Summer 2001

FROM THE DIRECTOR

H. Leon Thacker, DVM, PhD

Animal diseases continue to be highly visible news items in the world news media. The sites of continuing Foot and Mouth Disease outbreaks around the world is very newsworthy and ongoing; I am hopeful that the recognition of the potential ease of spread of this high impact economic disease by the general public of this country will cause each and every citizen to practice those biosecurity measures necessary to keep it out of our livestock and other susceptible animal populations. In addition to the potential direct loss to producers that could be affected by an outbreak of FMD or other foreign animal disease in this country, the indirect loss would come from reduced consumption of animal products by consumers would also be significant.

From the standpoint of establishing a definitive diagnosis of a foreign animal disease on an Indiana farm, I would re-emphasize the request that we make a visit to a farm or other premises to inspect a potential FMD case rather than transporting the suspect animal to one of our laboratories so that confinement of spread can be maintained as thoroughly as possible. One of the major contributing factors in the spread of FMD in the recent outbreak in England was the movement of animals during the outbreak. ADDL diagnosticians or other state and/or federal veterinarians will travel to a premises on very short notice to investigate any suspected case of a foreign animal disease. We remain most hopeful that we continue to have our animal populations free of such diseases as FMD and BSE but, if such diseases enter our country, the sooner we know of it and take the necessary actions to control and eradicate them, the lower will be the economic, physical, emotional and animal suffering consequences.

Regarding some of the interesting cases we have recently in the ADDL, for some unknown reason we have had quite a number of recent lead poisoning cases in cattle, the source of which remains undetermined. We have also had a number of aborted foals presented, although nothing like the hundreds or thousands seen and reported around Lexington; so far we have not detected elevated levels of cyanide or other toxins in the tissues of the aborted foals examined from Indiana.

We're well into the rush of testing of exhibition animals for fairs and shows. We hope that we can accommodate your requests and we ask for your patience in those instances when transportation, communication or other glitches get in the way of quick turnaround of test results. We will do everything we can from this end to get results to you as soon as possible.

Hope you all have a great summer; stop in to see us if you are in our vicinity.

FINAL DIAGNOSIS

Pancreatic eurytremiasis

In each issue, we will feature a case submitted to ADDL that we hope will be of interest to you.

Signalment: 4-year-old male neutered Domestic shorthair cat

Clinical history: The cat was presented to the referring veterinarian with an 8-month history of heart murmur, chronic weight loss and diarrhea. No cardiac abnormalities were observed on ultrasound.

The reported history indicated that the cat had a good appetite but failed to gain weight. A day prior to death, the cat had presented with acute onset of severe depression and central blindness. Chest auscultation revealed only a slight murmur, and no abnormal lung sounds. Clinical pathology revealed slightly elevated albumin, mild normocytic anemia, neutropenia, lymphopenia and eosinophilia. The cat was given supportive therapy but died the next day.

Gross Findings: At necropsy, the pancreas was diffusely atrophic and had extensive loss of normal lobular architecture. Other gross lesions observed included a thickened left ventricular wall and a pale mottled liver. The small intestine was dilated and gas-filled.

Histopathologic Findings: Histologically, the pancreas was markedly atrophied. The glandular architecture was effaced and replaced by thick bands of fibrous connective tissue that was infiltrated by eosinophils, fewer epithelioid macrophages, and lymphocytes. Remaining acinar cells were small and lacked acidophilic granules. Within an enlarged pancreatic duct in the section were several 25x40 microns trematode ova. Ova had thick brownish-yellow shells, a single operculum, and contained meracidia. A section of an adult trematode, characterized by a pink tegument, cross sections of a uterus, testis and intestinal tract, was also within the duct. The ductal wall was hyperplastic and markedly infiltrated by several eosinophils, macrophages and lymphocytes. Identification of trematodes as *Eurytrema procyonis* was made on paraffin-embedded tissues.

Morphologic Diagnosis:

1) Pancreas: Granulomatous, eosinophilic pancreatitis with marked atrophy and fibrosis

2) Pancreatic duct: Granulomatous, eosinophilic inflammation with intraductal trematode and ova (*Eurytrema procyonis)*

Discussion: The fluke *Eurytrema procyonis* was first described in the raccoon pancreas by Denton in 1942 in Houston. Since then, reports of its occurrence in the pancreatic duct of foxes, cats and other species have appeared. The primary habitat of these flukes is the medium pancreatic ducts, although they may simultaneously infest the biliary tract. Infestations of the pancreatic duct causes distention, thickening of the ducts, and chronic interstitial pancreatitis, leading to periductal and acinar fibrosis.

Significant loss of exocrine pancreatic function as compared to uninfected cats has been demonstrated by functional studies on the pancreas of infected cats. Impaired bicarbonate and protein secretions were observed in these cats, even in the absence of clinical manifestation of pancreatic insufficiency. The exocrine pancreas function of the cat in this report, however, was not evaluated. The slightly elevated albumin observed was most likely a spurious increase resulting from dehydration. Severe atrophy and fibrosis of pancreas is most likely a result of chronic obstruction and not direct effects of the flukes.

The life cycle of *E. procyonis* is believed to involve ingestion of the intermediate host (snail, grasshopper). Outdoor cats are therefore at a higher risk, especially in rural and semirural areas.

-by Victoria Owiredu-Laast, DVM
ADDL Graduate Student

Portosystemic Shunts in the Cat and Dog

Portosystemic shunts (PSS) are vascular communications between the portal and systemic venous systems that allow portal blood to reach the systemic circulation without first passing through the liver. PSS can be either congenital or acquired. Congenital PSS are usually single shunts that can be either intrahepatic or extrahepatic. In most cases, congenital PSS represent retained fetal vascular anastomoses, but can also occur when compensation for portal vein atresia results in formation or retention of collateral connections to adjacent veins. Examples of congenital PSS include persistent sinus venosus and direct portal vein connection(s) to the caudal vena cava or azygous vein. Acquired PSS are secondary to portal hypertension and are typically multiple extrahepatic shunts that connect the portal system to the caudal vena cava.

Congenital PSS are most frequently diagnosed in purebred dogs (Yorkshire terriers, miniature Schnauzers, Irish wolfhounds, Old English sheepdogs and Cairn terriers) and mixed breed cats. Some diagnostic features include central nervous system (CNS) signs (disorientation, ataxia, blindness, seizures), poor growth, nonspecific gastrointestinal signs, cryptorchidism in dogs and cats, polydipsia and polyuria in dogs, and heart murmurs, seizures, ptyalism, and copper iris color in cats. Large breed dogs usually have intrahepatic shunts whereas small breed dogs more often have extrahepatic shunts.

Laboratory findings include a mild nonregenerative anemia with microcytosis and poikilocytosis, mildly elevated ALT and ALP, low BUN, hypocholesterolemia, hypoglycemia, hypoalbuminemia, and hypoglobulinemia. Ammonium biurate crystalluria and urate calculi may be seen in up to 50% of the PSS cases.

Diagnostic tests can be used to determine liver function. These include sulfo-bromopthaleim (BSP) retention testing, fasting ammonia concentrations and ammonia tolerance testing (ATT), and serum bile acids (SBA). BSP is difficult to obtain and, due to many inadequacies associated with the use of organic anions for estimation of liver function, BSP is not commonly utilized. A normal fasting ammonia concentration does not rule out PSS since dogs and cats with PSS may have normal values. If the concentrations are above normal reference values an ATT is unwarranted. An ATT is a reliable test to detect hepatic insufficiency. One drawback of the ATT is that it is a labile test which requires immediate assay samples for diagnostic accuracy which is not feasible in all veterinary practices. ATT is contraindicated in patients with hepatic encephalopathy. High resting and postprandial SBA concentrations are good indicators of portosystemic shunting. The postprandial SBA concentration is the most dependable diagnostic test for detection of PSS in routine practice.

Abdominal survey radiographs may reveal microhepatica and renomegaly. Abdominal ultrasound, especially with Doppler capabilities, may reveal a small hypovascular liver and a shunt. Renal calculi may also be detected. Portography is the gold standard for documentation and anatomical location of the shunt.

A liver biopsy should be collected to ascertain the presence or absence of hepatic fibrosis and acquired hepatobiliary disease. When portal blood circumvents the liver, the liver fails to develop normally. Hepatic hypoplasia is recognized histologically as atrophy of hepatic lobules, compressed hepatic cords with dilated sinusoids, close proximity of portal triads, portal vein hypovascularity, hepatocellular degeneration

(vacuolization, lipidosis) and proliferation of the small vessels, arterioles, and lymphatics. If the animal had hepatic encephalopathy (HE), on necropsy, brain lesions would include bilateral symmetric polymicro-cavitation of the brain stem and diffuse neuronal necrosis throughout the cerebrum and cerebellar cortex.

Diagnosis of PSS should be made based on historical and physical findings, laboratory findings, and diagnostic tests.

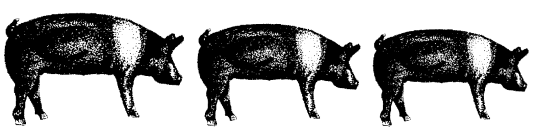
Treatment of PSS includes medical management (lactulose, neomycin, metronidazole), dietary therapy (high carbohydrate, low protein) and surgical intervention (ameroid ring contrictor, suture attenuation). Complete surgical ligation of the shunt has an excellent prognosis. Partial occlusion of the shunt usually results in improvement, but has a more guarded long-term prognosis. Exclusive medical management results in continuation of signs, but the patient may still survive for years. In some cases, a combination of surgical, medical, and dietary management may be necessary.

-by Grace Steenburgen, Class of 2001
-edited by Evan Janovitz, DVM, PhD,
ADDL Pathologist

The faculty and staff at Purdue ADDL congratulate Indiana swine practitioners **Dr. Max Rodibaugh** and **Dr. Larry Rueff** on their recent honors.

At their meeting in Nashville, Tennessee, the American Association of Swine Veterinarians named **Dr. Rodibaugh** 2001 Swine Practitioner of the Year.

Dr. Rueff is a recipient of the School of Agriculture 2001 Distinguished Agricultural Alumni Award and received his honor at an awards convocation at Purdue University .



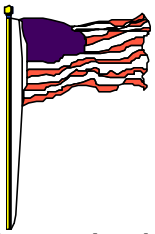
ON THE ROAD

Dr. Charles Kanitz attended the annual meeting of the National Institute for Animals in Agriculture annual meeting in Colorado Springs, Colorado, April, 2001.

Mary Woodruff, Bonita Vera, Ron Gillespie, Ching Ching Wu and Tom Hooper attended the Association of Veterinary Microbiologists meeting in Minneapolis, Minnesota, April 2001.

Dr. Leon Thacker attended an instructional course on laboratory accreditation and assessment presented by the American Association of Laboratory Accreditors in Washington D.C., April 2001.

Drs. Leon Thacker, Charles Kanitz, Bill VanAlstine and Marlon Rebelatto attended the North Central Veterinary Laboratory Diagnosticians meeting in Champaign-Urbana IL , June 2001



Purdue ADDL and Heeke ADDL will be closed on the following University holidays.

July 4, 2001 Independence Day
Sep 2, 2001 Labor Day

No samples can be accepted on these days.

Editor's note: This is the conclusion of a two-part article that is being reprinted with the written permission of *Compendium on Continuing Education For the Practicing Veterinarian*. This article was originally printed in this journal on November, 2000, Vol 22(11), pages S160-166.

Performing Diagnostic Procedures on Salmonid Fishes

Melvin Randall White, DVM, PhD

DIAGNOSTIC TECHNIQUES

Observation, Physical Examination, and Laboratory Evaluation

Before a physical examination is performed, salmonids should be observed in their aquatic environment. Feeding response as well as swimming behavior should be evaluated. Sick salmonids will usually not eat; however, they may put the feed in their mouths and then rapidly spit it back into the water. Therefore, close observation of the fish when they are offered food is critical. If sick salmonids lose their "fear" or "fright" response, they will not seek shelter from a shadow or a hand waved slowly over the tank. Healthy salmonids will usually respond to this stimulus by rapidly swimming away from shadows; conversely, fish that are accustomed to being fed by hand may actually surface in anticipation of being fed.

Erratic swimming behaviors should be noted. In a raceway, sick fish can usually be found at the end of the raceway nearest to the drainage outflow pipe, whereas healthy fish are usually swimming against the current closer to the inflow water pipe. Sick salmonids may be deeper in the water column and not swimming vigorously. Flashing is a common clinical sign that fish have external parasites. Flashing occurs when fish rub against the sides of the tank, making their underside visible[2]. Practitioners should also observe for any physical abnormalities (e.g., curvature of the spine); such abnormalities may first be noticed in fish that swim in a circular or "whirling" pattern.

Practitioners should observe the movement of the operculum, which is the covering over the gills. Fish with respiratory difficulties have more rapid operculum movement (pumping) than do healthy fish. With severe respiratory compromise, fish may actually extend heads out of the water and may be "piping." *Piping* is the term that characterizes the fish with flared opercula that actually appear to be gulping air at the water-air interface.[2]

Cutaneous lesions (e.g., fraying, loss of fins, ulcerations, neoplasms) should also be noted. Because fish have several layers of skin pigments, changes in the color of the fish should be observed; sick fish may be darker or paler than are healthy fish. Hemorrhages of the skin, especially around the fins, and accumulation of fluid within the coelomic cavity (ascites) are nonspecific lesions commonly associated with bacterial septicemia. Exophthalmos or "bug-eyes" can be unilateral or bilateral and is commonly caused by osmotic regulatory failure or gas bubble disease; however, this condition can occur with many different disease processes.

After the fish have been observed in their aquatic environment, a small number of fish with lesions or clinical findings representative of the current disease problem should be removed from the water and examined. Latex gloves are recommended when handling the fish because some bacterial pathogens of fish (e.g., *Mycobacterium* species) may also cause diseases in humans. A closer examination of these fish can often reveal lesions that were not detected while the fish were in the water. If the fish have lesions, samples should be taken for biopsy (see Biopsy section) or the fish euthanized for necropsy (see Necropsy section).

The ideal sample to submit to a diagnostic laboratory for evaluation is acutely affected, untreated live fish. The number of fish to be submitted varies and depends on the size of the fish. If fry or

fingerlings are submitted, then 20 to 30 fish should be adequate for diagnostic tests. If the specimens are adult fish, then three to six are usually sufficient. To transport the fish, it is recommended that they be placed in a large thick transparent plastic bag filled one third with water. An "air-cap" of oxygen occupying approximately one third to one half of the plastic bag should be present immediately above the water surface. The bag should be tied and placed inside another bag to prevent leakage. This bag should be placed within a thick wax-coated cardboard box or Styrofoam® cooler for overnight shipment. To evaluate water quality, a separate water sample should be shipped in addition to the fish samples (see Necropsy section).

Biopsy

Biopsies provide valuable information about the cause of diseases affecting salmonids. Samples should be taken after the fish have been properly anesthetized. The most common sites of biopsy samples are the gills, skin, and kidney. To rapidly anesthetize salmonid fishes a dose of 80 to 135 mg/L of tricaine methanesulfonate or MS-222 (Finquel®, Argent Laboratories, Redmond, WA) can be added to a separate container of adequately aerated water to be used as an "anesthesia tank." If the fish are being used as a food source, practitioners must remind producers to maintain the proper 21-day withdrawal time when using tricaine methanesulfonate. When fish reach surgical anesthesia, they will roll over ("belly up") and can then be removed from the tank. The entire fish should be covered with a wet soft towel to keep its surface moist.

Special consideration should be given to biopsy samples obtained from the kidney, which is a unique anatomic feature of salmonids. A fibrous connective tissue capsule covers the kidney of salmonids, which lies just ventral to the vertebrae. The salmonid kidney extends the entire length of the vertebrae and is a dark black, friable parenchymatous organ. The corpuscle of Stannius should not be confused with a granulomatous lesion or neoplasm of the kidney. This specialized endocrine organ, located approximately midway of the length of the kidney, is present as a single nodule or multiple, small, raised white nodules. The corpuscle of Stannius is embedded in the ventral aspect of the renal tissue.

Gill samples may be obtained by snipping a small number (three to five maximum) of the primary gill filaments from the cartilage arch of the gill. Practitioners must use care not to transect the gill arch. An unstained squash preparation with added saline of the gill filaments can be viewed immediately to detect bacterial and parasitic pathogens. Skin scrapings can be obtained to detect the presence of skin parasites by lightly scraping (in a cranial to caudal direction) the lesion with a microscope coverslip, which should be placed on a standard microscope slide that contains a few drops of saline. The slide should be viewed immediately because drying will cause the saline solution to form salt crystals. A small biopsy of the anal fin can also be obtained by clipping a 1- to 2-mm section. This tissue can then be placed on a microscope slide that contains saline solution and viewed using a microscope.

Skin biopsies can be taken using a small dermal skin punch, as it is used on dogs and cats. Usually one or two interrupted sutures of a 3-0 nonabsorbable suture can be used to close the biopsy site. The sutures can be removed in 10 to 14 days. A sterile swab of the biopsied lesion can be used for bacteriologic culture; the remaining tissue can be evaluated by histopathology or immunohistochemistry.

Renal biopsies are commonly performed to evaluate the presence of disease caused by such bacterial infections as *Yersinia ruckeri* (the causative agent of enteric red mouth disease) and *Renibacterium salmoninarum* (the cause of bacterial kidney disease). Kidney biopsies can be performed in two ways. When taking samples from small fish, the needle biopsy technique is the best method.[6] A needle should be placed into the kidney tissue by directing it through the lateral pharyngeal region lateral to the last branchial arch and

medial to the cleithrum (the concave semicircular bone that supports that portion of the pharynx). The needle should be guided in a caudodorsal manner into the cranialmost portion of the kidney. Negative pressure should be applied to the syringe and then the needle removed. No sutures are needed using this procedure. Large fish (e.g., adult broodstock) can be surgically biopsied[7] to obtain a larger sample for bacteriologic culture, fluorescent antibody testing, or histopathology and immunohistochemistry.

Venipuncture

Anesthetization is required before blood samples are taken via nonlethal venipuncture. Venipuncture of small salmonids should be performed by taking a blood sample from the caudal vein. Blood can be taken from this location either by placing the needle at a right angle to the lateral surface of the fish and probing for the caudal vein between the hemal arches or by placing the needle through the ventral abdominal musculature perpendicular to the long axis of the body, posterior to the anal fin. In both instances, the needle should be inserted until resistance is encountered and then pulled back ventrally, approximately 1 to 3 mm, to allow blood to flow into the syringe as the practitioner applies a small amount of negative pressure.[3] In larger fish (e.g., adult broodstock), cardiac puncture can be used to obtain a blood sample. For this technique, the needle should be placed at a 20° to 25° angle from the ventral midline of the fish across the anteriormost portion of the pectoral fins and guided cranially until the heart is penetrated. Approximately 3 to 5 ml of blood can be removed from a 15- to 20-lb salmonid with no adverse consequences.

Clinical Pathology

Blood from salmonid fishes is not usually submitted for clinical analysis. However, some clinical pathology data may be useful. Several guidelines for normal ranges of clinical pathology parameters have been published[8-10]; however, factors such as water temperature, nutrition, reproductive status, age of fish, and species may make the reference ranges nonapplicable. Therefore, care should be exercised in extrapolating data from an affected fish population to known reference ranges.

Necropsy

Necropsy is commonly performed in salmonids to determine disease processes. The necropsy procedure can be used to evaluate the organ systems as well as to collect samples for bacteriologic and virologic testing and histopathology. Practitioners should also consider collecting samples for toxicologic analysis. Fish can be euthanized by an overdose of tricaine methanesulfonate. After the fish have been euthanized, the exterior of the fish should be thoroughly examined. All fish necropsies should include gross examination of the gills, skin scrapings, and fin clippings. Any lesions of the integumentary system should be evaluated by performing a skin scraping as well as by taking a sterile swab of the lesion for bacteriologic cultures. Swabs that contain transport medium should be used if the sample is to be sent to a diagnostic laboratory for bacteriologic culture. The fins should be thoroughly examined for any evidence of fraying or overt necrosis as well as for congestion. Small portions of the fins can be clipped and evaluated (see Biopsy section). Observation of the gills and opercula may provide insight into a disease or problem. Flared opercula in fish that die naturally may indicate a water-quality and/or respiratory problem. Gills that have a thickening of the lamellae may have gill epithelial hyperplasia secondary to gill parasites or bacterial gill disease.

After the external system has been evaluated, an incision should be made just cranial to the anal opening at the ventral midline and extended up to the heart. An incision should then be made from the heart to the dorsal midline. Most of the skeletal muscle can then be reflected and removed for access to the viscera. The operculum should also be clipped away to expose the gills.

Pyloric ceca consist of numerous blind sac-like structures that extend just distal to the pylorus of the stomach.[11,12]

Histologically, the pyloric ceca are morphologically compatible with tissue of the small intestine. The pancreatic tissue surrounding numerous pyloric ceca should be closely examined for necrosis, atrophy, or hyperplasia, possibly caused by infectious pancreatic necrosis virus. If this disease is suspected, pancreatic tissue should be collected for histopathology.

The appearance of the reproductive tracts of salmonids varies according to the stage of sexual maturity. In sexually immature fish, the testes and ovaries appear very similar. Both reproductive tracts are paired organs, which extend from the caudal to the cranial portion of the coelomic cavity. The ovaries are slightly more transparent and triangular-shaped, especially toward their cranial poles.[13] In sexually mature salmonids, the male and female reproductive tracts can be easily distinguished. The testes are diffusely pale white, whereas the ovaries commonly contain numerous amber eggs. For virology sampling, a cannula with a blunt end or an oral gavage needle can be used to aspirate ovarian fluid. This fluid should be placed in Dulbeccos' phosphate buffered saline in a sterile container to be transported to a diagnostic laboratory for fluorescent antibody and viral isolation testing. Before collecting these samples, practitioners should check with the diagnostic laboratory regarding the preferred transport medium.

If bacterial septicemia is suspected, tissue samples should be collected from the spleen and kidney for bacteriologic culture. The spleen is easily located and identified within the coelomic cavity. This dark red to mahogany-colored organ, which varies in size and shape, generally is ellipsoid shaped and appears grossly similar to the spleen of mammals.

Practitioners should flame the renal parenchyma before collecting kidney tissue at necropsy to culture for *Renibacterium salmoninarum.* Flaming will destroy any surface contaminants, thus allowing a sterile sample to be collected. If fluorescent antibody testing is to be conducted, a sterile disposable loop or swab can be inserted into the renal parenchyma. The swab can then be quickly removed and a smear made on a 10-well fluorescent antibody microscope slide. For bacterial kidney disease evaluation using ELISA, a small amount (approximately 1 cm^2) of renal tissue from small salmonids can be obtained by scraping the tissue in a lateral motion to remove the tissue from its location. In large fish, the tissue can be snipped using sterile tissue forceps and scissors. The kidney sample should be placed in a sterile tube with a cap; the tube should be sealed before sending the tissue to a diagnostic laboratory.

The brain can be easily removed in small fish by using rongeurs to remove the skull over the dorsal midline just caudal to the eye sockets. Brain tissue can be cultured for evidence of bacterial meningitis, although this condition is uncommon in salmonids. After brain tissue has been collected for bacteriologic culture, the remaining tissue can be placed in formalin for histopathology.

Tissue collection is necessary for the evaluation of whirling disease. *Myxobolus cerebralis*, the causative agent of whirling disease, is detected by various digestion and centrifugation methods coupled with histopathology. In addition, polymerase chain reaction technology is becoming commonly used to evaluate fish samples for whirling disease. Because of the extreme sensitivity of polymerase chain reaction, practitioners should properly disinfect all instruments used for sample collection after each fish is sampled. For smaller salmonids, the entire head may be removed from the dead fish at the time of necropsy and submitted to the laboratory. The heads of the fish can be placed in properly sealed plastic bags, each containing a five-fish pool of the samples.

Although toxicologic problems are not commonly encountered in a private salmonid aquaculture setting, samples should be taken occasionally at necropsy to be evaluated for potential causes of disease. All water samples taken for water-quality and/or toxicologic analysis should be placed in a clean, acid-washed, triple-rinsed quart

glass jar and shipped chilled to a diagnostic laboratory. Additional samples needed for toxicologic analysis include a large fillet of muscle (at least 200 g), 50 to 100 g of liver tissue, and bile aspirated in a sterile syringe. Before they are transported to a diagnostic laboratory, muscle and liver samples should be wrapped separately in aluminum foil, properly labeled, and frozen. Tests commonly conducted by toxicology laboratories include screening water and fish tissue for herbicides and pesticides as well as heavy metal analysis.

SUMMARY

Veterinary practitioners can aid salmonid producers by obtaining a proper history of disease, evaluating the water quality of the facility, and performing physical examinations as well as other diagnostic tests on salmonids. Practitioners can obtain additional information about potential disease problems by performing such techniques as venipuncture, biopsy, and necropsy of affected fish.

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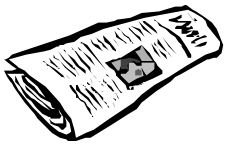

ADDL STAFF NEWS

Two of ADDL's long time and beloved employees are retiring this summer.

Necropsy technician and jack-of-all trades **Bob Smith** retired as of June 1, 2001. Bob came to ADDL in March, 1980 and has spent 21 years helping faculty members, graduate students, veterinary students and ADDL staff with a wide variety of needs including assisting with necropsies, accessioning cases, painting, fixing flat tires, building furniture, and lifting spirits and is responsible for the infamous "hooey stick" initiation for new employees.

Dr. Charles Kanitz, Professor of Veterinary Virology and Head of the Virology and Serology Sections of the ADDL is retiring during the summer of 2001. Following four years in the United States Air Force, Dr. Kanitz returned to Purdue to earn his DVM degree in 1964, his M.S. degree in 1968 and his Ph.D. in 1972. He then began building the diagnostic virology section of the ADDL He was instrumental in the efforts to eradicate hog cholera, collaborated to develop a vaccine against pseudorabies and has traveled internationally to offer his expertise to swine industries. Most recently, Dr. Kanitz was honored with the Award of Merit from Gamma Sigma Delta.

Both of these gentlemen have contributed immeasurably to the staff and users of ADDL. They will be missed.

Guidelines for Submitting Serology Samples for Fairs and Shows

The season for fairs and shows is fast approaching and plans should be made for performing inspections and tests. The following information is a general review for submitting samples to ADDL/Serology.

1. Samples hand-carried to ADDL by owners must be sealed using the veterinarian's label or tape bearing the veterinarian's signature.

2. All regulatory charts must include submitting veterinarian's signature and complete animal identification.

3. ADDL Form 3 (Request for Serological Tests) must be completed and attached to all regulatory test charts. ADDL will run only those tests requested on this form.

4. A health certificate is the only necessary test record for 4-H exhibition. Do not submit duplicate test charts.

5. Use of BD-Vacutainer or Monoject tubes is preferred. Venoject, Jelco or EDTA-treated tubes will not be accepted.

6. Each tube must be identified with a tube number; additional i.d. is desirable.

7. Tube numbers and numbers on chart must match and be in consecutive order. Tubes should be packaged in consecutive order as well.

8. Clear serum is preferable to whole blood.

9. Tests for Pseudorabies will be performed daily (M-F). Turnaround time will be 3-6 days (may be slightly longer at peak testing periods).

10. Brucellosis tests are performed daily (M-F). Turnaround time is 2-4 days.

11. Swine samples for both Brucellosis and Pseudorabies will be tested first for Brucellosis, followed by Pseudorabies. Turnaround time will be 4-7 days.

12. ADDL will not release results to owners.

-If you have questions, please contact ADDL/Serology at 765-494-7451 prior to submitting samples.

-by Charles Kanitz, DVM, PhD
Karen Crane, Serology Lab Supervisor

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Foot-and-Mouth Disease

How do I protect my farm from foot-and-mouth disease?

Following good biosecurity practices will go a long way toward keeping your farm safe.

Control who visits the farm

The FMD virus can be carried on people's clothes, shoes and bodies. Visitors to animal areas of the farm should wear plastic, disposable overboots or rubber boots, which can be disinfected.

Visitors, employees and family members who have been in an FMD-affected country in the last five days should not be allowed on the farm. Those returning from overseas should launder or dry-clean all clothes. Shoes, luggage and personal items should be cleaned with a solution of 5 tablespoons of household bleach diluted in 1 gallon of water.

Monitor what is being fed to your livestock

Food waste or garbage, which could contain meat, fish or poultry, should not be fed to FMD-susceptible animals. The practice is illegal under Indiana law. If the food waste contains illegally imported meat or milk products, it could carry the FMD virus.

Check regularly for FMD symptoms

Look for excessive drooling or lameness in your livestock. Check for any blisters or raw wounds that may appear around the feet, mouth and teats of the animal. FMD mimics many domestic diseases, and only laboratory testing can verify the cause. Report FMD symptoms immediately to your local veterinarian or the State Veterinarian. It is critical to report symptoms quickly, since FMD spreads rapidly.

If I suspect symptoms of foot-and-mouth disease in my livestock, what do I do?

-DO report cattle, sheep, swine, goats, llamas or other cloven-hooved animals that show unusual symptoms including lameness, drooling or lip smacking. Blisters or raw wounds may be visible in the mouth and on the tongue and gums. The soft tissue of the feet or the teats may show blisters as well. If you have any doubt, report the symptoms to your veterinarian immediately. For pictures of symptoms, visit:
www.aphis.usda.gov/oa/pubs/brofmd.pdf

-DON'T move any suspect animals. Movement will spread the disease to other susceptible livestock on your farm or neighboring farms.

-DO call your local veterinarian immediately. If you cannot reach the local veterinarian, call the **Office of the State Veterinarian** at 877-747-3038. After normal business hours, call **800-255-6508 ext. 303.** There are other diseases that could be confused with FMD. Only a veterinarian can make an accurate diagnosis.

-DON"T allow any visitors on the farm and **DON'T** leave the farm until a veterinarian has examined the animals. The FMD virus can be carried on people's clothes, shoes and bodies, as well as vehicles.

For more information:

Indiana State Board of Animal Health
Bret Marsh, D.V.M., State Veterinarian
877-747-3038
http://www.state.in.us/boah
Email: **animalhealth@boah.state.in.us**

U.S. Department of Agriculture
For technical questions call: 800-601-9327
For consumer and travel questions call:
866-SAFGUARD
http://www.aphis.usda.gov/oa/fmd/index.html

Purdue University Cooperative Extension foot-and-mouth disease web site:

http://www.ces.purdue.edu/fmd or call
1-888-EXT-INFO