

The Paratuberculosis Newsletter

Issue 2 | October 2019

The official publication of the International Association for Paratuberculosis



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Note from the Editor

There is a lot happening in the paratuberculosis world, some of which is captured in the current newsletter including celebration of a 50-year career in mycobacterial research, discontinuation of one of the three paratuberculosis vaccines in use and progress

towards Equity and Access Guidelines for the Association.

The next ICP now calling for abstracts and registration will open in November.

Best wishes,

Kumi de Silva

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15th International Colloquium for Paratuberculosis



The call for abstracts is now open. Please register for an account using this link to access the submission portal.

<https://abbey.eventsair.com/international-association-for-paratuberculosis-colloquium-2020/abstracts>

IMPORTANT DATES

ABSTRACT SUBMISSION DEADLINE

01 DECEMBER 2019

REGISTRATION OPENS

29 NOVEMBER 2019

NOTIFICATION OF ABSTRACT ACCEPTANCE

06 MARCH 2020

The six themes for the next ICP are:

1. Diagnostics and detection
2. Host response and immunology
3. National control programme
4. Pathogenomics, genotyping and MAP diversity
5. Epidemiology and economics
6. Public health and MAP in the environment

The Chair of the 15th ICP, Dr Peter Mallowney, has announced the keynote speakers:

Professor Vivek Kapur, Pennsylvania State University, USA

Dr Marian Price-Carter, Hopkirk Research Institute, New Zealand

Professor Marcel Behr, McGill University, Canada

Dr Kumudika de Silva, University of Sydney, Australia

Emeritus Professor Frank Griffin, University of Otago, New Zealand

Dr Evan Sergeant, Ausvet Pty Ltd, Australia

Updates can also be found at:



[@para_tb2020](https://twitter.com/para_tb2020)



[paratb2020](https://www.facebook.com/paratb2020)

IAP business

The IAP Equity and Access Guidelines were approved by the Board. The document will be circulated to the General Membership for approval.



International Association for Paratuberculosis

112 Barnview Road
Kennett Square, PA 19348 USA

Financial Report- December 31, 2018

	Checking	Money Market	PayPal	Total
Open (1/1/18)	\$43,579.17	\$14,075.82	\$ 1,938.95	\$ 59,593.94
May 16, 2018	\$47,114.17	\$14,184.54	\$ 2,216.29	\$ 63,515.00
Close (12/31/19)	\$27,791.81	\$14,329.31	\$ 3,883.26	\$ 46,004.38

INCOME

	<u>1/1/18 to 5/16/18</u>	<u>5/17/18 to 12/31/18</u>	<u>Annual Total</u>
Ducs	\$ 4,100.00	\$ 4585.00	\$ 8685.00
Interest	\$ 2.32	\$ 4.77	\$ 7.09
Royalties	\$ 11.40		\$ 11.40
Total	\$ 4113.72	\$ 4589.77	\$ 8703.49

EXPENSES

	<u>1/1/18 to 5/16/18</u>	<u>5/17/18 to 12/31/18</u>	<u>Annual Total</u>
PayPal /Wire fees	\$ 192.66	\$ 195.18	\$ 387.84
ICP Helping Hands		\$ 6063.35	\$ 6063.35
ICP Merkal		\$ 5007.65	\$ 5007.65
ICP Emeritus		\$ 3915.00	\$ 3915.00
ICP Officer travel and Misc (plaques etc)		\$ 6822.21	\$ 6822.21
Internet server fee		\$ 97.00	\$ 97.00
Total	\$ 192.66	\$ 22,100.39	\$ 22,293.05

Respectfully Submitted,

Raymond W. Sweeney, VMD
Secretary-Treasurer



International Association for Paratuberculosis

112 Barnview Road
Kennett Square, PA 19348 USA

Financial Report- June 30, 2019

	Checking	Money Market	PayPal	Total
Open (1/1/19)	\$27,791.81	\$14,329.31	\$ 3,883.26	\$ 46,004.38
Q2 (6/30/19)	\$34,791.81	\$14,343.66	\$ 113.30	\$ 49,248.77

INCOME

	<u>1/1/19 to 6/30/19</u>	<u>7/1/19 to 12/31/19</u>	<u>Annual Total</u>
Dues	\$ 3,385.00	\$	\$
Interest	\$ 3.55	\$	\$
Royalties	\$ 10.80		\$.
Total	\$ 3399.35	\$	\$

EXPENSES

	<u>1/1/19 to 6/30/19</u>	<u>5/17/18 to 12/31/18</u>	<u>Annual Total</u>
PayPal /Wire fees	\$ 154.96	\$	\$
Total	\$ 154.96	\$	\$

Respectfully Submitted,

Raymond W. Sweeney, VMD
Secretary-Treasurer

Paratuberculosis News

Dr. William C. Davis' exceptional 50-year career in immunology research celebrated

Bill Davis' contributions to veterinary immunology and mycobacterial research are of considerable importance. Earlier this year, he was [honoured by the Washington State University](#) which he joined in 1968. His contributions to paratuberculosis continue with his latest publication describing a peptide-based vaccine for MAP.



Dr Bill Davis with his daughters Valerie (L) and Jennifer (R) and the WSU mascot

Dr. Davis and his late wife Elizabeth Davis established the [Bill and Betty Davis Endowment for Basic and Applied Research in Immunology of Food and Companion Animals](#) to support research at WSU.

BioMed Central Series Blog

The [BMC series blog](#) highlighted the recent publication on global paratuberculosis control programs. The lead author, Emeritus Professor [Richard Whittington](#), was interviewed about the disease, how the survey was carried out and the implications of the survey findings.

Johne's Information Centre

An update from the [Johne's Information Center](#) noted that Mycopar®, a vaccine for paratuberculosis and the only one licensed for use in the USA, will no longer be manufactured.

Upcoming events

- [15th ICP](#) on 13-18 June 2020 in Dublin, Ireland



- [7th International Conference on *Mycobacterium bovis*](#)



- 16th ICP in 2022 Jaipur, India

Have you attended a conference recently where there were presentations related to paratuberculosis? Email editor@paratuberculosis.net to share this information

Recent publications (April 2019-September 2019)

Abdellrazeq, G.S., Elnaggar, M.M., Bannantine, J.P., Schneider, D.A., Souza, C.D., Hwang, J., Mahmoud, A.H.A., Hulubei, V., Fry, L.M., Park, K.T., Davis, W.C., 2019. A peptide-based vaccine for *Mycobacterium avium* subspecies paratuberculosis. *Vaccine* 37, 2783-2790.

Ali, Z.I., Saudi, A.M., Albrecht, R., Talaat, A.M., 2019. The inhibitory effect of nisin on *Mycobacterium avium* ssp. paratuberculosis and its effect on mycobacterial cell wall. *J Dairy Sci* 102, 4935-4944.

Avilez, C., Alfaro, M.A., Salazar, F., Encina, C., Verdugo, C., Martinez, O., Collins, M.T., Salgado, M., 2019. Fate of *Mycobacterium avium* subsp. paratuberculosis and changes in bacterial diversity populations in dairy slurry after chemical treatments. *J Appl Microbiol* 127, 370-378.

Bannantine, J.P., Zinniel, D.K., Barletta, R.G., 2019. Transposon Mutagenesis in *Mycobacterium avium* Subspecies Paratuberculosis. *Methods Mol Biol* 2016, 117-125.

Barber, B.M., Bell, N., Van Winden, S., 2019. *Mycobacterium avium* subspecies paratuberculosis seroconversion in dairy cattle and its association with raised somatic cell count. *Vet Rec*.

Barrero-Dominguez, B., Luque, I., Huerta, B., Gomez-Laguna, J., Galan-Relano, A., Gomez-Gascon, L., Sanchez, M., Astorga, R.J., 2019. Paratuberculosis in dairy goat flocks from southern Spain: risk factors associated with seroprevalence. *Vet Rec*.

- Bates, A., O'Brien, R., Liggett, S., Griffin, F., 2019. Control of *Mycobacterium avium* subsp. paratuberculosis infection on a New Zealand pastoral dairy farm. *BMC Vet Res* 15, 266.
- Begg, D.J., Dhungyel, O., Naddi, A., Dhand, N.K., Plain, K.M., de Silva, K., Purdie, A.C., Whittington, R.J., 2019. The immunogenicity and tissue reactivity of *Mycobacterium avium* subsp. paratuberculosis inactivated whole cell vaccine is dependent on the adjuvant used. *Heliyon* 5, e01911.
- Brauning, R., Plain, K., Gautam, M., Russell, T., Correa, C.C., Biggs, P., Whittington, R., Murray, A., Price-Carter, M., 2019. Complete Genome Sequence of the Telford Type S Strain of *Mycobacterium avium* subsp. paratuberculosis. *Microbiol Resour Announc* 8.
- Butot, S., Ricchi, M., Sevilla, I.A., Michot, L., Molina, E., Tello, M., Russo, S., Arrigoni, N., Garrido, J.M., Tomas, D., 2019. Estimation of Performance Characteristics of Analytical Methods for *Mycobacterium avium* subsp. paratuberculosis Detection in Dairy Products. *Front Microbiol* 10, 509.
- Cammi, G., Ricchi, M., Galiero, A., Daminelli, P., Cosciani-Cunico, E., Dalzini, E., Losio, M.N., Savi, R., Cerutti, G., Garbarino, C., Leo, S., Arrigoni, N., 2019. Evaluation of *Mycobacterium avium* subsp. paratuberculosis survival during the manufacturing process of Italian raw milk hard cheeses (Parmigiano Reggiano and Grana Padano). *Int J Food Microbiol* 305, 108247.
- Chaubey, K.K., Gangwar, N., Pawaiya, R.S., Jatav, G.P., Sohal, J.S., Singh, S.V., Singh, M., Gupta, S., Kumaresan, G., Kumar, N., Jayaraman, S., 2019. Evaluation of newly developed 'six recombinant secretory proteins based 'cocktail ELISA' and 'whole cell lysate' based 'indigenous ELISA' and tissue microscopy' with 'Gold standard' histo-pathology for the diagnosis of Johne's disease in slaughtered goats and buffaloes. *Comp Immunol Microbiol Infect Dis* 66, 101338.
- Cirone, K.M., Lahiri, P., Holani, R., Tan, Y.L., Arrazuria, R., De Buck, J., Barkema, H.W., Cobo, E.R., 2019. Synthetic cathelicidin LL-37 reduces *Mycobacterium avium* subsp. paratuberculosis internalization and pro-inflammatory cytokines in macrophages. *Cell Tissue Res*.
- Corbett, C.S., de Jong, M.C.M., Orsel, K., De Buck, J., Barkema, H.W., 2019. Quantifying transmission of *Mycobacterium avium* subsp. paratuberculosis among group-housed dairy calves. *Vet Res* 50, 60.
- Corneli, S., Corte, L., Roscini, L., Di Paolo, A., Colabella, C., Petrucci, L., Severi, G., Cagiola, M., Mazzone, P., 2019. Spectroscopic Characterization of Bovine, Avian and Johnin Purified Protein Derivative (PPD) with High-Throughput Fourier Transform InfraRed-Based Method. *Pathogens* 8.
- Correa-Valencia, N.M., Ramirez, N.F., Arango-Sabogal, J.C., Fecteau, G., Fernandez-Silva, J.A., 2019. Prevalence of *Mycobacterium avium* subsp. paratuberculosis infection in dairy herds in Northern Antioquia (Colombia) and associated risk factors using environmental sampling. *Prev Vet Med* 170, 104739.
- Davide, D., Yokoyama, K., Nobutaka, N., LA, A.S., 2019. From Sardinia to Japan: update on the role of MAP in multiple sclerosis. *Future Microbiol* 14, 643-646.
- Donat, K., Eisenberg, S.W.F., Einax, E., Reinhold, G., Zoche-Golob, V., 2019. Reduction of viable *Mycobacterium avium* ssp. paratuberculosis in slurry subjected to anaerobic digestion in biogas plants. *J Dairy Sci* 102, 6485-6494.
- Elsayed, M., 2019. Applicability of using 15 MIRU-VNTR loci for genotyping of *Mycobacterium avium* subsp. paratuberculosis from two cattle farms in Egypt. *Mol Biol Rep*.

- Eraghi, V., Derakhshandeh, A., Hosseini, A., Haghkhah, M., Sechi, L.A., Motamedi Borojeni, A., 2019. Recombinant fusion protein of Heparin-Binding Hemagglutinin Adhesin and Fibronectin Attachment Protein (rHBHA-FAP) of *Mycobacterium avium* subsp. paratuberculosis elicits a strong gamma interferon response in peripheral blood mononuclear cell culture. *Gut Pathog* 11, 36.
- Fechner, K., Dreyman, N., Schimkowiak, S., Czerny, C.P., Teitzel, J., 2019. Efficacy of dairy on-farm, high-temperature, short-time pasteurization of milk on the viability of *Mycobacterium avium* ssp. paratuberculosis. *J Dairy Sci*.
- Fernandez, B., Colavecchia, S.B., Ingratta, G.G., Jolly, A., Stempler, A., Fortuny, M.L., Paolicchi, F.A., Mundo, S.L., 2019. Early IgG2 in calves experimentally infected with *Mycobacterium avium* subsp. paratuberculosis. *Vet Immunol Immunopathol* 213, 109886.
- Folegatti, P.M., Bellamy, D., Roberts, R., Powlson, J., Edwards, N.J., Mair, C.F., Bowyer, G., Poulton, I., Mitton, C.H., Green, N., Berrie, E., Lawrie, A.M., Hill, A.V.S., Ewer, K.J., Hermon-Taylor, J., Gilbert, S.C., 2019. Safety and Immunogenicity of a Novel Recombinant Simian Adenovirus ChAdOx2 as a Vectored Vaccine. *Vaccines (Basel)* 7.
- Gamberale, F., Pietrella, G., Sala, M., Scaramella, P., Puccica, S., Antognetti, V., Arrigoni, N., Ricchi, M., Cersini, A., 2019. Management of *Mycobacterium avium* subsp. paratuberculosis in dairy farms: Selection and evaluation of different DNA extraction methods from bovine and buffaloes milk and colostrum for the establishment of a safe colostrum farm bank. *Microbiologyopen*, e875.
- Gierschner, P., Kuntzel, A., Reinhold, P., Kohler, H., Schubert, J.K., Miekisch, W., 2019. Crowd monitoring in dairy cattle-real-time VOC profiling by direct mass spectrometry. *J Breath Res* 13, 046006.
- Gupta, S., Singh, S.V., Singh, M., Chaubey, K.K., Karthik, K., Bhatia, A.K., Kumar, N., Dhama, K., 2019. Vaccine approaches for the 'therapeutic management' of *Mycobacterium avium* subspecies paratuberculosis infection in domestic livestock. *Vet Q*, 1-18.
- Hansen, S., Roller, M., Alslim, L.M.A., Bohlken-Fascher, S., Fechner, K., Czerny, C.P., Abd El Wahed, A., 2019. Development of Rapid Extraction Method of *Mycobacterium avium* Subspecies paratuberculosis DNA from Bovine Stool Samples. *Diagnostics (Basel)* 9.
- Hemati, Z., Derakhshandeh, A., Haghkhah, M., Chaubey, K.K., Gupta, S., Singh, M., Singh, S.V., Dhama, K., 2019. Mammalian cell entry operons; novel and major subset candidates for diagnostics with special reference to *Mycobacterium avium* subspecies paratuberculosis infection. *Vet Q* 39, 65-75.
- Hobmaier, B.F., Lutterberg, K., Kleinwort, K.J.H., Mayer, R., Hirmer, S., Amann, B., Holzel, C., Martlbauer, E.P., Deeg, C.A., 2019. Characterization of plant lectins for their ability to isolate *Mycobacterium avium* subsp. paratuberculosis from milk. *Food Microbiol* 82, 231-239.
- Hussain, T., Zhao, D., Shah, S.Z.A., Sabir, N., Wang, J., Liao, Y., Song, Y., Dong, H., Hussain Mangi, M., Ni, J., Yang, L., Zhou, X., 2019. Nilotinib: A Tyrosine Kinase Inhibitor Mediates Resistance to Intracellular *Mycobacterium* Via Regulating Autophagy. *Cells* 8.
- Jensen, K.J., Hansen, M.S., Heegaard, P.M.H., Benn, C.S., Jungersen, G., 2019. The Effect of Inactivated *Mycobacterium* Paratuberculosis Vaccine on the Response to a Heterologous Bacterial Challenge in Pigs. *Front Immunol* 10, 1557.

Jenvey, C.J., Hostetter, J.M., Shircliff, A.L., Bannantine, J.P., Stabel, J.R., 2019a. Quantification of Macrophages and Mycobacterium avium Subsp. paratuberculosis in Bovine Intestinal Tissue During Different Stages of Johne's Disease. *Vet Pathol* 56, 671-680.

Jenvey, C.J., Shircliff, A.L., Bannantine, J.P., Stabel, J.R., 2019b. Phenotypes of macrophages present in the intestine are impacted by stage of disease in cattle naturally infected with Mycobacterium avium subsp. paratuberculosis. *PLoS One* 14, e0217649.

Karuppusamy, S., Kirby, G.M., Mutharia, L., Tripathi, B.N., 2019. An update on Mycobacterium avium subspecies paratuberculosis antigens and their role in the diagnosis of Johne's disease. *World J Microbiol Biotechnol* 35, 120.

Khol, J.L., Eisenberg, S., Noll, I., Zschock, M., Eisenberg, T., Donat, K., 2019. [Two-stage control of paratuberculosis: Herd-status surveillance as the basis for operational measures to reduce the prevalence. - Experiences from Lower Saxony, Hesse, Thuringia and Tyrol]. *Tierarztl Prax Ausg G Grosstiere Nutztiere* 47, 171-183.

Koets, A., Ravesloot, L., Ruuls, R., Dinkla, A., Eisenberg, S., Lievaart-Peterson, K., 2019. Effects of Age and Environment on Adaptive Immune Responses to Mycobacterium avium subsp. paratuberculosis (MAP) Vaccination in Dairy Goats in Relation to Paratuberculosis Control Strategies. *Vet Sci* 6.

Kuntzel, A., Weber, M., Gierschner, P., Trefz, P., Miekisch, W., Schubert, J.K., Reinhold, P., Kohler, H., 2019. Core profile of volatile organic compounds related to growth of Mycobacterium avium subspecies paratuberculosis - A comparative extract of three independent studies. *PLoS One* 14, e0221031.

Llanos-Soto, S., Gonzalez-Acuna, D., 2019. Knowledge about bacterial and viral pathogens present in wild mammals in Chile: a systematic review. *Rev Chilena Infectol* 36, 195-218.

Lorencova, A., Babak, V., Kralova, A., Borilova, G., 2019. Survival of Mycobacterium avium subsp. paratuberculosis in raw fermented sausages during production and storage. *Meat Sci* 155, 20-26.

Ludwig, L., Egan, R., Baquero, M., Mansz, A., Plattner, B.L., 2019. WC1(+) and WC1(neg) gammadelta T lymphocytes in intestinal mucosa of healthy and Mycobacterium avium subspecies paratuberculosis-infected calves. *Vet Immunol Immunopathol* 216, 109919.

Luttikholt, S., Lievaart-Peterson, K., Gonggrijp, M., Aalberts, M., van Schaik, G., Vellema, P., 2019. Mycobacterium avium subsp. paratuberculosis ELISA Responses in Milk Samples from Vaccinated and Nonvaccinated Dairy Goat Herds in The Netherlands. *Vet Sci* 6.

Mallikarjunappa, S., Adnane, M., Cormican, P., Karrow, N.A., Meade, K.G., 2019. Characterization of the bovine salivary gland transcriptome associated with Mycobacterium avium subsp. paratuberculosis experimental challenge. *BMC Genomics* 20, 491.

Maurer, D.L., Ellis, C.K., Thacker, T.C., Rice, S., Koziel, J.A., Nol, P., VerCauteren, K.C., 2019. Screening of Microbial Volatile Organic Compounds for Detection of Disease in Cattle: Development of Lab-scale Method. *Sci Rep* 9, 12103.

Motamedi Borojeni, A., Derakhshandeh, A., Haghkhah, M., Jalali, S.A.H., Eraghi, V., 2019. A Novel Approach to Deliver a Mycobacterium avium subsp. paratuberculosis Antigen in Eukaryotic Cells. *Mol Biotechnol* 61, 506-512.

- Navarro-Gonzalez, N., Fourichon, C., Blanquefort, P., Delafosse, A., Joly, A., Ngwa-Mbot, D., Biet, F., Boichard, D., Schibler, L., Journaux, L., Meens, E., Guatteo, R., 2019. Longitudinal study of *Mycobacterium avium* ssp. paratuberculosis fecal shedding patterns and concurrent serological patterns in naturally infected dairy cattle. *J Dairy Sci*.
- Niegowska, M., Wajda-Cuszlag, M., Stepien-Ptak, G., Trojanek, J., Michalkiewicz, J., Szalecki, M., Sechi, L.A., 2019. Anti-HERV-WEnv antibodies are correlated with seroreactivity against *Mycobacterium avium* subsp. paratuberculosis in children and youths at T1D risk. *Sci Rep* 9, 6282.
- Palacios, A., Sampedro, L., Sevilla, I.A., Molina, E., Gil, D., Azkargorta, M., Elortza, F., Garrido, J.M., Anguita, J., Prados-Rosales, R., 2019. *Mycobacterium tuberculosis* extracellular vesicle-associated lipoprotein LpqH as a potential biomarker to distinguish paratuberculosis infection or vaccination from tuberculosis infection. *BMC Vet Res* 15, 188.
- Palmer, M.V., Kanipe, C., Cox, R., Robbe-Austerman, S., Thacker, T.C., 2019. Characteristics of subclinical *Mycobacterium avium* ssp. paratuberculosis infection in a captive white-tailed deer herd. *J Vet Diagn Invest*, 1040638719873028.
- Picasso-Risso, C., Grau, A., Bakker, D., Nacar, J., Minguez, O., Perez, A., Alvarez, J., 2019. Association between results of diagnostic tests for bovine tuberculosis and Johne's disease in cattle. *Vet Rec*.
- Pierce, E.S., 2019. Baseballs, tennis balls, livestock farm manure, the IDH1 mutation, endothelial cell proliferation and hypoxic pseudopalisading (granulomatous) necrosis: *Mycobacterium avium* subspecies paratuberculosis and the epidemiology, cellular metabolism and histology of diffuse gliomas, including glioblastoma. *Open Vet J* 9, 5-12.
- Pooley, H.B., Begg, D.J., Plain, K.M., Whittington, R.J., Purdie, A.C., de Silva, K., 2019. The humoral immune response is essential for successful vaccine protection against paratuberculosis in sheep. *BMC Vet Res* 15, 223.
- Punati, R.D., Mallepaddi, P.C., Poonati, R., Maity, S.N., Sohal, J.S., Polavarapu, K.K.B., Polavarapu, R., 2019. Development and evaluation of LAMP-coupled lateral flow device for the detection of MAP in livestock at point of care resource-limited areas. *Braz J Microbiol*.
- Purdie, A.C., Plain, K.M., Begg, D.J., de Silva, K., Whittington, R.J., 2019. Gene expression profiles during subclinical *Mycobacterium avium* subspecies paratuberculosis infection in sheep can predict disease outcome. *Sci Rep* 9, 8245.
- Richardson, H., Rhodes, G., Henrys, P., Sedda, L., Weightman, A.J., Pickup, R.W., 2019. Presence of *Mycobacterium avium* Subspecies paratuberculosis Monitored Over Varying Temporal and Spatial Scales in River Catchments: Persistent Routes for Human Exposure. *Microorganisms* 7.
- Rostami-Nejad, M., Yazdi, M.H., Nikfar, S., Rezaie, A., Abdollahi, M., 2019. Potential Vaccines for Treating Crohn's Disease. *Iran Biomed J*.
- Salem, M.A., El-Deeb, W.M., Zaghawa, A.A., Housawi, F.M., Alluwaimi, A.M., 2019. Investigation of *Mycobacterium paratuberculosis* in Arabian dromedary camels (*Camelus dromedarius*). *Vet World* 12, 218-223.
- Sange, M.D., Becker, A., Hassan, A.A., Bulte, M., Ganter, M., Siebert, U., Abdulmawjood, A., 2019. Development and validation of a loop-mediated isothermal amplification assay-a rapid and sensitive

detection tool for *Mycobacterium avium* subsp. *paratuberculosis* in small ruminants. *J Appl Microbiol* 127, 47-58.

Scherrer, S., Stephan, R., Zumthor, J.P., Kipar, A., Seehusen, F., 2019. Morphological and Molecular Characterization of a New *Mycobacterium avium* Subsp. *paratuberculosis* S-Type Strain Genotype in Goats. *Front Vet Sci* 6, 250.

Schwalm, A.K., Metzger-Boddien, C., Seemann, G., Mandl, J., Obiegala, A., Pfeffer, M., Sting, R., 2019. Field study on bovine paratuberculosis using real-time PCR and liquid culture for testing environmental and individual fecal samples implemented in dairy cow management. *J Dairy Sci*.

Selim, A., Ali, A.F., Ramadan, E., 2019. Prevalence and molecular epidemiology of Johne's disease in Egyptian cattle. *Acta Trop* 195, 1-5.

Singh, M., Gupta, S., Chaubey, K.K., Singh, S.V., Sohal, J.S., 2019. Profiling of *Mycobacterium avium* subspecies *paratuberculosis* in the milk of lactating goats using antigen-antibody based assays. *Comp Immunol Microbiol Infect Dis* 64, 53-60.

Smith, J., van Winden, S., 2019. Risk of Lameness in Dairy Cows with Paratuberculosis Infection. *Animals (Basel)* 9.

Sohal, J.S., Arsenault, J., Leboeuf, A., Helie, P., Buczinski, S., Robinson, Y., Labrecque, O., Lachapelle, V., Fecteau, G., L'Homme, Y., 2019. Molecular characterization of *Mycobacterium avium* subspecies *paratuberculosis* C-type and S-type isolated from sheep and goats by using a combination of MIRU-VNTR loci. *Can J Vet Res* 83, 160-167.

Steuer, P., Collado, B., Avilez, C., Tejada, C., Soto, J.P., Salgado, M., 2019. Is the transmission of *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection through milk intended to feed calves an overlooked item in paratuberculosis control programs? *Trop Anim Health Prod*.

Stinson, K.J., Duffield, T.F., Kelton, D.F., Baquero, M.M., Plattner, B.L., 2019. A preliminary study investigating effects of oral monensin sodium in an enteric *Mycobacterium avium* ssp. *paratuberculosis* infection model of calves. *J Dairy Sci*.

Supre, K., Roupie, V., Ribbens, S., Stevens, M., Boyen, F., Roels, S., 2019. Short communication: *Mycobacterium smegmatis*, basonym *Mycobacterium smegmatis*, causing pyogranulomatous mastitis and its cross-reactivity in bovine (para)tuberculosis testing. *J Dairy Sci* 102, 8405-8409.

Todd Kuenstner, J., Kali, M., Welch, C., 2019. Whole exome sequencing of patients who resolved Crohn's disease and complex regional pain syndrome following treatment for paratuberculosis. *Gut Pathog* 11, 34.

Tortoli, E., Meehan, C.J., Grottola, A., Fregni Serpini, G., Fabio, A., Trovato, A., Pecorari, M., Cirillo, D.M., 2019. Genome-based taxonomic revision detects a number of synonymous taxa in the genus *Mycobacterium*. *Infect Genet Evol* 75, 103983.

van den Esker, M.H., Koets, A.P., 2019. Application of Transcriptomics to Enhance Early Diagnostics of Mycobacterial Infections, with an Emphasis on *Mycobacterium avium* ssp. *paratuberculosis*. *Vet Sci* 6.

Verteramo Chiu, L.J., Tauer, L.W., Grohn, Y.T., Smith, R.L., 2019. Mastitis risk effect on the economic consequences of paratuberculosis control in dairy cattle: A stochastic modeling study. *PLoS One* 14, e0217888.

Wang, Z., Kong, L.C., Jia, B.Y., Chen, J.R., Dong, Y., Jiang, X.Y., Ma, H.X., 2019. Analysis of the microRNA Expression Profile of Bovine Monocyte-derived Macrophages Infected with *Mycobacterium avium* subsp. *Paratuberculosis* Reveals that miR-150 Suppresses Cell Apoptosis by Targeting PDCD4. *Int J Mol Sci* 20.

Whittington, R., Donat, K., Weber, M.F., Kelton, D., Nielsen, S.S., Eisenberg, S., Arrigoni, N., Juste, R., Saez, J.L., Dhand, N., Santi, A., Michel, A., Barkema, H., Kralik, P., Kostoulas, P., Citer, L., Griffin, F., Barwell, R., Moreira, M.A.S., Slana, I., Koehler, H., Singh, S.V., Yoo, H.S., Chavez-Gris, G., Goodridge, A., Ocepek, M., Garrido, J., Stevenson, K., Collins, M., Alonso, B., Cirone, K., Paolicchi, F., Gavey, L., Rahman, M.T., de Marchin, E., Van Praet, W., Bauman, C., Fecteau, G., McKenna, S., Salgado, M., Fernandez-Silva, J., Dziedzinska, R., Echeverria, G., Seppanen, J., Thibault, V., Fridriksdottir, V., Derakhshandeh, A., Haghkhah, M., Ruocco, L., Kawaji, S., Momotani, E., Heuer, C., Norton, S., Cadmus, S., Agdestein, A., Kampen, A., Szteyn, J., Frossling, J., Schwan, E., Caldow, G., Strain, S., Carter, M., Wells, S., Munyeme, M., Wolf, R., Gurung, R., Verdugo, C., Fourichon, C., Yamamoto, T., Thapaliya, S., Di Labio, E., Ekgatut, M., Gil, A., Alesandre, A.N., Piaggio, J., Suanes, A., de Waard, J.H., 2019. Control of paratuberculosis: who, why and how. A review of 48 countries. *BMC Vet Res* 15, 198.

Wright, K., Plain, K., Purdie, A., Saunders, B.M., de Silva, K., 2019. Biomarkers for detecting resilience against mycobacterial disease in animals. *Infect Immun*.

Yashiki, N., Yamazaki, Y., Subangkit, M., Okabayashi, T., Yamazaki, W., Goto, Y., 2019. Development of a LAMP assay for rapid and sensitive detection and differentiation of *Mycobacterium avium* subsp. *avium* and subsp. *hominissuis*. *Lett Appl Microbiol* 69, 155-160.

Zinniel, D.K., Sittiwong, W., Marshall, D.D., Rathnaiah, G., Sakallioglu, I.T., Powers, R., Dussault, P.H., Barletta, R.G., 2019. Novel Amphiphilic Cyclobutene and Cyclobutane cis-C18 Fatty Acid Derivatives Inhibit *Mycobacterium avium* subsp. *paratuberculosis* Growth. *Vet Sci* 6.

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