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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.

Please direct any contributions, suggestions and comments via email to: Vivek Kapur, JDIP Program Director, at vkapur@psu.edu



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The APHIS-JDIP Vaccine Project Update

http://www.jdip.org/index.php?option=com_content&task=view&id=118&Itemid=197

Watch for an email from the APHIS-JDIP Vaccine Project! Candidate vaccines are being received and processed. Detailed submission guidelines for live MAP vaccine candidates are available for those who would like to submit vaccine candidates for evaluation. Please contact the JDIP Project Assistant, Tiffany Cunningham, at tac18@psu.edu, if you would like to be sure that you are on our notification list.

JDIP Funding Update

The National Program Leader for Competitive Programs at the USDA-CSREES, Peter Johnson, has informed the JDIP that it will be receiving an additional \$115,000 in its budget this year. This was made possible by returned funds from another project. Based on productivity, accomplishment and need, the USDA-CSREES opted to divide the returned funds among two existing projects, one of which was the JDIP. The JDIP Executive Committee, in consultation with the SAB and EAB, has initiated the process of deciding where and how to allocate these additional funds. The JDIP would like to thank the USDA-CSREES for this generous and new opportunity to support and expand the JDIP program portfolio.

Congratulations!

JDIP Year 5 Funding Update

By: Tiffany Cunningham, J.D.

The JDIP received and reviewed 20 proposals in response to the Year 5 Request for Applications (RFA) with a total funding request exceeding \$1.43 million. For the current funding cycle a total of \$850,000 were available for support of JDIP programs and operations.

All of the submitted proposals were reviewed externally, as well as by the JDIP Scientific Advisory Board (SAB) at an in-person meeting. Members of the External Advisory Board (EAB) as well as the United States Department of Agriculture (USDA) program staff were in attendance at the SAB meeting to help provide input, oversight and observe the review process. As in past cycles, anyone, who may have had a conflict of interest relative to any of the proposals being reviewed, was excluded from the discussions and was not present in the room during the discussion. The JDIP Executive Committee (EC) compiled summary statements from the SAB meeting and based on the reviews and program priorities, made funding recommendations for the full EAB to consider. Based on a review of the proposals, summary statements, and recommendations by the EC, the EAB approved the following projects for support during year 5 (listed alphabetically by Principal Investigator last name):

Principal Investigator	Principal Investigator Institution	Co-Principal Investigator	Co-Principal Investigator Institution	Total Award
Bannantine, John	National Animal Disease Center, USDA-ARS	Stabel, Judith Paustian, Michael	National Animal Disease Center, USDA-ARS	\$35,111
Barletta, Raul	University of Nebraska-Lincoln	N/A	N/A	\$43,626
Bermudez, Luiz	Oregon State University	Eckstein, Torsten	Colorado State University	\$75,000
Chang, Yung-Fu	Cornell University	N/A	N/A	\$89,798
Grohn, Yrjo	Cornell University	Gardner, Ian Schukken, Ynte Wells, Scott	University of California, Davis Cornell University University of Minnesota	\$90,000
McDonald, Jeannette	The Board of Regents of the University of Wisconsin	N/A	N/A	TBD
Osterstock, Jason	Texas Agricultural Research and Extension Center	Seabury, Chris Schukken, Ynte	Texas A&M University Cornell University	\$41,392
Schukken, Ynte	Cornell University	Gardner, Ian Grohn, Yrjo Wells, Scott Wu, Ching Ching	University of California, Davis Cornell University University of Minnesota Purdue University	\$75,000
Sreevatsan, Srinand	The Board of Regents of the University of Minnesota	N/A	N/A	\$88,541
Talaat, Adel	The Board of Regents of the University of Wisconsin	N/A	N/A	\$77,750

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***** Please note that all sub-awards for the projects above are in process and have not been executed at this point. *****

Of the aforementioned recipients, the JDIP would like to welcome and introduce John Bannantine's developmental project entitled "Antigens of *Mycobacterium avium* subsp *paratuberculosis*." The goal of this new, one-year developmental project is to identify the strongest and most specific antigens of *Mycobacterium avium* subsp *paratuberculosis*. The antigens identified from these foundational studies will serve as leading candidates for evaluation in the JDIP's diagnostic test initiative scheduled for FY2010. This project will use extensively leveraged resources developed by the JDIP scientific core 3 as well as salaried personnel from USDA-ARS to enable high impact results with minimal JDIP funding.

The project consists of three specific aims as outlined below:

1. Construct a 384-spot protein array. Recombinant *M. avium* subsp *paratuberculosis* proteins have been produced as one of the tasks assigned to JDIP's scientific core 3. A total of 384 of these proteins will be spotted onto nitrocellulose filters.
2. Screen the 384-spot array of *M. avium* subsp *paratuberculosis* recombinant proteins using healthy controls and Johne's infected cattle.
3. Screen 96 recombinant proteins in a gamma interferon (IFN- γ) microassay. An IFN- γ microassay will be optimized and used to screen a selected 96 recombinant proteins for stimulation of IFN- γ , a measure of cell-mediated immunity.

Laboratory Methods for Paratuberculosis Isolation and Identification Training in Ames, Iowa

By: Beth Harris, Ph. D.

The National Veterinary Services in Ames, Iowa is offering an intensive 4 day course (August 3-6, 2009 from 8AM-4:30 PM) designed to familiarize attendees with the current methods for isolation and identification of *Mycobacterium avium* spp. *paratuberculosis*. This is a unique opportunity to see and use three different liquid media culture systems, as well as traditional solid media methods. Molecular methods will be covered in depth including 2 methods for direct real time PCR, as well as IS1311 REA and MLSSR genotyping of MAP strains. Students will receive a detailed manual with SOP's and will have a hands on training opportunity with well characterized samples in the JDIP bank that can be subsequently used in their laboratories for validation and method comparison. NVSL Johne's Laboratory is ISO 17025 certified.

Price: As a special benefit, JDIP members qualify for a reduced price of \$300, a savings of over \$1,000. Non-JDIP members can participate, but at the regular price of \$1356.

Further information regarding registration, directions to Ames, IA, and hotel accommodations can be directed to Dan Grause at (515) 663-7300 or by email, daniel.j.grause@aphis.usda.gov

Johne's at the Joint Annual Meeting of the American Dairy Science Association and the American Society of Animal Science

By: Ken Olson, Ph.D.

The Joint Annual Meeting (JAM) of the American Dairy Science Association (ADSA) and the American Society of Animal Science (ASAS) will be held July 12 – 16, 2009 in Montreal, Canada. This year the Canadian Society of Animal Science (CSAS) will also be a part of the meeting.

Several sessions with Johne's related information are scheduled during the meeting. On Monday, July 13 at 4:30 pm a "Johne's Interest Group" will meet in room 523a of the Convention Center. We will review current Johne's activities, program status and the new National Strategic Plan. We are also planning an open discussion on ways to continue to move the program forward. Several Johne's related presentations and posters are scheduled during the meeting, including:

Monday

M56 - Estimation of genetic parameters and transmitting ability for Minnesota Johne's milk ELISA test. S. A. Attalla^{*1,3}, A. J. Seykora¹, J. B. Cole², and B. J. Heins¹, ¹University of Minnesota, Saint Paul, ²Animal Improvement Programs Laboratory, ARS, USDA, Beltsville, MD, ³Cairo University, Giza, Egypt.

M167 - Advances in colostrum management. S. Godden^{*1}, S. Wells¹, J. Stabel², D. Haines³, R. Bey¹, J. Fetrow¹, P. Pithua¹, and M. Donahue¹, ¹University of Minnesota, St. Paul, ²USDA, ARS, National Animal Disease Center, Ames, IA,, ³University of Saskatchewan, Saskatoon, SK, Canada.

Wednesday

W7 - Factors affecting milk ELISA scores of cows tested for Johne's disease. H. D. Norman¹, J. R. Wright^{*1}, and T. M. Byrem², ¹Animal Improvement Programs Laboratory, ARS, USDA, Beltsville, MD, ²Antel BioSystems, Lansing, MI.

W8 - Characteristics of milk ELISA results for Johne's disease in US dairy cows. T. M. Byrem^{*1}, H. D. Norman², and J. R. Wright², ¹Antel BioSystems, Inc., Lansing, MI, ²Animal Improvement Programs Laboratory, Beltsville, MD.

W9 - Johne's outreach survey. K. E. Olson^{*}, KEO Consulting, Schaumburg, IL.

W10 - Perceptions of and participation in a Johne's control program. E. Hovingh^{*1}, K. E. Olson², and J. McDonald³, ¹Pennsylvania State University, University Park, ²KEO Consulting, Schaumburg, IL, ³University of Wisconsin, Madison.

Visit <http://adsa.asas.org/meetings/2009/> for additional meeting information and on-line registration.



Plan to Attend the 10th International Colloquium for Paratuberculosis (ICP) and the 2nd New Horizons Workshop – August 9 - 14, 2009

By: Ken Olson, Ph.D.

Abstracts are in and program details are being finalized. So if you haven't done so already, now is the time to register for the ICP. Held every two years and sponsored by the International Association for Paratuberculosis, the ICP is regularly attended by a large number of participants from around the world. The colloquium, being held in Wiley Hall at the University of Minnesota August 9 to 14, is expected to attract 300 to 350 scientists and administrators from universities, research organizations, and industry as well as state veterinary representatives and producers. This marks just the second time the ICP has been held in the United States.

A highlight of the 2009 ICP will be a special opening session Sunday evening on August 9 addressing the possible role of *M. avium* subsp. *paratuberculosis* as a public health threat. This event will be of particular interest to medical scientists, researchers and decision makers. Presenters for the session are Dr. Tim Bull and Dr. Herb Van Kruiningen. A lively discussion is anticipated.

The scientific program will be exciting and information packed with well-known international speakers, who provide an introduction to each section through plenary lectures, and dedicated scientists reporting new results in the focused scientific sessions outlined below. In addition, there will be poster sessions and a commercial exhibition adjoining the break area.

A special feature is an outreach workshop designed for veterinarians, producers and industry representatives, "**New Horizons in Johne's Disease Control**," that will be held on Monday August 10. The workshop will focus on field application of some of the basic research from around the world. The objective is to identify why herd programs are important, then discuss various strategies for working with the disease at the herd level and wrap up with a case study where various actions discussed have been used. The workshop is sponsored by industry partners and the Johne's Disease Integrated Program (JDIP).

10th ICP Schedule

Date	Time	Event
Sun. 8/9	1:30 PM	IAP Board Meeting
	2 – 6:00 PM	Registration
	6 – 7:00 PM	Opening Session – Public Health discussion
	7:00 PM	Reception
Mon. 8/10	9 AM – 2:30 PM	Session 1 – Diagnostics and Genotyping
	2:45 – 6:30 PM	Session 2 – Host Response and Immunology
	9 AM – 5:00 PM	New Horizons – Practitioner/ Producer Workshop
Tue. 8/11	9 AM – 2:30 PM	Session 3 – Epidemiology (molecular)
	3 PM – 5:30 PM	Poster Session
Wed. 8/12	8:30 AM – 1 PM	Session 4 - Pathogenomics and MAP Biology
	8:30 AM – 1 PM	Session 5 - MAP Control
	1:30 – 5:00 PM	ICP Social Event
Thur. 8/13	9 AM – 12:30 PM	Session 6 – Public Health
	1:30 – 2:30 PM	IAP General Meeting
	2:30 – 4:30 PM	Session 7 – International Initiatives
	5:00 PM	IAP Reception and Dinner
Fri. 8/14		Tour to NADC and / or Special Workshops

Please visit <http://www.cvm.umn.edu/outreach/events/icp/home.html> for registration and further meeting information.

10th ICP Reminders

Register by July 1st, 2009 to take advantage of the early registration discounted price for either IAP members or non-members.

After July 1st, 2009, registration fees will increase.

The deadline to secure lodging for the very affordable on-campus housing option is July 15th, 2009.

The JDIP EAB / EC / SAB annual meeting will be held on Monday, August 10, 2009 at 6:30 in the Minnesota Room at the McNamara Alumni Center of the University of Minnesota Minneapolis, MN

JDIP Scholarship Awardees

Castellanos, Elena
University of Madrid - Spain

Chen, Jenn-Wei
Cornell University - USA

Cho, Jaesung
Cornell University - USA

Foddai, Antonio
Queen's University Belfast –
Northern Ireland

George, Sajan
University of Minnesota -
USA

Kabara, Ed
Michigan State University -
USA

Lamont, Elise
University of Minnesota -
USA

Marce, Clara
University of London -
England

Plattner, Brandon
Iowa State University - USA

Pradhan, Abani
Cornell University - USA

Robinson, Mark
University of Otago – New
Zealand

Roupie, Virginie
Scientific Institute of Public
Health - Belgium

Upcoming Changes to CSREES

As you may have heard, the United State's Department of Agriculture's Competitive State Research, Education, and Extension Service (CSREES) is experiencing some organizational changes. As of October 1, 2009, CSREES will now be named the National Institute of Food and Agriculture (NIFA). CSREES authorities will be incorporated into NIFA. For the first time, the Agency will have a Director appointed by the President. A CSREES transitional team and multiple working groups have already begun planning and developing recommendations for structuring the NIFA. Broad internal and external input was solicited to formulate recommendations to the upper administration. The USDA's largest competitive program, the National Research Initiative (NRI), has already been replaced by a new competitive program known as the Agriculture and Food Research Initiative (AFRI). The new Agriculture and Food Research Initiative will provide funding for fundamental and applied research, extension, and education to address food and agricultural sciences. AFRI emphasis areas include programs for:

- Plant Health and Production and Plant Products
- Animal Health and Production and Animal Products
- Food Safety, Nutrition, and Health
- Renewable Energy, Natural Resources, and Environment
- Agricultural Systems and Technology
- Agricultural Economics and Rural Communities
- Rapid Response Food and Agricultural Science for Emergency Issues

JDIP Scholarship Awards to Attend the 10th ICP Meeting

By: Tiffany Cunningham, J.D.

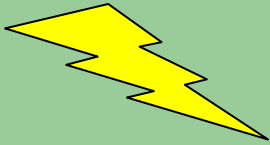
The JDIP would like to announce and congratulate the recipients of the JDIP scholarship award to assist in attending the 10th International Colloquium on Paratuberculosis ("ICP"). This award recognizes the outstanding research of graduate students and post-doctoral appointees from all over the world. This year, JDIP received a total of forty-one abstracts for its annual scholarship.

The submitted scholarship applications were reviewed in a three round process by the Executive Committee of the JDIP. As usual, any Executive Committee member that had a conflict of interest with an application was excluded from the discussions. Overall, the JDIP was able to award twelve scholarships spanning nine institutions and six countries.

Based on a review of the applications, the following graduate students and post-doctoral appointees were selected for support (listed alphabetically by last name):

- Castellano, Elena (University of Madrid - Spain)
- Chen, Jenn-Wei (Cornell University - USA)
- Cho, Jaesung (Cornell University - USA)
- Foddai, Antonio (Queen's University Belfast – Northern Ireland)
- George, Sajan (University of Minnesota - USA)
- Kabara, Ed (Michigan State University - USA)
- Lamont, Elise (University of Minnesota - USA)
- Marce, Clara (University of London - England)
- Plattner, Brandon (Iowa State University - USA)
- Pradhan, Abani (Cornell University - USA)
- Robinson, Mark (University of Otago – New Zealand)
- Roupie, Virginie (Scientific Institute of Public Health – Belgium)

Congratulations again to our awardees, and we look forward to seeing you all at the 10th ICP / JDIP annual meeting in Minneapolis, Minnesota.



Upcoming Meetings and Events

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/meetings/2009>

August 9 - 14, 2009

10th International Colloquium on Paratuberculosis (Minneapolis, Minnesota. USA)

August 10 – 2nd “New Horizon’s in Johne’s Disease Control” workshop for practitioners and producers in Conjunction with ICP

<http://paratuberculosis.org/> and
<http://www.cvm.umn.edu/outreach/events/icp/home.html>

August 10 - 14, 2009

12th International Symposium on Veterinary Epidemiology and Economics. (International Convention Centre * Durban, South Africa)
<http://www.isvee12.co.za>

August 24 – 27, 2009

Annual Meeting European Association for Animal Production (Barcelona, Spain)
<http://www.eaap2009.com:80/>

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/default.asp>

Sept.29 – October 3, 2009

World Dairy Expo (Madison, WI. USA)
<http://www.world-dairy-expo.com>

October 8 – 14, 2009

113th Annual Meeting of the United States Animal Health Association (Includes meeting of the National Johne’s Work Group) (Town and Country Hotel * San Diego, CA. USA)
<http://www.usaha.org/meetings/>

November 10 – 12, 2009

National Milk Producers Federation, National Dairy Board, United Dairy Industry Assoc. Joint Annual Meeting (Grapevine, TX. USA)
http://www.nmpf.org/annual_meeting

JD In Print – Producer Press

- **Lee, K.** New Johne's vaccine will offer more protection, fewer side effects. *Progressive Dairyman*. 2009. Mar.3. p 57.
- **Collins, M.T. and V. Eggleston.** Healthy Cows for a Healthy Industry. *Hoard's Dairyman*. 2009. Apr. 10. Insert
 - You can get ahead of Johne's
 - Cooperation is part of the solution
 - They proved you can do it
 - The Johne's approach that worked
 - Ready to continue expansion
 - They underestimated their Johne's
 - It's not just about Johne's
 - They wouldn't let Johne's disease win
 - Don't buy your Johne's
 - What is the best test?
 - Watching cows isn't enough
 - Their incidence dropped dramatically
 - Goal: Eradication – Plain and simple
 - What you can do
 - Their expansion brought on Johne's
 - Now, we stick to the plan
 - It put their registered business on hold
- **Wolf, C. and H. Groenedaal.** Economics assessed for Johne's control program. *Feedstuffs*. 2009. Apr. 13. p 16.
- Colostrum replacer may reduce Johne's risk. *Feedstuffs*. 2009 Apr. 13. p 16.
- Horizon workshop details. *Feedstuffs*. 2009. Apr. 13. p 17.
- **Gatz, T.S.,** Management changes lower Johne's rate. *Feedstuffs*. 2009. May 11. p 24.
- **Perry, A.** Coordinated pushback could help contain bovine bacterial diseases. *Eastern Dairy Business and Western Dairy Business*. 2009. May 18.

JD In Print – Peer Review

Johne's Disease Related Publications

- **Allen AJ, Park KT, Barrington GM, Lahmers KK, Hamilton MJ, Davis WC.** Development of a bovine ileal cannulation model to study the immune response and mechanisms of pathogenesis of paratuberculosis. *Clin Vaccine Immunol*. 2009 Apr;16(4):453-63. Epub 2009 Feb 18. PMID: 19225077.
- **Alinovi CA, Ward MP, Lin TL, Moore GE, Wu CC.** Real-time PCR, compared to liquid and solid culture media and ELISA, for the detection of *Mycobacterium avium* ssp. paratuberculosis. *Vet Microbiol*. 2009 Apr 14;136(1-2):177-9. Epub 2008 Nov 1. PMID: 19091493.
- **Alinovi CA, Ward MP, Lin TL, Wu CC.** Sample handling substantially affects Johne's ELISA. *Prev Vet Med*. 2009 May 27. PMID: 19477542.
- **Alvarez J, de Juan L, Bezos J, Romero B, Sáez JL, Marqués S, Domínguez C, Mínguez O, Fernández-Mardomingo B, Mateos A, Domínguez L, Aranaz A.** Effect of paratuberculosis on the diagnosis of bovine tuberculosis in a cattle herd with a mixed infection using interferon-gamma detection assay. *Vet Microbiol*. 2009 Mar 30;135(3-4):389-93. Epub 2008 Sep 21. PMID: 18986776.
- **Ansari-Lari M, Haghkhah M, Bahramy A, Novin Baهران AM.** Risk factors for *Mycobacterium avium* subspecies paratuberculosis in Fars province (Southern Iran) dairy herds. *Trop Anim Health Prod*. 2009 Apr;41(4):553-7. Epub 2008 Aug 26. PMID: 18726705.
- **Begg DJ, de Silva K, Bosward K, Di Fiore L, Taylor DL, Jungersen G, Whittington RJ.** Enzyme-linked immunospot: an alternative method for the detection of interferon gamma in Johne's disease. *J Vet Diagn Invest*. 2009 Mar;21(2):187-96. PMID: 19286496.

- **Bhide MR, Mucha R, Mikula I Jr, Kisova L, Skrabana R, Novak M, Mikula I Sr.** Novel mutations in TLR genes cause hyporesponsiveness to *Mycobacterium avium* subsp. paratuberculosis infection. *BMC Genet.* 2009 May 26;10(1):21. PMID: 19470169.
- **Castellanos E, Aranaz A, de Juan L, Alvarez J, Rodríguez S, Romero B, Bezos J, Stevenson K, Mateos A, Domínguez L.** Single nucleotide polymorphisms in the IS900 sequence of *Mycobacterium avium* subspecies paratuberculosis are strain type-specific. *J Clin Microbiol.* 2009 May 13. PMID: 19439536.
- **Chow JY, Wu L, Yew WS.** Directed evolution of a quorum-quenching lactonase from *Mycobacterium avium* subsp. paratuberculosis K-10 in the amidohydrolase superfamily. *Biochemistry.* 2009 May 26;48(20):4344-53. PMID: 19374350.
- **Delgado F, Etchehoury D, Gioffré A, Paolicchi F, Blanco Viera F, Mundo S, Romano MI.** Comparison between two in situ methods for *Mycobacterium avium* subsp. paratuberculosis detection in tissue samples from infected cattle. *Vet Microbiol.* 2009 Mar 2;134(3-4):383-7. Epub 2008 Aug 29. PMID: 18838233.
- **Delgado F, Estrada-Chávez C, Romano M, Paolicchi F, Blanco-Viera F, Capellino F, Chavez-Gris G, Pereira-Suárez AL.** Expression of NRAMP1 and iNOS in *Mycobacterium avium* subsp. paratuberculosis naturally infected cattle. *Comp Immunol Microbiol Infect Dis.* 2009 Apr 3. PMID: 19345998.
- **de Silva K, Begg D, Carter N, Taylor D, Di Fiore L, Whittington R.** The early lymphocyte proliferation response in sheep exposed to *Mycobacterium avium* subsp. paratuberculosis compared to infection status. *Immunobiology.* 2009 Mar 3. PMID: 19264377.
- **Dhand NK, Eppleston J, Whittington RJ, Toribio JA.** Association of farm soil characteristics with ovine Johne's disease in Australia. *Prev Vet Med.* 2009 May 1;89(1-2):110-20. Epub 2009 Mar 24. PMID: 19321215.
- **Diéguez FJ, González AM, Menéndez S, Vilar MJ, Sanjuán ML, Yus E, Arnaiz I.** Evaluation of four commercial serum ELISAs for detection of *Mycobacterium avium* subsp. paratuberculosis infection in dairy cows. *Vet J.* 2009 May;180(2):231-5. Epub 2008 Mar 7. PMID: 18314355.
- **Dimareli-Malli Z, Stevenson K, Sarris K, Sossidou K.** Study of Microbiological and Molecular Typing Aspects of Paratuberculosis in Sheep and Goats in Northern Greece. *Transbound Emerg Dis.* 2009 Apr 22. PMID: 19413882.
- **Donaghy J, Keyser M, Johnston J, Cilliers FP, Gouws PA, Rowe MT.** Inactivation of *Mycobacterium avium* ssp. paratuberculosis in milk by UV treatment. *Lett Appl Microbiol.* 2009 May 22. PMID: 19486288.
- **El Hussein HA, Hamid ME.** Evaluation of ELISA in the serodiagnosis of bovine farcy. *Trop Anim Health Prod.* 2009 Apr;41(4):617-22. Epub 2008 Sep 30. PMID: 18821086.
- **Foddai A, Elliott CT, Grant IR.** Optimization of a phage amplification assay to permit accurate enumeration of viable *Mycobacterium avium* subsp. paratuberculosis cells. *Appl Environ Microbiol.* 2009 Jun;75(12):3896-902. Epub 2009 Apr 24. PMID: 19395561.
- **Fortea Ormaechea JI, Gisbert JP, Marín-Jiménez I.** Role of *Mycobacterium avium* paratuberculosis in the etiopathogenesis of Crohn's disease. *Gastroenterol Hepatol.* 2009 May;32(5):353-63. Epub 2009 May 19. Spanish. PMID: 19457586.
- **Gao A, Odumeru J, Raymond M, Hendrick S, Duffield T, Mutharia L.** Comparison of milk culture, direct and nested polymerase chain reaction (PCR) with fecal culture based on samples from dairy herds infected with *Mycobacterium avium* subsp. paratuberculosis. *Can J Vet Res.* 2009 Jan;73(1):58-64. PMID: 19337397.
- **Greenstein RJ, Su L, Whitlock RH, Brown ST.** Monensin causes dose dependent inhibition of *Mycobacterium avium* subspecies paratuberculosis in radiometric culture. *Gut Pathog.* 2009 Feb 9;1(1):4. PMID: 19338684.
- **Greenstein RJ, Su L, Brown ST.** On the effect of thalidomide on *Mycobacterium avium* subspecies paratuberculosis in culture. *Int J Infect Dis.* 2009 Mar 19. PMID: 19303801.
- **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.* 2009 Feb 2;133(4):344-57. Epub 2008 Aug 5. PMID: 18786786.
- Johne's disease commonly diagnosed in cattle in south-west Scotland. *Vet Rec.* 2009 Feb 28;164(9):256-9. PMID: 19252211.

- **Khalifeh MS, Al-Majali AM, Stabel JR.** Role of nitric oxide production in dairy cows naturally infected with *Mycobacterium avium* subsp. *paratuberculosis*. *Vet Immunol Immunopathol.* 2009 Apr 7. PMID: 19409621.
- **Khare S, Nunes J, Figueiredo J, Lawhon S, Rossetti C, Gull T, Rice-Ficht A, Garry Adams L.** Early Phase Morphological Lesions and Transcriptional Responses of Bovine Ileum Infected with *Mycobacterium avium* subsp. *paratuberculosis*. *Vet Pathol.* 2009 Mar 9. PMID: 19276052.
- **Kirkwood CD, Wagner J, Boniface K, Vaughan J, Michalski WP, Catto-Smith AG, Cameron DJ, Bishop RF.** *Mycobacterium avium* subspecies *paratuberculosis* in children with early-onset Crohn's disease. *Inflamm Bowel Dis.* 2009 May 21. PMID: 19462429.
- **Krishnan MY, Manning EJ, Collins MT.** Comparison of three methods for susceptibility testing of *Mycobacterium avium* subsp. *paratuberculosis* to 11 antimicrobial drugs. *J Antimicrob Chemother.* 2009 May 20. PMID: 19457932.
- **Leroy B, Viart S, Trincherio N, Roupie V, Govaerts M, Letesson JJ, Huygen K, Wattiez R.** Use of *Mycobacterium avium* subsp. *paratuberculosis* specific coding sequences for serodiagnosis of bovine *paratuberculosis*. *Vet Microbiol.* 2009 Mar 30;135(3-4):313-9. Epub 2008 Sep 24. PMID: 18977614.
- **Lilenbaum W, Marassi CD, Varges R, Medeiros L, Oelemann WM, Fonseca LS.** Occurrence of false-positive results in three *Paratuberculosis* - ELISAs performed in a tuberculous herd. *Vet Res Commun.* 2009 Mar 31. PMID: 19333771.
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