LABORATORY SERVICES Newsletter
ANIMAL HEALTH LABORATORY GUELPH KEMPTVILLE RIDGETOWN

Volume 2, Number 3

In this issue:

What's happening at the AHL?

- **Dr. Jeff Caswell** began work at the AHL-Guelph on Sept 8 as a mammalian pathologist. Jeff graduated from OVC in 1990, worked in mixed practice for 2 years, completed a DVSc in Guelph in 1995, became board-certified by the American College of Veterinary Pathologists in 1996, and has just completed his PhD this year at the University of Saskatchewan. We are delighted to have Jeff on board as part of our laboratory team.
- **Mrs. Linda McCaig**, formerly in our avian virology and immunology section, has filled the new position of Central Services Supervisor in Guelph.
- In September and October, **Dr. Grant Maxie**, Manager of the AHL, will undertake consultations with clients and service providers in order to draft a 5-year strategic plan for the AHL. Your comments on our future direction are welcome. **Dr. Beverly McEwen** will be acting manager during this time.
- We accept "incoming collect" courier shipments *from within Ontario* at **no charge to you** if you quote the U of G account number from page 4 of the 1998 AHL Fee Schedule (e.g. Purolator - 6772212, in box 12, third party account no.; and in box 6, sender reference: 791-076-71-305).
- The AHL has withdrawn from CFIA- accredited testing for **bovine brucellosis for export.**
- ELISA testing for *Coxiella burnetii*, the agent of **Q fever**, is no longer available from our supplier, Santeia. There are no other ELISA alternatives, but we are investigating other types and sources of testing.
- **Revised AHL submission forms** are included with this newsletter. Please use the enclosed order form to request a supply, or customize by adding your clinic number, name and address to a master form, and photocopy to fill your needs.
- Also enclosed for food animal and mixed practices is our first ***AHL LabNote*** "Update on BVD testing at the Animal Health Laboratory"

Feedback for the AHL?

Please feel free to call, fax, or E-mail us at any of our labs.

SWINE

Type A porcine rotavirus
Dr. Susy Carman

Over the last few years, the AHL has noticed a dramatic increase in the number of diagnoses of type A porcine rotavirus in swine herds in Ontario, despite there being no changes in testing methods over this time. A brief summary of testing using the type A rotavirus latex agglutination test follows:

	1994	1995	1996	1997	1998 Jan-July
#herds	31	66	88	130	99
# +ve herds	2	3	9	18	16
% +ve herds	6%	4%	10%	14%	16%

Over the next few months, representatives from the AHL (**Drs. Gaylan Josephson, Bev McEwen, Susy Carman**) and from the University of Guelph, Department of Population Medicine (**Dr. Cate Dewey, Tim Pasma**) will be contacting attending veterinary practitioners for affected herds for help in identifying the risk factors associated with this increase in type A rotavirus diagnoses in swine herds in Ontario. **Thank you in advance to all the swine practitioners who participate in this survey**. For more information about this project, please contact **Dr. Susy Carman** at 519-824-4120 ext 4551, or any other members of the study team.

Update on K88 positive *E. coli*
Drs. Gaylan Josephson, Nonie Smart

The AHL continues to identify increased numbers of K88+ *E. coli* organisms from scouring piglets, many in the post-weaning stage. Since May 20, 1998 (see AHL Newsletter, vol 2, no 2), an additional 41 isolates have been made from a total of 113 enteric-related swine submissions. The average reported age of submitted piglets remains approximately the same as previously reported, at 3.6 weeks, with ages ranging from 2 days to 10 weeks. Again, as previously reported, most of the isolates are pure cultures of strongly hemolytic *E. coli* which often autoagglutinate in saline.

Although many of the submissions originate from post-weaning piglets in large SEW nurseries, the organism is now identified as a serious pathogen in smaller, continuous-flow, single site farrow-to-finish operations. Histories suggest sudden deaths in post-weaning pigs, with no clinical evidence of diarrhea. Post-mortem findings identify marked dehydration, which is due to pooling of fluid in the intestines. As the outbreak progresses, scouring piglets are identified.

In large SEW nurseries, outbreaks are often identified shortly after implementation of the Phase III diet. K88+ *E. coli* outbreaks may reoccur sporadically over a period of 10-12 months within the same herd.

Leptospira grippotyphosa outbreak
Dr. Gaylan Josephson

A 600 sow farrow-to-wean operation in southwestern Ontario has had multiple late-term abortions, with 12-15 sows aborting since mid-June, 1998. An increase in stillbirths and mummified piglets also accompanied this outbreak. The sows were not reported to be sick either before or after the abortion occurred.

Gestating sows are held in either stalls or in group pens in a converted grow/finisher barn. Facilities are at least 10 years old, and water pools in some areas of worn and/or pitted concrete. All gilts and sows are vaccinated prior to breeding with an inactivated, multiple-antigen vaccine that contains 6 *Leptospira* serovars, including *L. grippotyphosa.*

A tentative diagnosis of *Leptospira*-induced abortion was made by **Dr. Doug Key**, AHL immunologist, and AHL pathologists, based on serology and on histological findings in kidneys of aborted fetuses. Immunoperoxidase staining revealed numerous filamentous organisms that stained positive for *Leptospira* antigens (**Dr. Debbie Haines**, WCVM, Saskatoon). The diagnosis was confirmed when serum samples from sows that had aborted, as well as some that had not, were found to be positive for *Leptospira grippotyphosa*, but negative for *Leptospira pomona*. The herd was serologically positive, but considered stable, for PRRS. Bacteriological cultures of fetal tissues were negative, and fluorescent antibody tests for both PRRS and parvovirus antigens were negative.

The Middlesex-London Health Unit in London, Ontario, investigated 3 serologically confirmed cases of leptospirosis due to *L. grippotyphosa* in local trappers, who showed symptoms starting in November 1997. All gave a history of skinning raccoons without wearing gloves, and of having multiple abrasions on their hands at the time. More recently, raccoons from Middlesex and Kent counties were tested for the presence of *L. grippotyphosa* using the microscopic agglutination test. Ten of 42 raccoons, which came from 6 different areas in the 2 counties, were positive.

According to **Dr. Carole Bolin**, Research Leader, Zoonotic Diseases and National Leptospirosis Reference Center, National Animal Disease Center, Ames, Iowa, **raccoons are the major reservoir for *Leptospira serovar grippotyphosa***. Reservoir hosts have a high prevalence of infection (~30%), show only mild clinical signs, and shed the organism in the urine for long periods (months to years).

The source of drinking water for this operation was a stream. At the time the diagnosis was made, it was discovered that the chlorinator was non-functional, and the pigs had been drinking untreated water. **We believe that this stream water was the source of infection**.

CATTLE/SWINE

Salmonella typhimurium in cattle and swine

Drs. Beverly McEwen, Nonie Smart, Animal Health Laboratory;
Drs. David Alves, Rob Tremblay, Health Management, OMAF

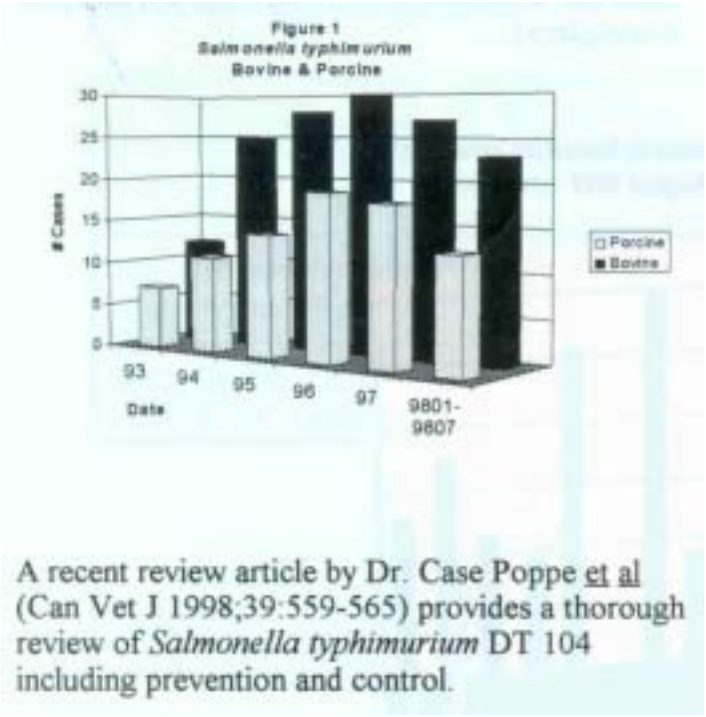
Salmonella typhimurium definitive type (DT) 104 is an emerging pathogen of worldwide importance to the health of animals and humans. Strains are identified by phage typing and are characterized by resistance to several antimicrobials, including ampicillin, chloramphenicol, streptomycin, sulfonamides, and tetracycline (ACSSuT). It is believed that the first human isolate was obtained in Canada in 1970 (USDA-FSIS), and animal isolates were first recognized in the United Kingdom in 1984. Since then, many European and North American countries have reported incidents of human and animal disease attributed to this pathogen, which are in some cases believed to have higher morbidity and mortality rates than incidents due to other *Salmonella spp*. Furthermore, recent reports from Britain indicate that some strains have acquired resistance to additional antimicrobials, including trimethoprim and ciprofloxacin (a fluoroquinolone antibiotic). Multiple antibiotic resistance is of considerable importance to animal and human health, and resistance to fluoroquinolones is of special concern because of the importance of this family of antibiotics for treatment of extra-intestinal salmonellosis in people.

Collectively, the emerging nature of this definitive type, its apparent international increase in

incidence, multiple drug resistance, and virulence for many species of animals warrant careful surveillance in Ontario.

Bacteriological testing of clinical submissions to the Animal Health Laboratory indicates that *Salmonella typhimurium* DT 104 is an important pathogen of both cattle and pigs in Ontario. Phage typing of AHL *S. typhimurium* isolates for identification of DT 104 strains began in April 1996, in the Guelph Laboratory, Health Canada (Dr. Case Poppe). Of the 215 *Salmonella* isolated from cattle in the period April/96-July/98, 87 (14%) were *S. typhimurium* DT 104 and these were recovered from 31 different herds (both dairy and beef). Isolations have also been made from 14 swine herds in this time period; 11% of 131 salmonellae from swine were DT 104. No fluoroquinolone resistance was observed among these DT104 isolated

Although laboratory identification of DT104 strains is fairly new, *Salmonella typhimurium* has been recognized as an important animal pathogen for many years. The data presented in Figure 1 indicate that isolations of this pathogen increased in the 1994-96 period in both cattle and pigs. Although a slight decrease was noted in 1997, based on the number of cases from January to July 1998, the trend is continuing to increase. It is clear that *Salmonella typhimurium*, and in particular DT104, should be the focus of continued surveillance by practitioners and the Animal Health Laboratory.



A recent review article by Dr. Case Poppe et al (Can Vet J 1998;39:559-565) provides a thorough review of *Salmonella typhimurium* DT 104 including prevention and control.

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CATTLE

Bovine abortion trends

Dr. Beverly McEwen AHL, **Dr. David Alves**, Health Management, Fergus

Neospora spp. is the pathogen most frequently identified in bovine fetuses submitted to the AHL for gross and/or histological examination. From April 1997 to March 1998, 54 of the 57 cases of *Neospora*

spp. associated abortion originated from dairy herds. As the AHL receives more submissions from dairy than beef herds, this may partly explain the greater frequency in dairy cattle, however, it may also reflect the relative prevalence of *Neospora spp*. infection in dairy and beef herds.

Most frequent etiologic diagnoses1 # cases/ (%)	**93/ 94**	**94/ 95**	**95/ 96**	**96/ 97**	**97/ 98**
Neospora spp.	8 1.6%	30 5.6%	46 11%	60 12.5%	57 15.8%
Bacterial - *A. pyogenes*	11 2.2%	9 1.7%	9 2.2%	23 4.8%	14 3.9%
Bacterial - *Bacillus licheniformis*	11 2.2%	6 1.1%	7 1.7%	9 1.9%	8 2.2%
Bacterial - other(2)	46 9.3%	71 13%	56 14%	55 11.5%	39 10.8%
Mycotic abortion	16 3.3%	20 3.7%	19 4.7%	23 4.8%	14 3.9%
Bovine viral diarrhea (BVD)	24 4.9%	15 2.8%	9 2.2%	11 2.3%	10 2.8%
Ureaplasma spp.	15 3%	5 0.9%	14 3.5%	13 2.7%	6 1.7%
Total abortions submitted(1)	492	537	405	480	361

(1) Pathology cases where pathogens were confirmed by AHL bacteriology, virology, mycoplasmology laboratories (does not include submissions submitted for microbiological testing only)
(2) Includes *E. coli, Salmonella spp, Staphylococcus spp., Listeria monocytogenes, Coxiella spp., Actinobacillus spp, & those with lesions compatible with bacterial abortion.*

Submissions of bovine abortions appears to have declined in 97/98, but this must be interpreted with caution due to the unknown level of bias affecting submission rates to the AHL.

Bovine mastitis update

Drs. Nonie Smart, Beverly McEwen, AHL; **Emmeline Tan, Dr. Scott McEwen**, Population Medicine, OVC

The AHL milk culture labs in Guelph and Kemptville receive approximately 40,000 milk samples annually for culture and susceptibility testing of clinically significant bacterial isolates. Most milk samples are composite samples for herd screening purposes, usually originating from herds in which a mastitis problem has become evident. Smaller numbers of milk samples are quarter or consecutive samples from "problem cows", or a collection of samples from identified count cows representing only a small proportion of the submitting herd.

The most common mastitis-causing bacteria isolated are shown in the histogram below. Antimicrobial resistance profiles appear to have remained quite stable over time.

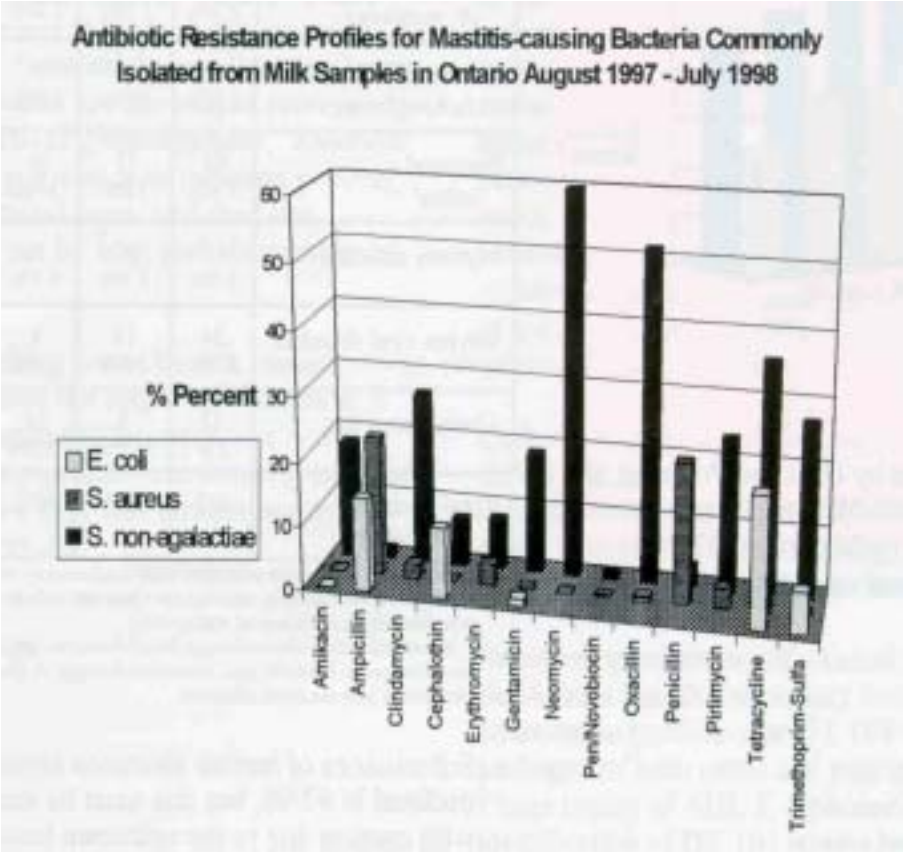
For ***Staphylococcus aureus***, approximately 20% of isolates are resistant to penicillin and ampicillin, with less than 10% of these isolates showing resistance to additional antimicrobials.

On the whole, ***Escherichia coli*** isolates are usually sensitive to the antimicrobials tested, with less than

20% of total isolates showing resistance to one or more compounds tested.

As a group, the ***Streptococcus non-agalactiae*** isolates show considerable variability in antimicrobial resistance profiles. This is partially due to the innate resistance of these organisms as well as the grouping of several different species under the heading of "Streptococcus non-agalactiae". Overall, these bacteria are most reliably sensitive to penicillin/novobiocin, penicillin and ampicillin.

Analysis of retrospective data is in progress at the AHL to evaluate antimicrobial resistance profiles in order to identify changes over time. We will share this information with you when our analysis is completed.



Animal Health Laboratory Accreditations:

American Association of Veterinary Laboratory Diagnosticians (AAVLD) (lab system)
Thyroid Registry of the Orthopedic Foundation for Animals Inc. (OFA) (thyroid function)
Canadian Food Inspection Agency (CFIA) (EBL, EIA)
Canadian Association of Environmental Analytical Laboratories (CAEAL) (metals)

Mailing list

If you would like to be added to, or removed from, the AHL Newsletter mailing list, please fax your request to **Ms. Helen Oliver** at 519-821-8072 or E-mail to holiver@lsd.uoguelph.ca

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Laboratory Services Division, University of Guelph, Box 3612,
Guelph, Ontario, Canada N1H 6R8.

Editor: **Dr. Grant Maxie**.

Animal Health Laboratory, Guelph
Phone: 519-824-4120 ext 4501
Fax 519-821-8072
Email gmaxie@lsd.uoguelph.ca

Animal Health Laboratory, Kemptville
Phone 613-258-8320
Fax 613-258-8324
Email dstevens@kemptvillec.uoguelph.ca

Animal Health Laboratory, Ridgetown
Phone 519-674-1551
Fax 519-674-1555
Email jgough@ridgetownc.uoguelph.ca