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JDIP News is published periodically to enhance intramural communications and ensure that JDIP participants and stakeholders are updated on news of relevance to our community.

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Visit our website at:  
<http://www.jdip.org>



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## JDIP – The Year 5 RFA

By Ken Olson, Ph.D.

JDIP has announced its annual "Request for Applications" (RFA). Through this process competitive awards will be made for research, education and extension efforts that focus on Johne's disease. Applicants must be a JDIP Investigator/Member, or must request membership prior to receiving an award. This is the second year of funding under the JDIP Phase II program from the USDA-CSREES-NRI-CAP program. It is expected that a total of approximately \$850,000 will be available for this annual funding cycle. Of this amount, approximately

\$750,000 will be used to fund new and existing projects and cores. It is anticipated that at least \$100,000 of the total funding will be directed towards developmental projects that show special promise. These proposals normally come from investigators who are not currently funded through the JDIP mechanism. Information, instructions and all needed forms are available on [www.jdip.org](http://www.jdip.org). Click on "Funding Opportunities" in the menu on the left of the screen for access to all forms. Applications must be received by November 14, 2008.



Review of the Year 4 RFA

## The APHIS-JDIP Vaccine Project

*By Ken Olson, Ph.D.*

There is interest among many veterinarians and producers in vaccination as a tool for use in Johne's programs; however, there is only one vaccine available at the present time. That vaccine has limitations and is not approved for use in all states. JDIP is collaborating with the USDA APHIS VS in an effort to identify viable vaccine candidates and evaluate those with the greatest potential for commercial development. The project is in the initial stages of a three step process.

**Phase I** – Potential candidates are currently being solicited. This includes both modified live organisms and subunits. In vitro screening in two laboratories will identify the "Best Candidates."

**Phase II** - These "Best Candidates" will be evaluated through the use of a mouse model. It is anticipated that two laboratories will conduct the infection/protection studies in the mouse.

**Phase III** – The "Best Candidates" identified through the mouse studies will then be evaluated using a "Goat model." This will provide data similar to that from cattle, but the data here are available in a much shorter time frame and at a lower cost.

**Summary** – The coordinated three-stage evaluation will take approximately three years to complete. It is expected that this rigorous screening process will identify one or more viable candidates to move forward for commercial development. Additional information about the project and its progress will be available at [www.jdip.org](http://www.jdip.org)

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## The National Dairy Producer Johne's Survey

*By Ken Olson, Ph.D.*

A National Dairy Producer Johne's Survey, funded by the Johne's Disease Integrated Program (JDIP) and led by The Pennsylvania State University, has recently been completed. The survey, which was mailed to approximately 15% of the dairy producers in each state, sought to identify barriers to and incentives for participation in the Voluntary Bovine Johne's Disease Control Program. Through this, additional educational needs and opportunities will also be identified. Over 2,000 surveys were returned. Results are being analyzed in detail, but several preliminary results are of special interest.

- ▶ Approximately 50% of respondents have had Johne's disease diagnosed, or have seen clinical signs of the disease in their herd
- ▶ Approximately 1/3 of the respondents did not know if their state had a Johne's program
- ▶ Respondents primarily participated in the program from concern over Johne's. Financial incentives, such as reduced testing cost and Risk Assessments, were positive factors.
- ▶ Over 80% listed farm magazines and Veterinarians as primary sources for Johne's Information. Veterinarians, farm magazines and extension were the most reliable sources of information

Additional details will be available at <http://vetextension.psu.edu>, <http://www.jdip.org> and through upcoming publications.

## Prevalence Estimation 101

*By Ian Gardner, Ph.D.*

What proportion of the dairy herds in the United States is infected with Johne's disease? Is it the same as in Europe? Has the prevalence of Johne's within infected herds decreased over the last 10 years? Has the prevalence of Johne's disease changed compared with 2 years ago when aggressive control procedures were implemented in the herd?

On the surface, these are four simple questions that can be answered with well-designed studies that include random sampling of herds and animals within herds. However, the analysis of data from these studies is more complicated when different tests, such as serum ELISA, fecal culture, and fecal PCR, are used in different countries, states or herds, or within the same herd over time. In these situations, the true (but unknown) prevalence should be used for the comparisons since it corrects for different sensitivities and specificities of tests used in the studies allowing the results to be evaluated on the same scale. Both traditional frequentist statistics and newer, and perhaps more controversial, Bayesian methods can be used for these analyses.

To help harmonize approaches to prevalence estimation and provide guidance as to appropriate sample sizes for prevalence studies, JDIP has posted a new document on its website. It is presented in a "Frequently-asked question" format that allows investigators to readily navigate to questions of most interest to them. This information is available at

[http://www.jdip.org/index.php?option=com\\_content&task=view&id=116&Itemid=193](http://www.jdip.org/index.php?option=com_content&task=view&id=116&Itemid=193).

The study that provided these answers was coordinated by the Epidemiology and Biostatistics Core at Davis and was lead by Locksley Messam, Adam Branscum, JDIP post-doctoral trainees both of whom now have University faculty appointments, and Ian Gardner. Dr. Mike Collins, another JDIP member, provided assistance in identifying the most relevant field questions to be addressed in the document. The original results of the study were published in *Animal Health Research Reviews* 2008; 9:1-23.

## The APHIS-JDIP Outreach Education Project

*By Ken Olson, Ph.D.*

A new project has been initiated by JDIP, with funding from USDA APHIS, that will assist in the assessment of existing state education efforts, work to incorporate findings from the national dairy producer Johne's survey into enhanced program efforts, draw on JDIP expertise to assist in implementing the new Johne's Strategic Plan and assist in reaching a broader audience with information about Johne's disease.

The first part of the project is underway. State Designated Johne's Coordinators are being surveyed to document education and outreach efforts that have been done, but in many cases have not been captured by the national program. Additional input will be gathered from industry sources. This information will be valuable for industry partners as they work to maintain funding for the program. Updates on additional parts of the project will be provided as the effort moves forward.

## The Cornell Workshops: “Tools for Infectious-Disease Epidemiology”

*By Yrjo Grohn, Ph.D.*

In addition to offering statistical and epidemiological consulting services and developing new statistical and mathematical methodology, the Epidemiology and Biostatistics Core offers training workshops to the members of the JDIP community. To support the training mission, the summer course in epidemiological methods was offered at Cornell University on June 17-19 (Part I) and August 11-13, 2008 (Part II). The course contents covered three major topics: diagnostic test evaluation, infectious disease models and risk assessment.

Twenty-one participants attended Part I. Dr. Hollis Erb taught diagnostic test evaluation, and Drs. Hussni Mohammed and Daryl Nydam covered risk analysis.

Twenty-four participants attended Part II., which covered more advanced material in risk analysis and infectious disease modeling. Hussni Mohammed and Daryl Nydam continued with risk analysis and Yrjo Grohn and Ynte Schukken with their post docs. Renata Ivanek, Cristina Lanzes and Zhao Lu taught infectious disease modeling. Both deterministic and stochastic models were covered.

Teaching methods in both workshops included mini lectures and case studies with hands on computer exercises. Case study examples were chosen to be relevant to veterinary medicine, such as paratuberculosis, salmonella and cryptosporidium.

One of our goals was to make sure that after the course, participants were able to: 1) contribute to the design of programs for disease control/prevention; and 2) interpret/evaluate protocols and literature on these topics. Therefore, we were very pleased to see thirteen state veterinarians, who are in the front line of Johnes disease control, attending the workshops.

Based on the teaching evaluations, both courses were well received. Students particularly appreciated the hands on exercises. Some recommendations made were that test evaluation and risk analysis should be covered in Part I, and Part II should be dedicated fully to infectious disease modeling, which would give more time to work with and understand how infectious disease modeling works.

The partial funding by JDIP to support JDIP members' attendance of this course was greatly appreciated. Check the JDIP website [www.jdip.org](http://www.jdip.org) for information on future workshops.

## The American Academy of Microbiology Report on MAP and Crohn's Disease is Released

By Vivek Kapur, Ph.D.

The report of a colloquium titled "*Mycobacterium avium paratuberculosis*: Infrequent human pathogen or a public health threat" held by the American Academy of Microbiology in June of last year has been released. This colloquium was supported in part by the JDIP program, and several members of JDIP participated in the colloquium and the writing of the report. The focus of the colloquium was to assess the current understanding of the role of MAP in Crohn's disease (CD).

The historical context of holding the colloquium in Salem, Massachusetts, best known for the witchcraft trials in 1692 and the resulting mass hysteria, was not lost on the participants. Special efforts were made to rigorously evaluate the scientific evidence associating MAP as a causative agent of CD and make recommendations for research and future action.

Participants were in general agreement that there was substantial circumstantial evidence suggesting a role of MAP in CD. However, there was also a broad consensus that causality could not be established based on a review of the current literature.

The report lists several recommendations and suggests that research to elucidate the role of MAP in CD should be directed at two major unknowns: (i) whether MAP from livestock and other animals is transmissible to humans and how it is transmitted; and (ii) whether humans are susceptible to infection and disease after exposure to MAP. There was also a broad consensus that studies that would help to identify reliable and validated biological markers of infection are needed.

As outlined in the report, colloquium participants outlined six general recommendations regarding research on the association between MAP and CD. These include:

1. Research to discover and standardize diagnostics that are both sensitive and specific for MAP in animals and in humans and can determine the source of MAP cultured from human tissue is imperative: virtually all the research topics that will clarify the role of MAP in CD rely on this.
2. Research must address the issue of MAP transmissibility and determine whether or not the MAP strains isolated from animals or food are genetically identical to the MAP strains isolated from humans.
3. Research should also examine the potential virulence factors in human MAP isolates, and determine whether MAP can be transmitted from human to human.
4. Researchers must develop better animal models for evaluating MAP effects on human hosts and for evaluating the effectiveness of potential therapies for MAP infection.
5. A policy for regularly screening foods for MAP should not be put into place until focused research studies can determine the actual risks of exposure and disease.
6. Identifying novel MAP-specific antimicrobials and effective antibiotic treatment regimens for MAP infections is a research priority.

It was gratifying to note that many of the recommendations, particularly relating to new diagnostics, strain differentiation, pathogenesis, and animal models are closely aligned with JDIP priority areas, and that JDIP investigators are leading the path forward in these areas. For more information, or to download the AAM report, please visit the JDIP website ([www.jdip.org](http://www.jdip.org)) or follow the link below – <http://www.asm.org/ASM/files/ccLibraryFiles/Filename/00000004169/MAP.pdf>.

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**ICP Coming to Minnesota**

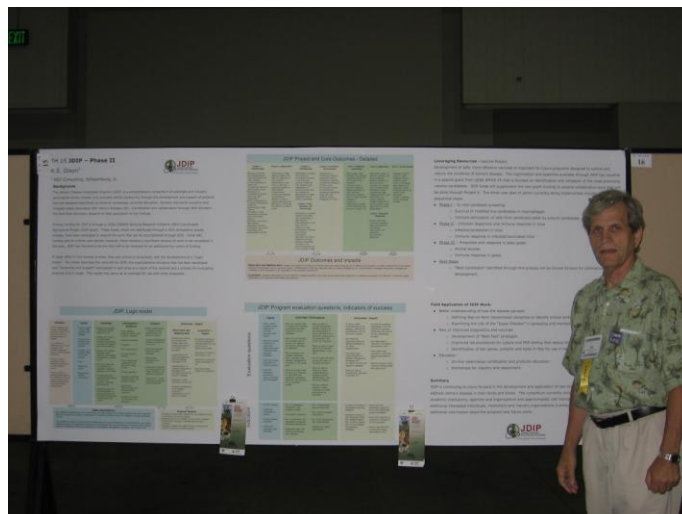
*By Ken Olson, Ph.D.*

The United States is the host country for the 10<sup>th</sup> International Colloquium on Paratuberculosis, sponsored by the International Association for Paratuberculosis (IAP). The scientific program will run from Sunday, August 9 through Friday, August 14 on the campus of the University of Minnesota. Since the biennial colloquium brings together many of the top Johne's researchers and educators from around the world, it will provide a great opportunity to learn more about the latest research into the disease. Speakers will also explore public health concerns relative to MAP and work that is being done to address these concerns. JDIP will be working closely with meeting organizers and plans to wrap our scientific presentations into the ICP meeting. As a follow-up to last year's very successful "New Horizons" workshop, a one-day session, targeted for veterinarians and producers, is being planned for Monday August 10. The session will focus on field application of the more basic research conducted around the world. Mark you calendar and plan to join us in Minnesota. Meeting details will be available on the IAP site <http://www.paratuberculosis.org/>, [www.jdip.org](http://www.jdip.org) and the University of Minnesota, College of Veterinary Medicine's Continuing Education page [www.cvm.umn.edu/outreach](http://www.cvm.umn.edu/outreach).

**JDIP at ADSA**

*By Ken Olson, Ph.D.*

The JDIP logic model, developed as part of our submission for renewal of the NRI CAP grant, was featured in a poster presentation at the 2008 joint annual meeting of the American Dairy Science Association (ADSA) and the American Society of Animal Science (ASAS) that was held in Indianapolis, Indiana in July. The poster, presented by Ken Olson, a member of the JDIP Executive Committee, also helped to create awareness of the JDIP mission and accomplishments among the dairy and animal scientists at the meeting.



*JDIP Poster at ADSA*

## Upcoming Meetings and Industry Events

- October 23 - 29, 2008  
USAHA & AAVLD Annual Meeting (Sheraton Greensboro Hotel \* Greensboro, NC. USA)  
<http://www.usaha.org>  
October 23 (1:00 pm – 5:00 pm) and 24 (8:00 am – 5:00 pm) National Johne's Work Group Meeting  
October 26 (12:30 pm – 5:30 pm) Committee on Johne's Disease
- October 27 - 30, 2008  
National Milk Producers Federation Annual Meeting (Gaylord Opryland Resort \* Nashville, TN. USA)  
<http://www.nmpf.org>
- January 28 - 31, 2009  
National Cattlemen's Beef Association Annual Meeting (NCBA Trade Show \* Phoenix, AZ. USA)  
[http://www.beefusa.org/convention\\_meetings.aspx](http://www.beefusa.org/convention_meetings.aspx)
- March 30 - April 2, 2009  
National Institute for Animal Agriculture Annual Meeting (Galt House Hotel & Suites \* Louisville, KY. USA)  
<http://www.animalagriculture.org/>  
March 30 – National Johne's Work Group Meeting
- May 17 - 21, 2009  
American Society of Microbiology Annual Meeting (Pennsylvania Convention Center \* Philadelphia, PA. USA)  
<http://www.gm.asm.org/>
- July 11 - 14, 2009  
American Veterinary Medical Association Annual Meeting (Seattle, WA. USA)  
<http://www.avma.org/>
- July 12 - 16, 2009  
American Dairy Science Association Annual Meeting. (Montreal, Quebec, Canada)  
<http://adsa.asas.org>
- August 9 - 14, 2009  
10th International Colloquium on Paratuberculosis (St. Paul/ Minneapolis, Minnesota. USA)  
August 10 – “New Horizon's” conference for practitioners and producers in Conjunction with ICP  
<http://paratuberculosis.org/>
- August 10 - 14, 2009  
12th International Symposium on Veterinary Epidemiology and Economics. (International Convention Centre \* Durban, South Africa)  
<http://www.isvee12.co.za>
- August 25 - 28, 2009  
5th International M. bovis V Conference (The Museum of New Zealand Te Papa Tongarewa \* Wellington, New Zealand)  
<http://www.mbovisconference.org/>
- September 10 - 12, 2009  
42nd Annual Conference of the American Association of Bovine Practitioners (Quest Center \* Omaha, NE. USA)  
<http://www.aabp.org/meeting/future.asp>
- Sept.29 – October 3, 2009  
World Dairy Expo (Madison, WI. USA)  
<http://www.world-dairy-expo.com>

## JD in Print – Producer Publications

- **Gatz, T.S.**, Johne's Disease: A Little Dab Will Do 'Em. Angus Journal. 2008. July p. 138.
- Beat Johne's with Sound Management. Jersey Journal. 2008. August.
- **Durst, P. and D. Grooms.** Johne's disease remains one of dairy's biggest herd health challenges. (JDIP Meeting Summary). Midwest Dairy Business. 2008. August.
- Johne's testing brochure available. Dairy Herd Mgt. 2008. Sept. 30.

**JD In Print – Peer Review  
Johne's Disease Related Publications**

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- **Ansari-Lari M, Haghkhal M, Bahramy A, Novin Baهران AM.**, Risk factors for Mycobacterium avium subspecies paratuberculosis in Fars province (Southern Iran) dairy herds. Trop Anim Health Prod. 2008 Aug 26. [Epub ahead of print] PMID: 18726705
- **Baran J, Mundy DI, Vasanji A, Parat MO.**, Altered localization of H-Ras in caveolin-1-null cells is palmitoylation-independent. J Cell Commun Signal. 2007 Dec; 1(3-4):195-204. Epub 2008 Feb 17. PMID: 18600479.
- **Bridger PS, Bulun H, Davis WC, Bauerfeind R, Menge C.**, Detection of antigen-specific memory T-cells in adult cattle naturally infected with Mycobacterium avium subsp paratuberculosis. Wiener Klinische Wochenschrift. 2008. 120, 185-185.
- **Clark DL Jr, Koziczowski JJ, Radcliff RP, Carlson RA, Ellingson JL.**, Detection of Mycobacterium avium subspecies paratuberculosis: comparing fecal culture versus serum enzyme-linked immunosorbent assay and direct fecal polymerase chain reaction. J Dairy Sci. 2008 Jul; 91(7): 2620-7. PMID: 18565921
- **de Almeida DE, Colvin CJ, Coussens PM.**, Antigen-specific regulatory T cells in bovine paratuberculosis. Vet Immunol Immunopathol. 2008 Oct 15; 125(3-4):234-45. Epub 2008 Jul 3. PMID: 18602164
- **Dennis MM, Antognoli MC, Garry FB, Hirst HL, Lombard JE, Gould DH, Salman MD.**, Association of severity of enteric granulomatous inflammation with disseminated Mycobacterium avium subspecies paratuberculosis infection and antemortem test results for paratuberculosis in dairy cows. Vet Microbiol. 2008 Sep 18; 131(1-2):154-163. Epub 2008 Mar 4. PMID: 18448275
- **Diéguez FJ, Arnaiz I, Sanjuán ML, Vilar MJ, Yus E.**, Management practices associated with Mycobacterium avium subspecies paratuberculosis infection and the effects of the infection on dairy herds. Vet Rec. 2008 May 10; 162(19): 614-7. PMID: 18480020
- **Eamens GJ, Walker DM, Porter NS, Fell SA.**, Radiometric pooled faecal culture for the detection of Mycobacterium avium subsp paratuberculosis in low-shedder cattle. Aust Vet J. 2008 Jul; 86(7):259-65. PMID: 18616475
- **Egan S, Lanigan M, Shiell B, Beddome G, Stewart D, Vaughan J, Michalski WP.**, The recovery of Mycobacterium avium subspecies paratuberculosis from the intestine of infected ruminants for proteomic evaluation. J Microbiol Methods. 2008 Sep; 75(1):29-39. Epub 2008 May 14. PMID: 18547663
- **Florou M, Leontides L, Kostoulas P, Billinis C, Sofia M, Kyriazakis I, Lykotrafitis F.**, Isolation of Mycobacterium avium subspecies paratuberculosis from non-ruminant wildlife living in the sheds and on the pastures of Greek sheep and goats. Epidemio Infect. 2008 May; 136(5): 644-52. [Epub 2007 Jun 20] PMID: 17578601
- **Florou M, Leontides L, Kostoulas P, Billinis C, Sofia M.**, Strain-Specific Sensitivity Estimates of Mycobacterium avium subsp. paratuberculosis Culture in Greek Sheep and Goats. Zoonoses Public Health. 2008 Sep 11. Epub ahead of print. PMID: 18793275
- **Fry MP, Kruze J, Collins MT.**, Evaluation of four commercial enzyme-linked immunosorbent assays for the diagnosis of bovine paratuberculosis in Chilean dairy herds. J Vet Diagn Invest. 2008 May; 20(3):329-32. PMID: 18460620
- **Fulton Z, McAlister A, Wilce MC, Brammananth R, Zaker-Tabrizi L, Perugini MA, Bottomley SP, Coppel RL, Crellin PK, Rossjohn J, Beddoe T.**, Crystal structure of an UDP-glucose specific glycosyltransferase from a mycobacterium species. J Biol Chem. 2008 Jul 30. Epub ahead of print. PMID: 18667419
- **Fulton Z, Crellin PK, Brammananth R, Zaker-Tabrizi L, Coppel RL, Rossjohn J, Beddoe T.**, Expression, purification, crystallization and preliminary X-ray characterization of a putative glycosyltransferase of the GT-A fold found in mycobacteria. Acta Crystallogr Sect F Struct Biol Cryst Commun. 2008 May 1; 64(Pt 5): 428-31. Epub 2008 Apr 30. PMID: 18453718
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- **Greenstein RJ, Su L, Juste RA, Brown ST.**, On the action of cyclosporine A, rapamycin and tacrolimus on M. avium including subspecies paratuberculosis. PLoS ONE. 2008 Jun 25; 3(6):e2496. PMID: 18575598
- **Gronesova P, Ficova M, Mizakova A, Kabat P, Trnka A, Betakova T.**, Prevalence of avian influenza viruses, Borrelia garinii, Mycobacterium avium, and Mycobacterium avium subsp. paratuberculosis in waterfowl and terrestrial birds in Slovakia, 2006. Avian Pathol. 2008 Oct; 37(5):537-43. PMID: 18798030
- **Gumber S, Taylor DL, Marsh IB, Whittington RJ.**, Growth pattern and partial proteome of Mycobacterium avium subsp. paratuberculosis during the stress response to hypoxia and nutrient starvation. Vet Microbiol. 2008 Aug 5. Epub ahead of print. PMID: 18786786



- **Haghighi M, Ansari-Lari M, Novin-Baheran AM, Bahramy A.**, Herd-level prevalence of *Mycobacterium avium* subspecies paratuberculosis by bulk-tank milk PCR in Fars province (southern Iran) dairy herds. *Prev Vet Med.* 2008 Aug 15; 86(1-2):8-13. Epub 2008 May 23. PMID: 18501450
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- **Hokama A, Mizoguchi E, Mizoguchi A.**, Roles of galectins in inflammatory bowel disease. *World J Gastroenterol.* 2008 Oct; 14(10):1366-72. PMID: 18484670
- Johne's disease continues to be the most common cause of bovine enteric disease. *Vet Rec.* 2008 Aug 9; 163(6):171-4. PMID: 18770912
- **Juste RA, Elguezabal N, Garrido JM, Pavon A, Geijo MV, Sevilla I, Cabriada JL, Tejada A, García-Campos F, Casado R, Ochotorena I, Izeta A, Greenstein R.J.**, On the prevalence of *M. avium* subspecies paratuberculosis DNA in the blood of healthy individuals and patients with inflammatory bowel disease. *PLoS ONE.* 2008 Jul 2; 3(7):e2537. PMID: 18596984
- **Karcher EL, Johnson CS, Beitz DC, Stabel JR.**, Osteopontin immunoreactivity in the ileum and ileocecal lymph node of dairy cows naturally infected with *Mycobacterium avium* subsp. paratuberculosis. *Vet Immunol Immunopathol.* 2008 Jun 8. Epub ahead of print. PMID: 18620757
- **Karcher EL, Bayles DO, Bannantine JP, Beitz DC, Stabel JR.**, Osteopontin: a novel cytokine involved in the regulation of *Mycobacterium avium* subspecies paratuberculosis infection in periparturient dairy cattle. *J Dairy Sci.* 2008 Aug; 91(8):3079-91. PMID: 18650284
- **Kim YG, Park JH, Daignault S, Fukase K, Nunez G.**, Cross-tolerization between Nod1 and Nod2 signaling results in reduced refractoriness to bacterial infection in Nod2-deficient macrophages. *J Immunol.* 2008 Sep 15; 181(6): 4340-6. PMID: 18768892
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- **Li XH, Conklin L, Alex P.**, New serological biomarkers of inflammatory bowel disease. *World J Gastroenterol.* 2008 Sep 7; 14(33): 5115-24. PMID: 18777587
- **Lu Z, Mitchell RM, Smith RL, Van Kessel JS, Chapagain PP, Schukken YH, Grohn YT.**, The importance of culling in Johne's disease control. *J Theor Biol.* 2008 Sep 7; 254(1):135-46. Epub 2008 May 16. PMID: 18573505
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