

WOAH Collaborative Centre Reports Activities 2025

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CENTRE INFORMATION

*Title of WOA Collaborating Centre	Food-Borne Zoonotic Parasites
*Address of WOA Collaborating Centre	Centre for Food-borne and Animal Parasitology, Canadian Food Inspection Agency (CFIA), Saskatoon Laboratory, 116 Veterinary Road, Saskatoon, SK, Canada S7N 2R3
*Tel:	13063857815
*E-mail address:	Laura.lalonde@inspection.gc.ca
Website:	https://inspection.canada.ca/en/about-cfia/science-and-research-cfia/our-laboratories/saskatoon/food-borne-zoonotic-parasites
*Name Director of Institute (Responsible Official):	David McKinnon, Director, CFIA Saskatoon Laboratory
*Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Laura Lalonde, Section Head, Centre for Food-borne and Animal Parasitology, CFIA Saskatoon Laboratory
*Name of the writer:	Laura Lalonde

TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Category	Title of activity	Scope
Disease control (true)	Ongoing provision of diagnostic services and scientific advice to CFIA Science, Policies and Programs, and Operations Branches	Domestic, import and/or export disease investigations pertaining to food-borne zoonotic parasites, including Cyclospora (non-zoonotic), Cryptosporidium, Toxoplasma, Giardia, Taenia saginata/Cysticercus bovis and Trichinella spp.
Epidemiology, surveillance, risk assessment, (true)	Ongoing provision of scientific advice pertaining to risk analyses for food-borne parasites	Risk management of bovine cysticercosis (Taenia saginata), Echinococcus, Trichinella, Cyclospora, Cryptosporidium, Toxoplasma, and Giardia
Training, capacity building (true)	Ongoing internal training and proficiency assessment of CFIA analysts for the detection of food-borne parasites	Cyclospora, Cryptosporidium, Toxoplasma, Giardia, Taenia saginata and Trichinella spp.
		This federal interdepartmental study (2022-2027) entails the use of genomics to monitor ongoing spatial and temporal climate-associated changes

Zoonoses (true)	GRDI (Genomics Research and Development Initiative) Shared Priority Projects-Sub-Project Title: Transmission patterns of zoonotic and emerging pathogens in Canada's North related to climate change (https://grdi.canada.ca/en/projects/genomicadaptation-resilience-climate-change-genarcc-project)	in the transmission of established, emerging and novel pathogens in Canada's North and aims to determine the prevalence and molecular characteristics of zoonotic parasites, emerging and novel viruses, and bacteria in Northern country foods, focusing on food safety and security, and the potential risks to human health due to emerging threats.
Wildlife (true)	Surveillance of wildlife for <i>Trichinella</i> spp.	Ongoing surveillance of wildlife in the Canadian North and Alaska.
Diagnosis, biotechnology and laboratory (true)	Ongoing routine diagnosis and monitoring/surveillance of food-borne parasites for domestic disease control, food safety, and import/export purposes	Detection and diagnosis of various food-borne parasites by direct (microscopic examination, digestion assay, PCR) including zoonotic coccidia, <i>Cyclospora</i> , <i>Cryptosporidium</i> , <i>Toxoplasma</i> , <i>Giardia</i> , zoonotic taeniids and <i>Trichinella</i>
Epidemiology, surveillance, risk assessment (true)	Ongoing monitoring and surveillance for foodborne parasites in animals, animal products and fresh produce for domestic disease control and food safety, and import/export purposes	National Microbiological Monitoring Program for detection of <i>Trichinella</i> in domestic swine via digestion assay; National Microbiological Monitoring Program and targeted surveys for detection of <i>Cyclospora</i> , <i>Cryptosporidium</i> , <i>Toxoplasma</i> , and <i>Giardia</i> contamination of imported fresh produce via qPCR and LAMP assays
Training, capacity building (true)	Ongoing training and mentoring of PhD candidates (at the University of Saskatchewan, Canada) conducting research studies involving food-borne parasites, via participation on graduate student advisory committees, coordination and teaching at the Veterinary Parasitology curriculum of University of Saskatchewan and supervising and training of undergraduate students working on summer research projects. Teaching and mentoring of graduate and undergraduate students of University of Calgary via teaching at the Doctor of Veterinary Medicine parasitology and clinical skills curriculum and participating in graduate student committee undergoing research projects on molecular diagnostics and molecular epidemiology in parasitology.	<i>Trichinella</i> spp., <i>Taenia saginata</i> , food-borne protozoa
Training, capacity building (true)	Ongoing scientific support, proficiency assessment, and capacity building of industry, academic institute, and territorial authorities analysts to perform artificial digestion assay for <i>Trichinella</i> in pork, horse meat or wildlife, including walrus meat (a food safety concern in northern Canada)	<i>Trichinella</i> spp. and food-borne protozoa <i>Trichinella</i> spp. from domestic and wildlife sources
Food safety (true)	Development, optimization, standardization, and/or validation of methods to detect and identify food-borne zoonotic parasites	Application of next-generation sequencing methodology in developing streamlined protocols for high-resolution genotyping of <i>Trichinella</i> spp. and <i>Cyclospora</i> in foods. to aid epidemiological surveillance and outbreak investigations; development and validation of molecular detection methods for <i>Cryptosporidium</i> spp. and <i>Toxoplasma gondii</i> in leafy greens and berry fruits

TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable Area
Application of next-generation sequencing methodology in developing streamlined protocols for high-resolution genotyping of parasites of public health concern	Ongoing use of genomics and bioinformatics to identify and characterize food-borne parasites, including deep amplicon sequencing of the ITS-1 region to effect high-resolution detection of all <i>Trichinella</i> spp. comprising mixed infections in a muscle tissue sample, and targeted amplicon sequencing for genotyping <i>Cyclospora</i> in foods, as well as DNA metabarcoding of foodborne protozoa using Oxford Nanopore sequencing.	Laboratory Expertise
Development of an international (ISO) standard for the detection of <i>Cyclospora cayetanensis</i> in food	Co-lead of project in food-borne parasites working group (ISO/TC34/SC9/WG6) to develop international standard for the detection of <i>Cyclospora cayetanensis</i> in foods. Leader of project proposed to conduct interlaboratory study for validation of <i>Cyclospora</i> ISO method.	Laboratory Expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOA?H?

No

4. Did your Collaborating Centre maintain a network with other WOA?H Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOA?H Collaborating Centre for Food-Borne Zoonotic Parasites from the European Region	Maisons-Alfort, France	Europa	Exchange of scientific information on food-borne parasites and proficiency testing (PT) samples (<i>Trichinella</i>) via joint participation in interlaboratory PT
US-FDA Center for Food Safety and Applied Nutrition	College Park, Maryland, USA	América	Ongoing collaboration to harmonize and improve methods for detection and NGS genotyping of <i>Cyclospora</i> in fresh produce

TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOA?H Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
			This federal interdepartmental

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<p>Genomic Adaptation and Resilience to Climate Change (Gen ARCC)/ GRDI (Genomics Research and Development Initiative) Shared Priority Projects-Sub-project Title: Transmission patterns of zoonotic and emerging pathogens in Canada's North related to climate change (https://grdi.canada.ca/en/projects/genomicadaptation-resilience-climate-change-genarcc-project)</p>	<p>Canada</p>	<p>Americas</p>	<p>study (2022-2027) entails the use of genomics to monitor ongoing spatial and temporal climate-associated changes in the transmission of established, emerging and novel pathogens in Canada's North and aims to determine the prevalence and molecular characteristics of zoonotic parasites, emerging and novel viruses, and bacteria in Northern country foods, focusing on food safety and security, and the potential risks to human health due to emerging threats</p>
<p>University of Saskatchewan</p>	<p>Saskatoon, Canada</p>	<p>Americas</p>	<p>Ongoing collaboration with the Dept. of Veterinary Microbiology, Western College of Veterinary Medicine, U of S to further elucidate the biology and ecology of a new species of <i>Trichinella</i> (<i>T. chanchalensis</i>) in northern North America.</p>
<p>Public Health Agency of Canada</p>	<p>Guelph, Ontario</p>	<p>Americas</p>	<p>Development of NGS method for genotyping of <i>Cyclospora</i> in fresh produce samples.</p>
<p>Brazilian Ministry of Agriculture</p>	<p>Brazil</p>	<p>Americas</p>	<p>Collaboration with the Brazilian Government to acquire samples for projects of relevance to Canada, including Bovine Cysticercosis samples</p>

TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?H?

No

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

*Ongoing training and/or proficiency testing assessment of Canadian industry analysts to perform the artificial digestion assay for *Trichinella* and to facilitate effective oversight of industry labs performing this testing on horse meat or pork to meet requirements for export and domestic food safety (i.e., ready-to-eat products).*

*Ongoing provision of scientific advice and proficiency testing assessment to Canadian territorial (Nunavik, Nunavut) analysts performing the artificial digestion assay for *Trichinella* in walrus meat, a food safety concern in the Arctic.*

*Ongoing provision of *Trichinella* artificial digestion assay proficiency testing samples and assessment of results to other WOA?H member countries (France).*

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA?H, to personnel from WOA?H Members?

Yes

- a) Technical visit : 0
 b) Seminars : 1
 c) Hands-on training courses: 0
 d) Internships (>1 month) : 5

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
B	Webinars pertaining to Trichinella biology and detection	Canada	2
D	Ongoing provision of scientific advice and training on Trichinella delivered via participation on PhD candidate's advisory committee (University of Saskatchewan)	Canada	1
D	Training and supervision of M.Sc. student on molecular diagnostics of foodborne protozoa (4 month internship under Erasmus Scholarship)	Italy	1
D	Training and supervision of PhD student on molecular diagnostics of <i>T. saginata</i> / <i>C. bovis</i> (6 months internship under Brazilian Federal government CAPES scholarship)	Brazil	1
D	Training and supervision of M.Sc. student on molecular diagnostics of foodborne protozoa	Canada	1
D	Training and supervision of an undergraduate student on bioinformatics and molecular diagnostics of foodborne protozoa	Canada	1

TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?H

No

TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA?H that may be useful to Members of WOA?H

a) Articles published in peer-reviewed journals:

3

Malone C.J., Jutha N., Awan M., Lobanov V.A., Jenkins E.J. (2026) Revealing the northern distribution of *Trichinella chanchalensis*: New geographic records from Nunavut and ecological perspectives. *Vet Parasitol Reg Stud Reports*. 67:101406.

Malone C.J., Beckmen K., Stimmelmayer R., Lobanov V.A., Voordouw M.J., Ellis J., Jenkins E.J. (2025) First report of *Trichinella chanchalensis*, and detection of foreign *Trichinella spiralis*, in wildlife in Alaska. *Parasit Vectors*. DOI: 10.1186/s13071-025-07142-x

Malone C.J., Harms N.J., Lobanov V.A., Scandrett W.B., Queiroz C.A., Voordouw M.J., Jung T.S., Parker S.E., Jenkins E.J. (2025) Broad host specificity of *Trichinella chanchalensis* and minimal interspecific competition with *T. nativa* and *T6* in naturally co-infected hosts. *Int J Parasitol*. S0020-7519(25)00165-1 DOI: 10.1016/j.ijpara.2025.09.001

b) International conferences:

1

Lalonde, Laura. *International Association for Food Protection 2025 Annual Meeting. Invited presentation: "Detection of protozoan parasites in fresh produce: update on surveillance, method development and validation"*.

Lalonde, Laura. *International Association for Food Protection 2025 Annual Meeting. Invited presentation: "Summary of FAO expert meeting on microbiological risk assessment of parasites in food-part I protozoa"*.

c) National conferences:

0

d) Other (Provide website address or link to appropriate information):

1

Food and Agriculture Organization of the United Nations. 2025. *FAO expert meeting on microbiological risk assessment of protozoan parasites in foods: Executive Summary*. <https://openknowledge.fao.org/handle/20.500.14283/cd5773en>

Lalonde, Laura. *CFIA Food Safety Research Webinar: "An update on targeted surveillance and method development activities at the CFIA Centre for Foodborne and Animal Parasitology"*.

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

Significant progress continues to be made in applying next-generation sequencing to genotyping two species of food-borne parasites that are in the scope of our diagnostic and research activities. Thus, a new method for identifying Trichinella taxa in larval pools with increased resolution for detecting underrepresented genotypes in mixed natural infections has been developed, validated and employed. A database of the internal transcribed spacer 1 (ITS-1) ribosomal cistron sequences has been established for Trichinella taxa identification using this method and continues to be improved by introducing sequences of additional ITS-1 haplotypes for selected taxa as they are generated. Furthermore, considerable progress has been made to demonstrate suitability of a new commercial kit for Cyclospora genotyping in foods by NGS. This kit is intended for target-specific amplification, target enrichment and sequencing of over 50 polymorphic loci distributed across the Cyclospora genome. This commercial kit is expected to facilitate genotyping of Cyclospora in produce samples with low oocyst counts. No other previously published NGS methods for Cyclospora had sufficient specificity, sensitivity or resolution for this sample type. In addition, we have implemented an in-house developed and validated duplex qPCR assay for detection of Cryptosporidium and Toxoplasma into our routine surveillance testing of fresh produce.

12. Additional comments regarding your report: