



**Atlantic Chicken Industry Research Chair
August 2018 – August 2023**

The process to hire an Industry Research Chair (IRC) for the chicken industry was initiated by the Atlantic Poultry Research Institute (APRI) in September 2016.

In 2018 APRI was successful in securing support from Chicken Farmers of Canada (CFC), the NS/Canada Growing Forward II program and Dalhousie University. The IRC position was to be located at Dalhousie University's Faculty of Agriculture for a 5-year period (August 2018 – August 2023). Chicken Farmers of Nova Scotia (CFNS) committed \$90,000 to be used towards research projects.

This industry approach to supporting a research chair position provides many direct benefits to Canadian industry, in particular:

- influence the type of research that is undertaken,
- ensure the research is relevant to industry; in that it addresses industry needs and priorities,
- leverage additional, matching research dollars, that require industry support,
- access research results, and share first-hand with industry, and
- transfer of research knowledge and techniques to industry.

APRI proposed that the incoming IRC would address national priorities for broiler chicken research, specifically finding antibiotic alternatives.

Dr. Deborah Adewole was hired in August 2018. She developed a comprehensive research strategy and reported regularly to her advisory committee which is comprised of representatives from APRI Board, Dalhousie Faculty of Agriculture and CFC.

SUMMARY OF DR. DEBORAH ADEWOLE'S RESEARCH PROGRAM

PROGRAM MANDATE

Sustainable Antibiotic Reduction in Poultry Production

PROGRAM GOALS

1. Investigating the prebiotic effect of fiber ingredients for improved gut functionality of broiler chickens.
2. Researching the use of phytogetic extracts, fruit pomaces, and other bioactive substances for promoting gut health and preventing infections and myopathies in poultry.
3. Investigating the delivery routes for bioactive compounds (probiotics, essential oils, and organic acids) for improved gut health of broiler chickens.
4. Conduct a surveillance of enteric pathogens and their resistance to antibiotics in broiler chicken farms in Atlantic Canada and relationship with flock health.

INDUSTRY FUNDING/SUPPORT PARTNERS

1. Chicken Farmers of Canada - \$60,000
2. Natures Crop International - \$29,460.17
3. Chicken Farmers of Nova Scotia - \$80,000
4. Canadian Poultry Research Council - \$80,000
5. Eden Valley - \$10,000
6. Country Ribbon - \$10,000
7. Egg Farmers of New Brunswick - \$10,000
8. Probiotech International Inc. – \$16,715 and supplied products and other in-kind contributions (worth \$ 9,806.00)
9. MyFlock + MITACS - \$15,000 (student stipend)
10. Jefe Nutrition Incorporation – \$49,960 (cash) + \$12,400 (in-kind).
11. Grain Millers Canada Corp., Saskatoon, SK. – Supplied product.
12. Red Dog Enterprises, Winnipeg, MB. – Supplied product.
13. Sealife Seaplants – Supplied product.
14. Gaspereau Vineyards – Supplied product.

The above support has leveraged additional support through various provincial and national funding agencies as shown below.

RESEARCH GRANTS:

Grant Title	Funding Source	My Role	Status	Amount	Year
Total funding received: \$1,782,939; Total funding submitted/in preparation: \$2,554,733					
Start-Up Grant	Dalhousie University	Principal Investigator	Awarded	\$60,000	2018
Improving growth and health of broiler chickens through the use of phytogetic compounds.	Mitacs Accelerate CPRC	Principal Investigator	Awarded	\$53,333	2019
Nutritional strategies to prevent woody breast and white striping in broiler chickens	Pan Atlantic CAP, Poultry Processors	Principal Investigator	Awarded	\$157,000	2019
In ovo delivery of bioactive substances in broiler chickens	Pan Atlantic CAP, CFNS	Principal Investigator	Awarded	\$232,000	2019
Enhancing gastrointestinal development and functionality in chickens through fiber nutrition	NSERC Discovery Grant	Principal Investigator	Awarded	\$132,500	2020
Enhancing gastrointestinal development and functionality in chickens through fiber nutrition	NSERC Discovery Launch Supplement	Principal Investigator	Awarded	\$12,000	2020
In ovo delivery of essential oils in broiler chickens	Mitacs Research Training Award	Principal Investigator	Awarded	\$5,000	2021
Functional Plant Materials to Boost Broiler Chickens' Gastrointestinal Health, Antioxidation, and Immunity	Nova Scotia CAP Program CFNS	Principal Investigator	Awarded	\$60,000	2021
Effect of a functional blend of botanical extracts on stress and behaviour use in laying hens	NSERC Alliance Probiotech	Principal Investigator	Awarded	\$51,597	2021
The Effects of PHYTOZEN on Laying Hen Enrichment Use	NB CAP Program	Principal Investigator	Awarded	\$68,530	2021
Utilizing Remote Sensing and Machine Learning to Improve Poultry Farm Productivity	Mitacs Accelerate MyFlock	Co-PI Q. Ye, Computer Sci.	Awarded	30,000	2021
Transcriptomic responses of in ovo delivered bioactive substances in heat-stressed broiler chickens	Mitacs Globalink Research Award	Co-PI, S. Dridi, Arkansas	Awarded	\$6,000	2022
Transcriptomic responses of in ovo delivered bioactive substances in heat-stressed broiler chickens	NSERC Alliance International Grant	Co-PI, S. Dridi, Arkansas	Awarded	\$25,000	2022
Functional encapsulated multivitamins for broiler chickens subjected to environmental and pathogenic stressors	NSERC Alliance Jefe Nutrition Inc	Principal Investigator	Awarded	\$162,250	2022
Functional plant materials for heat stressed and necrotic enteritis challenged chickens	Mitacs Accelerate CPRC	Principal Investigator	Awarded	\$180,000	2022
Ahiflower press cake and micronized ahiflower seed for laying hens	Mitacs Accelerate Natures Crop	Principal Investigator	Awarded	\$107,729	2023

MEDIA ARTICLES

1. Canadian Poultry – Who’s Who 2021 Innovators, Advocates and Industry Trailblazers July/August 2021
<https://mydigitalpublication.com/publication/?m=1191&i=714821&p=36&ver=html5>
2. Canadian Poultry – In ovo Probiotics, Researcher’s work to give broilers a head start April 2021 <https://mydigitalpublication.com/publication/?i=701104>
3. Dalhousie University – Healthy, Happy Chickens January 2019
https://www.dal.ca/faculty/agriculture/news-events/news/2019/01/30/healthy_happy_chickens.html
4. Handling heat stress: Seaweed shows potential as additive to broiler diet. Canadian Poultry Magazine, March 2023.
<https://mydigitalpublication.com/publication/?m=1191&i=784239&p=18&ver=html5>
5. Radio Broadcast Interviews: Antibiotic use and resistance in animal production, Deborah Adewole on CBC Radio Halifax, November 2018 (Antibiotic Resistance Week).

INDUSTRY FACTSHEETS

1. Erinle, T., M. Boulianne, and **D. Adewole**. 2023. Effect of red osier dogwood extract on growth performance, blood biochemical parameters, and gut functionality of broiler chickens challenged or unchallenged with *Salmonella Enteritidis* lipopolysaccharide. <https://aprinstitute.ca/wp-content/uploads/2022/04/Factsheet-50-ROD-for-Broilers.pdf>
2. **Adewole, D.**, J. MacIsaac and C. Yang. 2021. Effect of dietary energy density and folic acid supplementation on white striping occurrence and growth performance of broiler chickens. <https://aprinstitute.ca/wp-content/uploads/2021/05/Factsheet-46-Folic-Acid-and-White-Striping.pdf>
3. Oladokun, S., K. F. Clark, and **D. Adewole**. 2022. Microbiota and Transcriptomic Effects of an Essential Oil Blend and Its Delivery Route Compared to an Antibiotic Growth Promoter in Broiler Chickens. <https://aprinstitute.ca/wp-content/uploads/2022/11/Factsheet-52-Essential-Oils-and-Broilers.pdf>
4. Erinle, T. J., S. Oladokun, J. MacIsaac, B. Rathgeber, and **D. Adewole**. 2022. Effects Grape pomace on growth performance, intestinal health, blood parameters, and breast muscle myopathies of broiler chickens. <https://aprinstitute.ca/wp-content/uploads/2022/04/Factsheet-49-Grape-Pomace-for-Broilers.pdf>
5. **Adewole, D.**, S. Oladokun, and E. Santin. 2021. Effect of organic acids-essential oils blend and oat fiber combination on broiler chicken growth performance, blood parameters, and intestinal health <https://aprinstitute.ca/wp-content/uploads/2023/03/Factsheet-47-Organic-Acids-Essential-Oils-and-Oat-Fiber-Broilers.pdf>
6. **Adewole, D.** 2020. Effect of feeding coarse or extruded oat hulls on growth performance and gut health in broiler chickens. <https://aprinstitute.ca/wp-content/uploads/2020/12/Factsheet-43-Effect-of-Feeding-Course-and-Extruded-Oat-Hulls-on-Broiler-Chickens.pdf>
7. Oladokun, S., A. Koehler, J. MacIsaac, E. M. Ibeagha-Awemu, and **D. Adewole**. 2020. Effect of delivery route of a probiotic on growth performance and gut health of broiler chickens. <https://aprinstitute.ca/wp-content/uploads/2020/12/Factsheet-45-Probiotic-Delivery.pdf>

PUBLISHED MANUSCRIPTS (2020 to present)

1. **Adewole, D.**, MacIsaac, J., Fraser, G., and B. Rathgeber. 2020. Effect of Oat Hulls Incorporated in the Diet or Fed as Free Choice on Growth Performance, Carcass Yield, Gut Morphology and Digesta Short Chain Fatty Acids of Broiler Chickens. *Sustainability*. 12(9): 3744. <https://doi.org/10.3390/su12093744>.
2. **Adewole, D.** 2020. Effect of Dietary Supplementation with Coarse or Extruded Oat Hulls on Growth Performance, Blood Biochemical Parameters, Ceca Microbiota and Short Chain Fatty Acids in Broiler Chickens. *Animals* 2020(10):1429. <https://doi.org/10.3390/ani10081429>.
3. Oladokun, S. and **D. Adewole**. 2020. In ovo delivery of bioactive substances: an alternative to the use of antibiotic growth promoters in poultry production—a review. *Journal of Applied Poultry Research* 29 (3):744-763. <https://doi.org/10.1016/j.japr.2020.06.002>.
4. Lu, P, C. Yang, M. Mogire, S. Liu, L. Lahaye, **D. Adewole**, and C. Yang. 2020. Effects of antibiotic growth promoter and dietary protease on growth performance, apparent ileal digestibility, intestinal morphology, meat quality, and intestinal gene expression in broiler chickens: a comparison. *Journal of Animal Science* 98: 1 – 13. <https://doi.org/10.1093/jas/skaa254>.
5. Tan, Z., **D. Adewole**, M. S. Diarra, J. Gong, and C. Yang. 2020. Iron requirement in the pathogenesis of Salmonella and its relevance to poultry health: A review. *Journal of Applied Poultry Research* 30:100101. <https://doi.org/10.1016/j.japr.2020.09.016>
6. Oladokun, S., Koehler, A., MacIsaac, J., Ibeagha-Awemu, E., and **D. Adewole**. 2020. *Bacillus subtilis* delivery route: effect on growth performance, intestinal morphology, cecal short-chain fatty acid concentration and cecal microbiota in broiler chickens. *Poultry Science* 100 (3):100809. <https://doi.org/10.1016/j.psj.2020.10.063>.
7. **Adewole, D.**, S. Oladokun, and E. Santin. 2021. Effect of organic acids-essential oils blend with or without oat fiber on growth performance, blood parameters, gut morphology, microbiota, and short-chain fatty acids in broiler chickens. *Animal Nutrition* 7 (4):1039-1051. <https://doi.org/10.1016/j.aninu.2021.02.001>.
8. **Adewole, D.**, J. MacIsaac, C. Yang. 2021. Effect of dietary energy density and folic acid supplementation on white striping occurrence and growth performance of broiler chickens. *Canadian Journal of Animal Science* 101(4):788-792. <https://doi.org/10.1139/CJAS-2020-0175>.
9. Mogire, M., J. Choi, P. Lu, C. Yang, S. Liu, **D. Adewole**, A. Rodas-Gonzalez, and C. Yang. 2021. Effects of red osier dogwood extract as an alternative to in-feed antibiotics on growth performance, intestinal digestive and absorptive function and meat quality of broiler chickens. *Canadian Journal of Animal Science* 101(4):687-703.
10. Akinyemi, F. and **D. Adewole**. 2021. Gut Microbiota Dynamics, Growth Performance, and Gut Morphology in Broiler Chickens Fed Diets Varying in Energy Density with or without Bacitracin Methylene Disalicylate (BMD). *Microorganisms* 9:787. <https://doi.org/10.3390/microorganisms9040787>.
11. Khomayezi, R. and **D. Adewole**. 2022. Probiotics, prebiotics, and synbiotics: An overview of their delivery routes and effects on growth and health of broiler chickens. *World's Poultry Science Journal* 78 (1): 57–81. <https://doi.org/10.1080/00439339.2022.1988804>.

12. Akinyemi, F. and **D. Adewole**. 2021. Effect of dietary folic acid and energy density on immune response, gut morphology, and oxidative status in blood and breast muscle of broiler chickens. *Canadian Journal of Animal Science* 102:2 <https://doi.org/10.1139/cjas-2021-0075>.
13. Erinle, T., S. Oladokun, J. MacIsaac, B. Rathgeber, and **D. Adewole**. 2021. Dietary grape pomace – Effects on growth performance, intestinal health, blood parameters, and breast muscle myopathies of broiler chickens. *Poultry Science* 101 (1): 101519. <https://doi.org/10.1016/j.psj.2021.101519>.
14. Makinde, T. and **D. Adewole**. 2021. Can Feed Additives be used to Promote Positive Behavior in Laying Hens? A Review. *World's Poultry Science Journal* 78 (1): 21-40 <https://doi.org/10.1080/00439339.2022.2003171>.
15. Akinyemi, F. and **D. Adewole**. 2021. Environmental stress in chickens and the potential effectiveness of dietary vitamin supplementation. *Frontiers in Animal Science*. 2:775311. <https://doi.org/10.3389/fanim.2021.775311>.
16. Erinle, T. and **D. Adewole**. 2021. The use of fruit pomaces in poultry nutrition: A review of their nutrient and bioactive components and their effect on growth and health of poultry. *Animal Nutrition* 9:357-377. <https://doi.org/10.1016/j.aninu.2021.11.011>.
17. Akinyemi, F. and **D. Adewole**. 2022. Effects of brown seaweed products on growth performance, plasma biochemistry, immune response, and antioxidant capacity of broiler chickens challenged with heat stress. <https://doi.org/10.1016/j.psj.2022.102215>
18. Erinle, T., J. MacIsaac, C. Yang, and **D. Adewole**. 2022. Effect of red osier dogwood extract on growth performance, blood biochemical parameters, and gut functionality of broiler chickens challenged or unchallenged intraperitoneally with *Salmonella* Enteritidis lipopolysaccharide. *Poultry Science* 101(7):101861. <https://doi.org/10.1016/j.psj.2022.101861>
19. Oladokun, S., K. F. Clark, and **D. Adewole**. 2022. Microbiota and Transcriptomic Effects of an Essential Oil Blend and Its Delivery Route Compared to an Antibiotic Growth Promoter in Broiler Chickens. *Microorganisms* 10(5):861. [10.3390/microorganisms10050861](https://doi.org/10.3390/microorganisms10050861).
20. Oladokun, S. and **D. Adewole**. 2023. The effect of *Bacillus subtilis* and its delivery route on hatch and growth performance, blood biochemistry, immune status, gut morphology, and microbiota of broiler chickens *Poultry Science* 102:102473. <https://doi.org/10.1016/j.psj.2022.102473>
21. Erinle, T.J., M. Boulianne and **D. Adewole**. 2023. Red osier dogwood extract versus Trimethoprim- sulfadiazine (Part 1). Effects on the growth performance, blood parameters, gut histomorphometry, and *Salmonella* excretion of broiler chickens orally challenged with *Salmonella* Enteritidis. *Poultry Science* 102 (8): 102723. <https://doi.org/10.1016/j.psj.2023.102723>.
22. Erinle, T. J., M. Boulianne and **D. Adewole**. 2023. Red osier dogwood extract vs. trimethoprim-sulfadiazine (Part 2). Pharmacodynamic effects on ileal and cecal microbiota of broiler chickens challenged orally with *Salmonella* Enteritidis. *Poultry Science* 102 (4): 102550. doi: [10.1016/j.psj.2023.102550](https://doi.org/10.1016/j.psj.2023.102550).
23. Oladokun S. and **D. Adewole**. 2023. An investigation of the effect of folic acid and its delivery routes on broiler chickens' hatch and growth performance, blood biochemistry, antioxidant status, and intestinal morphology. *Journal of Animal Science* (In Press). <https://doi.org/10.1093/jas/skad083>.

24. Oladokun, S., E. Green, S. Dridi, and **D. Adewole**. 2023. An evaluation of the thermoregulatory potential of in ovo delivered bioactive substances (probiotic, folic acid, and essential oil) in broiler chickens. *Poultry Science* 102, (5), 102602. <https://doi.org/10.1016/j.psj.2023.102602>.
25. Oladokun, S. and **D. Adewole**. 2022. Biomarkers of Heat Stress and Mechanisms of Heat stress Response in Avian Species: Current Insights and Future Perspectives from Poultry Science. *Journal of Thermal Biology* 110:103332. <https://doi.org/10.1016/j.jtherbio.2022.103332>.
26. Erinle, T., M. Boulianne, Y. Miar, R. Scales, and **D. Adewole**. 2022. Red osier dogwood and its use in animal nutrition – A Review. *Animal Nutrition*. 13: 64-77. <https://doi.org/10.1016/j.aninu.2022.11.001>.
27. Erinle, T. and **D. Adewole**. 2022. Fruit pomaces—their nutrient and bioactive components, effects on growth and health of poultry species, and possible optimization techniques. *Animal Nutrition* 9:357-377. <https://doi.org/10.1016/j.aninu.2021.11.011>.

MANUSCRIPTS SUBMITTED/IN PREPARATION

1. Makinde, T. and **D. Adewole**. 2023. The effects of a botanical extract blend on stress response, enrichment use, and behaviour of laying hens housed in a furnished cage system. *Applied Animal Behaviour Science* (Submitted).
2. Makinde, T., J. MacIsaac, and **D. Adewole**. 2023. The Effects of a Blend of Botanical Extract on Production Performance and Egg Quality of Laying Hens Housed in a Furnished Cage System. *Research in Veterinary Science* (Submitted).
3. Oladokun S. and **D. Adewole**. 2023. Microbiocenosis of the chicken ceca: impact of in ovo delivered bioactive substances, heat stress, and antibiotic growth promoters. *Animal Microbiome* (Under Review).
4. Oladokun, S. and **D. Adewole**. 2023. Research Note: An evaluation of avian heat stress biomarker reliability. *Poultry Science* (In preparation).
5. Akinyemi, F. and **D. Adewole**. 2023. Effects of brown seaweed on the gut microbiome and gut morphology of broiler chickens challenged with heat stress (In preparation).
6. Akinyemi, F. and **D. Adewole**. 2022. Effects of red osier dogwood and grape pomace on gut microbiome, growth performance, plasma biochemistry, immune response, and antioxidant capacity of broiler chickens challenged with heat stress (In preparation).

INDUSTRY PARTICIPATION

Invited Presentations to the Industry:

1. **Adewole, D.** 2023. Antibiotic Reduction Strategies in Canadian Chicken Production. Chicken Farmers of Canada Annual General Meeting. March 22, 2023, Fairmont Chateau Laurier Hotel, Ottawa, Ontario.
2. **Adewole, D.** 2023. Alternative Products to Manage the Impacts of Reduced Antimicrobial Use in Poultry Production, Atlantic Poultry Conference, Feb 14-16, 2023, Halifax Convention Center, Halifax, Nova Scotia. <https://atlanticpoultryconference.com/speaker-deborah-adewole/>
3. Akinyemi, F. and **D. Adewole**. 2023. Plant products to alleviate heat stress in broiler

chickens. Atlantic Poultry Conference, Feb 14-16, 2023, Halifax Convention Center, Halifax, Nova Scotia.

4. **Adewole, D.** Antibiotic Reduction Strategies in Chicken Production – Updates from Dalhousie University IRC. Chicken Farmers of Newfoundland Annual General Meeting, Delta Hotels St. John's Conference Centre. April 27, 2022.
5. **Adewole, D.** Antibiotics use and alternatives in poultry production. Atlantic Poultry Conference, November 13- 15, 2018, Greenwich, Nova Scotia, Canada.

Participation in Industry Meetings:

- CFNS – presented at the 2019 AGM; attended the 2020 and 2021 AGM.
- Chicken Farmers of New Brunswick (CFNB) – Attended the 2019 and 2021 AGM
- Chicken Farmers of Prince Edward Island (CFPEI) – Communicating research plans with them through APRI
- Chicken Farmers of Newfound Land (CFNL) – Communication research plans with them – Planned to give a presentation at their 2020 AGM on April 22 but the AGM was cancelled due to COVID-19. Attended 2021 AGM.
- Chicken Farmers of Canada (CFC) Annual Meeting

Conference presentations:

1. Oladokun, S., A. Koehler, J. MacIsaac, and **D. Adewole**. “Does In ovo delivery of probiotics affect hatch and growth performance, and intestinal functionality in broiler chickens?” Animal Nutrition Conference of Canada 2020 Virtual Conference, May 26 – June 11, 2020. Poster Presentation.
2. **Adewole, D.**, G. Fraser, J. MacIsaac, and B. Rathgeber. Effect of oat hulls incorporated in the diet or fed as free choice on growth performance, short chain fatty acid production, gut morphology, gut microbiota and carcass yield of broiler chickens. Poultry Science Association (PSA) Annual Meeting, July 14 - 18, 2014 Montreal, Quebec, Canada.
3. Oladokun, S., J. MacIsaac, B. Rathgeber, and **D. Adewole**. 2021. Successive delivery of essential oil via in ovo and in-water route improves broiler chicken blood biochemical and antioxidant status without altering growth performance. Poultry Sci. 100 (supple. 1). Poultry Science Annual Meeting (Virtual).
4. Erinle, T., S. Oladokun, J. MacIsaac, and **D. Adewole**. 2021. Dietary grape pomace – Effects on growth performance, intestinal health, blood parameters, and breast muscle myopathies of broiler chickens. Poultry Sci. 100 (supple. 1). Poultry Science Annual Meeting (Virtual).
5. Akinyemi, F. and **D. Adewole**. 2021. Effect of dietary folic acid and energy density on immune response, gut morphology, and oxidative status in blood and breast muscle of broiler chickens. Poultry Sci. 100 (supple. 1). Poultry Science Annual Meeting (Virtual).
6. Oladokun, S. and **D. Adewole**. 2022. Effect of *Bacillus subtilis* and its delivery route on hatch and growth performance, blood biochemistry, and immune status of broiler chickens. Poultry Sci. 101 (supple. 1). Poultry Science Annual Meeting, San Antonio, USA.
7. Akinyemi, F. and **D. Adewole**. 2022. Unraveling the potential effects of brown seaweed products on growth performance, blood biochemistry, immune response, and antioxidant capacity of broiler chickens challenged with heat stress. Poultry Sci. 101 (supple. 1). Poultry Science Annual Meeting, San Antonio, USA.
8. Makinde, T., S. Cottee, B. Medina, and **D. Adewole**. 2022. A pecking block preference test on

- furnished-caged Lohmann Lite hens. Poultry Sci. 101 (supple. 1). Poultry Science Annual Meeting, San Antonio, USA.
9. Makinde, T., S. Cottee, B. Medina, J. MacIsaac, and **D. Adewole**. 2022. The Effects of a Blend of Botanical Extract on Production Performance and Egg Quality of Laying Hens Housed in a Furnished Cage System. Poultry Sci. 101 (supple. 1). Poultry Science Forum, Atlantic Georgia. Poultry Science Annual Meeting, San Antonio, USA.
 10. Oladokun, S. and **D. Adewole**. 2022. An investigation of the effect of folic acid and its delivery routes on broiler chickens' hatch and growth performance, blood biochemistry, immune and antioxidant status. Poultry Sci. 101 (supple. 1). ASAS-CSAS Annual Meeting & Trade Show, June 26-30, Oklahoma City, USA.
 11. Oladokun S. and **D. Adewole**. 2023. Microbiocenosis of the chicken ceca: impact of in ovo delivered bioactive substances, heat stress, and antibiotic growth promoters. International Poultry Scientific Forum, January 23-24, Atlanta, Georgia, USA.
 12. Makinde, T. and **D. Adewole**. 2023. The effects of a botanical extract blend on stress response, enrichment use, and behaviour of laying hens housed in a furnished cage system. International Poultry Scientific Forum, January 23-24, Atlanta, Georgia, USA.
 13. Akinyemi, F. and **D. Adewole**. 2023. Effects of red osier dogwood extract and grape pomace on growth performance, blood biochemistry, immune response, and antioxidant capacity of broiler chickens challenged with heat stress. International Poultry Scientific Forum, January 23-24, Atlanta, Georgia, USA.
 14. Akinyemi, F and **D. Adewole**. 2023. Effects of brown seaweed on the gut health of broiler chickens challenged with heat stress. Atlantic Poultry Conference, Halifax, NS.
 15. Akinyemi, F. and **D. Adewole**. 2023. Exploring the modulatory effects of brown seaweed on the gut microbiome and morphology of broiler chickens challenged with heat stress. PSA Annual Meeting, July 10-13, Philadelphia, USA.
 16. Akinyemi, F. and **D. Adewole**. 2023. Encapsulated versus free multivitamins: effects on the growth performance, immune response, and antioxidant ability of broiler chickens challenged with cold stress. PSA Annual Meeting, July 10-13, Philadelphia, USA.
 17. Erinle, T. M. Boulianne, and **D. Adewole**. 2023. Red osier dogwood extract versus Trimethoprim- sulfadiazine (Part 1). Effects on the growth performance, blood parameters, gut histomorphometry, and Salmonella excretion of broiler chickens orally challenged with Salmonella Enteritidis. PSA Annual Meeting, July 10-13, Philadelphia, USA.
 18. Erinle, T. M. Boulianne, and **D. Adewole**. 2023. Red osier dogwood extract versus Trimethoprim-sulfadiazine (Part 2). Pharmacodynamic effects on ileal and cecal microbiota of broiler chickens challenged orally with Salmonella Enteritidis. PSA Annual Meeting, July 10-13, Philadelphia, USA.
 19. Oladokun, S. and **D. Adewole**. 2023. An evaluation of the thermoregulatory potential of in ovo delivered bioactive substances (probiotic, folic acid, and essential oil) in broiler chickens. PSA Annual Meeting, July 10-13, Philadelphia, USA.

RESEARCH TEAM

- Alumni
 1. Alyssa Koehler (Undergraduate Honours Student)
 2. Rojman Khomayezi (Research Assistant)
 3. Erin Maxwell (MSc Student)
 4. Ranitha Fernando (MSc Student; Department of Plant, Food, and Environmental

- Science – Co-supervised)
5. Samson Oladokun (PhD Student)
 6. Taiwo Erinle (MSc Student)
 7. Taiwo Makinde (MSc Student)
- Current members
 1. Janice MacIsaac (Research Associate)
 2. Fisayo Akinyemi (PhD Student)
 3. Roseline Ogori (MSc Student)
 4. Shima Borzouie (Post-doctoral Fellow)
 5. Ritika Sehgal (Undergraduate NSERC USRA Student)
 6. Arpan Lotey (Undergraduate Summer Student)
 7. Eugenie Boutour (Mitacs Globalink Student)
 8. Italo Santos Reis Pereira (Mitacs Globalink Student)