvdl.org
Diagnostic Insights welcomes your suggestions for future articles or comments about current articles.
Send your ideas to Barbara Barkdoll at bbarkdol@vet.k-state.edu.
Diarrhea Outbreaks in Group-Housed Puppies: Problem Solving Basics

by William Fortney, DVM, Assistant Professor

Diarrhea is one of the most common and potentially serious problems encountered in group-housed puppies. Such problems are usually associated with boarding kennels, obedience classes, doggie care facilities and foster homes. Fortunately, most cases of diarrhea are either self-limiting or respond to empirical therapies; therefore, the definitive cause is seldom confirmed or even investigated.

The most common etiology of diarrhea outbreaks in puppies involves one or more infectious agents. However, a suppressed immunity from poor nutrition or environmental stressors such as overcrowding or the stress associated with weaning or shipping acts synergistically with an increase in morbidity and/or mortality within the facility. Inadequate cleaning/disinfection protocols combined with poor disease outbreak containment practices will facilitate the dissemination within the facility.

At the Kansas State Veterinary Diagnostic Laboratory it is not uncommon to find more than one “infectious” agent involved in the pathogenesis of a group-housed puppy presented for diarrhea. In addition to the common Streptococcus (CPV, 2a, 2b, 2c), the agents commonly found in common group-housed puppies in Kansas include Canine distemper virus, Canine adenovirus 1, Canine coronavirus, coccidiosis, bovovirus, Giardia sp., enterotoxigenic Clostridium perfringens, Clostridium difficile, enteropathogenic Escherichia coli and occasionally Salmonella sp.

While the KSVDL has the expertise and the diagnostic capabilities to identify the specific infectious agents involved in cases of puppy diarrhea, those contributory environmental and/or poor management practices cannot be detected by any laboratory methodology. Therefore, it goes without saying, the key to solving the management of diarrhea begins with a thorough knowledge of the facility, including their management practices, combined with a complete diagnostic workup.

10 Steps to Success

1. There is no substitute for an on-site visit to the facility (animal shelter, kennel, pet shop, etc.).
2. Always investigate for possible immune system stressors.
3. Review antihistamine and vaccination protocols.
4. Carefully evaluate the diet/nutrition and sick puppy segregation protocols. Infected fonts (boots, cleaning carts, boxes, etc.) are common causes of disease spread throughout the facility.
5. Since endemic problems (diseases firmly established in the kennel) are difficult if not impossible to eradicate, shifting to control” measures is a prudent practice. Canine parvovirus 2 virus (CPV2), hookworm, Giardia sp., and Leptospirosis are examples of such problems.
6. Asymptomatic carriers often act as the continuous or periodic sources of CPV2, Giardia sp., coccidia, Clostridium sp., and E. coli to susceptible puppies.
7. The proper diagnostic sample and the sample submission are usually critical in confirming the exact agent(s) involved in the outbreak.

The best possible diagnostic outcome begins with the selection and submission of the best possible representative sample(s).

Communication with KSVDL laboratory personnel in advance, regarding appropriate sample collection, proper packaging and shipping methods, can be critical in arriving at a diagnosis which will most benefit the owner.

The “best” sample(s) to submit for diagnostic evaluation will vary with the clinical/intestinal disease(s) suspected, transit time to the laboratory, and the level of interest (financial commitment) on the owner’s part. Diagnostic specimens should be collected from:

1. Acutely affected animals
2. Animals with symptoms characteristic of the problem
3. Animals that have not been treated with antibiotics which may inhibit bacterial cultures

All of the samples submitted as fresh as possible

In most circumstances, where morbidity is commonplace or where a specific disease is dominant in the diagnostic evaluation, submission of a live puppy / puppies would be considered the best possible sample for histopathologic and PCR studies which would enable collection of client fresh feces for parasite evaluation, bacterial cultures, molecular diagnostics, and/or electron microscopy. In other situations where abnormality is not an option, submission of feces, caecal/rectal swab, and/or 10+ grams of fresh feces, and/or sera may provide adequate diagnostic evaluation for the problem. For a complete fecal parastastic evaluation including examination for Giardia, a minimum of 5 grams of fresh feces (shipped on ice) is required.

Bovine Abortions - Achieving Better Diagnostic Results

by Casey Hackett, DVM and Jerome Niefeld, DVM, PhD, DACVP

Abortions can be a significant loss of revenue for cattle producers. Finding the cause of abortions can be frustrating for the client, practitioners and diagnostic personnel. In general, over 35% of cases submitted to diagnostic laboratories diagnosed. Of the abortions that are diagnosed, the cause is usually an infectious agent(s).

Submission of specimens

The quality of the sample received by the diagnostic lab directly affects the results of the laboratory examination. Because submission requirements vary with the laboratory, call KSVDL prior to shipment of samples to find out what is required and/or recommended. Every effort must be made to prevent leakage of body fluids from the package.

Two options are available:

1. Submit the entire fetus and part of the placenta (cotyledon + intercotyledary areas) to KSVDL (preferred method) with a detailed history. Keep cool, not frozen.
2. Perform a detailed necropsy examination on the aborted fetus and send fresh specimens on ice, but not frozen, to KSVDL with a detailed history and gross findings.

In Separate Whirl Packs (Fresh tissue on ice)

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In Separate Whirl Packs (Fresh tissue on ice)

10 to 20 ml of fresh tissue. Refrigerate and ship on ice. Can be used for bacterial culture, ELISA for rotavirus and coronavirus, and parasitologic examination.

In Separate Red Top Tubes (Fresh tissue on ice)

Summary of Samples to Submit

Antemortem:

1. 10 to 20 ml of fresh tissue. Refrigerate and ship on ice. Can be used for bacterial culture, ELISA for rotavirus and coronavirus, and parasitologic examination.

Postmortem:

1. 10 to 20 ml of fresh tissue from the distal large intestine. 2. Fresh small intestine and spiral colon, mesenteric lymph nodes, and liver. Fresh, refrigerated tissue is critical. 3. Formalin fixed small intestine, spiral colon, lymph nodes, lung, kidney, and liver for histopathology (if it is desirable to hold costs down, fixed tissues are the first thing to omit for diarrhea cases).

Do not randomly collect intestines for submission. Your success rate will increase if you collect fresh samples from the distal one-third of the small intestine and the colon. Bacteria, such as Escherichia coli and Salmonella, do not like the acid pH in the duodenum and the best sample for coronavirus is the spiral colon. For histopathology, multiple sections of small and large intestines are much better than one, including abnormal tissues and adjoining lymph nodes.

EIA (Coggins) Testing

In an attempt to meet needs of all clients, to capture laboratory ordered, bulky or routine work, the KSVDL. Serology Lab has established the following sample submission guidelines for equine infectious anemia testing:

ELISA Tests:

1. Samples will be tested at 2.00 PM Monday-Friday and will be reported by 3:30 the same day
2. Samples received after 2.00 PM will be reported by 3:30 the next business day

Haemophilus parasuis in Swine

by Steve Heny, DVM, Diplomate AAPP, Swine Practitioner/Consultant

Haemophilus parasuis has emerged as one of the significant bacterial diseases of swine and can be “proving ground” for swine clinicians. When the diagnosis is made and intervention is timely, success occurs often.

When the early stages of illness are missed or the incorrect diagnosis is made, many pigs and pigs are permanently damaged. Because this disease has so many appearances and presentations, an astute and careful observant clinician is needed. Early effort or diligence and H. parasuis will make a fool of the clinician. Critical points to have in mind in the clinical approach are:

• Always expect H. parasuis to make appearance in newly weaned pigs, those less than 14 days post weaning, if any viral respiratory pathogens are active.
• Remember always the “five blind alleles” rule for seroreagents, meningitis, pericardia, pleura, peritonitis and symphony. If any one of these body tissues is not examined, H. parasuis may be missed.
• Know that the most common expression of H. parasuis is in the immediate post-weaning phase, but be alert to older animal outbreaks.
• Identification of likely H. parasuis outbreaks calls for immediate and vigorous intervention. This is an emergency situation and antibiotic needs to be on board for all in the group – timing is critical.
• Water or feed-based prophylactic therapies are effective only to the point of the first clinical case. Oral tetracycline or potassium penicillin may be most effective when begun at weaned and continued for 5-7 days post-weaning in affected, endemic herds. The cost of this approach needs to be weighed against the parenteral intervention at first clinical signs.

Diagnostics of Neonatal Diarrhea in Calves

by Jerome Niefeld, DVM, PhD, DACVP

Soon it will be calving season and with it that age-old question, what are the best samples to determine the cause(s)? An entire calf for necropsy is a good specimen, but feces from acutely affected calves are almost as good. In fact, feces from the calf after weaned are better than the whole calf that has been scouring for a week, because peak shedding of most agents begins to decrease after 2-3 days of illness. In the early 1990s, Dr. David Zeman, of South Dakota State University, looked at over 1,400 cases of calf diarrheas and found that the diagnostic success rate was better than 70%. When only feces were submitted the success rate was 71.5% and when the calf was necropsied in the field and tissues shipped to the lab the success rate was 97%.

Pool feces from several animals to increase the likelihood of success without increasing costs.

Postmortem:

1. 10 to 20 ml of feces from the distal large intestine.
2. Fresh small intestine and spiral colon, mesenteric lymph nodes, and liver. Fresh, refrigerated tissue is critical.
3. Formalin fixed small intestine, spiral colon, lymph nodes, lung, kidney, and liver for histopathology (if it is desirable to hold costs down, fixed tissues are the first thing to omit for diarrhea cases).
4. Do not randomly collect intestines for submission. Your success rate will increase if you collect fresh samples from the distal one-third of the small intestine and the colon. Bacteria, such as Escherichia coli and Salmonella, do not like the acid pH in the duodenum and the best sample for coronavirus is the spiral colon. For histopathology, multiple sections of small and large intestines are much better than one, including abnormal tissues and adjoining lymph nodes.

AGID Tests:

1. Serum samples received by 2:00 PM Monday-Friday will be resulted by 3:30 the following day.
2. Samples received after 2:00 PM Monday-Friday will be set up the following day and resulted 24 hours later.

We hope these guidelines will be helpful as we endeavor to meet client needs and expectations.