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Research results and strategies on AMU reduction in Canadian poultry and their impact

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References and useful readings

Structure of the Canadian poultry industry

Canada's Supply Management system:

https://lop.parl.ca/sites/PublicWebsite/default/en_CA/ResearchPublications/201842E (last consulted 0ct 2023)

Some statistics

https://www.chickenfarmers.ca/good-for-canada/ (last consulted 0ct 2023)

https://agriculture.canada.ca/en/international-trade/market-intelligence/reports/customized-report-service-canadian-poultry-meat-trends (last consulted 0ct 2023)

The article describing the correlation between antimicrobial use in animals and resistance in humans (ceftiofur use in hatcheries and ceftiofur-resistant *Salmonella* serovar Heidelberg infections in humans)

Dutil L, Irwin R, Finley R, Ng LK, Avery B, Boerlin P, Bourgault AM, Cole L, Daignault D, Desruisseau A, Demczuk W, Hoang L, Horsman GB, Ismail J, Jamieson F, Maki A, Pacagnella A, Pillai DR. Ceftiofur resistance in *Salmonella* enterica serovar Heidelberg from chicken meat and humans, Canada. Emerg Infect Dis. 2010 Jan;16(1):48-54. doi: 10.3201/eid1601.090729. PMID: 20031042; PMCID: PMC2874360.

Chair in Poultry Research, University of Montreal

www.cra-fmv.org (last consulted Oct. 2023)

Some the Chair in Poultry Research publications:

Boulianne M, Arsenault J, Daignault D, Archambault M, Letellier A, Dutil L. Drug use and antimicrobial resistance among *Escherichia coli* and *Enterococcus* spp. isolates from chicken and turkey flocks slaughtered in Quebec, Canada. Can J Vet Res. 2016 Jan;80(1):49-59. PMID: 26733732; PMCID: PMC4686034.

Parent E, Fernandez D, Boulianne M. The use of a live non-attenuated coccidiosis vaccine modifies *Eimeria* spp. excretion in commercial antibiotic-free broiler chicken flocks compared to conventional shuttle anticoccidial programs. Poult Sci. 2018 Aug 1;97(8):2740-2744. doi: 10.3382/ps/pey140. PMID: 29897515.

Verrette L, Fairbrother JM, Boulianne M. Effect of Cessation of Ceftiofur and Substitution with Lincomycin-Spectinomycin on Extended-Spectrum-β-Lactamase/AmpC Genes and Multidrug Resistance in *Escherichia coli* from a Canadian Broiler Production Pyramid. Appl Environ Microbiol. 2019 Jun 17;85(13):e00037-19. doi: 10.1128/AEM.00037-19. PMID: 31028030; PMCID: PMC6581166.

Gaucher ML, Quessy S, Letellier A, Arsenault J, Boulianne M. Impact of a drug-free program on broiler chicken growth performances, gut health, *Clostridium perfringens* and *Campylobacter jejuni* occurrences at the farm level. Poult Sci. 2015 Aug;94(8):1791-801. doi: 10.3382/ps/pev142. Epub 2015 Jun 5. PMID: 26047674.

Parent E, Archambault M, Moore RJ, Boulianne M. Impacts of antibiotic reduction strategies on zootechnical performances, health control, and *Eimeria* spp. excretion compared with conventional antibiotic programs in commercial broiler chicken flocks. Poult Sci. 2020 Sep;99(9):4303-4313. doi: 10.1016/j.psj.2020.05.037. Epub 2020 Jun 24. PMID: 32867974; PMCID: PMC7597979.

https://modernpoultry.media/environmental-factors-have-more-sway-in-broilers-microbiome-than-antibiotics/?mp=1696517469002 (last consulted Oct 2023)

Charlebois A, Parent E, Létourneau-Montminy MP, Boulianne M. Persistence of a *Clostridium perfringens* Strain in a Broiler Chicken Farm over a Three-Year Period. Avian Dis. 2020 Sep 1;64(3):415-420. doi: 10.1637/aviandiseases-D-19-00112. PMID: 33205171.

Franco L, Boulianne M, Parent E, Barjesteh N, Costa MC. Colonization of the Gastrointestinal Tract of Chicks with Different Bacterial Microbiota Profiles. Animals (Basel). 2023 Aug 15;13(16):2633. doi: 10.3390/ani13162633. PMID: 37627423; PMCID: PMC10451890.

Simjee S, Gould G, Maduro L, Boulianne M, Pridmore A, Parent E. No change in avilamycin (Surmax® Premix) minimum inhibitory concentration for *Clostridium perfringens* isolates recovered from poultry up to 7 years post-approval in Canada. J Antimicrob Chemother. 2023 May 3;78(5):1278-1281. doi: 10.1093/jac/dkad089. PMID: 36995979.

Tremblay CL, Letellier A, Quessy S, Boulianne M, Daignault D, Archambault M. Multiple-antibiotic resistance of *Enterococcus faecalis* and *Enterococcus faecium* from cecal contents in broiler

chicken and turkey flocks slaughtered in Canada and plasmid colocalization of tetO and ermB genes. J Food Prot. 2011 Oct;74(10):1639-48. doi: 10.4315/0362-028X.JFP-10-451. PMID: 22004810.

Emergence of *Enterococcus cecorum* in poultry (in French):

https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/agriculture-pecheries-alimentation/sante-animale/surveillance-controle/raizo/reseau-aviaire/Bulletinzoosanitaire_enterococcuscecorum_volaille_MAPAQ.pdf

VIDEO on optimal chick brooding:

In French: https://www.youtube.com/watch?v=7TtZ_KjhP-U

In English: https://www.youtube.com/watch?v=itTGTkRtHbU

VIDEO on how to calibrate a medicator:

In French: https://www.youtube.com/watch?v=OPip8Jh4_hA

Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) website

https://www.canada.ca/en/public-health/services/surveillance/canadian-integrated-program-antimicrobial-resistance-surveillance-cipars.html (last consulted Oct. 2023)

Chicken Farmers of Canada (CFC) website

https://www.chickenfarmers.ca/ (last consulted Oct. 2023)