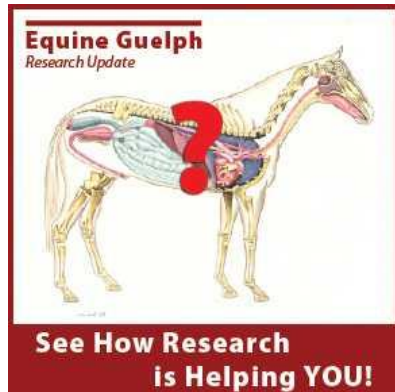


UNIVERSITY of GUELPH

Equine Guelph



Annual Report
May 1, 2018 – April 30, 2019

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Executive Summary

The foundation and future sustainability of the equine industry remains a priority in Canada and beyond. Globally, there is increased pressure from those outside the equine industry to address concerns of health and welfare. As a result, the need continues for a strong and sustained focus on the health and welfare of horses in sport and performance and the supportive role that can be played by research. In turn, the research contributes to continuing development of evidence-based information that flows into the equine industry at all levels so that best practices can be enhanced through training and education.

In this, our 16th year of operation, Equine Guelph continues with its unique partnership of the equine industry in Canada and the University of Guelph.

The research program of Equine Guelph continues to fund new and innovative research that is of benefit to the racing and non-racing sectors with over 15 years of contributing to the body of knowledge that contributes to health, welfare and performance.

Progress is being made to obtain higher awareness of equine research with the funding program of OMAFRA and the timing of the funding cycle so that Equine Guelph funding from the industry can be used to leverage further contributions from OMAFRA.

New research funding, developed through an innovative new Ontario Equestrian member initiative, contributed further amounts available for research. This was allocated to research on the gut biome in horses according to the designated priority of the membership.

The Equine Foundation of Canada once again played an important role as they gave a generous donation to the Ontario Veterinary College which enabled the purchase of "Maple Stirrup", a specialized teaching horse for the OVC students. The life-like horse model enhances hands-on learning by allowing students to practice skills at their own pace before working with live horses. It has now been incorporated into the DVM curriculum and is an important aspect of enhancing clinical skills to build competence and confidence of the veterinarian students.

The members of the Equine Guelph Research Committee spend many hours each year reviewing the research proposals to ensure they meet industry priorities for their funding group. Final decisions are based on the results of the external peer review and the relation of the research goals for the priorities. In 2018-2019, approximately \$330,000 was allocated to research programs for new and continuing projects, based on industry priorities and peer-review results. Additional value for this investment is achieved when the knowledge gained from the research projects is redeveloped and used for the Equine Guelph education program, the communications program, and the veterinary student program.

Industry-designated priority projects included many areas of study:

- Advances in stem cell treatments
- Disease prevention and prevalence in the Ontario equine industry through modelling the risk
- Training equipment and its use for horses
- Studies on gut health using an in-vitro model for the horse
- On-Farm Welfare Assessment Tools
- Investigations on infertility in horses
- Thyroxine use in horses

Further details on these and other studies are provided in the Research section and Appendices.

New education initiatives continue to be offered to the equine industry, in Canada and internationally, with an unprecedented number of options for training and education through Equine Guelph and its innovative partnership program, The Horse Portal. Working with all the English-speaking equestrian federations, several racing partners and more, this program continues to expand to offer training and short, focused programs on health and welfare topics. It has also developed to the point where further partners are invited to consider partnering with Equine Guelph on customized online training.

The Horse Portal continues to grow and provides many options for students on focused, short online courses. Youth and adult versions of the Horse Behaviour and Safety course are becoming popular for parents and youth to learn together.

New this year was a very popular offering of the Equine First Aid Workshop, thanks to a grant from Grand River Agricultural Society. This in turn helped the development of the online version on TheHorsePortal.ca.

Also new this year is the development of a pilot project for online training geared to the racing industry with more courses to be offered in 2019-20.

Fire safety and emergency preparedness (including large animal rescue training) continue to be a focus for educational efforts by Equine Guelph and OMAFRA.

EquiMania! has been a featured exhibit at four of the top 50 North American Agricultural Fairs this year, bringing smiles and fun learning activities to young and old on health, welfare and safety. A special visitor came to visit EquiMania! at the Can-Am All Breeds Expo – the well-known Canadian star of Heartland, Amber Marshall!

A special thank you is extended to all past and present Advisory Council and Research Committee members for their ongoing support and volunteer hours, while providing their expertise. Sincere appreciation is also extended to our donors, volunteers and sponsors

who contribute to the ongoing success of Equine Guelph and its programs in support of the industry. The dedication and contributions are greatly appreciated.

Equine Guelph acknowledges with sincere appreciation the Council partners as they continue to provide support and guidance for the programs of Equine Guelph on industry priorities – the Alcohol and Gaming Commission of Ontario, the E.P. Taylor Equine Research Fund, Equestrian Canada, the Horsemen’s Benevolent and Protective Association of Ontario, Ontario Equestrian, the Ontario Harness Horse Association, Ontario Racing (which includes CTHS, COSA and SBOA), Ontario Ministry of Agriculture and Food, Standardbred Canada, the Quarter Racing Owners of Ontario, Inc. and the University of Guelph.

This annual report provides the details on the 2018-2019 activities of Equine Guelph and salutes the partnerships that make these achievements possible for the benefit of the equine industry and the horse.





Dear Partners and Supporters of Equine Guelph,

Good foundations build strong partnerships, and in turn, strong program development. Over its history, Equine Guelph has always valued the partnerships with our equine industry in Ontario and beyond. The programs developed provide a return on the investment made by the industry into research on priority areas and development of new and innovative programs to disseminate the findings and best practices to the industry through the education and communications programs.

The research program, funded through Equine Guelph and its industry partners, continues to provide a significant return on this investment. New and on-going research programs have been funded in the areas of lameness and track safety, respiratory concerns, digestive tract health and others. Many of our researchers continue to be leaders internationally with their global collaborations in their areas and acknowledged for their expertise. The return on this investment to the industry is realized through the dissemination of new knowledge and procedures to the veterinarians, caretakers and owners of horses through various communications and extension programs, including new online education programs.

Equine Guelph staff worked hard on developing several new proposals and were successful in obtaining new funds for several new proposals that help to support ongoing communications and education programming and develop new ones. Partnerships with our sponsors help develop further educational programs for the communications and education programs.

One of the highlights was an invitation to speak at the inaugural offering of the Kentucky Equine Safety Summit in Lexington where a presentation was made on Behaviour and Safety courses for youth and adults, one of nine courses now offered on The Horse Portal, as an example of a program that can make a difference for safety of humans and horses.

Student interest continues to grow for educational and training opportunities and new partners have joined up with The Horse Portal. This is good news for our industry as graduates have been engaged in thorough studies of evidence-based equine health and welfare research and studying current issues related to the welfare of horses in our industry.

It is important to remind us all that Equine Guelph is a centre created by the industry for the industry, providing services to the industry that include research and communications, education and training, and communications in many priority areas for the equine industry. The continuing growing number of associations and groups help to move the programs of research and health and welfare education during times of great change.

We thank all our donors, supporters, and partners for their important role in supporting Equine Guelph.

Yours sincerely,



Dr. Jeffrey Wichtel
Dean, Ontario Veterinary College



Mr. Al Patterson
Co-Chair, Equine Guelph

Introduction

Equine Guelph celebrates 16 years on July 1, 2019!

“The Centre for the horse owner at the University of Guelph” -- Equine Guelph was created in a unique partnership of the equine industry and the University of Guelph as a two-way portal for research, education and training, and communications. Welfare of horses continues to dominate the discussions both in the public and within the industry. It is that partnership that can help make Equine Guelph continue in its role in being a positive force in that discussion.

The Advisory Council of Equine Guelph is an important foundation for this discussion as it represents the leaders of the industry, along with the University of Guelph, working together. Membership includes Equestrian Canada, The Horsemen’s Benevolent and Protective Association of Ontario, Ontario Equestrian, Ontario Racing, Ontario Harness Horse Association, Ontario Ministry of Agriculture, Food and Rural Affairs, the Alcohol and Gaming Commission of Ontario, Standardbred Canada, Quarter Racing Owners of Ontario, Inc. and the University of Guelph. The E.P. Taylor Equine Research Fund, originally developed by the racing industry and now managed by the UofG is an important contributor to the research program.

The Co-Chairs of the Equine Guelph Council, OVC Dean, Dr. Jeff Wichtel and Mr. Al Patterson, oversee the funding process and program initiatives. Over last 16 years, there have been many changes in programming and development and the input of the Advisory Council has been integral to this process for the research, education and communications programs.

This Annual Report for the 2018-2019 fiscal year will highlight progress and achievements of Equine Guelph and its programs in service to the equine industry, in Ontario and beyond.

Programs of Equine Guelph

Research

The unique partnership that exists between the equine industry and the University of Guelph, through the Equine Guelph Advisory Council and its Research Committee, illustrates the value of industry and academia working together. The industry, through a common interest in the health and welfare of their horses, helps to set priorities and fund the research program. The research in turn strengthens the industry by informing and advancing veterinary standards of care, and contributes to a higher level of knowledge within the industry for trainers, grooms, coaches, facility owners and more.

Traditionally the majority of funding for the equine research program through Equine Guelph came through the Horse Improvement Program of the Ontario racing industry. This has been an important role of the racing industry to facilitate the research program

and enables researchers to conduct quality research on industry priorities and build provincial equine veterinary capacity of highly specialized clinicians and researchers.

This year the research funding to Equine Guelph from the racing industry reached an all-time low with one breed not supporting research at all. However, Equine Guelph continues to work closely with our racing industry partners during this time of re-organization within the industry and Equine Guelph is hopeful that the industry will be able to support Equine Guelph in a meaningful manner again in the near future. Funding also comes directly from the HBPA, the E.P. Taylor Foundation and the Ontario Equestrian Federation. This year \$200,000 was allocated to new research projects. In addition to these grants Equine Guelph provided matching funds for a successful equine grant submitted to the Tier I OMAFRA competition and thereby leveraging the Equine Guelph funds 1:2.

The support of the racing industry and Ontario Equestrian, along with the generous donations from individuals, is a critical and valued part of the research program in support of horse health and welfare. Equine Guelph and the equine researchers extend a special thank you to all our partners and we look forward to continuing our close collaboration and to finding new ways to support equine research for the benefit of our beloved horses.

In the previous year, changes were made to the Terms of Reference for both the Advisory Council and the Research Committee, with the addition of two UofG researchers to the Advisory Council and the Research Committee, and added representation from the Ontario Association of Equine Practitioners. These changes have been well received with increased representation. The members of the Research Committee have volunteered their time to also act as internal peer-reviewers for equine grants destined for submission to granting agencies outside of EG, nationally and internationally. All equine researchers are thankful for this additional support that can only strengthen the grants and increase their likelihood of success.

Research co-chair, Dr. Koch and the University of Guelph team are looking to work closely with the industry to develop funding mechanisms that will provide predictable and robust research funding to sustain the world-class research conducted in Ontario for the benefit of the equine industry as a whole. Research funding is at a critical impasse due to the historical low funding support from the racing industry and there is a real risk of losing research capacity to support both emerging and established health and welfare research programs.

Based on the substantial government support pledged to the racing industry over the next two decades in order to support the development of a sustainable racing model it is our hope that the racing industry will acknowledge the importance of a sustainable equine research funding model as well and the positive role Equine Guelph can play in this context based on our past collective achievements.

The research program supported by Equine Guelph enables a strong education program of equine veterinary students, practitioners and specialists, which provides the foundation for state-of-the-art emergency preparedness programs within the province. OVC researchers are known for their global contributions. This past year, Dr. James Raeside, Professor Emeritus at the University of Guelph, is the recipient of a Lifetime Achievement Award for his contributions to the field of Equine Reproduction, presented at the

International Equine Reproduction Symposium, held in Cambridge, UK July 22nd-28th, 2018. Congratulations Dr. Raeside!

The many hours dedicated by volunteers of the EG Research Committee, reviewing and working on behalf of the industry is also gratefully acknowledged.

There is a great diversity of projects ongoing for 2018-2019 studying many areas of health and well-being of horses, including hindgut microflora and gut health, emerging diseases and health risks for horses, airway disease and management, stem cell advances, track surfaces along with lameness and injury studies, cardiovascular health, reproductive health, 3D modelling, as well as many others.

Summaries of each project are found in Appendix 5, and a list of publications and research presentations in Appendices 6 and 7. Industry groups who would like to hear directly from researchers should feel free to contact Dr. Koch.

Education and Training

Online Education Program for Certificates and Diplomas

Recognizing a need for educational opportunities for our horse industry in 2002, Equine Guelph began offering 12 week online courses in 2002 with 6 courses that led to a University of Guelph certificate in Equine Science. The goal of this program is to provide updated, evidence-based information for quality learning opportunities for those in the horse industry to support and enhance the health and well-being of horses. Many in the horse industry understand the need for this continuing education and find it challenging to keep up with the new research findings and resulting best practices for management, so the online courses provide an ideal opportunity.

The goals for this program are to:

- include high-quality, evidence-based information from leading researchers, practitioners and experts in the field
- provide practical skills knowledge to improve health and welfare
- provide flexible opportunities for continuing learning while balancing work, family and horse care needs
- encourage lasting relationships with members of the global equine community who share a love of horses and are willing to share experiences to support health, welfare and safety
- be a globally recognized program for students to improve employment opportunities and advance careers for individuals in the equine industry.

Today, in partnership with the Office of Open Learning and Educational Support, there are three certificates (Science, Business and Welfare) and a Diploma program which have been developed, with over 20 online courses, including three advanced level courses. In 2018-19, there were 17 courses scheduled, with a total of 26 courses offered and 863 registrations, a slight increase over the previous year. Students continue to join

our courses from every Canadian province and over 40 different countries as part of our unique global equine learning community. Work on re-development and enhancements to our courses continues to reach the higher standards of the “Quality Matters” program. Courses are accepted for professional development credits for coaches by Equestrian Canada. We are also seeing a trend of higher interest from students to continue to obtain the Diploma, after completing one of the Certificate programs.

Detailed information can be found in Appendix 10.

A New Approach – TheHorsePortal.ca

Our new online program, TheHorsePortal.ca was developed in response to survey feedback from our industry citing “time” and “money” as barriers to lifetime learning. Equine Guelph is proud of the growing partnerships that are represented by this program, including every English-speaking province for the equestrian federations and Equestrian Canada, a growing number of associations in the racing sector, welfare associations and more. Nine courses were offered with a total of 681 students, a significant increase over the 260 students enrolled in 2017, joining our courses from both the racing and non-racing sectors and a special pilot program has been launched exclusive to the racing sector, with thanks to the AGCO, and more courses are in development for Fall of 2019 and Winter of 2010. The Horse Portal has grown significantly thanks to the partners and support of our Council members and grant funding and has now reached a maturity of the platform to offer customized training programs for the equine industry.

The partners currently include:

Provincial Horse Federations

- Alberta Equestrian Federation
- Equine Association of Yukon
- Horse Council of British Columbia
- Island Horse Council
- Manitoba Horse Council
- New Brunswick Equestrian Association
- Newfoundland and Labrador Equestrian Association
- Nova Scotia Equestrian Federation
- Ontario Equestrian
- Saskatchewan Horse Federation

Racing Organizations

- Ontario Racing

Animal Welfare Organizations

- Campbell Centre for the Study of Animal Welfare
- Ontario SPCA

Accreditation Partners

- Equestrian Canada

International Partners

- Saddle Up Safely (a program of the University of Kentucky Health Care, UK college of Agriculture and many community organizations)

Other highlights include:

Education Tuition Awards Continue

Important opportunities are provided to individuals in the racing industry through the ongoing Stuart Stocks Memorial award, won this year by Holly De Way. Equine Guelph sincerely thanks the Stuart Stocks family for this moving award that is in memory of a passionate follower of the racing industry as it gives an important opportunity for a participant to further their career goals in the racing industry while achieving higher education and knowledge.

The Roger L'Heureux Memorial Award also commemorates a dedicated racing enthusiast and provides an opportunity for a Standardbred driver, trainer or groom or University of Guelph student to continue with their educational studies. Thanks to the L'Heureux family, this award was given to Cynthia Naydani.

Equine Guelph sincerely thanks the Stocks family and the L'Heureux family for their generosity of providing these special educational awards and for their foresight in supporting the efforts of students for their career aspirations in the racing industry.

EquiMania!

The flagship youth and family program, called EquiMania!, continues to grow and attract audiences both young and old. EquiMania! continues to be a main feature at 3 international events including the Minnesota State Fair, the Royal Winter Agricultural Fair and the Canadian National Exhibition. Several other events such as the Can-Am All Breeds Equine Expo continue to bring EquiMania! to their events as a featured exhibit. New this year is the addition of EquiMania! to TheHorsePortal.ca to provide youth a place to continue learning about horses with a new, interactive learning activity profiled each month in the Equine Guelph e-news.

EquiMania! is about youth today being part of our industry tomorrow, for a healthy and sustainable horse community. We sincerely thank our partners who assist us in developing and maintaining this unique program – Can-Am All Breeds Expo, Equestrian Canada, Greenhawk, Intercity Insurance Services, Kubota Canada, Ontario Equestrian, The Royal Agricultural Winter Fair, Shur-Gain, SSG Gloves, Standardbred Canada, System Fencing, and Workplace Safety and Prevention Services.

Fire Prevention, Emergency Preparedness and Large Animal Rescue Training Program

Through funding received from the Canadian Agricultural Partnership Program Equine Guelph has developed new programs to deliver comprehensive community-based training in the equine emergency management category with a focus on fire and emergency preparedness.



Collaborating partners include Ontario Equestrian and Ontario Racing. Other industry partners include: Standardbred Canada, Workplace Safety & Prevention Services, Intercity Insurance Services, Meaford Fire Department Training Centre, Farm & Food Care Ontario, Ontario Association of Equine Practitioners, Equestrian Canada, Ontario Veterinary College, Ontario Society for the Prevention of Cruelty to Animals and Professional Livestock Auditing Inc

The initiative includes four milestones.

1. Large Animal Rescue Training workshop, October 12, 13 and 14, 2018 at the Meaford Fire Department Training Centre. This was the third offering at this location and participants included over 8 fire departments, OSPCA officers, the Hamilton Mounted Police and many from the horse industry.

“The course was truly amazing!” said participant Paulene Tiemens-Weber, Territory Manager – Equine Boehringer Ingelheim Canada. *“The most important take away for me was the feeling of collaboration between the Fire Fighters, the Police and the University of Guelph instructors that were there. All were from different districts yet everyone had one factor in common – a passion for animal welfare and commitment to rescues that save lives without compromising safety.”*

The course was featured on Barrie CTV: <https://barrie.ctvnews.ca/video?clipId=1513647>

Video footage was filmed for development of further milestones.

2. Fire and Emergency Preparedness online course (April 8 to 15, 2018): **this initial course offering attracted 160 participants**, both paid and unpaid as made available through the grant.

“This course was eye-opening and very informative. I learned about the realities of barn fire detection and response, and the importance of doing due diligence in planning and prevention. The best way to deal with a barn fire is to prevent it from occurring in the first place, and this course provides a wealth of information that will help you to accomplish the goal of a fire-safe facility. Every horse owner can do something to make their horse's space safer. Every horse owner/enthusiast can benefit from the information in this course.” Cathy Vogelweid, DVM, Columbia Missouri, USA

3. ONLINE FIRST RESPONDERS BEST PRACTICES GUIDE (under development)

Online resource (Reference sheets/videos) available to first responders as a post-workshop reference of rescue protocols/techniques

4. ONLINE FIRE DEPARTMENT PRESENTATION KIT (under development)

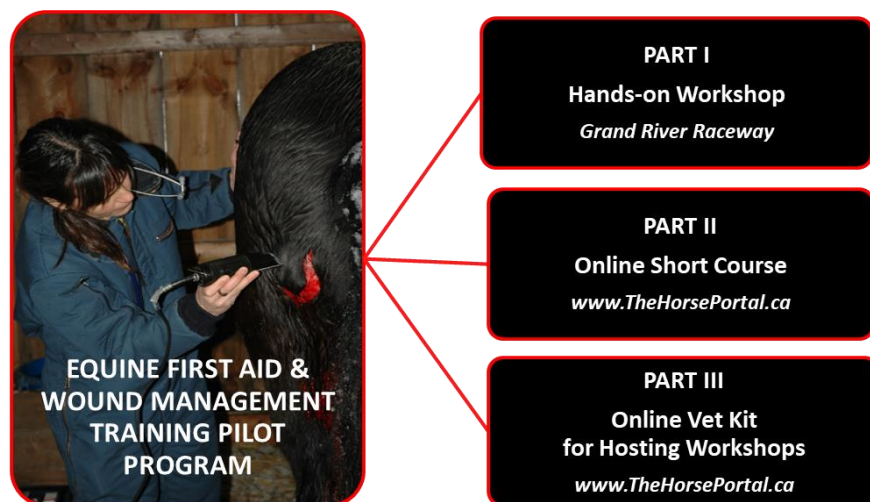
Online resources on barn fire prevention for fire department to host presentations/distribute materials in their communities to horse farm owners

Equine First Aid Pilot Program

Accidents and injuries can happen at any time anywhere, for any number of reasons. This makes it essential that everyone involved with horses – grooms, trainers, riders, drivers, coaches – learn how to administer first aid and how to do so safely. When minutes count, these stakeholders need to know how to make the most of every second until the veterinarian arrives.

Equine Guelph's Equine First Aid Pilot Program was funded through Grand River Agricultural Society with industry sponsors: Standardbred Canada, Intercity Insurance, Ontario Racing, Ontario Equestrian and the Ontario Association of Equine Practitioners.

The training program involved a three-level approach:



The hands-on workshop (Part I) was held at Grand River Raceway, October 20 and 21, 2018, free of charge for 40 participants from both racing and non-racing sectors. Video footage was filmed for development of both Part II and III.

The online short course (Part II) was offered the week of February 25, 2018. **Two hundred and sixty-seven students enrolled.** Enrollment was a combination of free tuition provided by the grant and paid participants. The one-week format was designed to be efficient, flexible and practical. To accommodate schedules, the course remained open for an additional 2 weeks to allow participants to finish up the course.

“Whether you are new to horses or an experienced horse owner, this course will help you make sound decisions about recognizing when to call your veterinarian and what to do while you’re waiting for them to arrive. Knowing what to do in an emergency increases the likelihood of a good outcome for your horse. It’s worth your time!”

Jennifer Derksen, Rider / Biomechanics Coach (The Rider Mechanic – Carleton Place, ON) Student – Equine First Aid

Part III, the online veterinarian instructor kit is currently under development with a target of end of June for availability. Given the resources developed as part of Part I and II, Equine Guelph is in the position to develop and offer an online workshop kit to equine practitioners, so that they in turn, could deliver hands-on workshops in their local communities across Ontario and globally. The Ontario Association of Equine Practitioners support this project and will promote the initiative to their member vets.

Communications and Marketing

Great feedback continues to be received from our equine industry for the communications program and extensive pickup of our articles continues from the horse industry and its publications in published print and web articles. Equine Guelph has enjoyed an over 12% increase in the uptake of articles released compared to our 2016-2017 year! There was a decrease in uptake compared to last year, however 2017-2018 was an especially high year for distribution and media coverage.

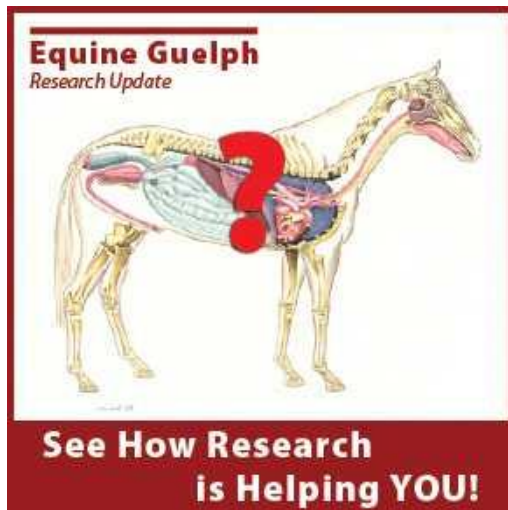
The media continues to pay special attention to the resources and courses that The Horse Portal has to offer. Coverage of racing industry specific courses like gut health and colic prevention, respiratory health, and lameness and injury prevention have been shared across many Standardbred, Thoroughbred, and Quarter Horse racing news sources. Additionally, our new Mare and Foal Care Tool that was launched in February of this year was very popular. There has been additional coverage across media outlets about the horse behaviour and safety course designed for youth.

Fire safety and prevention continues to be a hot topic and there is ongoing coverage of Equine Guelph's fire safety resources and courses. Closely related is the exceptional coverage of Equine Guelph's Large Animal Emergency Rescue courses providing valuable training to fire fighters, first responders and the racing industry. Collectively there have been over 40 articles pertaining to the importance of fire safety and prevention, large animal emergency rescue training and related courses. (See Education section special report on Large Animal Rescue courses offered by Equine Guelph).

There has been continued coverage of Ontario Equestrian's support of Equine Guelph through their Member Equine Research Fund that donates \$1.50 per OE member annually as part of the Equine Guelph annual research allocation. The donation of over \$30,000 was featured by many equine media outlets across Canada as well as the U.S. and even New Zealand and the U.K.

Fifty-nine articles pertaining to research coming out of the Ontario Veterinary College were picked up, including representation of Equine Guelph research featured in the 2019 Canadian Horse Annual.

NEWSLETTER



The 16th edition of Equine Guelph Research update was released for spring 2019. It featured gut research by Dr. Arroyo that is being funded in part by Ontario Equestrian. Equine Guelph's newsletter has a major research focus along with providing updates on educational programs. The newsletter is partially supported by the industry investment into the research program as it extends distribution of research findings to the industry. A PDF copy is available on the Equine Guelph website. It is broadly advertised through the Equine Guelph Enews and press releases. This year, Equine Guelph mailed out a one-page flyer directing our subscribers to the new easily accessible format now available online. This measure will not only

save costs of production but is also eco-friendly. The research flyer is also distributed at trade shows attended by Equine Guelph.

E-news & HEALTHflash

A monthly distribution of e-news ensures our readers are up-to-date and informed. The media pick-up of Equine Guelph communications continues to indicate that there is a strong interest in the articles and a value for re-distribution to their audience to keep them informed of new information, research findings and special events. The e-news enjoys a high "open rate" for the articles – 20% higher than the industry average!

In partnership with our sponsors, *HEALTHflash*, consisting of 4 seasonal email reminders + monthly health alerts, was introduced in January 2013. This publication continues to be highly popular and links have been created from equine media across North America including: Equestrian Canada, Horse-Canada.com , HorseJournals.com, TheRider among a growing number of others.

Website

The overarching goal of the website is to create a virtual portal for the equine industry to have a place for updated information on research, events and educational opportunities. Equine Guelph's website continues to remain popular with the horse industry with over 162,000-page views from those seeking to improve welfare for horses including; research advances, diagnostic developments and educational/training programs.

Equine Guelph's website has reached over 39,500 new unique visitors with the most popular pages continuing to be Job Track. There has been an increase of traffic landing on the home page suggesting an increase of visitors using organic searches such as Google. This is followed by Equine Guelph's Educational program pages and fire prevention tool page.

Media, Seminars and Presentations, Association Targeted Communication

For a complete list of seminars and presentations given by Equine Guelph staff, please see Appendix 8. Regular communications are released to the equine media in formats that are easily included in their publications, whether in print or electronic form. Over 263 articles have been published about the programs of Equine Guelph in the industry media (see Appendix 12).

A broad range of coverage continues from a variety of industry publications, including both racing and non-racing interests. Equine Guelph staff regularly review and monitor industry magazines, newsletters and websites to follow and record the ongoing coverage.

In 2018-19, there has been extensive coverage from: HorseJournals.com, Horse-Canada.com, TheRider, COSAonline.com as well as Standardbred Canada and HarnessLink.com. Equine Guelph stories were also featured in the 2019 Canadian Horse Annual, HBPA.com, Holistichorse.com, OntarioRacing.com, Raceline, Quarter Racing Owners of Ontario Inc., Horse Sport Magazine, and the Ontario Veterinary College bulletin among others.

In addition, Equine Guelph received coverage from international horse industry websites such as; TheHorse.com, HorseTalk.co.nz, EquiMed.com, HorseNation.com, Horse and Hound (U.K), HorseCouncil.org.au, Grand Prix HS (France) and Equine Science Update.

Equine Guelph's Large Animal rescue training workshops received television coverage both from CTV News Barrie and London CTV news.

Links to Equine Guelph resources continue to be created from sites including: Equestrian Canada, Provincial Equestrian Federation websites, veterinarian web sites, and blogs from social media sites (i.e. Facebook, Twitter, LinkedIn and Instagram). Information and service sites are also actively posting links to Equine Guelph resources e.g.: Intercityinsurance.com and SystemEquine.com directing the public to Equine Guelph's online courses, horse owner tools and research.

Ontario Equestrian (OE) continues their strong and on-going support of Equine Guelph with their e-broadcast program to OE members (over 20,000). This provides important assistance in alerting their members to new educational opportunities, thus helping to boost student enrollment and increase tuition revenue. Important new partnerships have been developing with OE including the new program to contribute to research support, partnering for OE/EquiMania! programs at the Royal Agricultural Winter Fair and other events.

Several other sponsors and provincial equine organizations have been posting buttons on their sites to help promote the communications, research and education/training initiatives including the tuition awards for racing, The Horse Portal course offerings, racing industry specific course offerings and 12 –week course offerings and more.

The Horse Portal has linked 10 provincial equestrian federations nation-wide, as well as the OSPCA, Campbell Centre for the Study of Animal Welfare, Ontario Racing, 4-H Ontario and Saddle Up Safely, each with their own unique landing page generating traffic to the new short courses offered by Equine Guelph.

Information Inquiries

Each year Equine Guelph receives many information requests from the industry on a wide variety of concerns and topics and the small staff continue to provide resources and contacts for the significant number of emails, phone calls, information packages, walk-ins and letters. This includes a significant number of people looking for employment opportunities.

Tradeshows are a common venue for information requests as many visit the booths, displays and attend the seminars, indicating ongoing confidence in the evidence-based information that is provided to the horse industry. Providing an information portal for the industry as well as Job Track is important to the industry for ongoing industry development and sustainability. Equine Guelph was developed by the industry for the industry to play the role of “portal” between the industry and the knowledge developers in the equine research and extension programs at the University of Guelph, and this program remains without a funding basis by the industry or government. An important opportunity remains to be developed for enhancements to this “portal” role to continue to attract new people to the horse industry as workers or horse owners and provide them with important lifelong learning pathways to contribute to the industry.

Popular topics include information requests on large animal emergency rescue courses, fire prevention and safety, biosecurity for horse owners, identifying sources of information on new and emerging diseases, concerns about real or perceived welfare issues such as over population of horses and rehoming/retraining questions, management and nutritional questions.

Development

A. Equine Guelph ‘Helping Horses for Life’ Development Campaign:

The following information reflects fundraising initiatives and private donations as well as corporate sponsorship sales over the past fiscal year:

	FY17-18 Amount Raised	FY18-19 Amount Raised	FY18-19 No. of Unique Donors	FY18-19 Median Gift
Area of Greatest Need	\$22,261.47	\$42,129.78*	103	\$50
Education	\$7,086.20	\$5,820.10	5	\$250
Research	\$34,221.66	\$86,012.48**	15	\$100
OE Welfare Education Fund	\$5,506.30	\$2,803.04	Info not available	Info not available
Sponsorship	\$87,995.04	\$77,500	9	\$5,000
Equine Guelph – Stuart Stocks Memorial Award	\$1,000.00	\$1,000	1	\$500
Equine Guelph – Roger L’Heureux Memorial Equine Award	\$10,400.00	\$0	0	\$0
TOTAL	\$162,470.67	\$215,265.40	Info not available	Info not available

TABLE I - Funds raised from private donations and sponsorship to EG accounts during FY17-18 and FY18-19 including number of unique donors and the median size of gift for each account.

* includes one large planned giving donation from a private estate, bringing Area of Greatest Need in line with donations last year

**Includes two large donations for research from Ontario Equestrian (\$31,237.50) and planned giving gift from a private estate, bringing Research in line with donations last year

The amount raised in the FY18-19 increased dramatically from the year before as a result of one major private estate’s planned giving donation.

1. Annual Appeal: Equine Guelph includes donation cards with its annual spring newsletter mailing. The following stats measure the gifts that came from people who received the EG appeal and responded directly to the letter. This audience had two segments:

- Past Equine Guelph donors from the last five years – 766 individuals
- EG’s internal distribution list – 1,494 individuals

	FY 17-18	FY 18-19
Recipients	1,936	2,260
Total cash-in	\$1,560	\$2,445*
Total donors	19	31
Average gift	\$82	\$79
Participation	1%	1%

TABLE II – Comparison of select metrics from the EG annual appeal for the past two fiscal years.

*Although only \$2,445 in physical gifts were received by mail in FY2018-19, during the months after the mailing (February, March and April), \$12,497 in total donations arrived – mainly online donations which may have been prompted by receiving the annual appeal. The most popular accounts supported were Equine Guelph - Area of Greatest Need and Equine Guelph - Research.

The 2019 spring newsletter mailing included a newsletter (focus on research and The Horse Portal), donation card, return envelope and education flyer.

One month after the mailing, a chaser appeal followed, encouraging those who had not yet responded to please do so. This was sent electronically to past donors with active e-mail addresses who had not yet given in FY18-19 – a total of 263 individuals. Accounts supported include Equine Guelph- Area of Greatest Need and Equine Guelph - Research. Stats related to the e-mail message are below. Given that there is zero cost to this initiative, it is worth repeating next year to monitor result trends.

	FY2017-18	FY2018-19
Recipients	148	262
Open rate	53 (36%)	117 (45%)
Recipient click-throughs	3 (2%)	9 (3.6%)
Recipient actions	2 (1.4%)	2 (0.77%)
Donors (#)	2	4
Dollars raised	\$158	\$283
Forwarded opens	36	102
Unsubscribes/Opt-outs	1	2

TABLE III – FY17-18 and FY18-19 chaser e-mail results

Ontario Equestrian Annual Membership Mailing Fundraising Program: Each year Ontario Equestrian (OE), through its annual membership renewal form, gives members an opportunity to donate to a cause (Equine Guelph is one on a list of choices). The FY2018-19 member donations are 2,803.04 (payment to be received in FY2019-20)

2. **Corporate Sponsorship Program:** The FY2018-19 sponsorship program has resulted in effective sponsor retention and existing* sponsors investing in more programs. Total revenue from the corporate sponsorship program was **\$77,500:**

Online Tools & Other Education Programs – \$42,500

1. ***Boehringer Ingelheim** – EG E-Newsletter + senior horse tool ▪ \$12,500
2. **Bucas** – horse blanketing tool ▪ \$5,000
3. ***Capri/Intercity Insurance** (payment received in FY2019-20) – colic tool, Hoofprints program, portal short course, portal PTSO pages ▪ \$13,000
4. **Heartland Insurance** – barn fire prevention tool ▪ \$5,000
5. **Duck et associates on behalf of Merck** (payment received in FY2019-20) – HEALTH*flash* initiative, vaccination tool + portal short course ▪ \$7,000

EquiMania! – \$35,000

1. **Kubota** – youth safety activity ▪ \$5,000
2. **Shur-Gain/Nutreco** – nutrition display ▪ \$5,000
3. **SSG Gloves** – youth safety activity ▪ \$15,000
4. **Workplace Safety & Prevention Services** – youth safety activity ▪ \$10,000

- B. **Equine Guelph Grants:** In 2018-19, grant writing was a main focus of Equine Guelph. Three grants were secured in the amount of **\$331,519** – all in support of our strategy for course development and promotion of The Horse Portal:

Alcohol and Gaming Commission of Ontario – \$230,600 (funding to be received in FY2019-20 and FY2020-21)

‘Online Training Pilot Project for the Ontario Horse Racing Industry’: In 2019-2020, EG will deliver 12 offerings of seven online courses available for free to the first 100 AGCO licensees to register/course. Three of these courses will be developed exclusively for the industry in response to industry-identified priorities: gut health, respiratory and injury/lameness. These courses will help trainers, grooms and all caregivers to maximize racehorse health – promoting peak performance on the track.

Grand River Agricultural Society – \$29,949

‘Equine First Aid Training Pilot Program’: includes a workshop at Grand River, development of a short one-week portal course with 150 free courses to be

delivered to the racing industry (AGCO license holders and OE (coaches, facilities and general members) in winter of 2019 and an online vet kit for hosting workshops.

Canadian Agricultural Partnership Program (CAP) – \$70,970 (partial funding received in FY2018-19 and continue into FY2019-20)

'Equine Welfare Training: Fire & Emergency Preparedness Pilot Project': includes a large animal emergency rescue workshop at Meaford, development of a short one-week portal course (Fire & Emergency Preparedness) with 170 free courses to be delivered to the racing industry (AGCO licence holders), OE (coaches, facilities and general members) and OSPCA officers in spring of 2019, online first responders best practices guide (large animal emergency rescue) and online fire department presentation kit (barn fire prevention).

CAP grant partners providing cash contributions included:

1. Capri/Intercity Insurance – \$750
2. Ontario Racing – \$1,000
3. Standardbred Canada – \$1,500
4. Workplace Safety & Prevention Services – \$1,000

- C. Equine Guelph Store:** Made possible by a GF2 grant secured in FY2012-13, Equine Guelph has developed new tools which will help grassroots caregivers give the best possible care to their horses when they're healthy and sick. Not only do these three tools support the welfare of the horse, but they provide critical revenue to support Equine Guelph's welfare education program.

Total revenue raised in FY2018-19 is **\$1,189.34** with a breakdown by item below:

Horse Health Check (HHC) Posters: Posters are available at 30 Greenhawk locations across Canada (including the Greenhawk online store). Equine Guelph wholesales the posters to Greenhawk. Total poster revenue was **\$75**.



Horse Health App: The *Horse Health Tracker App* has been developed for both Google Play and Apple iTunes. The tool allows horse caregivers to be active participants in their horse's healthcare. Total revenue generated in FY2018-19 was **\$1,114.34** (Note: Apple sales were \$891.34 and Google Play sales were \$223).

Financial Report

The Year End Financial Report is included in the Appendices. Quarterly reports are produced for the Equine Guelph Advisory Council. Financial reports include forecasting of revenue and expenditure for each of the program areas and year-to-date statements.

Equine Guelph revenue totaled \$696,279 (compared to \$788,806 for previous year) for the fiscal year with funding provided by our funding partners, donations, tuition and a substantial portion coming from grants and increased sponsorships. Program expenditures totaled \$931,619 (\$860,691 last fiscal year) using planned carry forwards from the previous year to buffer the anticipated decrease in revenue.

The research program allocated \$330,832 for research projects. Expenditures for the education program were \$496,556 which included program development and exhibits as specified from grant money or sponsorship agreements. Expenditures for the Communications and Marketing program were \$99,640. The workshops and online education tuition returned \$115,960.

Challenges of stability in funding for the racing industry remain under discussion and this in turn has continued to impact funding for Equine Guelph with industry funding of only \$18,950. This funding is used for the support of administration and communications related to the research and overall communications program back to the industry.

The majority of funding for the education/communications program continues to come from tuition, sponsorships and successful grant proposals. Research funding continues to be a source of significant concern going forward without specific designated funding identified and protected. The goal of stable consistent funding for the programs of Equine Guelph, as a Centre at the University for the horse industry will continue to be an issue of high priority as the industry continues with its efforts to develop a re-organized model that provides it with a sustainable business model. Research and education/training of the members of the racing and non-racing community will continue to be an important part of future success.

Highlights and Special Events

May 2018 – April 2019

Delayed Shedding? Laminitis? –Is your senior horse challenged with a metabolic issue?

Ah Spring; when countless materials are covered in shedding horse hair including your clothes, car, perhaps even your couch if you don't change out of barn clothes immediately when you get home. But what if you are not covered in your horses shedding coat? Delayed shedding or regional hypertrichosis can be early warning signs of Pituitary Pars Intermedia Dysfunction (PPID). Equine Guelph's **Senior Horse Challenge Healthcare Tool** contains useful resources to practice identifying metabolic issues.



Full Story: <https://www.equineguelph.ca/news/index.php?content=562>

Woodbine brings LAER to ORI International Training Conference



With a hefty focus on emergency management, this year's annual conference for the Organization of Racing Investigators (ORI), at Woodbine racetrack in Toronto, included Large Animal Emergency Rescue training provided by Equine Guelph. On the morning of Tuesday March 27th, Racing Investigators from as far afield as Australia received Awareness Level presentations on the technical aspects of rescue and then participated in hands-on practical exercises.

“The Equine Guelph Large Animal Emergency Rescue (LAER) course that was provided for the Organization of Racing Investigators at their 2018 annual conference was excellent,” said Racing Investigator/Firefighter, Troy Moffatt. *“The content and delivery methods were accurate for the audience and there were numerous positive comments from our international partners claiming that this conference was one of the best. Having been a past student of this (LAER) course at both Mohawk and Meaford in 2017, I knew it was one not to miss. I would encourage anyone involved in the equine world to attend and gain this valuable practical knowledge. I would also encourage any first responder to seek out this training and take it home to their departments.”*

Full Story: <https://www.equineguelph.ca/news/index.php?content=563>

Large Animal Rescue Course in Demand

Equine Guelph's [Large Animal Emergency Rescue Program](#) has been presented at six venues already since the start of 2018 with the same message. This training is critical for first responders faced with emergencies dealing with large animals. For the animal's owner, it is valuable knowledge to stop a highly emotional situation from turning into catastrophic one.



Full Story: <https://www.equineguelph.ca/news/index.php?content=564>

Large Animal CT scanner fund raising is being helped by Esther the Wonder Pig!



Esther the Wonder Pig, the real-life star of a new hit children's book and one of the most beloved and famous pigs on Earth, is making a very large contribution to the University of Guelph's Ontario Veterinary College (OVC).

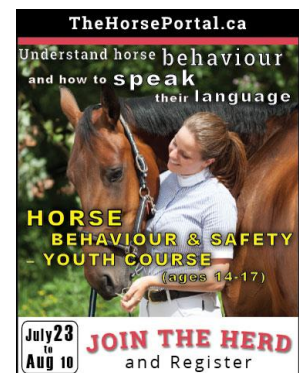
The porcine celebrity, and the two men who rescued her as a tiny piglet, are the benefactors behind a large, life-saving scanner coming to OVC.

Full Story: <https://www.equineguelph.ca/news/index.php?content=565>

Totally Cool Summer School Online for Horse Lovers

Equine Guelph's Horse Portal will be a hub of activity for teenagers this summer from July 23 to Aug 10 when the new Horse Behaviour & Safety online course is offered for the third time!

For less than the cost of one riding lesson, students will spend three weeks learning new things they will find useful when thinking about why horses act the way they do.



Full Story: <https://www.equineguelph.ca/news/index.php?content=566>

Pilot Study looks at On-Farm Welfare Assessment Tool for Equines in Canada



Thanks to a team of University of Guelph researchers, we are one step closer to having a welfare assessment tool tailored for horses in Canada. The research team, headed by Cordelie DuBois and Katrina Merkies, recently designed and tested an on-farm welfare assessment tool. The tool aimed to evaluate whether the National Farm Animal Care Council's (NFACC) Code of Practice standards are being met on equine

farms in Canada, while helping farm managers learn about the current standards. The results were recently published in the Journal of Equine Veterinary Science.

Full Story: <https://www.equineguelph.ca/news/index.php?content=567>

EquiMania! Faring Well at Top Fairs in North America

To say EquiMania! continues to grow in popularity would be an understatement. EquiMania! will be featured at four of the top 50 agricultural fairs in North America this year! –

Georgia National Agricultural Fair, October 4 -14,

Canadian National Exhibition (CNE), August 17 - September 3,

Royal Agricultural Winter Fair, Nov 2 – 11,

Minnesota State Fair, August 23 - September 3.

“The smiles say it all when youth and family have fun learning about the wonderful world of horses,” says Equine Guelph director, Gayle Ecker. *“Since 2005, EquiMania! has grown into a hugely popular travelling exhibit, gaining international awards and delighting horse lovers across North America!”*

Full Story: <https://www.equineguelph.ca/news/index.php?content=570>



Dr. James Raeside Honoured with Lifetime Achievement Award in Equine Reproduction



Presentation of the award to Dr. Raeside by Dr. Barry Ball, Chair of the International Equine Reproduction Symposium Committee, in King's College Cambridge on Friday, July 27 2018

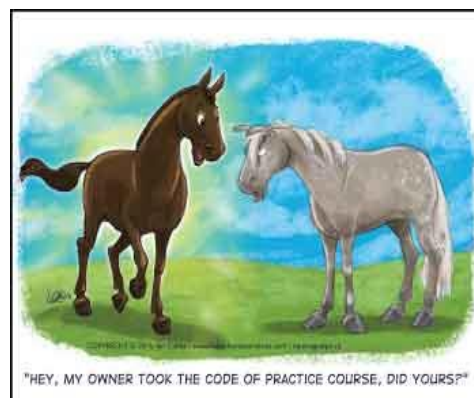
Congratulations to Dr. James Raeside, Professor Emeritus at the University of Guelph! Dr. Raeside is the recipient of a Lifetime Achievement Award for his contributions to the field of Equine Reproduction, presented at the International Equine Reproduction Symposium, held in Cambridge, UK July 22nd-28th, 2018.

Dr. Raeside has contributed to several important projects that have been funded in part by Equine Guelph, including studies looking at [early pregnancy failure in mares](#) and [steroid metabolites in equine embryos](#).

Full Story: <https://www.equineguelph.ca/news/index.php?content=571>

Horse Care and Welfare Short Online Course at The Horse Portal

“Possessing evidence-based horse care and welfare knowledge will save you money and reduce your horse’s risk of injury and illness,” says Equine Guelph director and course instructor, Gayle Ecker. Covering a broad array of topics, every horse owner and caregiver will come away having learned something new about horse care and welfare after the Sept 17 – Oct 5, three-week short online course. The best news is with 24/7 access to the site and no set times to be online, it fits into a busy schedule and costs less than a visit from the veterinarian. It is very true that an ounce of prevention is worth a pound of cure!



Full Story: <https://www.equineguelph.ca/news/index.php?content=572>

Equine First Aid Workshop—Free for 40 Participants



(L to R) Paul Walker, Grand River Agricultural Society President, Gayle Ecker, Equine Guelph and Jamie Martin, Grand River Raceway Director Of Operations

Equine Guelph has announced it will be offering a FREE hands-on equine first aid workshop facilitated by veterinarians for 40 Ontario horse industry participants. Thanks to a grant from Grand River Agricultural Society, horse racing track managers from Ontario, horse caregivers from the province and OSPCA assessment officers will have the opportunity to sign up on a first-come-first-serve basis for this Oct 20 -21 weekend workshop to be held at Grand River

Raceway in Elora, Ontario.

Full Story: <https://www.equineguelph.ca/news/index.php?content=573>

Large Animal Rescue Awareness/Operational Training Calling All First Responders

Meaford Fire Department Training Centre in Ontario is opening its doors once again, for intensive training on what to do in emergency situations involving large animals. Over sixty fire fighters and first responders took advantage of the training at Meaford in spring and fall 2017 to build expertise and resources within their respective communities. Registration is open to first responders for the next offering of Equine Guelph's



Large Animal Rescue Awareness/Operational Training to be held October 12 (evening), 13 & 14, 2018 (If capacity allows registration will be open to non-first responders).

Full Story: <https://www.equineguelph.ca/news/index.php?content=574>

How Big is Your Horse's Fall and Winter Wardrobe? –Blanketing Decisions



"I'M NOT COLD, MY OWNER, SHE'S COLD!"

Does your horse's wardrobe rival your own? Yes, is a common answer among many in the equine industry. But before you go out and buy yet another rug this fall, Equine Guelph has your blanketing questions covered in their free online healthcare tool – [Horse Blanketing Tool](#), sponsored by internationally renowned blanket manufacturer, Bucas of Ireland.

"One common misconception is that if you are cold, so is your horse," says Gayle Ecker, Equine Guelph director. *"The Horse Blanketing Tool explains thermoregulation and how horse owners can help maintain their horse's health by neither over or under blanketing."*

Full Story: <https://www.equineguelph.ca/news/index.php?content=578>

Guelph researchers spurred by interest in use of equine training equipment in Canada

Guelph researchers are continuing to put Canada on the map in the world of horse welfare research – this time focusing on the use of training equipment in horses. The researchers, led by Dr. Katrina Merkies, were interested in how often riders and trainers use training equipment, such as whips, spurs and head-control equipment (think martingales, draw reins, etc.), and how often horse enthusiasts not actively involved with horses think that the equipment is used.



Photo: Samantha Ruffell-Smith

Interestingly, they found that the non-active horse enthusiasts thought that spurs and head-control equipment were used more often than what was actually reported by riders and trainers. [These results](#) and more were recently published in the Journal of Applied Animal Welfare Science.

Full Story: <https://www.equineguelph.ca/news/index.php?content=579>

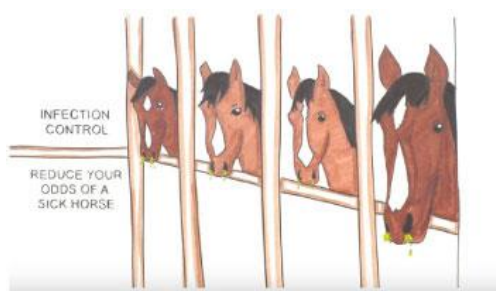
15 Years of Leading the Herd in Equine Studies Online Don't Miss out on Tuition Awards!

Equine Guelph celebrates 15 years of serving the horse industry with online courses for those looking to optimize the health and welfare of the horses in their care. Students from over 40 countries continue to enroll in the 20 + courses on offer, every September, January and May. *“With top instructors teaching evidence-based knowledge, our students enter the horse industry as well-prepared, confident professionals,”* says Equine Guelph director, Gayle Ecker, *“and with the flexibility of our online programs - everyone with a love for horses can find their learning pathway.”*



Full Story: <https://www.equineguelph.ca/news/index.php?content=580>

Savvy Online Studies Support Sickness Prevention in Horses



A human sneeze can propel around 100,000 germs up to 25 feet according to the [Massachusetts Institute of Technology](#)! Now imagine the distance and volume a horse can achieve! No elbow or hankie will be raised to contain this potential biohazard but Equine Guelph has you covered with their [Sickness Prevention in Horses short online course](#). This October 15 -26, you can join a community that will be learning Canada's new Equine Biosecurity standard together and reducing the odds of sickness in their horses. Consider the tips you will acquire as your horse handkerchief!

Full Story: <https://www.equineguelph.ca/news/index.php?content=581>

Readers Digest New Chapter on Gut Bugs

As summer comes to an end, most can agree that bugs like flies and mosquitoes have become strong contenders for a horse's public enemy number 1. But did you know that some bugs that live in a horse's gut can actually be a horse's best friend? The University of Guelph's own horse gut guru, Dr. Scott Weese, recently put together a new book chapter explaining what we know about the different bugs, known as the microbiota, in your horse's gut. The chapter is titled [The Equine Intestinal Microbiota](#) and can be found in the Equine Acute Abdomen.



Full Story: <https://www.equineguelph.ca/news/index.php?content=582>

Launch of the Equine Industry Symposium discussion group on TheHorsePortal.ca



Just in time to kick start the upcoming Equine Industry Symposium hosted by the University of Guelph on October 27, 2018, a new discussion group has started on theHorsePortal.ca website. In response to one of the suggestions that arose from the second Equine Industry Symposium held last February, the organizing committee has created this discussion group as a platform for anyone to share resources and knowledge, network, collaborate, identify common issues, discuss common solutions, and promote actions based on evidence and professionalism.

Full Story: <https://www.equineguelph.ca/news/index.php?content=583>

Strong OVC representation at the North American Veterinary Regenerative Medicine Association's 2018 meeting

The Hurtig and Koch labs were both strongly represented at the recent 2018 NAVRMA meeting in Sacramento, September 5-9th.

Dr. Hurtig, Master student Candace Flynn and undergraduate student Kristen Lamers represented the Hurtig lab. Dr. Koch, postdoctoral fellow Sarah Lepage and PhD Candidate Hamed Alizadeh represented the Koch lab. PhD Candidate Ian Tobias represented former OVC faculty member and current adjunct faculty in BMS, Prof. Dean Betts.

Full Story: <https://www.equineguelph.ca/news/index.php?content=584>



People are hungry for more information on Guts



Come to the Erin Fall Fair on October 6-8th and participate in an “*Interactive Journey through the Horse’s Digestive Tract*” with Gayle Ecker, Equine Guelph’s director.

Ecker will be helping participants understand how proper nutrition and management can keep a horse’s digestive system healthy and happy. The “*Journey*” is popular with horse lovers of all ages and allows participants the chance to see and feel the different parts of a horse’s digestive system.

Full Story: <https://www.equineguelph.ca/news/index.php?content=585>

Equine Guelph Announces Fire & Emergency Preparedness Program

Equine Guelph has received funding from the Canadian Agricultural Partnership Program to deliver comprehensive community-based training in the equine emergency management category with a focus on fire and emergency preparedness.



“When it comes to risk mitigation issues such as barn fire prevention and emergency planning, we are learning that there are sometimes barriers for the livestock/equine industries to take preventative actions on their farms,” says Gayle Ecker, director of Equine Guelph. *“While fact sheets and checklists are helpful, we believe that to achieve transformative behaviour, the training needs to go deeper in a more community-based, expert-led environment – either face-to-face or online where people can come together to share their ideas, encouragement, challenges and expertise.”*

Full Story: <https://www.equineguelph.ca/news/index.php?content=586>

Engage in Community Wide Discussion at the Equine Industry Symposium



The University of Guelph’s annual Equine Industry Symposium is fast approaching. On Saturday October 27th, 2018 from 9:30AM to 4:00PM, students in the Bachelor of BioResource Management degree majoring in Equine Management will once again be hosting the Equine Industry Symposium for horse enthusiasts from all backgrounds to come out and engage in a community-wide discussion about prevalent issues

within the equine industry.

The goal of this event is to further unite our community and develop practices that benefit the industry and above all, the horse.

Full Story: <https://www.equineguelph.ca/news/index.php?content=587>

YOUTH LITERARY DERBY CROWNS WINNERS

October 6 was ‘graduation day’ for a quartet of young Ontario students as they stepped up to the podium at Woodbine Mohawk Park to receive accolades and prizes for their literary accomplishments in the \$2,000 Youth Literary Derby, sponsored by St. Catharines, Ont. horseman and construction magnate Tom Rankin.



Full Story: <https://www.equineguelph.ca/news/index.php?content=588>

EquiMania! Lucky 13 at the Royal



Come see the interactive, award-winning display EquiMania! Trotting back into Toronto for its 13th appearance at the Royal Agricultural Winter Fair, EquiMania! looks forward to once again joining in the tradition of bringing the country to the city this November 2 – 11.

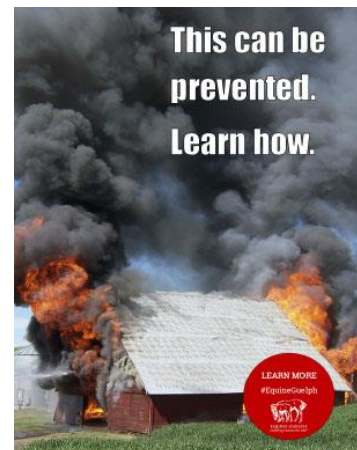
There is plenty of hands-on fun and no one will leave without learning something new about horses.

Full Story: <https://www.equineguelph.ca/news/index.php?content=589>

Fire Safety Site Visit—Painless Procedure to Prevent Future Panic

No one sees the hidden hazards in your horse barn quite like an expert. One simple call to your local fire department for a site walk through may be the best investment you make to protect your herd. As advocates of prevention, featuring the [Barn Fire Prevention Tool](#) as Equine Guelph's Tool of the Month for November, Equine Guelph and tool sponsor, Heartland Farm Mutual set out to discover the benefits of making that call.

After picking up the phone and speaking with Assistant Fire Chief, Jason Benn of the North Perth Fire Department in Ontario, it became crystal clear that having your local department out for a site visit is not only painless but the best way to create a solid pre-plan.



One quick call to your local fire department to book a site visit can help to prevent this scene. Learn more on Equine Guelph's [Barn Fire Prevention online tool](#).

Full Story: <https://www.equineguelph.ca/news/index.php?content=590>

Large Animal Emergency Rescue Training Returns to Meaford



In a unique training opportunity bringing together first responders from Fire, Police and EMS, invaluable lessons in large animal rescue were learned at the Meaford Fire department training centre, Oct 12 -14, 2018. For the third time, this hands-on Equine Guelph course has been offered at this location with very positive feedback not only from the first responders but also large animal owners that have benefitted from the intensive workshop.

See the Barrie CTV News report.

Thank you to Scott Granahan, Chief, Meaford Fire Department for lending the fantastic facility which over the three days hosted over 8 fire departments, OSPCA officers, the Hamilton Mounted Police and many interested participants from the horse industry.

Full Story: <https://www.equineguelph.ca/news/index.php?content=591>

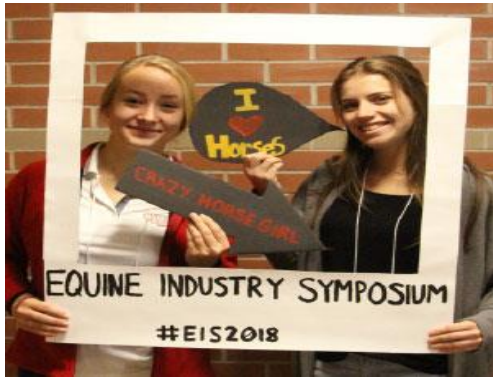
Guelph PhD student takes on Leaky Gut in horses

The University of Guelph has become a Canadian hub for gut health research in horses, and PhD student Shannon Stanley is eager to add to this research with her upcoming work. Shannon, who started her PhD in the Animal Biosciences department at Guelph earlier this fall, plans to look at leaky gut in horses. Leaky gut is a topic of interest to researchers and the medical community in other species, but is only just starting to be investigated in horses. Shannon hopes to address this gap with her project looking at links between nutrition and leaky gut.



Full Story: <https://www.equineguelph.ca/news/index.php?content=592>

The Importance of standards and professionalism in the equine industry



Horse enthusiasts from all backgrounds participated in engaging discussions on prevalent industry issues centered on standards and professionalism led by invited speakers. Catherine Geci, Business Development Manager at the University of Ottawa spoke about the importance of professionalism in building connections and lasting partnerships. Dr Kendra Coulter, Professor of Labour Studies at Brock University, reported on her recently released study on horse farm employers and employees in

Ontario, showing that 50% of stable workers reported earning minimum wage or less and almost half of the workers are improperly classified as independent contractors, and are thus are not protected by the Employee Standards Act.

Full Story: <https://www.equineguelph.ca/news/index.php?content=593>

Bringing Science to the Stable

Put the dates of August 19-21, 2019 into your calendar for the [15th Annual Equitation Science Conference](#) being held at The University of Guelph – Canada’s largest and most renowned agricultural university and one of only five veterinary colleges in Canada. Come and be fascinated by what science has uncovered about the unique horse-human connection. With the theme “Bringing Science to the Stable” the conference will focus on mankind’s history with horses, what we have learned about horse-human interactions, and how we can continue to improve our relationships with these amazing animals.



Full Story: <https://www.equineguelph.ca/news/index.php?content=594>

Ontario Equestrian Donates over \$30,000 to Research



Ontario Equestrian and its members are helping strengthen research programs aimed at improving health and welfare of horses. With \$1.50 per OE membership allocated to the Ontario Equestrian Member Equine Research Fund, this year's cheque presented at the Royal Agricultural Winter Fair came out to just over \$30,000!

Full Story: <https://www.equineguelph.ca/news/index.php?content=596>

Keep your First Aid Kit and First Aid Skills Up to Date

If your tack locker lives in an unheated area and stores your first aid kit, there are certain items that may need relocating once temperatures dip below zero.

1. Topical creams and ointments - hard to spread once frozen, separation can occur and the active ingredient may not withstand the cold.
2. Injectable medications – many do require storage in the fridge, but others must be kept at room temperature. Always check with your veterinarian where to store medications.
3. Oral medications – while some medicines can withstand a wide temperature range, certain ones require storage between 2°C and 8°C, and others can be irreversibly degraded even by brief periods at sub-zero temperatures – check the bottle and if you do not see any directions, consult your veterinarian.



Full Story: <https://www.equineguelph.ca/news/index.php?content=597>

Equine Gastric Ulcer Syndrome: Dietary Management



The horse's stomach is divided into two distinct regions. The upper, non-glandular portion is covered with thin epithelial, or squamous, cells. This portion has little protection from stomach acid. The dividing line between the upper and lower regions of the stomach is known as the margo plicatus and is the most common site of non-glandular ulcers. The lower, glandular region is where acid is secreted, and it has a protective coating to prevent damage from acid. While ulcers can occur in the lower portion of the stomach, the cause is usually from long-term use of nonsteroidal anti-inflammatory drugs. These ulcers are less common than those that occur in the upper portion of the stomach.

Full Story: <https://www.equineguelph.ca/news/index.php?content=598>

Behaviour & Safety Q&A

If you work around horses, safety is of paramount concern. Learning horsemanship through understanding equine behaviour and language is one of the best ways to reduce physical risks. Equine Guelph is offering their [Horse Behaviour and Safety online course](#) for teens and adults to learn practical horse handling skills. Both courses will run from January 21 - February 8.



Full Story: <https://www.equineguelph.ca/news/index.php?content=599>

15th Annual International Society for Equitation Science Conference



Planning is well underway for the 15th Annual International Society for Equitation Science (ISES) Conference, being held at the University of Guelph, Canada's largest agricultural university, on August 19-21, 2019.

The theme for this year's conference is "Bringing Science to the Stable", highlighting our past relationship with horses and examining where we are headed.

Both conference registration and abstract submissions opened on January 18, 2019. All information regarding the conference, including links to conference registration, abstract submissions and accommodations can be found on [the Horse Portal](#) website. Researchers in the field of equitation science are invited to submit an abstract of their research findings for consideration to present during the conference. *Abstracts were due by April 1, 2019.*

Full Story: <https://www.equineguelph.ca/news/index.php?content=600>

Racing Industry Scholarship Winners Announced

Equine Guelph has announced the recipients of its 2018 tuition awards. Cynthia Naydani is the recipient of the Roger L'Heureux Memorial Equine Award and Holly De Way has received the Stuart Stocks Memorial Equine Award.

Selected for their love of horses, commitment to horse welfare and desire to learn, both winners will receive two online courses through Equine Guelph valued at \$549 each (Certificates are available in Equine Science, Equine Welfare and Equine Business – six courses complete the certificate).



Full Story: <https://www.equineguelph.ca/news/index.php?content=601>

New Opportunities—Online Training Pilot Project for the Ontario Horse Racing Industry Announced



In 2019-2020, Equine Guelph will offer free online training to the Ontario Racing Industry as part of a new Pilot Project.

Equine Guelph announces that an unprecedented seven online short courses developed by Equine Guelph will be offered for free to Ontario racing industry members beginning in February this year! AGCO licence holders will be able to reap the benefits of learning the latest in equine healthcare from industry experts in a series of upcoming relevant online courses. Three of the seven courses have been specifically designed for and will be offered exclusively to members of the Ontario racing industry.

Full Story: <https://www.equineguelph.ca/news/index.php?content=602>

Equine Guelph launches free online Mare & Foal Care Tool

Equine Guelph announces its new [Mare & Foal Care Tool](http://equineguelph.ca/marefoaltool) (<http://equineguelph.ca/marefoaltool>), a free and interactive online tool that will help users learn about reproduction in horses. The Mare & Foal Care Tool was designed and developed in partnership with PFERA, an equine reproductive biotechnology company, as a resource for horse owners and breeders.



Full Story: <https://www.equineguelph.ca/news/index.php?content=603>

Guelph researchers investigating infertility in horses



Researchers at the Ontario Veterinary College (University of Guelph) are gaining a better understanding of one of the most common causes of infertility in mares, while also investigating ways to treat the condition.

The team includes Dr. Michelle Caissie, a DVSc graduate student of Dr. Tracey Chenier, faculty member at the Ontario Veterinary College and equine reproductive specialist. Caissie recently presented the team's findings at the 45th Annual Conference of the International Embryo Technology Society in New Orleans, Louisiana held on January 20 – 23rd, 2019.

Full Story: <https://www.equineguelph.ca/news/index.php?content=604>

Make a Point to Discuss Vaccinations with your Vet to Guard against Influenza and Disease

A real and present threat to your horse's health

More than 100 racing yards were on lockdown this past Thursday Feb 7 as horse races were called off due to a [flu outbreak in Britain](#). All horse owners need to guard against the very real and present threat of equine influenza. According to a recent [FEI health update](#) in response to equine flu outbreaks, the virus can be easily transmitted between horses that are in close contact, such as attending events, group training and hunting, or between vaccinated and unvaccinated horses in the home yard.



Full Story: <https://www.equineguelph.ca/news/index.php?content=607>

Fork's Recovery From Fire



"You never think it would happen to you, and one of your horses, until one day you wake up to a phone call in the middle of the night," recounts Sarah Scott, member of the horse racing community for over 20 years, and owner of Fork.

Since the fire at the Fire Line Training Center in December, Sarah has not only been busy with her horse's recovery but also spreading awareness of fire prevention programs.

Sarah works as an account manager specializing in equine rehabilitation, at System Equine in Rockwood and they hosted a [Barn Fire Prevention and action plan](#) evening on March 19 at 6pm. Special guest speakers included: TJ Snow of Milton Fire Department, Riley McGilloway of Halton Hills Fire Department, and Dr. Liz Shiland DVM (one of several vets who assisted at the First Line fire). Sarah also be shared her experience as a horse owner.

Full Story: <https://www.equineguelph.ca/news/index.php?content=608>

Guelph research looks at tools to help predict disease spread in horse populations

Researchers at the University of Guelph are leading the way in equine research again, this time with studies looking at tools that may help predict disease spread in horse populations. The studies were published in early January. In the first study, researchers looked at using small, non-invasive radio frequency identification (RFID) tags, placed under vet wrap on each horse's halter, to collect data on which horses came into contact with one another on horse farms. In the second study, researchers used data collected with the RFID tags to help create and compare contact networks (see explanation below) at horse facilities in Ontario.



Full Story: <https://www.equineguelph.ca/news/index.php?content=609>

Study Reveals Thyroxine Detrimental to Racing Performance and Horse Health



Responding to research needs of the Ontario Racing Commission (now AGCO), a recent study led by Dr. Janice E. Kritchevsky, at Purdue University College of Veterinary Medicine, reveals use of thyroxine supplementation is deleterious to a racehorse's performance and may result in cardiac arrhythmias. Researcher Dr. Janice E. Kritchevsky was selected to do this work by the Equine Guelph Research Committee with AGCO support.

Full Story: <https://www.equineguelph.ca/news/index.php?content=610>

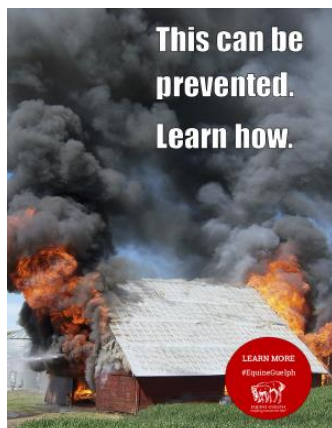
Equine Laminitis Expert Gives Talk at OVC

OVC Equine Club members were afforded the opportunity to attend a lunchtime lecture on March 14th given by Dr. Lorenzo D'Arpe, a Professor at the University of Bologna in Italy (the oldest University of the Western world, founded in 1088 A.D.). D'Arpe, a speaker at global events, including the Bluegrass Laminitis Symposium in Louisville, KY, is highly regarded for his expertise on the topic of Laminitis.



Full Story: <https://www.equineguelph.ca/news/index.php?content=611>

Horse Owners in Strong Attendance at Fire Prevention Education Opportunities in the Wake of the First Line Fire



Milton Fire Chief Dave Pratt recalls the fire at First line Training Centre in Milton, ON, Dec 21. The call came in the middle of the night, around 1:30 am. The scene upon arrival was that of a front-end loader tractor beside a barn engulfed in flames. The tractor block heater plugged into the barn appeared to be the cause of the fire and the side of barn next to the tractor was fully involved. Crews of fire fighters from both Milton and Halton responded. Milton put hot spots out, Halton worked on suppression (knocking down the fire with water) and then all hands were on deck evacuating horses from the barn.

Full Story: <https://www.equineguelph.ca/news/index.php?content=612>

EquiMania! Only for Youths? Think Again!

From April 5 -7, EquiMania! will once again be at the Can-Am Equine Expo in Markham, ON. If you think this exhibit is just for the kids, you are in for a surprise! We have something for all ages – the visual and interactive learning environment delights children and adults alike. Read on for the Sunday, Kids day, special prizes.



As you enter the EquiMania! exhibit, you are transported into the wonderful world of the horse. Displays are plentiful and enthusiastic helpers cannot wait to show you around and answer your questions. The first thing to catch many an eye is “Quattro,” a life-sized horse skeleton, usually accompanied by his human handler skeleton, “Winston.” “*You will have to visit to find out why these two are paired up!*” says Equine Guelph director, Gayle Ecker with a wink.

Full Story: <https://www.equineguelph.ca/news/index.php?content=613>

Take our quiz: How will your horse's risk of colic change this spring?



Spring is the season of change. Unfortunately, horses aren't great with change. Changes to a horse's routine and diet can increase the risk of colic and are often overlooked as a potential cause. However, 80% of colic cases can be prevented with proper management strategies. Do your part to prevent colic this spring by learning more. Equine Guelph has a free [Colic Tool](#) for horse owners that contains information on risk factors for colic, and tips for preventing colic from happening. There is also a quiz, called the Colic Risk Rater, that will tell you how likely it is that your horse will suffer from colic.

Full Story: <https://www.equineguelph.ca/news/index.php?content=614>

Celebrating the Can-Am Community

"It's hard to beat the Can-Am community, coming together for the love of horses," says Equine Guelph director, Gayle Ecker *"Many thanks go out to the organizers, participants, sponsors, supporters and volunteers that make this event amazing every year!"* Entertainment, shopping, getting together with friends and informative clinics and educational presentations – Can-Am All Breeds Expo in Markham, April 5 – 7 had it all!



In 14 consecutive years featured at Can-Am; EquiMania! and Equine Guelph have accumulated quite a following. Sincere thanks to all our loyal supporters and new partners! The exhibit simply would not run without you. The numerous donations received at Can-Am are very much appreciated and will stimulate Equine Guelph's educational programs.

Full Story: <https://www.equineguelph.ca/news/index.php?content=615>

Better Advocates to Promote Positive Equine Welfare



“Is it generally human behaviour and human decisions that impact on the negative welfare of horses? By the same token, is it human behaviour and human decisions that can impact on the positive welfare of horses?” This was a question posed to me by Equine Guelph Director, Gayle Ecker, during the Equine Welfare course in the summer of 2018.

This took me on a learning journey into Human Behaviour Change for Animal Welfare (HBCA) – a journey I am still on today and will continue to pursue. HBCA has only recently emerged as a scientific approach to improving equine welfare. This science can be the key to helping us understand why we make the decisions that we do when it comes to our horses by studying our own behaviours.

Full Story: <https://www.equineguelph.ca/news/index.php?content=616>

Do you know what care your senior horse needs?

Have an older horse? Take a minute this May to learn about the management and health of your loyal companion during their golden years with [Equine Guelph’s Senior Horse Tool](#), developed in partnership with Boehringer Ingelheim.

There is no standard age to determine when a horse becomes a senior. Instead, factors like breed, health conditions, previous use, and history of care can all affect when your horse is considered senior. Changes that might make your horse a senior can creep up slowly over time and this makes it important to continually assess your older horses.



Full Story: <https://www.equineguelph.ca/news/index.php?content=617>

Summary of Highlights

As Equine Guelph celebrates its 16th year of partnership with the equine industry in Ontario and beyond, progress continues with the industry-directed mandate of developing priority programs in support of equine health and welfare, and in turn the sustainability of our equine industry.

“Developed by the industry and for the industry”.

Equine Guelph is a partnership with associations, organizations and individuals of the Ontario industry and those beyond the provincial borders to help direct industry research funding towards industry-identified priorities.

While the industry still finds itself in difficult times, this does not diminish the need for equine research – one of the important pillars of programming for Equine Guelph and the industry. The challenge is in continuing to find ways to increase the funding available for equine research and to leverage existing funding with other programs as industry priorities are identified by the partners of the Advisory Council. The partnership of the University of Guelph and the industry is the important foundation for the success of the research program.

The return on the investment of research funding is found in the updated information and training that benefits current and student veterinarians, and through the education programming for the caretakers of our horses.

New education and training programs, most notably with the exciting launch and ongoing development of The Horse Portal, take the updated, evidence-based information from the research and incorporate that into new and existing courses – both face to face and online. The Horse Portal program offers new learning opportunities as short, affordable programs with a focus on industry-designated topics of priority.

New this year was the addition of racing-specific courses and the ability to develop customized courses. Fire safety and emergency preparedness continue to play a strong role in the development of new courses and the enhancement of existing courses.

A strong and pro-active communications program further extends the distribution of evidence-based information and helps increase awareness and knowledge of best practices for health, performance and welfare.

Equine Guelph acknowledges and sincerely thanks the members of the Advisory Council and funding/support partners: Quarter Racing Owners of Ontario, Inc., Equestrian Canada, the Horsemen’s Benevolent and Protective Association of Ontario, the E.P. Taylor Equine Research Fund, Standardbred Canada, Ontario Equestrian, the Ontario Ministry of Agriculture, Food and Rural Affairs, the Ontario Harness Horse Association,

the Alcohol and Gaming Commission of Ontario, Ontario Racing, the Ontario Veterinary College, and the University of Guelph.

The core values of supporting health and welfare of the horses - and the industry - remain the focus of programs for Equine Guelph.

Appendices

Appendix 1: Current Equine Guelph Advisory Council

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Appendix 2: Equine Guelph Partners

**E.P Taylor Equine
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Appendix 4: Research Projects for 2018-2019

New Projects in 2018-19:

Investigator	Title
Arroyo, L.	Culture-Based Molecular Profiling of the Colonic Bacteria of Horses with Typhlocolitis
Arroyo, L.	Improving Fecal Microbiota Transplantation in Horses
Barta, J. and Zeldenrust, E.	Detecting <i>Klossiella equi</i> , a potential cause of renal disease, in Ontario horses
Koch, T.	Equine Mesenchymal Stromal Cells Ability to Help Fight Bacterial Infections
Koch, T.	Isolation and Culture of Equine Mesenchymal Stromal Cells in Serum-Free Conditions

Continuing Projects:

Investigator	Title
Arroyo, L.	Characterization of extracellular matrix proteins and resident cells in calcified pulmonary arteries in horses
Arroyo, L.	Plasma transfusions in horses: does it improve the clinical outcome?
Arroyo, L.	Characterization of the equine hindgut microflora and metabolites using an in-vitro model
Arroyo, L.	Seroprevalence investigation and isolation of endemic strain (s) of <i>Neorickettsia risticii</i> (PHF) in the province of Ontario
Arroyo, L.	Effects of exercise and Lasix on the pulmonary artery hemodynamics of EIPH affected horses
Beeler-Marfisi, J.	Pathogenesis and characterization of inflammatory airway disease in Ontario Thoroughbred and Standardbred racehorses
Betteridge, K.	Proteins involved in failure of early pregnancy
Bienzle, D.	Ciliary function in horses with inflammatory lung disease
Hurtig, M.	Sustained release drug formulations for equine joint conditions: Formulation and forensic considerations
Koch, T.	Development of Osteochondral Constructs Using Equine Umbilical Cord-Derived Mesenchymal Stromal Cells for Treating Joint Cartilage Defects
Koch, T.	Allogeneic Equine Umbilical Cord Blood Mesenchymal Stem Cells for Treatment of Exercise Induced Pulmonary Hemorrhage
Koch, T.	Comparison of umbilical cord tissue and cord blood stem cells
Koch, T.	MicroRNAs as Equine Joint Health Biomarkers

Koch, T.	In vivo assessment of efficacy of equine cord blood-derived MSC in an induced tendon model
Koenig, J.	Evaluation of the significance of arthropathy of the caudal facet joints in horses
Koenig, J.	Evaluation of the repeated use of allogeneic umbilical cord blood mesenchymal cells in clinical cases of equine superficial digital flexor tendinitis
Koenig, J.	Effect of extracorporeal shockwave therapy on umbilical cord blood mesenchymal stromal cells
Lillie, B.	Equine Herpes Virus (EHV) and EHV-associated disease in the Ontario Equine Industry - Disease prevalence and prevention
Merkies, K.	Nutritional and feeding behaviour effects of steaming or soaking hay for horses
Thomason, J.	Comparing loading between the forelimbs of racing Thoroughbred to investigate possible causes of laterality in catastrophic injury
Weese, S.	Characterization of the epidemiology and clinical impact of Clostridium difficile infection in hospitalized foals
zur Linden, A.	Development of 3D printed models of the sacroiliac, hip and cervical articular facet joints for ultrasound guided joint injections training of equine practitioners

Appendix 5: Lay Summaries of Research Projects for 2018 – 2019

New Projects:

Arroyo, L. Culture-Based Molecular Profiling of the Colonic Bacteria of Horses with Typhlocolitis

Typhlocolitis is an inflammatory process of the cecum and colon that can lead to acute and severe diarrhea horses. Affected horses can develop life threatening hypovolemia, electrolytes and acid-base disorders, toxemia and sepsis. The most common enteropathogens associated with diarrhea in adult horses include Salmonella spp., Clostridium spp (mainly C. perfringens and C. difficile), Neorickettsia risticii (endemic areas) and coronavirus; but a causal agent for a large proportion of these cases (>60%) cannot be established. In recent years, culture-independent methods revealed that microbial communities of the cecum and colonic contents of healthy horses are dominated by a fairly stable population of Firmicutes and either Bacteroidetes or Verricomicrobiota. This method also showed that there is marked decrease in microbial richness and diversity occurs humans and animals with gastrointestinal disease. The aim

of this study is to characterize the anaerobic bacteria within the large colon by combining culture enriched-based methods and molecular profiling of intestinal contents of horses with or without colitis.

Arroyo, L. Improving Fecal Microbiota Transplantation in Horses.

Fecal transplantation has saved thousands of lives in other species, but the method needs to be refined before it can be used to treat horses with intestinal flora imbalances (e.g. colic and colitis). The intestinal flora, also called microbiota, is comprised by thousands of microorganisms, especially bacteria. It is now known that the intestinal bacteria are very important to maintain health and that several diseases can occur because of imbalances on the composition of this bacteria (called dysbiosis). Diseases affecting the gastrointestinal tract are the main cause of mortality in horses and bacterial imbalances have been demonstrated in horses with colitis, colic and under stressful situations (e.g. post-partum and shipping). Recent efforts have focused on manipulation of the intestinal bacteria to treat and prevent dysbiosis. Microbiota manipulation can be achieved by controlling diet, by using therapies such as antibiotics and probiotics, or by transferring the bacteria from a healthy individual to a patient. This procedure is called “fecal microbiota transplantation” (FMT). FMT has been used with great success to treat other species, but our preliminary data demonstrated that current recommendations are not efficient in horses. Therefore, a refinement of the method is necessary before FMT can be recommended to be used in horses. In this study, we propose to test new doses to successfully use FMT to restore the normal intestinal bacteria of horses with bacterial imbalance. We will also bypass the proximal portions of the intestine by delivering the microbiota directly into the large colon to try to increase FMT efficacy. Experimental Design: We propose to induce microbiota imbalance in a group of horses by treating them with oral antibiotics (TMS). Then we will evaluate the efficiency of FMT by comparing current recommendations (FMT once a day) with a group receiving the procedure four times per day. Fecal bacteria before and after FMT will be evaluated using next generation DNA sequencing. Furthermore, we will deliver FMT directly into the distal gut to determine if the FMT efficacy can be increase.

Barta, J. and Zeldenrust, E. Detecting Klossiella equi, a potential cause of renal disease, in Ontario Horses

Klossiella equi is a single celled, obligate intracellular parasite (Apicomplexa, Adeleorina) that parasitizes the kidneys of equids, including horses. The prevalence of Klossiella infections is unknown because infected hosts usually have no clinical signs. Most infections are found incidentally during necropsy. The infective stages (sporocysts) are difficult to detect in urine making diagnosis of infections in living horses challenging. It has been shown that this parasite can cause damage to equine kidneys in cases of heavy infection, especially in immunocompromised hosts. The proposed research would attempt to establish prevalence of the disease by developing a molecular diagnostic test specific for this parasite. The DNA-based test could be applied retrospectively to previous parasite-positive post mortem cases as well as for detection of infections in live horses. Without knowing the infection status of a particular horse, it is difficult to associate an infection with this biologically unusual parasite with particular clinical presentations or evaluate any contribution to renal disease. This research will create a sensitive DNA-based test to detect K. equi and then apply this assay on kidney tissues, blood or urine from clinically normal horses in Ontario. The newly developed test could provide the prevalence of this potential pathogen, K. equi, in Ontario horse populations. Klossiella equi was first described in Hungary (Baumann 1946) so it is unknown if the same parasite, or a different species, is responsible for infections in Ontario horses. The next step of this research will be to do multi-locus sequence-based genotyping of Klossiella-positive samples from Eastern Europe and compare the European sequences to the sequence of the Klossiella already sequenced from Ontario horses.

Koch, T. Equine Mesenchymal Stromal Cells Ability to Help Fight Bacterial Infections

Antimicrobial resistance may be one of the biggest medical challenges in the coming decades. This issue transcends species and a one-health approach, including both veterinary and human patients, is therefore desirable to test new potential treatment tactics. One recent approach is the use of mesenchymal stromal cells (MSC) to eliminate microorganisms. MSC have demonstrated antimicrobial effects not only through the modulation of the immune response, but also through the secretion of antimicrobial substances. These properties may allow MSC to make currently ineffective antibiotics effective again against resistant bacteria. Understanding what these MSC secreted substances are may allow us to produce or isolate these substances and use them as regular drugs in combination with currently utilized antibiotics to develop new treatment strategies. We have selected bacteria commonly affecting horses to prove the principle idea of the project that MSC can make antibiotics more effective. MSCs from five horses

will be paired with three isolates of anti-microbial resistant bacteria and tested for antimicrobial susceptibility. MSC included in the MSC bacterial co-culture will be harvested following co-culture, and RNA will be isolated for next generation sequencing (NGS) to evaluate which MSC genes could be related to this antimicrobial effect. This work has the long-term potential to discover new therapies that can either potentiate current antimicrobials or maybe even act as novel antimicrobials on their own. This foundational work will support future funding applications to support clinical trials in client-owned horses of natural diseases.

Koch, T. Isolation and Culture of Equine Mesenchymal Stromal Cells in Serum-Free Conditions

Fetal bovine serum is a central component of current culture media for the isolation and expansion of mesenchymal stromal cells in veterinary medicine. The use of fetal bovine serum supplementation has many drawbacks including increased risk of adverse reactions and batch-to-batch variation that can make it more difficult to predict the efficacy of a given cell-based therapy. For these reasons, so-called serum-free media has been developed to support the isolation and expansion of human mesenchymal stromal cells. Few studies have tested serum-free media on equine cells and the results have been discouraging showing reduced growth rate and other cell alterations compared to cells maintained in fetal bovine serum. These disappointing results could be due to unique metabolic requirements of equine mesenchymal stromal cells or improper coating of culture vessels and poor adaptation protocols when using media developed for human cells. We hypothesize that equine umbilical cord blood-derived MSC can be isolated and culture expanded in commercially available serum-free media. Our objectives are: 1) To compare the isolation success of equine umbilical cord blood-derived (CB) MSC in FBS containing media and one serum free media on different surfaces. 2) To compare the functional properties of established CB-MSC cultures with regards to differentiation potential towards the adipogenic, osteogenic and chondrogenic cell fates as well as ability to suppress lymphocyte proliferation in vitro. 3) To determine if serum-free grown cells are cryotolerant. We expect that we can establish MSC cultures using serum free conditions. The ability to isolate and expand MSC under standardized conditions is an important step towards more standardized therapeutic effect due to reduced product variability. Reduced risk of adverse reactions is another important goal of this work.

Continuing Projects:

Arroyo, L. Characterization of extracellular matrix proteins and resident cells in calcified pulmonary arteries in horses.

Recently, we observed fibro-calcification of the tunica media of large elastic arteries, predominantly of the pulmonary artery in greater than 80% of young racehorses in Ontario based on a post-mortem survey study. The lesions found in equine arteries resemble a well-described vascular pathology in humans involving the tunica media of major arteries. This lesion is the most important cause of stiffening of the blood vessel in humans and it has been established beyond reasonable doubt that there are strong independent associations between increased arterial stiffness or pulse pressure and increased morbidity, and mortality from cardiovascular disease. The potential clinical consequences of arterial calcification in horse's unknown, but vascular degenerative lesions occasionally lead to vascular failure and result in death. Although the pathogenesis of this lesion is not fully understood, human and animal model studies suggest that an imbalance between calcification inhibitors and promoters in the arterial wall ultimately tip this balance to cause calcification. Ectopic calcification promoters (bone morphogenetic proteins and elastin degradation products) and inhibitors (matrix Gla protein (MGP), osteopontin and osteoprotegerin) have been found at the arterial calcification site. In addition, cells associated with the artery calcification site have osteo / chondrocytic morphological features. These histopathological similarities among different species suggested to us that there is a potential parallel of the pathogenesis process among species, although the triggering or risk factor (s) may be different and/or unrelated. The objectives of this study are to, first, investigate changes to the extracellular matrix proteins and whether proteins (i.e. collagen II, alkaline phosphatase) normally involved in bone development are present in calcified arteries of racehorses. Second, to characterize resident cells (osteo/chondrocyte-like cells) in tunica media of unaffected.

Arroyo, L. Plasma transfusions in horses: does it improve the clinical outcome?

Equine frozen plasma is commonly prescribed for a diverse range of medical and surgical conditions. Veterinary textbooks dictate to clinicians that horses with hypoproteinemia require plasma transfusions. Plasma is generally administered to restore colloid oncotic pressure (COP), relieve edema, as a source of protein for nutrition support; to counteract endotoxemia and supplementation of immunoregulatory factors. Common clinical conditions in horses for which plasma is prescribed include chronic and/or acute hypoproteinemias as a result of protein losing enteropathies, intra/post-operative colic surgery and endotoxemias due to enterocolitis. The rationale for transfusions interventions in horses is poorly defined and there are very little clinical studies measuring

the clinical impact (benefit) and outcomes (i.e. mortality/survival). This well accepted clinical practice has been subjected to minimal or null clinical research scrutiny, which is required to demonstrate effectiveness in equine medicine. In human medicine the only major clinical indication for plasma transfusions is to provide coagulation factors for the prevention or treatment of prolonged bleeding disorders. Plasma products are used however in a variety of horses despite the lack of evidence-based medicine to indicate any clinical benefit. In times of increasing cost consciousness and financial containment in the equine industry, since plasma transfusions are expensive and its clinical usefulness unknown, if not questionable, this clinical practice must be critically evaluated. This study aims to retrospectively evaluate the clinical uses, added treatment cost, adverse reactions associated and outcomes of plasma transfused cases at OVC. Prospectively, this project aims to evaluate the effects of plasma transfusions on COP of horses with hypoproteinemia and determine associations with clinical outcomes.

Arroyo, L. Characterization of the equine hindgut microflora and metabolites using an in-vitro model.

The equine gastrointestinal tract is a large tubular structure that houses complex microbial ecosystems within multiple compartments along its length. The hindgut compartment (cecum and colon) comprises the larger portion of the tract and it is here where complex sugars are fermented by the resident microbes, providing between 60-70% of the daily energy requirements of the horse. Microbial communities (microbiota) disturbances may affect the health of the host leading to potentially life threatening disorders in horses, such as colitis and laminitis. The composition and function of the equine hindgut microflora is currently a topic undergoing intense research and much knowledge had been generated. However, a better understanding of the microbial ecosystem, in particular how disturbances in microbiota homeostasis change its function and the consequences of these changes to host health, is needed. In order to understand the effects of gut microbiota disturbances, it is imperative to know the status of the microbial ecosystem under healthy conditions. Culture of whole gut microbial communities *in vitro*, under physiologically relevant conditions, can be achieved by using continuous culture (chemostat) systems. The aim of this proposal is to develop an *in vitro* system that mimics the nutritional and environmental conditions of the hindgut of the horse, which (when seeded with GI samples obtained from horses) will allow analysis of the microbial population composition, abundance and distribution and their metabolic products.

Arroyo, L. Seroprevalence investigation and isolation of endemic strain (s) of *Neorickettsia risticii* (PHF) in the province of Ontario.

Potomac Horse Fever (PHF) is a seasonal infectious disease caused by the bacterium *Neorickettsia risticii*. PHF occurs in Ontario mainly during the summer months (July to September). The clinical disease is usually sporadic with most of the cases reported from eastern and south-western Ontario. The severity of the clinical signs varies between horses, but in general characteristic clinical signs include depression, decreased appetite, fever, diarrhea and colic. A high percentage of cases (up to 40%) of horses suffering from PHF may develop laminitis, which is the most serious and life threatening complication. Recent studies conducted on the life cycle of *N. risticii* have shown that fresh water snails and aquatic insects, such as caddisflies, mayflies, and dragonflies, are common carriers of the bacterium. Ingestion of contaminated hay, grain, pasture or drinking water with dead insects may result in clinical disease. Currently, there is an increasing concern among horse owners in Ontario because of the lack of information about the epidemiology and prevalence of the disease, natural reservoir of the bacterium, and biosecurity measures to prevent and control the disease. Preliminary data at the Ontario Veterinary College support clinical, serological and molecular evidence of the presence of the disease in different parts of the province. However, up to date there are only 2 published cases of PHF from horses in Ontario. The objectives of this preliminary study are to a) investigate the seroprevalence of PHF in horses from Ontario, and b) to isolate the endemic strain (s) of *N. risticii* from horses with clinical disease in Ontario for molecular analysis.

Arroyo, L. Effects of exercise and Lasix on the pulmonary artery hemodynamics of EIPH affected horses.

Effects of exercise and Lasix on the pulmonary artery hemodynamics of arterial wall remodeling (calcification and fibrosis) occurs in racehorses and is the most important cause of vascular stiffness in humans. There is a growing body of evidence to support the hypothesis that excessive pressure pulsatility resulting from arterial stiffness promotes abnormalities in micro-vascular structure and function, contributing to end-organ damage and dysfunction in humans (Mitchell GF 2008; Tan W et al., 2013). We hypothesize therefore that stiffening of the pulmonary arteries of racehorse's leads to hemodynamic changes (excessive pressure pulsatility) promoting micro-vascular structural and functional abnormalities in the lungs, and that this contributes to the development of EIPH. Our research group is a multidisciplinary team of equine and human clinicians, pathologists and bioengineers that for many years has been conducting equine pulmonary mechanics research (material properties, wall stress, pulse wave quantification, *in vitro* functional testing). We have access to specialized research equipment and clinical facilities necessary for this type of research project and we have already developed both innovative lab and clinical testing methods and analysis strategies. We aim to investigate the compliance of the pulmonary arterial wall of horses with arterial remodeling (i.e. fibro-calcification), the hemodynamics of the pulmonary

artery blood flow, and the potential role of these alterations in the pathogenesis of EIPH in horses.

Beeler-Marfisi, J. Pathogenesis and characterization of inflammatory airway disease in Ontario Thoroughbred and Standardbred racehorses

Inflammatory Airway Disease is a type of lung inflammation in horses that is similar to mild asthma in people. It is common in racehorses, especially 2 and 3 year olds that are stabled, but the asthma is not caused by an infection and the horse's temperature remains normal. The asthma causes the horse to have a persistent cough, which is made worse by exercise. We think it is partly caused by breathing in barn dust from hay, bedding and the floor (during sweeping). In part, barn dust is made up of very fine mould spores (even from good looking hay), and little pieces of dead bacteria (from manure). Both of these things cause the horse's lungs to react and that reaction causes the asthma. Another thing we think causes horse asthma is air pollution. It is true that in Ontario air pollution causes asthma in people, but we haven't studied whether it does the same in horses. It's important to study this disease because it is costly to treat and means missed training and racing days, so the earnings potential of the horse is decreased. In this project, we will work with Thoroughbred and Standardbred trainers and veterinarians at Woodbine and Mohawk racetracks. When a trainer has a horse that they think is coughing bad enough to call their veterinarian, the vet will do a physical examination on the horse and will use their scope to look in the horse's windpipe and down into the lungs. The vet will then perform a 'lung wash' on the horse. This is a safe procedure where they put a small amount of sterile saline into the lung and suck it right back out. It doesn't fix the problem, but it allows us to look at the cells and mucus in the lungs and tells us what the horse has wrong with it (asthma, lung infection, or bleeding). Based on what we find we will be able to work out approximately how many racehorses have asthma, and we will see whether air pollution, the mould spores and pieces of bacteria cause asthma. If we can get scientific evidence of these things we will be able to help racehorses to be healthier and improve their earnings potential to the benefit of all involved.

Betteridge, K. Critical gene expression in the uterus and conceptus during successful and failing equine pregnancies.

Timely foaling of brood mares is very important to the racing industry with its fixed 'birthdays' and can be disrupted by early pregnancy loss. Our aim is to identify key mechanisms by which the mare and her conceptus (the embryo, its membranes and contained fluids) interact successfully in early pregnancy, and how these change when pregnancy fails. We have found pregnancies to fail spontaneously either between Days 12-16 after breeding when the conceptus should be 'recognized' by the mare (so that she does not return to heat), or between Days 19-25. The latter stage coincides with deterioration and loss of the embryonic capsule (a non-cellular membrane) that envelops the conceptus and, we believe, shields it from potentially hostile uterine products as pregnancy is established. Experimentally, pregnancy can be terminated by injecting the mare with a prostaglandin (PG) which lowers progesterone concentrations. This is accomplished more immediately by PG treatment at Day 18 than at earlier stages.

Recently, we have compared gene activity in the endometrium (lining of the uterus) of mares undergoing spontaneous and PG induced failures with activities found during normal pregnancy. For this we use an advanced molecular technique (transcriptome-wide sequencing of RNA) at Day 20, and have similarly examined normal pregnancies at Days 14-15

Bienzle, D. Ciliary function in horses with inflammatory lung disease

Cilia are small hair-like extensions on cells that line the nose, trachea and larger airways. The function of cilia is to move a layer of mucus produced by cells in the lower airways toward the mouth for swallowing, and therefore to protect the lung from inhaled particles. Thus, cells with cilia that constantly beat to move a layer of mucus “outward” line the entire upper airway. Inhaled bacteria, molds and particles “stick” to the mucus layer and are then moved by beating ciliary toward the mouth. People and animals born with cilia that are defective in the proteins necessary for ciliary movement (“primary ciliary dyskinesia”) have recurrent pneumonia throughout their life as well as abnormalities in other organs. In conditions such as asthma and heaves, recurrent inflammation of the airways results in injury to cells lining the airways, including ciliated epithelial cells. It is thought that in these conditions cilia do not regenerate properly, leading to a vicious cycle of poor clearance of particles by shortened or poorly beating cilia and recurring inflammation. Viral infections of the nose and lungs have also very recently been recognized to affect the function of cilia. We will collect epithelial cells from healthy horses’ noses with a simple short medical brush, put the cells into culture and measure how well they move particles mimicking bacteria (fluorescent beads). We will compare the results from nasal samples to tracheal samples obtained with a bronchoscope and a longer medical brush. If cilia in samples from the nose function similar to those from the trachea, routine samples for assessments can be readily acquired. Once the functional assays are established we will collect samples from young and older horses with mild and severe lung inflammation (“inflammatory airway disease”, IAD, and “heaves”), respectively, to measure how cilia function in these conditions and to assess their appearance. If abnormal cilia function is a consistent feature of respiratory diseases of horses, inhaled medication to change the composition of mucus and/or to increase the production of mucus may be helpful.

Hurtig, M. Sustained release drug formulations for equine joint conditions: Formulation and forensic considerations

In past studies we have studied long acting drugs that were created by a drug company for the human market to control inflammation in joints for up to 90 days. Using the sheep knee as a model we showed that these drug and polymer combinations take up residency in the joint lining where they are slowly broken down to release the drug and control pain and inflammation. The duration and drug levels in joints can be changed by altering the polymer-drug binding, so release times of a few days to several months are possible. Through a collaboration with polymer chemist Dr. Elizabeth Gillies (Western University, Ontario) we will create non-steroidal anti-inflammatory drug (NSAIDs) formulations that will last from a few days to several months after injection into joints. The advantage of this delivery system is that no drug leaks from the joint into the rest of the horse's body to cause the all too common complications of colic and gut ulcers. Dr. Gillies' role will be to create the polymer carriers from safe, food grade chemicals. These are widely used in human sustained release drugs for the eye conditions, cancer therapies etc. Dr. Gillies will modify NSAID drugs so they can be trapped in the polymer carrier system. Laboratory experiments will be used to estimate the rate of drug release into joint fluid over 21 days. With this information we will conduct trials of sustained release NSAID formulations by injecting them into the fetlocks of horses at the University of Guelph Arkeel Research Station. By injecting the drug and then challenging the horse joint with an inflammation-causing molecule (lipopolysaccharide) at intervals of up to 90 days, we will be able to determine the duration of the drugs' anti-inflammatory effect. Many horses have low grade inflammation in joints that is difficult to address and requires repeated, costly treatments. Such medication regimes are expensive and not without risk, particularly when steroids are used since they may promote cartilage loss over time. An additional consideration is the potential for doping with similar drug formulations. By measuring drug levels in plasma, urine and joint fluid we will be able to estimate when drugs would be detected in doping tests. We will share all our data with racing and clean sport/doping jurisdictions and provide samples of our drug formulations for their own use. This project will provide the basis for commercialization of a sustained release formulation that would improve the safety of NSAID use in the horse and potentially reduce the incidence and rate of osteoarthritis progression in horses.

Koch, T. Development of Osteochondral Constructs Using Equine Umbilical Cord-Derived Mesenchymal Stromal Cells for Treating Joint Cartilage Defects

Co-investigators' names and Departments: Rita A. Kandel, M.D., Department of Pathology, Mount Sinai Hospital, Toronto, ON, Mark Hurtig, Clinical Studies, OVC, Judith Koenig, Clinical Studies, OVC, Ms. Sarah Lepage, PhD Candidate, Biomed Sci, OVC

Orthopedic injuries, constituted mainly of trauma to joint cartilage, are the most common cause of lost training days or premature retirement in the equine athlete. As cartilage tissue has a low intrinsic capacity to heal, repeated injury will eventually result in post-traumatic osteoarthritis in the joint. Though current regenerative therapies for the treatment of focal cartilage defects are showing promising preliminary results, they are wrought with potential complications from secondary surgical sites to isolate patient-

specific cells or tissue. Therefore, we propose to investigate the potential of a novel cell type in the generation of osteochondral-like plugs without requiring a secondary surgical site on the patient. We have successfully and reproducibly isolated mesenchymal stromal cells from umbilical cord blood (CB-MSC) and demonstrated their ability to generate cartilage in vitro. We found that by subsequently growing the engineered cartilage on a bone substitute, we could generate an osteochondral construct that could serve as an implant. In 2006, Dr. Rita Kandel's group in Toronto generated similar constructs and implanted them into sheep with induced cartilage injuries; the implants successfully contributed to cartilage repair at 9 months post-surgery. We believe that with further optimization, we can generate an osteochondral-like implant using CB-MSC with superior properties for in vivo repair of focal cartilage defects. The biomechanical properties of cartilage generated in vitro are historically poor, making the graft susceptible to damage upon transplantation. We propose to mechanically mature the cartilage prior to implantation in order to better withstand the large loading forces within the equine joint upon transplantation.

Koch, T. Allogeneic Equine Umbilical Cord Blood Mesenchymal Stem Cells for Treatment of Exercise Induced Pulmonary Hemorrhage

Exercised induced pulmonary hemorrhage (EIPH) is a common condition in race horses and a significant equine welfare issue. The etiology of EIPH is poorly understood but pulmonary inflammation is a downstream consequence of frequent bleeding. Mesenchymal stem cells (MSC) have non-progenitor functions through secretion of various proteins. Through such secreted factors MSC have demonstrated immune modulatory properties in vitro and in vivo. In our lab we have demonstrated that equine umbilical cord blood-derived (CB) MSC are more immune-modulatory than the more commonly used MSCs derived in vitro from adipose tissue or bone marrow aspirates. We have also shown that CB-MSC suppress lymphocyte proliferation in vitro equally immediately after thawing or after one week of culture expansion post-thawing. These CB-MSC have low to no expression of MHC-I and II, suggesting they can be applied in an allogeneic manner. In vivo studies in the horse may lend support to allogeneic application of CB-MSC. Attenuation of pulmonary inflammation from bleeding following intravenous MSC injection has been shown in vivo in humans and non-equine species. The hypothesis of this project is that allogeneic equine CB-MSC will attenuate EIPH associated pulmonary inflammation. Funds are sought to perform a feasibility study to test this hypothesis. Use of allogeneic CB-MSC holds the promise of developing a novel off-the-shelf cell-based product for this important equine disorder.

Koch, T. Comparison of umbilical cord tissue and cord blood stem cells

Equine mesenchymal stromal cells are increasingly explored as novel therapeutic agents in equine medicine for a variety of conditions. The field is increasingly focused on using these cells in an allogeneic manner due to ease of application and reduced cost of cell production. Cells from neonatal tissues have higher proliferative potential than similar cells derived from adult tissues. The use of cells with high proliferative potential is essential in order to leverage the potential advantages of using allogeneic cells. However, extended culture expansion may result in cellular drift with regards to phenotype, function and cytogenetic stability (normal chromosome numbers and sizes). The Koch lab has extensively studied equine umbilical cord blood-derived mesenchymal stromal cells and found the cells to have higher proliferative potential than similar cells from bone marrow and adipose tissue. One limitation of cord blood cells is the collection of the umbilical cord blood and the relatively few progenitor cells present in the blood. Advanced foaling management is required at the farm level and trained personnel have to be present during foaling to obtain the blood. Extensive laboratory cell expansion is needed due to the few progenitor cells present, which is associated with increased laboratory selection pressure on the cells. Mesenchymal stromal cells have been isolated from the connective tissue of equine umbilical cords. This cell source is easier to obtain and a higher number of putative progenitor cells has been reported. However, it is unclear if mesenchymal stromal cells from cord tissue and cord blood are equivalent with regards to phenotype, proliferation, function and cytogenetic stability. The goal of this project is to compare donor-matched mesenchymal stromal cells from cord tissue and cord blood with regards to the above-mentioned parameters. The influence of oxygen tension on these cell parameters will also be evaluated for both cell sources.

Koch, T. MicroRNAs as Equine Joint Health Markers

Injuries involving joint cartilage such as osteoarthritis (OA) are some of the most common causes of lameness and pain in horses. Sophisticated means of monitoring joint health status are needed to allow early detection and intervention as well as monitoring the effect of interventions. MicroRNAs are a class of short non-coding RNAs that participate in various biological processes including cartilage development and homeostasis. MicroRNAs have been measured at the tissue level, in synovial fluid and serum, and may reflect some aspects of the health status of the animal. MicroRNAs may therefore be useful biomarkers of joint health that could be evaluated through frequent blood and or joint fluid sampling and analysis. In the present proposal, operating funds are sought to determine robust methods for detecting microRNAs in synovial fluid and blood plasma from horses and to determine cut-off values for selected microRNAs in healthy horses and horses with joint inflammation.

Koenig, J. Evaluation of the significance of arthropathy of the caudal facet joints in horses.

Arthritis of the neck joints is commonly present in performance horses and in many cases causes debilitating clinical signs. In older horses osteoarthritis of lower neck vertebra facet joints is classified as Type-2 Wobblers syndrome. Clinical signs include neck stiffness, neck pain, reluctance to collect, and forelimb lameness without neurological deficits. In more severe cases the osteoarthritis causes compression of the spinal cord and neurological deficits can be present. There are conflicting reports in the literature as to the significance of diagnosing osteoarthritis of lower neck vertebra facet joints on radiographs, the age at which it becomes clinically significant, how often it causes spinal cord compression, and the success rate of long-term treatment. Therefore, our objectives are to quantify degenerative changes of lower neck vertebra facet joints and to obtain inter and intravertebral measurements of the neck vertebrae on radiographs of horses with clinical signs compatible with this disease and age, breed and sports matched healthy Warmblood horses. Follow up information will be gathered by telephone survey of owners on the outcome of intra-articular treatment of osteoarthritis of lower neck vertebra facet joints to evaluate the effectiveness of this treatment method.

Koenig, J. Evaluation of the repeated use of allogeneic umbilical cord blood mesenchymal cells in clinical cases of equine superficial digital flexor tendinitis.

Tendon and ligament injuries are common in the equine athlete. These types of soft tissue injuries result in significant economic loss to the equine industry each year as a result of decreased performance, prolonged rehabilitation, and recurrent injury. Even though tendons heal well, the scar tissue formed in this repair is functionally deficient in comparison to normal tendon. The result is compromised performance of the horse and high re-injury rates. Improved clinical lameness outcome and a better overall prognosis for return to exercise was noted upon injection of simple bone marrow aspirate directly into damaged suspensory ligaments. This observation spurred the interest of biologics for the treatment of equine tendon injuries. Concerns related to the volume of unaltered bone marrow and its content of bone spikes and fat cells on tendon healing lead to the use of cultured stem cells derived from bone marrow (BM) aspirates. Such BM stem cells have been used commercially to treat injured tendons in more than 500 horses with naturally occurring injuries. Only 18% of these horses were re-injured once they entered full training, which appears more favorable than a 56% re-injury rate reported in a previous study where a routine rehabilitation protocol was used. This much improved reinjury rate of only 18% was only observed when the stem cells were injected in the first 6 weeks after injury. Bone marrow derived stem cells need to be culture expanded in the lab after harvest from the horse's bone marrow, which can take 4 weeks. This requires very prompt action after injury to ensure a diagnosis is established, bone marrow is harvested from the horse and transported to the lab for expansion and back to the veterinarian to be injected within 6 weeks after injury to achieve the reported benefits. We have shown previously, that it is safe to inject allogeneic (unrelated horse) equine umbilical cord blood

stem cells into horse's joints and that equine umbilical cord blood stem cells are more immune-modulatory than stem cells from equine bone marrow, even after prolonged freezer storage. These findings support the cell banking of umbilical cord blood stem cells for later allogeneic use, which means they can be taken off the shelf and injected into horses as needed without having to wait for culture expansion.

Koenig, J. Effect of extracorporeal shockwave therapy on umbilical cord blood mesenchymal stromal cells

Shockwave has been used as a treatment to decrease the healing time and improve the quality of the repair in bone and soft tissue injuries, but the exact mechanism is not completely understood. Intra-lesional (into bowed tendons) administration of stem cells in combination with shockwave has been used as an alternative treatment for orthopedic diseases like tendon and ligament lesions in horses, without scientific evidence, but anecdotally has resulted in faster healing times and return to function. There is a need to evaluate the effect that shockwave has on stem cells. One in vitro study showed that equine fat derived stem cells grow more rapidly and differentiate faster into different tissues, but nothing is known about the secretory function of these cells or the effect of shockwave on bone marrow or umbilical cord blood derived stem cells. Labelling these cells allows tracking of these cells also in vivo. Therefore, we hypothesized that shockwave will enhance the progenitor (their ability to differentiate into different tissue) and nonprogenitor (their anti-inflammatory and secretory) functions of stem cells. Our objectives are to firstly evaluate if shockwave increases umbilical cord blood derived stem cell growth rate, proliferation rate and differentiation in comparison to untreated cells in vitro. And secondly, to evaluate the effect of shockwave on topically injected allogeneic (derived from unrelated foals) umbilical cord blood derived stem cell and follow the cells in a neck wound model in vivo.

Lillie, B. Equine Herpes Virus (EHV) and EHV-associated disease in the Ontario Equine Industry - Disease prevalence and prevention

Equine herpesvirus-1 (EHV-1) can cause a variety of diseases in horses, from simple runny nose and fevers, to abortion or even neurologic disease and death. We are hoping to better understand abortion rates in Ontario broodmares and determine what effect EHV-1 is having on the industry. One aspect of the virus that was overlooked until recently, is that many horses become infected when they are still with their dams. Once a horse is infected with the virus, it can remain in the body and can reactivate at any time. Many characteristics of this viral infection are unknown, such as how many horses in a population are infected, when or why it reactivates within the body, and why it causes one form of disease over another. EHV-1 vaccines have been thought to be the reason for a steep reduction in abortion. However, studies have found that the vaccines are not completely protective, outbreaks occur even in vaccinated herds and over-vaccinating can actually decrease the body's protective immune response. Considering that the acceptable rate of abortion is not known, it is difficult to gauge the effect that EHV-1 has on infected mares and therefore the value of vaccination. Vaccinating them after they are infected has not been strongly studied, so the effects of the vaccine to prevent disease in already infected horses is unclear. Further, no vaccines have been labelled protective

against the neurologic form. Researchers have recently found a genetic change in the virus from horses.

Merkies, K. Nutritional and feeding behaviour effects of steaming or soaking hay for horses

Dried hay is the most common feedstuff for horses in North America. Horse owners supply hay in a variety of formats for a variety of reasons. Two such methods in which dried hay is altered before being offered to horses is soaking and, to a lesser extent, steaming. When grass hay is soaked or steamed the resulting wet or steamed hay has less carbohydrates. Soaking, but not steaming, also results in a loss of protein and micronutrients. A lower carbohydrate-content hay can help to reduce blood glucose and this is appealing for horses with laminitis, insulin resistance (Cushings), Equine Polysaccharide Myopathy, and those who are overweight. The extent of the effects of soaking and steaming on timothy/alfalfa hay, the most commonly available hay in Ontario, is unknown as the majority of research has been conducted in the United Kingdom where grass hays are more common. Therefore, under commonly-used soaking and steaming practices, this research seeks to understand how soaking and steaming affect the nutrient content of timothy/alfalfa hay and additionally whether soaking or steaming alters the preference horses have for dried, soaked or steamed hay.

Thomason, J. Comparing loading between the forelimbs of racing Thoroughbred to investigate possible causes of laterality in catastrophic injury

The U.S. Jockey Club's Equine Injury Database (EID) has information on more than 1.6 million racing starts by Thoroughbreds in North America. A recent survey of the approximately 3000 catastrophic injuries (CI) appearing in the database confirmed that the frequency of CI is related to the surface type, being greater on dirt, intermediate on turf and least on synthetics. In addition the study found that the left fore and right hind limbs were significantly more prone to CI on dirt tracks than the opposite limbs, but this effect was not evident on synthetic or turf tracks. The researchers speculated that this laterality of injury might be due to uneven forces acting on the left and right limbs in turns combined with relative inconsistency of support during the stance on dirt. These findings are significant for Ontario's TB racing industry because races are on turf or synthetics while most training is on dirt. The aims of this study are to assess whether laterality of biomechanical loading exists on dirt and synthetic surfaces, and whether epidemiological data identify that as an issue in Ontario. We will tackle this project in 4 ways: (a) We'll collaborate with the researcher currently studying the Ontario Death Registry, to look for evidence of injury laterality. The emphasis will be on the forefeet, which sustain higher rates of injury. (b) We will take another look at data we have from previous experiment on forces acting on the feet of Thoroughbreds galloping on the straight and turns of different tracks, and will look for evidence of laterality in loading at all stages of the stance for both front feet. We have data from dirt, turf and synthetic surfaces, using the same horse but on different days. (c) We will record new biomechanical data from the front feet of horses galloping on a training dirt track and a racing synthetic track within a few minutes, to find whether and how much laterality of loading exists on each surface. (d) We combine the analyses from all of the data from parts a-c to assess whether laterality is a problem in

Ontario, and to categorize which parts of the complex mechanical loading acting on the horse' hoof during galloping might be at the root of the problem.

The results should identify whether turning or the surface induces the higher risk for injury, from a biomechanical perspective.

Weese, S. Characterization of the epidemiology and clinical impact of Clostridium difficile infection in hospitalized foals

Co-investigators' names and Departments: Nathan Slovis DVM, Dipl. ACVIM and Anne Kullmann DVM, Hagyard Equine Medical Institute (HEMI), Diego Gomez-Nieto DVM DipACVIM, Dept of Pathobiology

Neonatal foal diarrhea is a common problem in foals, and Clostridium difficile is an important cause. In Central Kentucky, there has been an increased recognition of C. difficile (CDI) infection in the foals on farms and at an equine hospital, with the latter characterized initially by a subclinical infection that develops clinical disease usually after 48 hours of hospitalization. Disease that is different from classical enterocolitis is consistent with recognition in humans that CDI is not always accompanied by overt diarrhea. Preliminary data have indicated 7 different ribotypes from nine C. difficile clinically affected foals, something that is consistent with multiple community sources rather than a hospital focus. This prospective case control study will therefore evaluate the prevalence and epidemiology of Clostridium difficile colonization in hospitalized foals versus farm-matched controls, evaluate the impact of C. difficile colonization on development of disease during hospitalization, characterize C. difficile recovered from foals, evaluate diagnostic tests for CDI and evaluate the transmission of C. difficile between mares and foals. It will involve collection of fecal samples from foals presented to two equine hospitals (Kentucky, Ontario) for reasons other than diarrhea, plus their mares, age and farm-matched controls and foals with disease potentially attributable to CDI. This study will provide important information about the nature of this important pathogen, the risks associated with C. difficile shedding at hospital admission, transmission of C. difficile between mares and foals and risk factors for disease, with a goal of better understanding the disease to better diagnose, treat and prevent infections.

zur Linden, A. Development of 3D printed models of the sacroiliac, hip, and cervical articular facet joints for ultrasound guided joint injections training of equine practitioners

Three-dimensional models are used to teach various skills and techniques without needing cadavers or practice on live patients. Ultrasound guided injections of the neck, hip, and sacroiliac joints are challenging to perform but very useful for diagnosing and treating arthritis in sports and racehorses. Joint injections are used for diagnosing lameness by injecting local anesthetics, or treating arthritis by injecting steroids or other similar substances. These specific injections are often only performed by radiologists or those with advanced training and access to ultrasound machines. With the increased use of ultrasound by equine veterinarians for the diagnosis of tendon injuries in racehorses, this imaging modality can also be used for diagnostic and therapeutic joint injections. One

goal of this project is to determine the proper 3D printed material to mimic equine bones via ultrasound examination. The next step is to scan various body parts of a cadaver (neck, sacroiliac joints, and hips) with computed tomography (CT) to create highly accurate digital versions of these joints. These body parts will then be 3D printed in high resolution and embedded in clear ballistics gel to mimic tissue, while allowing the user to directly see the needle and underlying bones. The models will then be assessed for validity by radiologists, equine surgeons, and residents at the Ontario Veterinary College. Once validated, these models will be used to teach interested equine veterinarians in Ontario how to perform these techniques via seminars.

Appendix 6: Research Publications:

Dr. Luis Arroyo

HorseJournals.com (<https://www.horsejournals.com/horse-care/illness-injury/diseases/airway-disease-racehorses-more-prevalent-previously-thought>), April 2018.

Horse Canada. (<https://horse-canada.com/horse-news/research-university-guelph-targets-equine-virus/>), 12 April 2018.

Xiong Q, Bekebrede H, Sharma P, Arroyo LG, Baird JD, Rikihisa Y. An Ecotype of *Neorickettsia risticii* Causing Potomac Horse Fever in Canada. *Appl Environ Microbiol.* 2016 16;82(19):6030-6.

“Arterial Calcification in Horses”, *Equine Guelph Fall 2014 Newsletter*.

Dr. Keith Betteridge

Betteridge, K.J., Raeside J.I., Waelchli R.O., Christie H.L., Hayes M.A. 2018. Patterns of conceptus development and of progesterone concentrations in maternal blood preceding spontaneous early pregnancy failure in mares. *Reprod Fertil Dev.* 2018 Jul;30(8):1066-1076. doi: 10.1071/RD17336.

Maloney SE, Khan FA, Chenier TS, Diel de Amorim M, Hayes MA, Scholtz EL. A comparison of the uterine proteome of mares in estrus and diestrus. *Reproduction in Domestic Animals*. 2019, 54(3).473-479.

Diel de Amorim M, Khan FA, Chenier TS, Scholtz EL, Hayes MA. Analysis of the uterine flush fluid proteome of normal mares and mares with endometritis or degenerative endometrial fibrosis. *Reprod Fert Dev* (Submitted - In revision)

Klein, C., Lillie, B.N., Betteridge, K.J., Hayes, M.A. (in preparation). Endometrial gene expression in the mare before, during and after disappearance of the embryonic capsule.

Raeside, J.I. and Christie, H.L. (in preparation). A 'new' estrogen metabolite: an epoxide of estrone as a sulfated steroid. *J Steroid Biochem Molec Biol*. Dr. Dorothee Bienzle

"Project Update – Global Lung Epithelial Response to Inhaled Dust," *Equine Guelph – Research Update*, Spring 2018.

"Internationally Acclaimed Contributions to Embryo Transfer and Reproduction Technologies," *Equine Guelph – Research Update*, Spring 2018.

Dr. Dorothee Bienzle

Bienzle D, Katavolos P, Côté O, Tessier L, Lee G, Viel L. Insights into equine asthma pathophysiology from transcriptomics. *Equine Asthma: Current understanding and future directions*, Custer State Park, Custer, South Dakota, USA – May 22-25, 2019

Tessier L, Côté O, Clark ME, Viel L, Diaz-Méndez A, Anders S, Bienzle D. Gene set enrichment analysis of the bronchial epithelium implicates contribution of cell cycle and tissue repair processes in equine asthma. *Sci Rep*. 2018 Nov 6;8(1):16408.

Dr. Amy Greer

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. (in press: July 2018). A longitudinal study describing horse characteristics and movements during a competition season in Ontario, Canada in 2015. *Canadian Veterinary Journal* 59.

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. (2018). Using an agent-based modeling approach to determine the potential impact of infection prevention and control measures on a facility-level equine influenza outbreak. *Canadian Journal of Veterinary Research* 82: 89-96.

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. (2018). Estimating the potential for disease spread in horses associated with an equestrian show in Ontario, Canada using an agent-based model. *Preventive Veterinary Medicine* 151:21-28.

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. (2017). Descriptive and network analyses of the equine contact network at an equestrian show in Ontario, Canada and the application to potential disease transmission. *BMC Veterinary Research* 13:191.

Dr. Mark Hurtig

Nelson BB, Mäkelä JTA, Lawson TB, Patwa AN, Barrett MF, Wayne McIlwraith C, Hurtig MB, Snyder BD, Moorman VJ, Grinstaff MW, Goodrich LR, Kawcak CE. "Evaluation of Equine Articular Cartilage Degeneration After Mechanical Impact Injury Using Cationic Contrast-Enhanced Computed Tomography." *Osteoarthritis Cartilage*. 2019 May 7. pii: S1063-4584(19)30962-8. doi: 10.1016/j.joca.2019.04.015. [Epub ahead of print] PMID: 31075424

Villamagna IJ, Gordon TN, Hurtig MB, Beier F, Gillies ER. "Poly (ester amide) particles for controlled delivery of celecoxib." *J Biomed Mater Res A*. 2019 Jun;107(6):1235-1243. doi: 10.1002/jbm.a.36632. Epub 2019 Feb 22.

Horse Canada. (https://horse-canada.com/magazine_articles/joint-medication-of-the-future/), Feb 2018.

Sustained Release Intra-articular Medication. *Equine Guelph –Research Update*. Spring 2017. pp1-2

Sustained-release intra-articular medication. *Ontario Equine Practitioners Equine Research Update* December 15, 2016, OVC Lifetime Learning Centre.

Dr. Thomas Koch

Lepage S, Alizadeh AH, Lee O, Koch TG. Equine cord blood MSCs has greater differentiation and similar immunosuppressive potential to donor-matched cord tissue MSCs. Intended journal for submission is *Stem Cells and Development*, June 2018.

Alizadeh AH, Briaire R, Villagomez DAF, King WA, Koch TG. Cell identity, proliferation, and cytogenetic assessment of equine umbilical cord blood mesenchymal stromal cells. Submitted to *Stem Cell and Development* on May 26, 2018 (SCD-2018-0105).

Costa L, Dennis D, Hewson J, Koch TG. "Evaluation of cell function and viability of Molday ION™ Rhodamine B labeled equine cord blood mesenchymal stromal cells." Poster presentation by Lisa Costa at the National Veterinary Scholars Symposium 2017.

Dr. Brandon Lillie

HorseTalk (<https://www.horsetalk.co.nz/2018/04/12/ehv-link-equine-abortions/>) 12 April 2018.

Horse Canada. (<https://horse-canada.com/horse-news/research-university-guelph-targets-equine-virus/>), 12 April 2018.

Dr. Katrina Merkies

DuBois C, DeVries T, Haley DB, Lawlis P, Merkies K. 2018. Putting an On-Farm Welfare Assessment Tool into Practice in the Canadian Equine Industry – A Pilot Study. *J Eq Vet Sci* 63:35-40

HorseJournals (<https://www.horsejournals.com/popular/rescue-welfare/major-threats-equine-welfare-identified-research-study>). 29 March 2018.

DuBois C, Hambly-Odame H, Haley DB, Merkies K. 2017. An Exploration of Industry Expert Perception of Equine Welfare Using Vignettes. *Animals* 7:102-110
doi:10.3390/ani7120102

HorseTalk (<https://www.horsetalk.co.nz/2017/12/25/welfare-risk-horses-study/>) 25 Dec 2017.

HorseTalk. (<https://www.horsetalk.co.nz/2017/12/07/whinny-non-horsey-now-researchers/>) 7 Dec 2017.

Dr. Patrick Physick-Sheard

“TVEC Goes Global,” *Equine Guelph - Research Update*, Spring 2018.

Estimates of heritability of atrial fibrillation in the Standardbred racehorse. Kraus, M. P.W. Physick-Sheard, L.F. Brito, F.S. Schenkel. *Equine Veterinary Journal*, 2017. Vol 49 (6): 718-722.

Dr. Elizabeth Scholtz

Endometrial nitric oxide synthase activity in mares susceptible or resistant to persistent breeding-induced endometritis and the effect of a specific iNOS inhibitor in vitro. Khan, FA, Chenier, TS, Foster, RA, Hewson, J, Scholtz EL. *Reproduction in Domestic Animals*. 2018. Vol 53 (3): 718-724.

Dose-dependent inhibition of uterine contractility by nitric oxide: A potential mechanism underlying persistent breeding-induced endometritis in the mare. Khan, FA, Chenier,

TS, Murrant, CL, Foster, RA, Hewson, J, Scholtz EL. Theriogenology. Vol 90 (2017): 59-64.

The nitric oxide system in equine reproduction: current status and future directions. Journal of Equine Veterinary Science. Khan, F., Scholtz, E., & Chenier, T. (2015).

Dr. Jeff Thomason

“Health Studies with an Impact – Reducing Catastrophic Racing Injuries,” Equine Guelph – Research Update, Spring 2018.

Horse Talk (<https://www.horsetalk.co.nz/2017/08/03/shoe-equine-joint-pressure-loading/>) 3 Aug, 2017

Dr. Scott Weese

The Horse (<https://thehorse.com/18361/exploring-the-equine-microbiome>) 7 Aug 2017

Horse Canada (https://horse-canada.com/magazine_articles/miraculous-microbes/).
Sept 2017

The Horse (<https://thehorse.com/139445/quick-response-key-in-equine-antimicrobial-resistance-cases/>) 30 Jan 2018.

Appendix 7: Research Presentations:

Dr. Luis Arroyo

“Duodenitis Proximal-Jejunitis in Horses. What is the culprit? What is the evidence?”
OVC-Pathobiology, Departmental Seminar. November 7th, 2014.

“Investigation of Clostridium difficile toxins to experimentally induced duodenitis proximal jejunitis in horses”. Arroyo, L.G., Costa, M.C., Guest, B.B., Beaudoin-Kimble, M., Lillie, B., Weese, J.S. Eleventh Equine Colic Research Symposium, Trinity College Dublin, Dublin, Ireland. July 7th-9th, 2014. (Podium Presentation)

2013 World Equine Airway Symposium in Calgary, Canada. (Podium Presentation) Ex-vivo Pulmonary Arterial Perfusion System to model biomechanical and hemodynamic phenomena in equine pulmonary arteries

Dr. Janet Beeler-Marfisi

CORE platform & poster presentations – Quinn Marshall & Sylvie Becker – 2017

Dr. Keith Betteridge

Raeseide, J.I. and Christie, H.L. 2019. A ‘new’ estrogen metabolite: an epoxide of estrone as a sulfated steroid. So what! Southern Ontario Reproductive Biologists Ann Mtg June 2019

Bruce, P., Lillie, B. N., Hammermueller, J. D., Hayes, M. A., & Betteridge, K. J. 2017. The relationship of blood progesterone levels to endometrial gene expression in mares during spontaneous pregnancy loss. Summer CORE Symposium, Guelph, Canada-Ontario.

Bruce, P., Lillie, B. N., Hammermueller, J. D., Betteridge, K. J., & Hayes, M. A. 2016. Endometrial gene expression in normal and failing pregnancies in mares. Summer CORE Symposium, Guelph, Canada-Ontario.

Bruce, P., Lillie, B. N., Hammermueller, J. D., Hayes, M. A., & Betteridge, K. J. 2017. The relationship of blood progesterone levels to endometrial gene expression in mares during spontaneous pregnancy loss. Summer CORE Symposium, Guelph, Canada-Ontario.

Dr. Dorothee Bienzle

Invited to speak on equine asthma at Eastern Ontario Thoroughbred Association Annual Meeting (2019)

Invited speaker at Havemeyer Workshop on Equine Asthma, May 22 to 25, 2019, Custer National Park, SD

Presented a seminar on drug use detection and lung disease to officials at the Annual AGCO meeting in Niagara Falls on Feb. 17, 2017

Dr. Amy Greer

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. Using longitudinal questionnaire data to create networks of horse movements in Ontario, Canada. International Conference on Network Science (NetSci 2018) satellite symposium: Integration of Empirical data in network epidemiology. Paris, France. June 2018. Oral.

Spence, K., T. O'Sullivan, Z. Poljak, and A.L. Greer. A longitudinal study describing horse characteristics and movements during a competition season in Ontario, Canada in 2015. Conference for Research Workers in Animal Disease. Chicago, IL. December 2017. Oral.

Spence, K.L., T.L., O'Sullivan, Z. Poljak, and A.L. Greer. Using an agent-based model to describe the potential spread of equine influenza within a network of horses attending an equestrian show. Modeling in Animal Health Conference. Nantes, France. June 2017. Oral.

Spence, K.L., T.L. O'Sullivan, Z. Poljak, and A.L. Greer. Estimating potential disease spread at an equestrian show in Ontario, Canada using an agent-based network model. Conference for Research Workers in Animal Diseases. Chicago, IL. December 2016. Oral

Spence, K.L., T.L., O'Sullivan, Z. Poljak, and A.L. Greer. Dynamic network analysis of equine travel patterns during the 2015 competition season in Ontario, Canada. Canadian Association of Veterinary Epidemiology and Preventive Medicine. Calgary, AB. June 2017. Poster.

Spence, K.L., T.L. O'Sullivan, Z. Poljak, and A.L. Greer. Mathematical modeling of potential disease spread within a network of horses attending an equestrian event. OVC Graduate Student Symposium. Guelph, ON. November 2016.

Hai, B., K.S. *Spence, T.L. O'Sullivan, and A.L. Greer. Network analysis of Ontario Standardbred racetracks. Ontario Veterinary College, Summer CORE Program Research Day. Guelph, ON. August 2016.

Dr. Mark Hurtig

Sustained-release intra-articular medication. Ontario Equine Practitioners Equine Research Update December 15, 2016, OVC Lifetime Learning Centre.

Success and failure in translational medicine. *Frontiers in Biomedical Science*, University of Calgary, October 2016.

Dr. Thomas Koch

Costa L, Dennis D, Hewson J, Koch TG. "Evaluation of cell function and viability of Molday ION™ Rhodamine B labeled equine cord blood mesenchymal stromal cells." Poster presentation by Lisa Costa at the National Veterinary Scholars Symposium 2017.

Roberts E, Dang T, Lepage SIM, Alizadeh HA, Walsh T, Koch TG, Kallos MS. Improved Expansion of Equine Cord Blood Derived Mesenchymal Stromal Cells on Microcarriers in Stirred Suspension Bioreactors. *Journal of Biological Engineering J Biol Eng*. 2019 Mar 21;13:25. doi: 10.1186/s13036-019-0153-8. eCollection 2019.

Lepage SIM, Robson N, Carvajal D, Davis O, Gilmore H, Hooper A, Kamesan V, St. John S, Gelis P, Hurtig M, Koch TG. A look below cartilage: The role of the osteochondral unit in joint health and disease. *Tissue Eng Part B Rev*. 2019 Apr;25(2):114-125. doi: 10.1089/ten.TEB.2018.0122.

Lepage SIM, Sharma R, Dukoff D, Stalker L, LaMarre J, Koch TG. Gene expression profile is different between intact and enzymatically digested equine articular cartilage. *Cartilage*. 2019 Mar 6:1947603519833148. doi: 10.1177/1947603519833148.

Lepage SIM, Lee OJ, Koch TG. Equine cord blood mesenchymal stromal cells have greater differentiation and similar immunosuppressive potential to cord tissue mesenchymal stromal cells. *Stem Cells Dev*. 2019 Feb 1;28(3):227-237. doi: 10.1089/scd.2018.0135. Epub 2019 Jan 14.

Alizadeh AH, Briah R, Villagomez DAF, King WA, Koch TG. Cell identity, proliferation, and cytogenetic assessment of equine umbilical cord blood mesenchymal stromal cells. *Stem Cells Dev*. 2018 Nov 10. doi: 10.1089/scd.2018.0105.

Dr. Brandon Lillie

Botts, M. B., Cooper, C. J., Hammermueller, J. D., Arroyo, L. G., & LILLIE, B. N. (2017, August). Comparison of nasal and vaginal equine herpesvirus-1 shedding in Ontario broodmares. OVC Summer CORE Research Symposium, Guelph, Canada-Ontario. August.

Cooper, C. J., Arroyo, L. G., & LILLIE, B. N. (2018). EHV-1 vaginal shedding occurs in healthy broodmares. American Association of Equine Practitioners 64th Annual Convention. Abstract accepted for podium presentation. December.

Arroyo L. G. et al. (2018). Merck Animal Health-Ontario Equine Practitioners CE event. Orangeville, ON. January.

Mantel, K. Research targets equine herpesvirus. (2018) In Canada's Equine Guide 2018. Special Annual Issue of Canadian Horse Journal. January.

Mantel, K., Research targets equine virus. (2018). Equine Guelph - Equine News. January.

Dr. Katrina Merkies

Preliminary results of the conditioning phase of the trial were presented at the University of Guelph Animal Behaviour and Welfare Group seminar

DuBois C, Haley DB, DeVries TJ, Lawlis P, Robinson A, Merkies K. On-farm horse welfare assessment tool: value as an educational opportunity? Campbell Centre for the Study of Animal Welfare (CCSAW) Annual Research Symposium. Guelph, ON, May 2017

DuBois C, Haley DB, Lawlis P, DeVries T, Merkies K. Examining the usefulness of qualitative data to supplement an on-farm equine welfare assessment tool. UFAW International Symposium, Surrey, UK, June, 2017.

DuBois C, Haley D, Merkies K. Equine industry expert perception of critical issues in horse welfare in Canada. Campbell Centre for the Study of Animal Welfare (CCSAW) Annual Research Symposium. Guelph, ON, May 2016

Dr. Scott Weese

Data presented at OVC Practitioner Night, Dec 14, 2016, and the OAEP Annual Meeting, Feb 2017

Dr. Alex zur Linden

Research presented at ACVR Scientific Conference, October 2018, Fort Worth Texas. "Ultrasonographic evaluation of three-dimensional printed models of the equine cervical articular process joints." (A. Beaulieu, A. zur Linden, J. Phillips, G. Monteith, Judith Koenig, Luis Arroyo.

Appendix 8: Presentation and Talks Given by Equine Guelph

Presentations & Talks by Gayle Ecker

2018

June 17th The Programs of Equine Guelph: The Centre for the Horse Owner at the University of Guelph, Kentucky Trade Delegation, Guelph, Ontario

September 22nd Fire Prevention in the Stable, Table Display and presentation, Puslinch Fire Department Open House, Puslinch, Ontario

October 5th The Horse Health Check, Erin Fall Fair, Erin, Ontario

October 6th An Interactive Tour Through the Horse's Gut and Colic Prevention, Erin Fall Fair, Erin, Ontario

October 7th An Interactive Tour Through the Horse's Gut and Colic Prevention, Erin Fall Fair, Erin, Ontario

October 13th A Comparison of the Human-Horse Anatomy, Large Animal Emergency Rescue Training, Meaford Fire Department, Meaford, Ontario

October 20th The Horse Health Check: An Important Tool for the Horse Owner, Equine Guelph's Equine First Aid & Wound Management Workshop, Grand River Raceway, Elora, Ontario

October 20th The Horse Health Check: Practical Application and Hands-On, Equine Guelph's Equine First Aid & Wound Management Workshop, Grand River Raceway, Elora, Ontario

October 21st Needs of the Horse, Quality of Life and Euthanasia

2019

January 20th An Interactive Tour Through the Horse's Gut, a presentation made to Pony Club, Guelph, Ontario

March 27th Quality of Life Decisions, Erin Equine Seminar Series

April 23rd Effective online Equine Behaviour and Safety Education for members of the equine industry. Horse Industry Safety Summit, Kentucky

April 26th The Programs of Equine Guelph, Ontario Peruvian Horse Association tour, OVC, Guelph, Ontario

May 27-30th Equine Welfare Assessment, OSPCA Training, Guelph, Ontario

Presentations & Talks by Susan Raymond

2018

September 14th “Equine Guelph—Volunteer Opportunities”, Undergraduate Degree BBRM, University of Guelph, Guelph, ON

October 12th “Introduction to Large Animal Rescue Training”, as part of Large Animal Rescue Training Course, Meaford Fire Department, Meaford, ON

December 7th “Fire Prevention & Large Animal Rescue Resources & Training”, as part of South West Oxford Fire Department Fire Prevention Event, South West Oxford, ON

December 14th “Fire Prevention & Large Animal Rescue Resources & Training”, as part of Ontario Livestock and Poultry Council Meeting, Guelph, ON

2019

April 2nd “Fire Prevention and Emergency Preparedness”, Undergraduate Degree BBRM, University of Guelph, Guelph, ON

Events and Seminars

Over 19 talks and seminars were given at meetings, tradeshow and other equine events over the year to the equine industry (over 14 talks by Gayle Ecker, and 5 by Susan Raymond) on several educational topics and to promote the programs of Equine Guelph. Equine Guelph also attended 23 events and tradeshow with displays.

Appendix 9: Educational Offerings by Equine Guelph

Educational Courses offered by Equine Guelph and Open Learning and Educational Support

Advanced Equine Health through Nutrition (Instructor: Dr. Kathleen Crandell, PhD)

Advanced Equine Behaviour (Instructor: Lindsay Nakonechny, MSc & Kelly Hecker, MSc)

Advanced Functional Anatomy (Instructor Dr. Jeff Thomason, PhD)

Equine Behaviour (Instructor: Lindsay Nakonechny, MSc)

Equine Business Finance and Risk Management (Instructor: Nicole Velozo Sclama)

Equine Business Management (Instructors: Rachael Hunter & Christine Polhkamp)

Equine Event Management (Instructor: Tracy Dopko and Marjory Gaouette)

Equine Genetics (Instructor: Dr. Dianne Winkelman-Sim, PhD)

Equine Nutrition (Instructor: Dr. Kathleen Cavanagh, DVM)

Equine Welfare (Instructors: Cordy DuBois, MSc, Gayle Ecker, MSc)

Exercise Physiology (Instructor: Dr. Amanda Waller, PhD)

Functional Anatomy (Instructors: Dr. Jeff Thomason, PhD, Dr. Janet Douglas, PhD)

Global Perspectives in Equine Welfare (Instructor: Dr. Tamara Tadich, PhD, DVM)

Management of the Broodmare, Stallion and Foal (Instructor: Dr. Pat Meyers)

Health & Disease Prevention (Instructor: Dr. Ev Post)

Management of the Equine Environment (Instructors: Dr. Susan Raymond & Kathy Femes)

Marketing & Communications (Instructor: Tracy Dopko)

Stewardship of the Equine Environment (Instructor: Dr. Susan Raymond, PhD)

The Equine Industry (Instructor: Gayle Ecker, MSc)

Short Online course offered by Equine Guelph on TheHorsePortal.ca

Behaviour and Safety online Horse Portal Short Course (Instructor: Dr. Susan Raymond, PhD)

Behaviour and Safety online Horse Portal Short Course for Youth (Instructor: Jackie Zions)

Colic Prevention online Horse Portal Short Course (Instructor: Diane Gibbard, MSc)

Horse Care and Welfare online Horse Portal Short Course (Instructor: Gayle Ecker, MSc)

Sickness Prevention online Horse Portal Short Course (Instructor: Dr. Susan Raymond, PhD)

Appendix 10: Summary of the Equine Studies program

Diploma in Equine Studies

The diploma in equine studies requires 6 core and 4 elective courses. We are seeing an increase in students beginning the program with the intent to complete the Diploma in Equine Studies. In 2009 we awarded our first Diploma in Equine Studies. With 15 diplomas awarded in 2018/19, the total number of diplomas awarded has increased to 248.

Program Requirements:

Management of the Equine Environment	Core
Health & Disease Prevention	Core
Equine Nutrition	Core
Functional Anatomy	Core
Equine Behaviour	Core
Stewardship of the Equine Environment	Core

Students can continue with electives from the Equine Science specialty

Growth & Development	Elective
Exercise Physiology	Elective
Equine Genetics	Elective

and/or combine Equine Business Management courses

Equine Business Management	Elective
Marketing & Communications in the Equine Industry	Elective
Finance & Risk Management	Elective
The Equine Industry	Elective
Equine Journalism	Elective
Equine Event Management	Elective

and/or combine Equine Welfare courses

Equine Welfare	Elective
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Equine Science Certificate

The Equine Science Certificate requires 4 core and 2 elective courses. The first Equine Science Certificates were awarded in 2004/05 to 36 students. With 11 Equine Science Certificates awarded in 2018/19, to date 409 Equine Science Certificates have been awarded.

Program Requirements:

Management of the Equine Environment	Core
Health & Disease Prevention	Core
Equine Nutrition	Core
Functional Anatomy	Core

Growth & Development	Elective
Equine Behaviour	Elective
Exercise Physiology	Elective
Equine Genetics	Elective

Certificate in Equine Business Management

The Certificate in Equine Business Management requires 5 core and 1 elective course. With 4 Certificates in Equine Business Management awarded in 2018/19, to date 62 Equine Business Management Certificates have been awarded.

Program Requirements:

Management of the Equine Environment	Core
Equine Business Management	Core
Marketing & Communications in the Equine Industry	Core
Finance & Risk Management	Core
The Equine Industry	Core
Equine Journalism	Elective
Equine Event Management	Elective
Stewardship of the Equine Environment	Elective

Equine Welfare Certificate

The Equine Welfare Certificate requires 3 pre-requisite courses, 4 core and 2 elective courses. The Equine Welfare Certificate is a partnership between Equine Guelph, Campbell Centre for the Study of Animal Welfare and Open Learning and Educational Support. With 4 Certificates in Equine Welfare awarded in 2018/19, to date 14 Equine Welfare Certificates have been awarded.

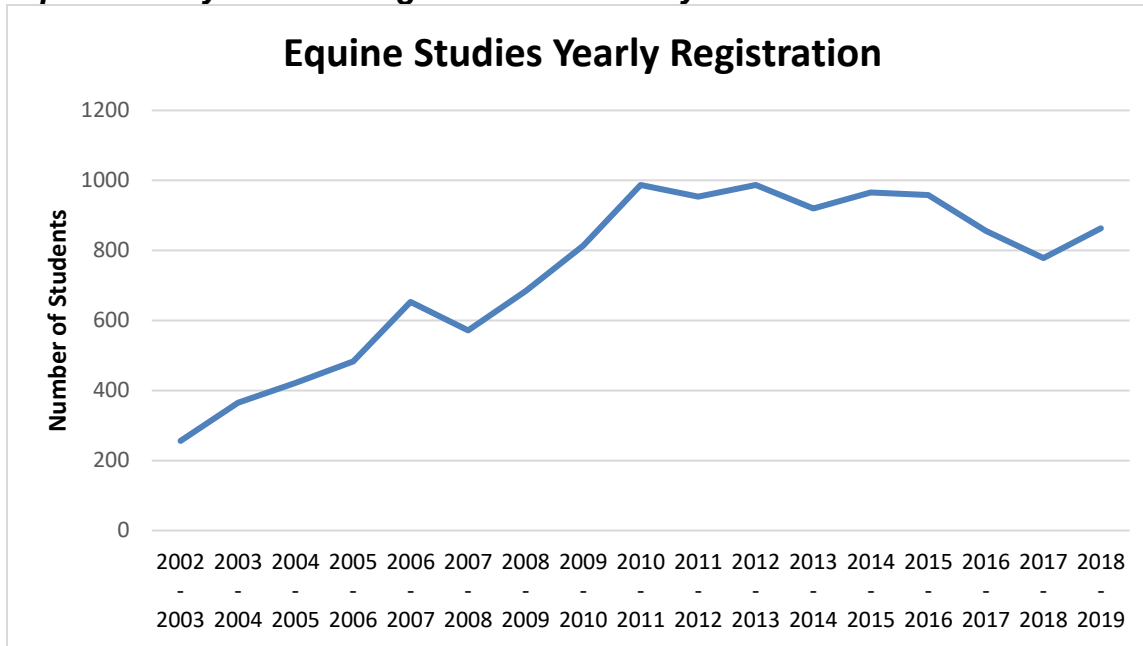
Program Requirements:

Management of the Equine Environment	Pre-requisite
Equine Behaviour	Pre-requisite
Course of your choice from Equine Science or Business	Pre-requisite
Equine Welfare	Core
Advanced Equine Behaviour	Core
Advanced Equine Health through Nutrition OR Equine Nutrition	Core
Global Perspectives in Animal and Equine Welfare	Core
Health & Disease Prevention	Elective
The Equine Industry	Elective
Equine Nutrition OR Advanced Equine Health Through Nutrition	Elective
Advanced Equine Anatomy	Elective

2018 - 2019 Student Registration Profile

Number of individual students	562
Total number of registrations	863

Equine Yearly Student Registration Summary



Yearly Student Registration All Programs and Courses

Year	# of reg	Projections	# of Students
2002 - 2003	256	180	
2003 - 2004	365	360	
2004 - 2005	422	480	
2005 - 2006	483	540	
2006 - 2007	653	760	
2007 - 2008	572	600	
2008 - 2009	684	710	
2009 - 2010	814	888	
2010 - 2011	987	1009	503
2011 - 2012	954	949	524
2012 - 2013	987	1125	487
2013 - 2014	920	1110	503
2014 - 2015	966	995	516
2015 - 2016	958	975	530
2016 - 2017	856	975	540
2017 - 2018	778	900	545
2018 - 2019	863	920	562

Student Numbers 2018-2019

Number of individual students	562
Total number of registrations	863

Enrollment Registrations by Course 2018-2019

Summer 2018

2200000	Management of the Equine Environment	33
2200002	Equine Behaviour	58
2200004	Equine Health and Disease Prevention	38
2200005	Equine Functional Anatomy	28
2200008	Equine Genetics	35
2200012	Equine Business Finance and Risk Management	24
2200013	Equine Welfare	22

Fall 2018

2200000	Management of the Equine Environment	47
2200002	Equine Behaviour	27
2200004	Equine Health and Disease Prevention	33
2200005	Equine Functional Anatomy	43
2200006	Equine Nutrition	43
2200010	Stewardship of the Equine Environment	42
2200015	Advanced Equine Behaviour	16
2210002	Equine Business Management	32

Winter 2019

2200000	Management of the Equine Environment	56
2200001	Equine Exercise Physiology	39
2200004	Equine Health and Disease Prevention	42
2200005	Equine Functional Anatomy	61
2200006	Equine Nutrition	58
2200009	Equine Event Management	25
2200011	The Equine Industry	26
2200017	Global Perspectives in Equine Welfare	17
	Marketing and Communications in the	18
2240000	Equine Industry	
Total		
Enrollments		863

Advanced Courses

The Advanced courses are included in the Equine Welfare Certificate

Course	Semester	# of reg
Advanced Behaviour	F18	16
	Total	16

Equine Welfare Certificate Courses

The Equine Welfare Certificate is a partnership between Equine Guelph, Campbell Centre for the Study of Animal Welfare and Open Learning and Educational Support.

Course	Semester	# of reg
Global Perspectives in Equine Welfare	W19	17
Equine Welfare	S18	22
	Total	39

Course Distribution

Number of courses offered each year

Year	Courses
2002 - 2003	4
2003 - 2004	6
2004 - 2005	8
2005 - 2006	9
2006 - 2007	13
2007 - 2008	10
2008 - 2009	12
2009 - 2010	16
2010 - 2011	19
2011 - 2012	21
2012 - 2013	24
2013 - 2014	21
2014 - 2015	22
2015 - 2016	22
2017 - 2018	21
2018 - 2019	26

Different individual courses available

Year	Courses
2002 - 2003	3
2003 - 2004	4
2004 - 2005	6
2005 - 2006	7
2006 - 2007	8
2007 - 2008	7
2008 - 2009	11
2009 - 2010	14
2010 - 2011	15
2011 - 2012	17
2012 - 2013	19
2013 - 2014	16
2014 - 2015	17
2015 - 2016	17
2017 - 2018	16
2018 - 2019	17

Where are our students coming from?

Canadian Students

Student numbers	
AB	58
BC	70
MB	13
NB	10
NL	4
NS	11
NU	0
NT	2
ON	208
PE	2
PQ	32
SK	18
YT	0
TOTAL	428

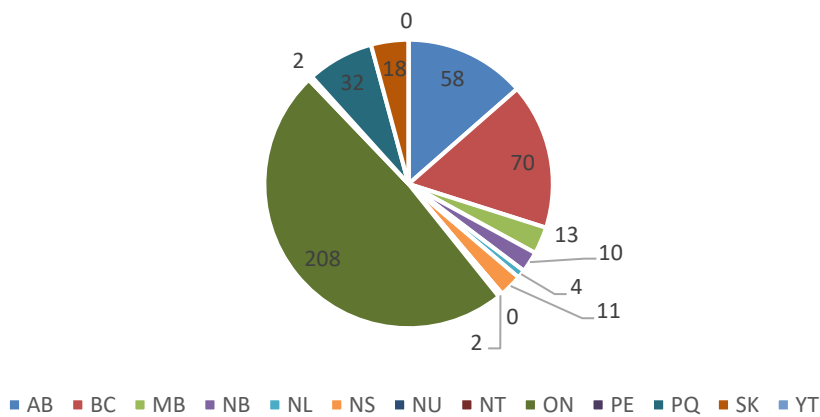
International Students

Student numbers	
Australia	4
Austria	1
Chile	1
Colombia	3
Finland	2
France	1
Switzerland	2
Venezuela	1
India	2
Netherlands	1
Denmark	2
Kazakhstan	1
Mexico	2
New Zealand	1
Kenya	1
Qatar	2
Saudi Arabia	1
South Africa	1
Spain	1
Sweden	2
UAE	1
Luxembourg	1
UK	6
TOTAL	40

US Students

Student Numbers	
AL	2
CA	10
CO	6
FL	4
GA	1
IL	4
IN	2
IA	1
KY	1
ME	3
MD	5
MA	5
MI	3
MN	2
MS	1
MO	2
MT	2
NY	3
PA	11
TN	1
TX	7
VT	2
VA	4
WA	9
WI	3
TOTAL	94

Canadian Student Distribution by Province



Year to Year Comparison by student geographic location

	2009	2010	2011	2012	2013	2014	2015	2017	2018
CAN	457	482	451	459	442	461	451	428	428
US	32	27	19	31	54	38	44	40	40
INT	14	15	17	13	20	23	45	80	94
	503	524	487	503	516	522	540	548	562

Year by Year Comparison of the geographic location of Canadian Students

	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19
AB	47	39	49	54	48	49	48	61	50	58
BC	38	47	48	64	63	66	70	60	67	70
MB	7	10	13	10	4	7	14	10	11	13
NB	5	4	8	7	5	4	6	9	8	10
NF	2	2	2	3	4	4	7	4	6	4
NS	5	11	10	15	18	16	13	7	11	11
NU	0	0	1	0	0	0	0	0	0	0
NT	1	0	0	0	3	3	1	0	2	2
ON	313	338	296	275	259	275	249	229	223	208
PI	2	0	0	4	3	1	2	0	2	2
PQ	27	19	18	12	21	20	22	29	30	32
SK	5	10	6	14	14	16	17	15	13	18
YT	5	2	0	1	0	0	2	0	2	0
	457	482	451	459	442	461	451	424	425	428

Graduates of our Certificates and Diploma Program of Studies

	ESC	CEBM	DipES	WEL
2004/05	36	n/a	n/a	
2005/06	27	n/a	n/a	
2006/07	32	n/a	n/a	
2007/08	25	n/a	n/a	
2008/09	38	n/a	n/a	
2009/10	20	n/a	22	
2010/11	30	2	13	
2011/12	30	6	23	
2012/13	28	7	29	
2013/14	19	9	25	
2014/2015	21	6	20	
2015/2106	50	14	38	3
2016/2017	27	6	34	3
2017-2018	15	8	29	4
2018-2019	20	10	27	8
	418	68	260	18

ESC - Equine Science Certificate	
CEBM - Certificate in Equine Business Management	
DipES - Equine Studies Diploma	
WEL - Certificate in Equine Welfare	

The Horse Portal 2018 – 2019

Course Offering Overview 2018-2019

Course	Enrollment Total	Enrollment PTSO	# Paid Students	% Paid Enrollment	Revenue
Horse Behaviour and Safety (Youth) – S18	17	5	13	76%	\$562.50
Horse Care and Welfare – F18	31	21	29	94%	\$2546
Sickness Prevention in Horses – F18	24	13	13	54%	\$1020
Gut Health and Colic Prevention – F18	67	47	28	42%	\$2378
Horse Behaviour and Safety – W19	49	30	34	69%	\$3030.50
Horse Behaviour and Safety (Youth) – W19	16	7	10	63%	\$409.50
Equine First Aid – W19*	250	149	97	39%	\$7650
Gut Health and Colic Prevention (Exclusive for Racing) – W19**	95	0	0	0	\$0
Fire and Emergency Preparedness – W19*	132	61	21	16%	\$1683
Total	681	333	245	50%	\$19,279.50

* Free coupons issued to Ontario Equestrian members for these courses as part of GRAS and CAP grants.

** Free course offered to Ontario Racing as part of AGCO pilot project.

Course Enrollment Stats (w/o pilot program & racing)

Year	Total Enrollment	Federation Enrollment	% Federation Enrollment
2016-2017	58	35	60%
2017-2018	434	207	48%
2018-2019	681	333	49%

Provincial Breakdown

PTSO	Registered Students – 2018-19
Alberta (AEF)	20
British Columbia (HCBC)	26
Manitoba (MCH)	6
New Brunswick (NBEA)	15
Newfoundland (NEA)	1
Nova Scotia (NSEF)	15
Ontario (OE)	223*
Prince Edward Island (IHC)	5
Saskatchewan (SHF)	11
Yukon (EAY)	11
Totals	333
% of Registrations:	49%

* Ontario Equestrian members received free coupon offers to three 2018-19 courses as part of GRAS and CAP grants.

Appendix 11: Equine Guelph's Promotional Events

Another busy year kept the Equine Guelph staff on the road, taking the message of education, lifelong learning, career pathways, safety and horse welfare out to the equine community in Ontario and beyond!

Displays and Events for Equine Guelph programs

Events Calendar – 2018

Summer Semester 12-week online courses begin - May 07

Equine Guelph at Youth Equine Event, Erin District High School - May 14

EquiMania! at Mohawk Racetrack – May 19

EquiMania! at Brooklin Spring Fair - May 31 - June 03

Horse Behaviour & Safety Online Course for Youth - July 23 - August 10

EquiMania! Horse Capades - July 28 - August 16

EquiMania! CNE - August 17 - September 03

EquiMania! Minnesota State Fair - August 23 -September 03

Events Calendar – 2019

Horse Behaviour & Safety: Winter '19 - January 21 - February 08

Equine First Aid: Winter '19 - February 25 – March 04

Equine Emergency First Aid Workshop, Erin, ON - March 27

EquiMania! at Can-Am All Breed Equine Expo, Markham, ON - April 05-07

Fire & Emergency Preparedness online short course - April 08 – 15

Barn Fire Safety Seminar, Mohawk Raceway, Campbellville, ON – April 10

Summer semester 12-week online courses begin - May 06

EquiMania! at Woodbine Mohawk Park Fireworks & Family Fun Night - May 18

EquiMania! at Brooklin Fair, Brooklin, ON - May 30 -June 02

EquiMania! at Paris Fairground with Pony Club - July 10

EquiMania! at Horse Capades - July 27 - August 15

EquiMania! at Canadian National Exhibition Toronto, ON - August 16 – September 02

15th Annual (ISES) Conference, University of Guelph - August 19 - 21

EquiMania! at Minnesota State Fair St. Paul, MN - August 22 - September 02

EquiMania! at Royal Agricultural Winter Fair Toronto, ON - November 01 - 11

Appendix 12: Media Coverage Summary

Topic	Articles (May 1, 2018-April 30,2019)
Research	59
Education	87
Special Projects	115
EquiMania!	6

Coverage of Special Events and Programs

Topic	Articles (May 1, 2018- April 30, 2019)
The Horse Portal	28
Fire Safety	25
Biosecurity	19
Large Animal Emergency Rescue	16
Nutrition	10
Mare & Foal Care Tool	9
Equine Welfare	8
Youth Literary Derby	8
Colic	7
Blanketing	7
Ontario Equestrian Donates	7
Tuition Awards	7
Gut Health	6
Thyroxine Study	6
International Society for Equitation Science Conference Guelph 2019	5
Ester the Wonder Pig Fundraiser	5

Total Features: 267

Equine Guelph's media pick up is down 25.84% from last year, however 2017-2018 was an especially high year, and our current numbers are on par with previous years. There

was a 12.18% increase over our 2016-2017 year. Additionally, there was an uptake in a number of high quality industry news distributors. The discerning audience currently following Equine Guelph's releases and re-publishing them include: national and provincial equine associations, veterinary practices, equestrian media outlets, racing associations, feed companies, insurance companies, newspaper companies, stable owners and industry professionals. The engagement of this audience results in further reach to the industry in Ontario and beyond. 100% of the media releases sent out by Equine Guelph were picked up for further distribution. Equine Guelph's releases are distributed to a media list of over 160 equine media outlets!

Equine Guelph continues to maintain a presence on many social media platforms including Facebook and Twitter. Followers include many equine media associations and: Woodbine Entertainment Group, Spruce Meadows, Canadian Horse Racing News, AGCO Racing, Ontario Racing, many raceways, racing fans, many Canadian and Ontario Fire Departments, horse trainers, therapeutic riding academies, breed organizations, saddle fitters, rescue and rehoming facilities, equine trade shows, EquiMed, the Royal Agricultural Winter Fair, Dutch Masters, Omega Alpha, American Farriers Journal, Tack shops, Veterinary Daily, AAEP American Association of Equine Practitioners, OAVT Ontario Association of Veterinary Technicians, The College of Veterinarians of Ontario, Ontario Veterinary Medical Association and Canadian Vet Medical Association. Equine Guelph sent out 282 tweets garnering 217,667 impressions. Equine Guelph made 364 posts on Facebook and those posts resulted in a collective reach of 191,886.

Early 2017 Equine Guelph launched The Horse Portal, partnering with 10 provincial equestrian federations and Equestrian Canada (Canada's national equine association). Articles and news pertaining to The Horse Portal continue to be very popular and were the top pick-up by media outlets this year, once again.

Many links to pages of Equine Guelph's website continue to be developed by a variety of industry groups including educational websites, provincial equine associations and veterinary pages, student graduates of our program and many of our sponsors. Equine Guelph's membership with American Horse Publications (AHP) results in a much wider audience as 2 media articles per month are distributed to a broad list of U.S. equine publications.

Media Coverage List

18-May	HarnessLink.com	Racing Investigators Value Rescue Training
18-May	HarnessLink.com	Delayed Shedding? Laminitis?
18-May	Race Line	Equine Guelph Summer Courses
18-May	Puslinch Pioneer	Saving Animals During Emergency Situations
18-May	HorseJournals.com	11 Reasons for Not Wearing a Riding Helmet
18-May	HorseTalk.co.nz	The Heart of the Matter: What Causes Sudden Death in Racehorses?
18-May	Cbc.ca	Intense Exercise Linked to Hundreds of Deaths of Ontario Racehorses
18-May	ScienceDaily.com	Racing Can be Fatal to horses
18-May	Horse Sport	Growing Together or Diminishing Apart
18-May	Horse Sport	Hands-On Horse Model for OVC
18-May	StandardbredCanada.ca	Additional Prizes for Literary Derby
18-May	InsideHalton.com	Woodbine Mohawk Park Celebrates Victoria Day with Family Fun & Fireworks
18-May	HorseTalk.co.nz	Researchers Examine Inheritance Behind Heart Condition in Standardbreds
18-May	MNStateFair.org	EquiMania!
18-May	Horse-Canada.com	Esther the Wonder Pig Helps Raise Funds for Large Animal CT Scanner
18-May	BrantfordExpositor.ca	Horses Subject of Writing Contest
18-May	HorseNation.com	Traveling Horse Checklist
18-May	HorseTalk.co.nz	Metabolic Issues in Horses: Can You Tell PPID from EMS?
18-May	EquiMed.com	Delayed Shedding? Laminitis? - Is Your Senior Horse Challenged with Metabolic Issues?
18-May	The Rider	What is your Risk of Colic this Spring? Use the Colic Risk Rater
18-May	HorseJournals.com	Esther the Wonder Pig Helps Raise Funds for Large Animal CT Scanner

18-Jun	MN Extension Horse Newsletter	Equine Guelph's Biosecurity Risk Calculator
18-Jun	Equestrian.ca	Large Animal CT Scanner Fundraising is Being Helped by Esther the Wonder Pig!
18-Jun	OVC Bulletin	Pilot Study Looks at On-Farm Welfare Assessment Tool for Equines in Canada
18-Jun	The Rider	Equine Guelph Donates Courses for Youth Literary Derby Winners
18-Jun	The Rider	Large Animal Rescue Course in Demand
18-Jun	The Rider	Delayed Shedding? Laminitis? -Is Your Senior Horse Challenged with a Metabolic Issue?
18-Jun	The Rider	Large Animal CT Scanner Fundraising is Being helped by Esther the Wonder Pig!
18-Jun	The Rider	Teaming up to Go with the Gut
18-Jun	CosaOnline.com	On-Farm Welfare Assessment Tool Nears
18-Jun	HorseJournals.com	Pilot Study Looks at On-Farm Welfare Assessment Tool for Equines in Canada
18-Jun	HorseNation.com	Horse Travelling Checklist
18-Jun	HorseTalk.co.nz	Free Online Colic Tool Helps Tackle Horses' Biggest Threat
18-Jul	TheRider	Totally Cool Summer School Online for Horse Lovers
18-Jul	TheRider	Pilot Study looks at On-Farm Welfare Assessment Tool for Equines in Canada
18-Jul	TheRider	Wood-Chewing in Horses: Examine the Diet for Cause
18-Jul	TheRider	Airway Disease in Racehorses More Prevalent Than Previously Thought, Study Reveals
18-Jul	Horse-Canada.com	What Are Macronutrients?
18-Jul	CosaOnline.com	Equine Guelph Health Flash
18-Jul	HorseNation.com	Equine Dentistry
18-Jul	Gizmodo.com	Horses Make this Funny Sound When Happy (Dr. Merckies mentioned)
18-Jul	QROOI	Equine First Aid Workshop - Free for 40 Participants!
18-Jul	Horse-Canada.com	40 Free Spots in Ontario Equine First Aid Workshop
18-Jul	CosaOnline.com	Equine Studies Online

18-Jul	OntarioRacing.com	Totally Cool Summer School Online for Horse Lovers
18-Aug	HarnessLink.com	Large Animal Rescue Course in Demand
18-Aug	Horse-Canada.com	Equine Guelph Studies the Effects of Soaking and Steaming Hay
18-Aug	Horse-Canada.com	Ontario's Erin Fair Announces Horse Heritage Hall of Fame
18-Aug	Horse-Canada.com	Ad for Equine Studies Online
18-Aug	Horse-Canada.com	Ontario Large Animal Rescue Awareness Course
18-Aug	HorseJournals.com	Ontario Equestrian Contributes \$28,000 Toward Gut Research
18-Aug	HorseTalk.co.nz	Scooping the Poop to Reveal the Secrets of the Equine Gut
18-Aug	HorseTalk.co.nz	Hay, Hay: Horses Prefer Steamed or Dry to Soaked, Study Finds
18-Aug	HorseNation.com	Parasite Control with Dr. Peregrine
18-Aug	QROOI enews	Large Animal Rescue Awareness/Operational Training
18-Aug	EquineScienceupdate.blogspot.com	Advances in Heart Treatment
18-Aug	Horse-Canada.com	Horse Canada Aug 28- E-News - Equine Studies Online Ad
18-Aug	TheHorse.com	Using Computer Simulation to Prevent Equine Disease
18-Aug	HorseJournals.com	Large Animal Rescue Awareness Training Open for All
18-Aug	AmericanHorsePubs.org	15 Years of Leading the Herd in Equine Studies Online
18-Aug	Grand Prix HS	Gayle Ecker, ou les bienfaits du mineral sur l'animal
18-Aug	The Rider	American Society of Animal Science honours U of G researchers
18-Aug	The Rider	Equine First Aid Workshop-Free for 40 Participants!
18-Aug	CosaOnline.com	Large Animal Rescue Training in Oct.
18-Aug	HarnessLink.com	Horse Care and Welfare short online Course
18-Sep	Canadian Horse Journal	Rugging Up: The Wrap on Blanketing
18-Sep	Canadian Horse Journal	Caring For Tack & Riding Equipment

18-Sep	StandardbredCanada.ca	Steamed, Soaked and Dry Hay
18-Sep	bulletin.ovc.uoguelph.ca	Readers Digest New Chapter on Gut Bugs
18-Sep	Horse-Canada.com	Check out the Equine Industry Symposium Discussion Group
18-Sep	Bulletin.ovc.uoguelph.ca	Large Animal Rescue Course Open for Horse Owners, Vets and More
18-Sep	Bulletin.ovc.uoguelph.ca	Launch of the Equine Industry Symposium discussion group on theHorsePortal.ca
18-Sep	HarnessLink.com	Equine Guelph Launches Talk Group
18-Sep	Horse-Canada.com	A New and Improved Zelador (OVC success story)
18-Sep	YouTube	Dr. Trout Thank you
18-Sep	OLPC Newsletter	Large Animal Rescue Course October 2018
18-Sep	TheHorse.com	Study: Equestrians' Views Vary on What Constitutes Good, Bad Horse Welfare
18-Sep	ThePeterboroughExaminer.com	Kawartha Downs Naming Race in Bowmanville Schoolgirl's Honour Saturday
18-Sep	Horse-Canada.com	Sign Up for a Sickness Prevention in Horses Online Course
18-Sep	HarnessLink.com	Savvy Online Studies Support Sickness Prevention
18-Sep	The Rider	Horse Care and Welfare Short Online Course at The Horse Portal
18-Sep	The Rider	Ontario Equestrian Contributes Toward Gains for Gut Research
18-Sep	The Rider	Dr. James Raeside Honoured with Lifetime Achievement Award in Equine Reproduction
18-Sep	The Rider	Equine Guelph Funded Research Investigates Steamed, Soaked and Dry Hay in Ontario
18-Sep	The Rider	15 Years of Leading the Herd in Equine Studies Online Don't Miss out on Tuition Awards!
18-Sep	CosaOnline.com	Horse Care and Welfare Short Online Course Starts on Monday
18-Sep	CosaOnline.com	Large Animal Rescue Operational Rescue Course
18-Sep	CosaOnline.com	Don't Miss out on Tuition Awards!
18-Sep	CosaOnline.com	Steamed, Soaked and Dry Hay
18-Sep	HorseNation.com	Mud Management

18-Sep	InsideHalton.com	Now Cancer Free, Esther the Wonder Pig Sheds Light on Issues with CFIA Chemo Regulations
18-Sep	HorseCouncil.org.au	When the Rider is Hot, the Horse is Hot
18-Oct	HBPA.on.ca	Equine Guelph Announces Fire & Emergency Preparedness Program
18-Oct	StandardbredCanada.ca	Youth Literary Derby Crowns Winners
18-Oct	Horse-Canada.com	2018 Ontario Youth Literary Derby Winners
18-Oct	Horse-Canada.com	Does Your Horse Need A Winter Blanket?
18-Oct	Horse-Canada.com	Equine Industry Symposium Will Focus on Horse Welfare
18-Oct	HarnessLink.com	Community Wide Discussion at Equine Symposium
18-Oct	CTV News Barrie	Large Animal Emergency Rescue Training
18-Oct	Equestrian Canada	How Big is Your Horse's Fall and Winter Wardrobe? - Blanketing Decisions
18-Oct	Equestrian Canada	Registration is Open for Equine Guelph Winter Courses
18-Oct	Race Line	Equine Guelph Tuition Awards for Ontario Racing Industry Members
18-Oct	Ontario Farmer	When You Find a Passion, Why Do Anything Else?
18-Oct	CosaOnline.com	Large Animal Emergency Rescue Training Returns to Meaford
18-Oct	CosaOnline.com	EquiMania! Lucky 13 at The Royal
18-Oct	HorseJournals.com	EquiMania! Lucky 13 at The Royal Winter Fair
18-Oct	CosaOnline.com	Equine Symposium Discussion Nears
18-Oct	CosaOnline.com	Equine Guelph Announces Fire & Emergency Preparedness Program
18-Oct	StandardbredCanada.ca	Large Animal Rescue Training at Meaford
18-Oct	AmericanVeterinarian.com	The Equine Referral Experience
18-Nov	The Rider	Youth Literary Derby Crowns Winners
18-Nov	The Rider	How Big is Your Horse's Fall and Winter Wardrobe? - Blanketing Decision
18-Nov	The Rider	People are Hungry for More Information on Guts

18-Nov	The Rider	Equine Guelph Announces Fire & Emergency Preparedness Program
18-Nov	OVC Bulletin	Guelph PhD Student Takes on Leaky Gut in Horses
18-Nov	Horse-Canada.ca	How to Prevent Future Panic With a Fire Safety Site Visit
18-Nov	Horse-Canada.ca	Guelph Student to Study Leaky Gut in Horses
18-Nov	HorseTalk.co.nz	Nutrition and Leaky Gut in Horses Under Investigation
18-Nov	HorseJournals.com	Hidden Fire Hazards in Your Horse Barn
18-Nov	HorseJournals.com	Equine Industry Symposium 2018
18-Nov	HorseJournals.com	Caring for Tack and Riding Equipment
18-Nov	HorseJournals.com	The Scoop on Supplements
18-Nov	OAC	Pursue Your Passion (OAC flyer)
18-Nov	QROOI	Free Equine First Aid Courses to Horse Racing Industry
18-Nov	CosaOnline.com	Free Online Courses for Trainers and Grooms!
18-Nov	CosaOnline.com	Barn Fire Prevention Tool
18-Nov	HorseJournals.com	Wildfire! Flood! Earthquake!
18-Nov	HorseJournals.com	Sweet Itch...Flaxseed Can Help
18-Nov	StandardbredCanada.ca	Painless Fire Prevention Procedure
18-Nov	HorseJournals.com	The Wrap on Horse Blankets
18-Nov	HorseJournals.com	Footing the Riding Arena
18-Nov	Canadian Horse Journal	Equine Industry Symposium 2018: Focus on Professional and Standards
18-Nov	Canadian Horse Journal	Equine Guelph Ad
18-Dec	WoodstockSentinelReview.com	South-West Firefighters Serious About Barn Fire Prevention
18-Dec	London.ctvnews.ca	Video on South-West Firefighters Barn Fire Prevention Event
18-Dec	Bulletin.OVC.uoguelph.ca	South-West Firefighters Serious About Barn Fire Prevention

18-Dec	Bulletin.OVC.uoguelph.ca	Ont. Groups Host Barn Fire Prevention Event
18-Dec	Bulletin.OVC.uoguelph.ca	Ontario Equestrian Donates Over \$30,000 to Research
18-Dec	HeartFM.ca	Keeping Barns Fire Free
18-Dec	Farms.com	Ont. Groups Host Barn Fire Prevention Event
18-Dec	Flamborough Revie.com	Millgrove's Kyla Civiero Garners Attention in Youth Literary Derby
18-Dec	EC Enews	To Rug or Not to Rug
18-Dec	EC Insider	Don't Miss Out on Equine Guelph Online Winter Courses
18-Dec	HorseAndHound.co.uk	Thousands Donated to Equine Research After Member Body Scraps Plastic Cards
18-Dec	Horsetalk.co.nz	Ditching the Plastic Leads to \$30,000 Cheque for Equine Research
18-Dec	The Rider	Fire Safety Site Visit: Painless Procedure to Prevent Future Panic
18-Dec	The Rider	Free Equine First Aid Courses to Horse Racing Industry (GRAS grant)
18-Dec	The Rider	The Importance of Standards and Professionalism in the Equine Industry
18-Dec	The Rider	Guelph PhD Student Takes on Leaky Gut in Horses
18-Dec	Holistic Horse	Gesundheit! Savvy Online Studies Support Sickness Prevention in Horses
19-Jan	News.ontario.ca/omafra	Ontario Supporting Fire Safety on Farms
19-Jan	SystemFence.com	Tack & Clothing Inventory Reduction Sale (HEALTHflash)
19-Jan	OntarioEquestrian.ca	Ontario Equestrian Donates over \$30,000 to Research
19-Jan	Bulletin.OVC.uoguelph.ca	Ontario Equestrian Donates over \$30,000 to Research
19-Jan	EquiMed.com	Equine Guelph Horse Behaviour and Safety Online Course Coming Soon
19-Jan	Bulletin.OVC.uoguelph.ca	Behaviour & Safety Q&A
19-Jan	Equine Science update	ISES 15th Annual Conference Guelph, Ontario, Canada
19-Jan	Horse-Canada.com	International Society for Equitation Science Conference Coming to Ontario
19-Jan	HorseJournals.com	Equitation Science Conference 2019 to be Held at University of Guelph

19-Jan	HorseJournals.com	5 Great Horse Careers
19-Jan	HorseJournals.com	The Wrap on Horse Blankets
19-Jan	CosaOnline.com	Behaviour & Safety Q&A
19-Jan	StandardbredCanada.ca	Equine Career Night Announced
19-Jan	HarnessLink.com	Bringing Science to the Stable
19-Jan	HarnessLink.com	Equine Guelph HEALTHflash Program
19-Jan	2019 Canadian Horse Annual	Soaking or Steaming Hay
19-Jan	2019 Canadian Horse Annual	Artificial Aids Study
19-Jan	2019 Canadian Horse Annual	Loss of Slots at Racetracks Impacts Research
19-Jan	2019 Canadian Horse Annual	Equine Guelph Ad
19-Jan	HorseJournals.com	How to Test your Horse for Dehydration
19-Feb	QROOI	New Opportunities Online Training Pilot Project for the Ontario Horse Racing Industry Announced
19-Feb	Standardbred Canada	Equine Guelph Seeks Ambassadors
19-Feb	QROOI	Equine Guelph Launches Free Online Mare & Foal Care Tool
19-Feb	QROOI	Free Equine First Aid Courses to Horse Racing Industry
19-Feb	AmericanHorsePubs.org	Equine Guelph Research Update
19-Feb	AllAboutHorses.com	Two Students Win Equine Guelph Online Tuition Awards
19-Feb	Horse-Canada.com	Two Students Win Equine Guelph Online Tuition Awards
19-Feb	HorseJournals.com	Online Training Pilot Project for the Ontario Horse Racing Industry Announced
19-Feb	CosaOnline.com	Free Online Mare and Foal Care Tool
19-Feb	CosaOnline.com	Equine First Aid Online Short Course
19-Feb	CosaOnline.com	Free Courses for Ontario Horse People
19-Feb	StandardbredCanada.ca	Equine Guelph Award Winners Unveiled

19-Feb	StandardbredCanada.ca	Free Courses for Ontario Horse People
19-Feb	HorseCanada.com	Equine Guelph Offers Free Online Courses for Ontario Horse Racing Industry
19-Feb	Trot	Equine Guelph Full Page Ad
19-Feb	Canada's Equine Guide 2019	Intense Exercise Can be Hazardous to Horses
19-Feb	Canada's Equine Guide 2019	Winds of Change
19-Feb	Canada's Equine Guide 2019	Winds of Change
19-Feb	HorseJournals.com	Air Quality in the Horse Barn
19-Feb	Mantiobahorsecouncil.ca	Horse Portal Courses 2019
19-Feb	HBPA.on.ca	Industry Ambassadors Opportunity
19-Feb	HBPA.on.ca	New Opportunities-Online Training Pilot Project for the Ontario Horse Racing Industry Announced
19-Feb	HBPA.on.ca	Free Online Courses for Thoroughbred Racing Industry This Winter
19-Feb	OHHA.ca	Equine Guelph Looking to Hire Industry Ambassador
19-Feb	OHHA.ca	Free Online Courses for Thoroughbred Racing Industry
19-Feb	OHHA.ca	Equine Guelph Launches Free Online Mare & Foal Care Tool
19-Feb	OntarioRacing.com	Equine Guelph Research Update/New Online Course Information
19-Feb	OntarioRacing.com	Racing Industry Scholarship Winners Announced
19-Feb	OntarioRacing.com	Equine Guelph Launches Free Online Mare & Foal Care Tool
19-Feb	Kentucky Performance Products	Mare & Foal Care Tool
19-Feb	PFERA	Equine Guelph: Mare and Foal Tool
19-Feb	Paulick Report	Equine Guelph Launches Free Online Mare & Foal Care Tool
19-Feb	Horsetalk.co.nz	Free Breeding and Foaling Help Launches Online
19-Feb	HolisticHorse.Com	Equine Guelph Launches Free Online Mare & Foal Care Tool
19-Mar	CosaOnline.com	Last Call to Trainers and Grooms for Free Online Course

19-Mar	StandardbredCanada.ca	Last Call for Free Online Course
19-Mar	AGCO.ca	Ontario's Horse Racing Industry to Benefit from Racing-Specific Online Courses
19-Mar	Race Line Magazine	Ontario's Horse Racing Industry to Benefit from Racing-Specific Online Courses
19-Mar	AGCO.ca	Safety First: Information & Resources Help Prevent Barn Fires
19-Mar	Race Line Magazine	Safety First: Information & Resources Help Prevent Barn Fires
19-Mar	Harnessracingupdate.com	A Healthy Horse is a Top Performer
19-Mar	System Equine	Spring Sale and Seminars Announcement (Winter HF link)
19-Mar	Horse-Canada.com	Free Online Gut Health for Racehorses Course
19-Mar	TheHorse.com	Finding the Cause of Chronic Diarrhea in Horses: Be Methodical
19-Mar	HBPA.on.ca	Equine Guelph March E-News
19-Mar	StandardbredCanada.ca	Reminder: Free Gut Health Course
19-Mar	HarnessLink.com	Free Gut Health Course Exclusive to Racing
19-Mar	PaulickReport.com	Researchers Show How Equine Diseases Can Spread Without Nose-To-Nose Contact
19-Mar	Horse-Canada.com	Study Reveals Thyroxine Detrimental to Racehorse Performance & Health
19-Mar	HBPA.com	Study Reveals Thyroxine Detrimental to Racehorse Performance
19-Mar	CosaOnline.com	Make a Point to Discuss Vaccinations with your Vet to Guard Against Influenza and Disease
19-Mar	CosaOnline.com	Reminder: Free Gut Health Course
19-Mar	Canadian Thoroughbred	Equine Guelph Full Page Ad
19-Mar	Canadian Thoroughbred	Airway Disease in Racehorses More Prevalent Than Previously Thought, Study Reveals
19-Mar	Canadian Thoroughbred	Spring Training
19-Mar	Trot	Equine Guelph Full Page Ad
19-Mar	HorseJournals.com	Research on Perceptions and Use of Horse Training Equipment
19-Mar	HorseJournals.com	How to Protect your Horse from Hazards on the Farm

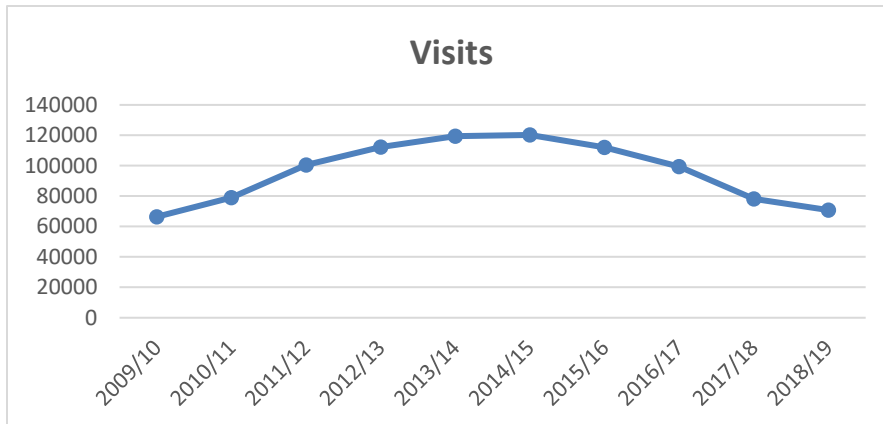
19-Mar	Horse-Canada.com	Introducing the Guelph Equine Public Policy Group
19-Mar	Horsetalk.co.nz	Canada Makes Push for Equine Voice to be Heard in Government
19-Mar	Horsetalk.co.nz	Yearlings Revealed as Easy Targets for Equine Rhinitis A Virus
19-Mar	HarnessLink.com	Study Reveals Thyroxine Detrimental to Racehorse Performance
19-Mar	OVC bulletin	Study Reveals Thyroxine Detrimental to Racehorse Performance
19-Mar	CosaOnline.com	Study Reveals Thyroxine Detrimental to Racehorse Performance
19-Mar	HarnessLink.com	A Touching Story of Casualty Turned Crusader
19-Mar	Horsetalk.co.nz	Study Reveals the Dangers of Thyroid Supplements in Fit Horses
19-Mar	Horse and Country magazine (Erin, ON)	Fork's Recovery from Fire
19-Mar	CosaOnline.com	Sign up for Free Fire & Emergency Preparedness Online Short Course
19-Mar	StandardbredCanada.ca	Scott Reflects on First Line Fire
19-Mar	HarnessLink.com	Make a Point to Discuss Vaccinations
19-Mar	StandardbredCanada.ca	Ontario Animal Health Network Update (OVC/U of G)
19-Mar	HarnessLink.com	Bringing Science to the Stable
19-Mar	HarnessLink.com	Strong attendance at fire prevention presentation
19-Apr	StandardbredCanada.ca	Last Call: Free Online Emergency Course
19-Apr	OFLSE.com	Barn Fire Safety
19-Apr	OVC bulletin	EquiMania! Only for Youths? Think Again!
19-Apr	OVC bulletin	Horse Owners in Strong Attendance at Fire Prevention Education Opportunities
19-Apr	OVC bulletin	Equine Laminitis Expert Gives Talk at OVC
19-Apr	SystemEquine.com	Can-Am promo (EG HEALTHflash link included)
19-Apr	OVC bulletin	Take Our Quiz: How Will Your Horse's Risk of Colic Change This Spring?
19-Apr	OAHN.ca	One Confirmed Case of Equine Herpes Myeloencephalopathy (EHM) in the Regional Municipality of York

19-Apr	StandardbredCanada.ca	Check Guelph's Colic Risk Rater Tool
19-Apr	Horse-Canada.com	Thoroughblog: Colic Quiz-Test your Knowledge on This Dangerous Illness
19-Apr	EquineChronicle.com	Discuss Influenza Vaccination With Your Vet
19-Apr	OVC bulletin	Take Our Quiz: How Will Your Horse's Risk of Colic Change This Spring?
19-Apr	EquestrainCanada.ca	Register your Horse Day Event
19-Apr	Horse-Canada.com	Equine Herpes Myeloencephalopathy in Ontario
19-Apr	HarnessLink.com	Tools to Help Predict Disease Spread
19-Apr	OVC bulletin	Tools to Help Predict Disease Spread
19-Apr	Horse-Canada.com	Are Horses at Risk of Infection From New Ontario Tapeworm?
19-Apr	News.uoguelph.ca	Potentially Deadly Tapeworm More Widespread in Ontario Than Thought, U of G Research Finds
19-Apr	PuslinchToday.ca	Potentially Deadly Tapeworm More Widespread in Ontario Than Thought, U of G Research Finds
19-Apr	BestHorsePracticesSummit.org	New Sponsors to Celebrate
19-Apr	HorseJournals.com	How Will Your Horse's Risk of Colic Change This Spring?
19-Apr	HorseJournals.com	Caring for Tack and Riding Equipment
19-Apr	HorseJournals.com	Wildfire! Flood! Earthquake!

Appendix 13: Web Site Report

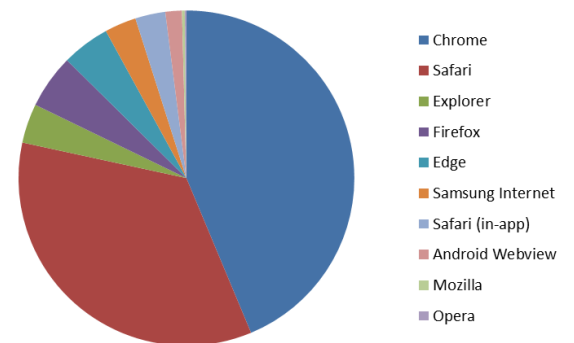
MAY 01, 2018 - APRIL 30, 2019

Visits	70,834
Page views	162,085
New Users	39,574
Avg. Session Duration	00:01:52



TOP 10 BROWSERS – OPERATING SYSTEM (Audience – Technology – Browser)

Operating system	Sessions	Percentage
Chrome	30,016	42.38%
Safari	23,821	33.63%
Internet Explorer	2,608	6.46%
Firefox	3,577	5.05%
Edge	3,179	4.49%
Samsung Internet	2,092	2.95%
Safari (in-app)	1,993	2.81%
Android Webview	1,087	1.53%
Mozilla	184	0.26%
Opera	109	0.15%

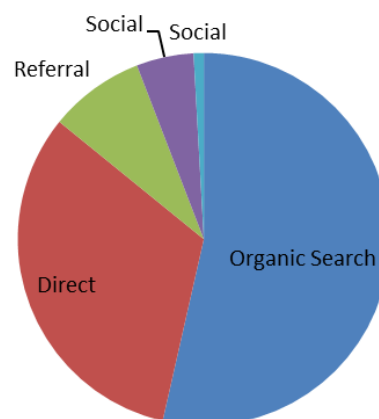


TECHNOLOGY OVERVIEW
(Audience – Mobile – Overview)

Device	Sessions	Percentage
Desktop	36,861	52.04%
Mobile	26,522	37.44%
Tablet	7,451	10.52%

ACQUISITION CHANNELS
(Acquisition – All Traffic – Channels)

	Channel	Sessions	Percentage
1	Organic Search	37,932	53.55%
2	Direct	22,878	32.30%
3	Referral	5,873	8.29%
4	Social	3,525	4.98%
5	Email	623	0.88%
6	Other	3	0.00%



TOP REFERRAL SOURCES
(Acquisition – All Traffic – Source/Medium)

Source	Sessions	Percent
1. google/organic	36,771	51.91%
2. direct	22,878	32.30%
3. m.facebook.com/referral	2,097	2.96%
7. equineguelph.ca	1,212	1.71%

4. bing/organic	820	1.16%
5. standardbredcanada.ca/referral	718	1.01%
6. facebook.com/referral	706	1.00%
8. ovc.uoguelph.ca/referral	484	0.68%
9. yahoo/organic	312	0.44%
10. equinestudiesonline.ca/referral	269	0.38%

TRAFFIC SOURCES SOCIAL MEDIA
(Acquisition – Social – Network Referrals)

Social Network	Sessions	Percentage
1. Facebook	3,107	88.14%
2. Twitter	255	7.23%
3. YouTube	64	1.82%
4. Pinterest	53	1.50%
5. Instagram	15	0.43%
6. Tumblr	12	0.34%
5. Instagram Stories	11	0.31%
7. LinkedIn	7	0.20%
8. Blogger	1	0.03%

CONTENT

TOP 10 LANDING PAGES
(Behaviour – Site Content – Landing Pages)

	Page	Sessions	Percentage
1.	/jobtrack/jobs.php	17,802	25.13%
2.	/index.php	8,850	12.49%
3.	/ education/programs_list.php	3,212	4.53%
4.	/jobtrack/index.php	2,309	3.26%
5.	/education/indiv_courses.php	1,897	2.68%
6.	/education/tuition_awards.php	1,526	2.15%
7.	/Tools/fireprevention.php	1,422	2.01%
8.	/Tools/lame_checklist.php	1,292	1.82%
9.	/Tools/equiplanner.php	1,226	1.73%
10.	/education/index.php	907	1.28%

Appendix 14: Sponsors

Equine Guelph would like to thank the following sponsors for their contributions and support of Equine Guelph's program.



• Senior Horse Challenge



• ThermoRegulator Tool



• EquiMania! Exhibit



• National Training Partner



• EquiMania! Youth Safety Initiative



• Horse Health Check Poster



• Barn Fire Safety Tool



• Colic Risk Pater Tool
• Hoofprints Tribute Program
• Education Patron
• Risk Series Brochures
• Short Course on The Horse Portal



• EquiMania! Youth Safety Initiative



• HEALTHflash • Vaccination Equi-Planner Tool
• Short Course on The Horse Portal



• EquiMania! Youth Safety Initiative



• Mare & Foal Healthcare Tool



• EquiMania! Exhibit



• EquiMania! Nutrition Display



• EquiMania! Youth Safety Initiative



• EquiMania! Youth Industry Display



• EquiMania! Youth Safety Initiative - HEALTHflash



• EquiMania! Youth Safety Initiative

Equine Guelph Financial Report 2018-2019
As at April 30th, 2019

	Holding Accounts					To Program Support	Programs				Total Equine Guelph
	E. P. Taylor	HIP/QH	SRA	HBPA	General Research		Education	Communi-cations	Research Support	Sponsorship	
	710655	045878	046069	046071	022298		022201	022202	022299	022203	
FUND BALANCE, Previous Year-end	200,533	91,668	-	53,941	0	-	373,454	58,611 ¹	27,933	188,459	994,599
REVENUE											
Funds Received from Funding Agencies	101,261 ²	-	-	130,000 ⁴	28,637 ⁵	-	-	-	-	-	259,906
HIP Funds	-	21,250 ³	-	-	-	-	-	-	-	-	21,253
Quarter Horse Program	-	8,500	-	-	-	-	-	-	-	-	8,500
Alumni House Donations (individuals)	-	-	-	-	55,685 ⁶	-	-	-	-	-	55,691
Tuition & Workshops (S18, F18, W19)	-	-	-	-	-	-	115,960	-	-	-	115,960
Other University Contributions	-	-	-	-	-	-	-	-	-	-	-
External Contributions	-	-	-	-	-	-	172,558	22,407 ⁵	-	40,000	234,970
TOTAL REVENUE	101,261	29,750	-	130,000	84,322	-	288,517	22,407	-	40,000	696,279
INTERNAL TRANSFERS:											
From Agency Fund to Support	-	(5,950)	-	(13,000)	-	18,950	-	-	-	-	-
From Agency Fund to Program	-	-	-	-	-	-	-	-	-	-	-
From Support to Program	-	-	-	-	-	(18,950)	-	12,697	6,254	-	-
Transfers b/w EG accounts	-	-	-	-	-	-	(15,500)	33,500	(18,000)	-	-
Transfer from Sponsorship	-	-	-	-	-	-	34,000	-	-	(34,000)	-
TOTAL TRANSFERS	-	(5,950)	-	(13,000)	-	-	18,500	46,197	(11,747)	(34,000)	-
PROGRAM EXPENDITURES											
Research Projects ⁷	(156,586)	(91,668)	-	(53,941)	(28,637)	-	-	-	-	-	(330,832)
Research Support	-	-	-	-	-	-	-	-	(261)	-	(261)
Education	-	-	-	-	-	-	(496,556)	-	-	-	(496,556)
Communications	-	-	-	-	-	-	-	(99,640)	-	-	(99,640)
Sponsorship	-	-	-	-	-	-	-	-	-	(4,330)	(4,330)
Welfare/Racing	-	-	-	-	-	-	-	-	-	-	-
TOTAL PROGRAM EXPENDITURES	(156,586)	(91,668)	-	(53,941)	(28,637)	-	(496,556)	(99,640)	(261)	(4,330)	(931,619)
FUND BALANCE as at April 30th, 2019	145,208	23,800	-	117,000	55,685	-	183,916	27,574	15,925	190,129	759,236

- 1) Includes Development Account balance of \$11,763.94. Development Account now merged with Communications
- 2) 2018-19 EP Taylor allotment, received in July.
- 3) Includes 2018-19 HIP QH funds. N. Cribb project funds (grant 051433) were returned to her account after Q1 transfer
- 4) Includes 2019-20 HBPA, received in April. Internal transfer of admin support to appear in Q1 report.
- 5) Ontario Equestrian donation to be allocated to L. Arroyo and S. Weese projects.
- 6) Includes Donation from Caird Wilson estate (\$50k research, \$22k communications)
- 7) Transfer of 50% OVC grant in aid (\$142k) and 2nd year projects (totalling \$160k) completed in Q3