



Equine Guelph



Annual Report
May 1, 2020 – April 30, 2021

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Executive Summary

Despite the ongoing challenges that continue for the world, Equine Guelph has remained strong and determined to continue during the 2020-2021 year to provide support for the equine industry through the Research, Communications and Education/Training programs.

The basic priorities remain the same. Equine Guelph can continue to assist in developing programs that help support the foundation for sustainability and the social license to operate in the equine industry. Calls and e-mails continue to be received for information and education that will help individual facility and horse owners continue to weather the challenges.

In this, our 18th year of operation, Equine Guelph continues with its unique partnership of the equine industry in Canada and the University of Guelph.

Equine Guelph continues to work with the equine industry in Ontario and across Canada in a partnership that combines industry and academia working together. This helps to give a solid foundation to the equine industry by working today to develop research, education/training for the industry in support of the Social License to Operate, == The ongoing and developing partnerships with the industry demonstrate a strong commitment to providing opportunities for education for all levels of the industry in support of horse health and welfare.

The research program of Equine Guelph continues to fund areas of priority as designated by the Research Committee with contributions of knowledge for health and welfare. Funding is received from the racing sector through Ontario Racing and the Horsemen's Benevolent and Protective Association of Ontario (HBPA), and through the non-racing sector from Ontario Equestrian with their innovative membership donation program. There are further details on the research programs in this report, including the publications and national/international speaking engagements, underscoring the research excellence that has developed from this partnership. The members of the Equine Guelph Research Committee spend many hours each year reviewing the research proposals to ensure industry priorities are being supported and final decisions also include the external peer review assessments to ensure quality.

In 2020-2021, an allocation of \$407,000 was made to support research projects. Further details on these and other studies are provided in the Research section and Appendices.

The cancellation of events and tradeshow continued into 2021, changing our education program dramatically. Tradeshow and other face to face events were cancelled or shifted to online where possible. The major re-development program continued for the online Diploma and Certificate programs for Equine Science, Welfare and Business incorporating new technical enhancements and evolving best practices for quality online experiences. The Horse Portal continued its strong pattern of growth this year with the addition of new courses (Equine Business 101) and the offering of racing-focused short courses on designated industry priorities, thanks to funding from the Alcohol and Gaming

Commission of Ontario (AGCO). Enhanced functionality also has been added to TheHorsePortal.ca as we hear from our students and partners across Canada and customized training for specific partners has now been offered or is under development and continues to provide opportunities for new partnerships.

EquiMania! had experienced impressive growth as a program for youth and adult education with an interactive display on health, welfare and safety but due to the pandemic and cancellation of events, the display has not been in use. With the anticipated opening of events, Equine Guelph staff are looking forward to the opportunities for bringing EquiMania! to events in 2022, including for Family Days at racetracks, equestrian events and tradeshow and agricultural fairs. Youth activities continue to be promoted online to sustain youth engagement.

A sincere thank you is extended to all past and present Advisory Council and Research Committee members for their ongoing support, and for providing their time and insight. Warm appreciation is extended to donors, volunteers and sponsors who continue to support the ongoing development and success of Equine Guelph and its programs in such a way that helps us in turn support 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., Ontario Association of Equine Practitioners, and the University of Guelph.

This annual report provides the details on the 2020-2021 activities of Equine Guelph and recognizes the valuable partnerships that make these achievements possible for the benefit of the equine industry and the health and welfare of the horse.





Dear Partners and Supporters of Equine Guelph,

The challenges continue into 2020-2021 due to the pandemic, but programs and services to the equine industry continued. Starting with development in the year 2000-2001, we began creating online equine education and training programs, and the first course was offered in May, 2002. While Equine Guelph had not become a formal entity until July 2003, the development of this program to be brought into the Equine Guelph structure was fortuitous.

Equine Guelph was a pioneer in online education and training offerings, and this was a highly valuable investment (starting in the year 2000-2001 prior to the official opening of Equine Guelph and the first equine course offering in May, 2002). As the changes of 2020 became significantly greater, the development of the online approach would prove to be pivotal as strengthening of the online offerings and opportunities for programming and outreach became available. However, other programs were greatly affected such as ongoing research projects (equipment was being diverted for human use, supplies were difficult to obtain), special events/tradeshows and live training opportunities for large animal rescue and others.

With progress for vaccinations, we hope there is full resumption of all Equine Guelph programs. Some research programs were able to recommence as things stabilized. Other programs shifted, taking advantage of growing skills for transition to virtual meetings and online education. The University of Guelph researchers continue their research programs as feasible and are making progress in their efforts to produce new knowledge for equine health and welfare.

Biosecurity within the horse industry remains a concern with sporadic outbreaks of infectious diseases including the neurological form of herpes virus in Canada and other countries. This emphasizes the priority for infectious disease research, outreach and training programs.

The ongoing restrictions and lockdown continue to put pressure on the vulnerable areas of the industry, in all sectors of horse ownership and businesses, and the focus on recovery and sustainability remains a priority. The research and industry education programs of Equine Guelph can be important contributors for this in partnership with our Council partners.

The value of partnerships working closely together to achieve mutual goals continues to be important. Equine Guelph, as the Centre created by the industry for the industry, will continue to work with industry for research, education/training, and communications in priority areas.

A sincere thank you is extended to our equine associations and their designates, who sit at the Advisory Council table, Committee members, donors, supporters, and partners for their continuing support of Equine Guelph.

Yours sincerely,

A handwritten signature in black ink, appearing to read "J. Wichtel".

Dr. Jeffrey Wichtel
Dean, Ontario Veterinary College

A handwritten signature in black ink, appearing to read "A. Patterson".

Mr. Al Patterson
Co-Chair, Equine Guelph

Introduction

“The Centre for the horse owner at the University of Guelph” -- Equine Guelph, founded in 2003, was created in a unique partnership of the equine industry and the University of Guelph as a portal for research, education and training, and communications. Health, welfare and safety continue to be the dominate themes for our industry and for the public, and sustainability of our equine industry also dominates the discussions in the public forum and within industry and government. The continuing partnership of Equine Guelph working with the industry, particularly in light of the ongoing events of 2021, demonstrates the value of working together to be a positive force.

The Advisory Council of Equine Guelph is the foundation for this partnership, representing the leaders of the industry, along with the University of Guelph members. 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 University of Guelph, 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. Since its inception in July 2003, Equine Guelph has worked with the industry to develop many programs and in service to the industry. The Advisory Council provides the industry with important opportunities for two-way discussions to provide the needed input for development and refinement of programs to reflect current priorities during changing times. The members of the Advisory Council and the Research Committee are integral to the process of development for the research, education and communications programs and will continue to play an important role responding to the changing events of 2020 and beyond.

This Annual Report for the 2020-2021 fiscal year highlights progress, achievements and challenges of Equine Guelph and its programs in service to the equine industry throughout the province and across Canada.

Programs of Equine Guelph

Research

Research funding from the equine industry supported significant progress on a diversity of topics by UofG researchers.

Working with our industry partners, Equine Guelph conducts a competition annually for research funding on industry priorities. This is done through the Research Committee composed of the research funding bodies and this committee reviews the proposals, with input from an external review panel, then directs those resources to priority research programs and projects to deliver new evidence-based information to support health, welfare and performance of horses. This unique partnership program between Equine Guelph, UofG researchers and the industry continues to serve industry needs through the dedicated work of volunteer representatives to ensure that quality, priority-based projects continue to be funded with annual reporting of progress to ensure oversight and effective use of funds. Further return on those investments is found through the communications and education program of Equine Guelph. These two programs distribute the growing knowledge to practicing veterinarians, students, and industry participants at all levels in both the racing and non-racing sectors to provide the industry with a growing foundation of knowledge at all levels.

Research funding allocated was \$407, 847 (up from \$379, 000 the previous year) to be allocated for research projects for 2020-2021.

Nine new projects were accepted for funding on priority-designated topics for projects including pulmonary hemorrhage, the gut biome, foal care, lameness treatments, specialized imaging techniques and disease studies. There are also 26 continuing projects that received second year funding. Detailed information on those studies are found in the Research Projects for 2020-21 in the Appendices including the lay summaries and their application to the industry priorities.

Researchers were busy writing up and publishing results and over 75 papers/articles were published and distributed on the research, showing the effort of researchers to get the results of their work out into the industry.

A streamlined process for funding has gone well despite the inability to meet face to face with committee members. With thanks to the volunteer members of the committee, hours are spent reviewing proposals and scientific reviews, along with annual reports, to ensure the research is in line with current industry-designated priorities. The contributions are greatly appreciated.

Funding for the research program comes from the HBPA, the E.P. Taylor Research Fund, Ontario Racing and donations from Ontario Equestrian. Industry funding is critical for leveraging funding from other agencies to fund research at a higher level.

It is important to highlight that the research program supported by Equine Guelph contributes to the education program of equine veterinary students, practitioners and

specialists and in this way continues to build the foundation for state-of-the-art emergency preparedness programs in Ontario and beyond.

While many projects had to be placed on hold for part of 2020, as the re-opening takes place, more research projects were able to open up in 2021 and planning is on-going for the 2021-2022 research year to ramp up as soon as possible.

Equine Guelph invites all industry groups to develop opportunities to help disseminate the research knowledge by distributing the research stories, showcasing the educational programs. There is also the opportunity to offer direct presentations for their members to hear about ongoing research as an important way to help disseminate the practical applications that help support health and welfare.

Dr. Koch, Co-chair of the Research Committee, welcomes the opportunity to assist in these events and to further the discussions on strategic planning for expanding the research program with our funding partners.

Education and Training

In 2002, with input from the industry, the first online equine education program sanctioned as a Senate-approved university course was started with 5 courses as part of a Certificate program. Since that time, this program has been an important investment by the industry, particularly in light of current events where online programming has become a vital part of daily life. This program has grown to offer over 20 online courses, in partnership with OpenEd, and now offers three certificates in Equine Science, Business and Welfare, and a Diploma in Equine Studies from the University of Guelph attracting students from over 40 different countries. Since that time, Equine Guelph has been acknowledged as a pioneer in the development of online programming.

Funding for the education program comes through tuition/workshops, corporate sponsorships, and external contributions through successful grant proposals for 2020-2021. Expenditures for the education program were \$412, 525 (down slightly from \$427,813 of the previous year). This was invested into new program development, online education programs, and virtual presentations and webinars. Live training workshops were cancelled. The online education tuition returned \$189, 680, a nice increase over last year (\$112,464) as more people were interested in online education resulting in increased student enrollment.

The EquiMania! program could not travel to exhibits, however, a virtual presentation was made for youth on equine careers as part of the “Royal Rave” in place of attending the Royal Agricultural Winter Fair. Monthly online learning activities were promoted through social media and through e-news.

Enrollment tracked higher each semester for the 12-week Certificate and Diploma programs with students coming from over 28 countries (over 40 countries are represented in our student population to date) and about 1/3 of the students were new to our program. Our enrollment for the year brought in over 1,000 students. Interest in quality online

programs was a notable trend, and our senate-approved courses were of interest. The re-development and updating of our 12-week courses continues to take advantage of new research knowledge and emerging technology that proves to be of use in the online educational setting.

Updating Schedule for Fall 2020 Completed

Stewardship in the Equine Environment
Equine Nutrition research updates
Advanced Equine Behaviour

Ongoing Updating Winter/Spring 2021

Equine Genetics
Advanced Equine Health through Nutrition
The Equine Industry
Equine Welfare
Global Perspectives in Equine Welfare
Management of the Broodmare, Stallion and Foal
Equine Functional Anatomy

New Webinar Series in Partnership with OpenEd!

A new webinar series was offered last year, with 4 presentations, to expand awareness of the online program and these were well-attended. Equine Guelph and OpenEd have developed a second webinar series, with 6 presentations to be offered in 2021, starting in June to continue to expand our reach with webinars from our instructors and popular guest speakers.

TheHorsePortal.ca short courses

Working in partnership with the equine industry across Canada has helped Equine Guelph deliver further options for the horse industry to pursue education and training in the online forum. Started five years ago in partnership with every English-speaking equestrian federation and multiple partners from racing, the welfare sector and other provincial and national groups, TheHorsePortal.ca was a customized platform developed to provide cost-effective, short courses with a focused topic and practical application of knowledge to the equine industry across Canada. We were able to develop and offer 2 courses in 2016 on the National Code of Practice and Canada's Biosecurity standard. With further support and funding from sponsors, industry partners AGCO and CAP, this program has now expanded to offer 11 portal courses in 2020-2021 providing over 1,600 students the opportunity to access this new format for learning.

New this year, has been the development of the Equine Emergency Preparedness Certificate and the new Equine Facility Management Certificate program, in response to Advisory Council input and the pressure on equine facilities due to the shutdown. The centre of this Certificate program, Equine Business 101, will launch in June, thanks to our equine partners and CAP funding which allowed Equine Guelph to develop this new

program. Surveys to the industry and feedback from our students and industry groups helped define new pathways for this program.

The Horse Portal has grown significantly thanks to the partners and support of our Council members and grant funding. The Horse Portal has now reached a maturity of the platform to offer customized training programs for the equine industry.

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
- Horse Racing Alberta

Animal Welfare Organizations

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

Accreditation Partners

- Equestrian Canada
- the Canadian Therapeutic Riding Association

International Partners

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

Youth Partners

- 4-H Ontario

More information is provided in the Appendices.

Other highlights include:

Equine Financial Futures Webinar Series with Sean Jones

Born out of great need to provide resources for an industry facing unprecedented financial challenges. Equine Guelph and Sean Jones from Sun Life Financial, partnered with Ontario Equestrian to create this well received, seven-part webinar series on business management for equine facility owners. Replays are currently available on Equine Guelph's YouTube channel and on TheHorsePortal.ca.

Free Youth Equine Behaviour and Safety course offered.

There were no EquiMania! events to attend in 2020 but instead there was a hugely popular free course for youth offered. This was entirely thanks to the loyal support of our amazing EquiMania! youth initiative sponsors: ESSO, Kubota Canada, Ontario Equestrian, SSG Gloves, System Equine and Workplace Safety & Prevention Services.

From Nov 6, 2020 to Feb 6, 2021, youth from around the globe were able to join the online community learning safety skills and how to 'speak horse', with this free on-demand offering. This very successful initiative engaged over 860 youth!

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 Jason Copeman. Equine Guelph sincerely thanks the 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 Victoria Chellew.

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

Large Animal Rescue Training Program

Partnership with Farm & Food Care – Ontario

Farm & Food Care – Ontario offers a training program focused on livestock transport emergencies, which complements Equine Guelph's Large Animal Rescue training. Both agencies cross promote programs to attendees. In addition, Farm & Food Care – Ontario has partnered with Equine Guelph to assist with delivery of webinars using Farm & Food Care – Ontario's zoom capabilities.



Global Animal Disaster Management Conference (GADMC)

Equine Guelph presented “*Large Animal Rescue and Livestock Emergency Response Training – Best Practices*” at the Global Animal Disaster Management Conference (2021) (Feb 23). The presentation was given by Susan Raymond, Equine Guelph and Victor MacPherson, Large Animal Rescue Lead Instructor, Equine Guelph and Farm & Food Care Ontario. The conference included 50 speakers from 16 countries with over 1,350 delegates registered.

Equine Guelph also submitted an article for consideration for the Australian Journal of Emergency Management (AJEM) publication in July 2021.

Large Animal Rescue Training webinars

In partnership with Farm & Food Care Ontario, Equine Guelph offered four Large Animal Rescue Awareness Level Virtual workshops (March – April 2021). Participants included a number of fire departments, Hamilton Mounted Police, York Ceremonial Mounted Police and Woodbine Entertainment Group.

A custom webinar was held for McKee-Pownall Equine Services (March 2021).

“One of our veterinarians has been involved in multiple Large Animal Emergency Rescues. Based on her experience we, as a company, felt it was important to invest in Large Animal Rescue (LAR) training and education for all of our veterinarians and staff. We specifically wanted to learn how best to work with emergency responders on the scene and stay safe ourselves while assisting the animals in various emergency situations. The LAR webinar offered by Equine Guelph was very informative and gave all of our team a very good understanding of how to best handle an emergency situation with first responders. We will be sure to enroll new vets and support staff on our team on future webinars.”

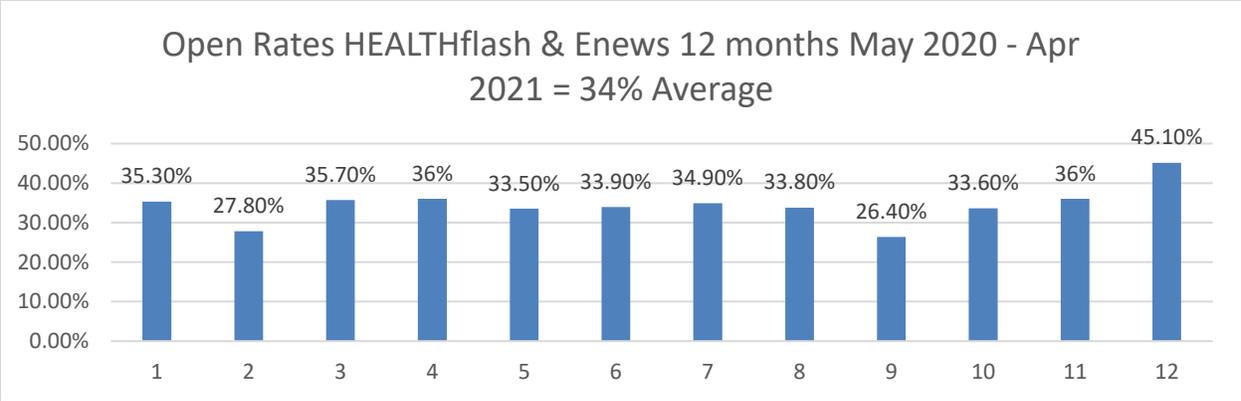
Mike Pownall, DVM, McKee-Pownall Equine Services

Additional webinars are scheduled for Provincial Animal Welfare Officers (SOLGEN) as part of their training (May 2021).

Expenditures for the Education program were \$412,525 for 2020-2021.

Communications and Marketing

This has been yet another year of growth and increased reach of our communications program to the industry. Equine Guelph has enjoyed an over 5% increase in the uptake of articles released compared to our 2019-2020 year. International and national pickup continues from major publications and websites. Equine Guelph continues to enjoy high open rates; 34% for both our press releases and monthly E-news (shown in the following graph). The industry average open rate for an educational institute as of April 2021, according to Constant Contact is 19.6%.

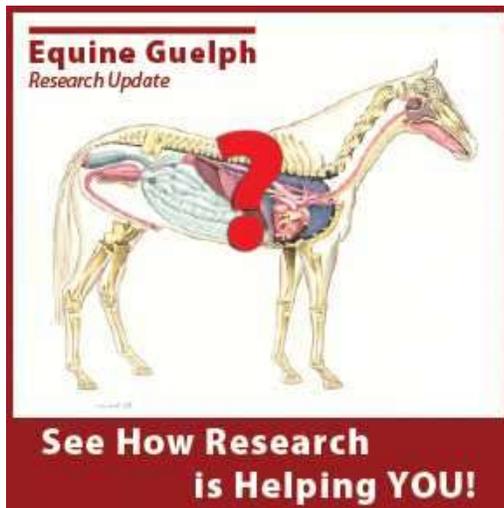


The media continues to pay special attention to the resources and courses that The Horse Portal has to offer. With the support of Alcohol and Gaming Corporation of Ontario (AGCO) funding, Equine Guelph was able to offer free courses for the racing sector, including respiratory health, lameness/injury prevention, and gut health and colic prevention, for AGCO license holders, as a special pilot project. The communications on this program received excellent pickup in the racing media. Coverage of racing industry specific courses have been shared across many Standardbred, Thoroughbred, and Quarter Horse racing news sources and the racing media have responded with exceptional distribution of the newly launched Racing Pilot program.

Equine Guelph produced and released many videos during 2020 and 2021. Topping the media pick-up and garnering much interest across social media channels was the three part nutrition series and then a subsequent webinar taking participants on a 'Tour of the Equine Digestive Tract.' Many interviews with researchers also received excellent distribution including: lameness research, 3-D printing, equine conditioning, equine osteoarthritis of the neck, stem cells and cartilage repair.

Launched in a new webinar format and selling out moments after press release, Equine Guelph's Large Animal Emergency Rescue program continued providing valuable introductory training to fire fighters, first responders and the racing industry. (See Education section special report on Large Animal Rescue courses offered by Equine Guelph).

NEWSLETTER



The 18th edition of Equine Guelph's Research update was released in January 2021. It features research by Dr. Dorothee Bienzle, and her team, who made contributions to a global paper on equine asthma.

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 E-news and press releases. Equine Guelph has discontinued the print version of this

newsletter in favor of the easily accessible, eco-friendly, cost effective format now available online.

The annual digital version of the Equine Guelph Research Update was well-received and covered several 2020 research related news releases complete with links to video interviews.

There was also increased uptake in research articles via the monthly E-news and press releases with a 9% increase over the previous year.

COVID-19 Special Response

Equine Guelph was keenly aware of the many issues arising due to the pandemic in all sectors of the equine industry. In response to societal changes, Equine Guelph pulled forward several courses from TheHorsePortal.ca and offered several at reduced prices or for free. These quickly filled up and added many new subscribers to the e-news list.

A new section of equine-related COVID-19 response resources was developed and distributed to the industry through e-news, websites, and social media with continuous updating and development of resources for horse owners. This resource page has become one of the top three landing pages on TheHorsePortal.ca website.

With no trade shows for the EquiMania! Interactive youth education display to reach its audience, a special online offer for youth was supported by our sponsors. A free offering of TheHorsePortal.ca online course: Horse Behaviour and Safety for Youth ran from Nov 2020 to Feb 2021, to the delight of over 850 participants.

As mentioned earlier in this report, the new webinars for Equine Guelph's Large Animal Emergency Rescue program and the Journey through the Digestive Tract have been hugely popular.

Equine Financial Futures was another webinar series born out of great need to provide resources for an industry facing unprecedented financial challenges. Equine Guelph and Sean Jones from Sun Life Financial, partnered with Ontario Equestrian, to create this well received, seven-part webinar series on business management for equine facility owners. Replays are currently available on Equine Guelph's YouTube channel and on TheHorsePortal.ca.

Expenditures for the Communications and Marketing program were \$90,325, of which \$23,450 came from direct industry funding.

Equine JobTrack

JobTrack has been a free job finding platform that has been offered by Equine Guelph. It was developed over 15 years ago with seed money from the Horsemen's Benevolent and Protective Association of Ontario (HBPA), but over the years, the platform has become outdated, cumbersome, and experienced security issues.

With renewed support from HBPA and new funding from Grand River and Ontario Racing, Equine JobTrack has now been re-launched with enhanced features and security that will provide free upgraded service to the industry. The Equine JobTrack website aims to provide enhanced services helping to connect jobseekers and employers in our industry. The re-launch in March 2021 certainly made a big splash in equine media and the site is quickly garnering a large selection of job listings from both racing and non-racing facilities.

Equine Guelph sincerely thanks HBPA, Ontario Racing, and Grand River Agricultural Society for their contributions that have enabled this valuable and free service to be upgraded and enhanced.

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. Overall, the e-news enjoys a high "open rate" for the articles – Just over 14% 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, SystemEquine.com and TheRider, among a growing number of others.

Website

The overarching goal of the Equine Guelph and Horse Portal websites are 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 114,900 page views from those seeking to improve welfare for horses including; research advances, diagnostic developments and educational/training programs. The Horse Portal draws primarily visitors interested in educational offerings for a further 303,478 page views. The combined total of page views for this fiscal year is 418,497, which is a 22% increase over the last fiscal year!

Equine Guelph's website has reached over 38,431 new unique visitors with the most popular pages continuing to be Job Track, followed by the educational programs list. Traffic to both websites are arriving primarily through organic and direct search with Google as the number one source. The top landing page on TheHorsePortal.ca is the home page followed by course listings and the Covid updates and resources 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 333 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 2020-21, there has been extensive coverage from: The Rider magazine, Standardbred Canada, COSA, Horse-Canada.com and HorseJournals.com. Equine Guelph stories were also featured in the Canadian Horse Annual, HBPA.com, Raceline, Quarter Racing Owners of Ontario Inc., CanadianThoroughbred.com, Horse Sport Magazine, SystemEquine.com, Western Ontario Pony Club Newsletter, Producer.com, WellingtonAdvertiser.com, Woodstock Sentinel Review, News.Ontario.ca, CTVNews.ca, RoyalFair.org, University of Guelph Newslinks, Campbell Centre for the Study of Animal Welfare, Ontario Association of Veterinary Technicians, and the Ontario Veterinary College bulletin, among others.

In addition, Equine Guelph received coverage from international horse industry websites such as; HarnessLink.com, HorseTalk.co.nz, EquiMed.com, EquineChronicle.com, EquusMagazine.com, AmericanFarriers.com, HolisticHorse.com, TheHorse.com, StableManagement.com, American Riding Instructors Association, Cayuse Communications, BestHorsePracticesSummit.org, EquineInfoExchange.com, QuarterHorseNews.com, NickerNews.net, HorseNation.com and Horse and People (Aus.).

New international distributors this past fiscal year include EverythingHorseUKco.uk, EliteEquestrianMagazine.com, Horsellustrated.com, EquiManagement.com, ScienceSupplements.com , HorseSafetyTips.com and st georg magazine (Germany).



Infectious Disease Expert, Scott Weese at the University of Guelph, has had a very busy year in the media responding to questions about the potential spread of Covid-19 between animals and humans and how veterinary practices are operating during the pandemic. The 'Worms & Germs Blog' has provided posts nearly daily since mid-March 2020'. Weese, was recognized for his work supporting Ontario veterinarians during the COVID-19 pandemic with the 2021 Award of Merit from the Ontario Veterinary Medical Association (OVMA).

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.: Capri CMW Insurance Services Ltd. 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 partnerships have been

developed with OE including the 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, Horse Racing Alberta, Standardbred Canada, 4-H Ontario, Canadian Therapeutic Riding Association, Equestrian Connection 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, walk-ins and letters. This includes a significant number of people looking for employment opportunities.

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 and current outbreaks, nutritional management for special circumstances, identifying sources of information on new and emerging diseases, concerns about real or perceived welfare issues such as investigations for welfare issues, transportation issues, over population of horses and rehoming/retraining questions, management and general nutrition 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:

	FY19-20 Amount Raised	FY20-21 Amount Raised	FY20-21 No. of Unique Donors	FY20-21 Median Gift
Area of Greatest Need	\$15,573	\$20,211.20	70	\$30
Education	\$4,265	\$25	1	\$25
Research	*\$29,028.74	\$2,369	19	\$87.50
OE Welfare Education Fund	\$1,030	\$690	6	\$10
Sponsorship	\$74,500	\$81,800	8	\$6,500
Kerr Fund for Equine Education and Community Outreach	\$100,000	\$0	-	-
Equine Guelph – Stuart Stocks Memorial Award	\$1,000	\$0	-	-
Equine Guelph – Roger L’Heureux Memorial Equine Award	\$0	\$0	-	-
TOTAL	\$225,396.74	\$105,095.20	104	\$30

TABLE I - Funds raised from private donations and sponsorship to EG accounts during FY19-20 and FY20-21 including number of unique donors and the median size of gift for each account.

*Includes a large donation from Ontario Equestrian (\$27,706.35 in 2019-20)

- 1. Annual Spring Appeal:** As a result of Covid-19, the 2019-20 spring appeal was delayed and mailed in June 2020. It included a focus on equine emergency preparedness and included a letter, donation card and return envelope. The following stats measure the gifts that came from people who received the EG appeal responded directly to the letter.

	FY 18-19	FY 20-21
Recipients	2,260	454
Total cash-in	\$1,560*	\$6,120
Total donors	31	39
Average gift	\$79	\$156
Participation	1%	8.6%

TABLE II – Comparison of select metrics for the past two appeals.

EG reduced the number of people we mailed in order to decrease costs. It was a decision based on data that the group of non-donors was consistently not giving, so we chose to cut the costs of mailing significantly by focusing on donors/past donor group. This audience has two segments:

- Recent Equine Guelph donors – 128
- Lapsed Equine Guelph donors – 326

The most popular accounts supported were Equine Guelph - Area of Greatest Need and OVC Horse Health Fund (Healthcare)

2. **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 option on a list of choices). OE raised \$5,613.50 for EG from its membership for the calendar year 2020. (payment pending).

B. Corporate Sponsorship Program: The FY2020-21 sponsorship program was up slightly from the year before, gaining one new* sponsorship program. Total revenue from the corporate sponsorship program was **\$81,800**:

Online Tools & Other Education Programs – \$44,300

1. BOEHRINGER INGELHEIM – EG E-Newsletter + senior horse tool ▪ \$12,500

CAPRI CMW INSURANCE SERVICES LTD – colic tool, Hoofprints program, portal short course, portal PTSO pages ▪ \$19,500 (includes late payment from FY2019-20 due to COVID delays)
\$

2. MERCK (AGENCY: DUCK & ASSOCIATES) – EG HEALTH*flash* + portal short course ▪ \$10,000 (includes payment for the past two years)

STANDARD BRED CANADA – Racehorse Respiratory Health* course & grant in-kind partner ▪ \$2,300

EquiMania! (Initiatives were online due to COVID) – \$37,500

1. KUBOTA – youth safety course ▪ \$5,000
2. SHUR-GAIN/TROUW – nutrition webinar ▪ \$5,000

SSG GLOVES – youth safety course ▪ \$15,000

3. WORKPLACE SAFETY & PREVENTION SERVICES – youth safety course + fire prevention partner ▪ \$12,500

C. Equine Guelph Grants: Grant writing and fulfillment has become a major priority and requires significant time investment. This has been a main focus of Equine Guelph again this year. Funding totaling **\$151,991.57** from two granting agencies has been secured this past year with **\$64,178** received in FY2020-21 – all in support of our strategy for course development and promotion of The Horse Portal to support the priorities for courses as established through the industry surveys:

Alcohol and Gaming Commission of Ontario – \$ 64,178 (represents year two of a two-year program: \$230,600 total over period of 2019-2021)

'Online Training Pilot Project for the Ontario Horse Racing Industry': The Pilot Project delivered 12 offerings of seven online courses available for free to the first 100 AGCO licensees to register for each course over the course of two years. Three of these courses were developed exclusively for the industry in response to industry-identified priorities: gut health, respiratory and injury/lameness. At the conclusion of the Pilot Project, an industry survey was administered and final report and 5-year strategy document submitted to AGCO.

Canadian Agricultural Partnership (CAP) Program: Labour and Supply Challenges Fund – \$0 (\$87,813.57 project secured with funding pending for payment in FY2021-22)

'Equine Industry Recovery Project: JobTrack Redevelopment & Facility Management Training Program': EG received funding for two projects: 1. to complete a major redevelopment Equine JobTrack – providing a free service linking employers and job seekers in the equine industry to support the equine industry in Canada, and 2. develop the Equine Facility Management Certificate program, featuring a new *Equine Business 101* course. With many facilities in dire financial straits (and the ongoing loss of facilities and school horses) and horse racing dealing with a labour shortage, it was clear there was a need for programs to address this COVID-magnified revelation as well as pre-existing gaps.

D. Equine Guelph Store: Equine Guelph sells horse healthcare resources to promote welfare to the industry and to provide revenue to support Equine Guelph's education programs. Total revenue raised in FY2020-21 is **\$730.96** with a breakdown by item below:

Equine Guelph retails laminated barn posters at major events such as Can-Am (N/A this past year due to COVID) and are also made available through mail-order. Total poster revenue was **\$417.45**.



Horse Health App: The *Horse Health Tracker App* has been developed for both GooglePlay and Apple iTunes. The tool allows horse caregivers to be active participants in their horse's healthcare. Total revenue generated in FY2019-20 was **\$313.51** (Note: Apple sales were \$266.23 and Google Play sales were \$47.28).

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 \$685,285 (compared to \$884,821 for previous year) for the fiscal year with funding provided by our funding partners, donations, and online course tuition, as well as a final installment from our Alcohol and Gaming Commission of Ontario grant. Program expenditures totaled \$911,691 (\$901,002 last fiscal year).

The research program allocated \$407,847 for research projects. Expenditures for the education program were \$412,525 which included program development, online education programs. Expenditures for the Communications and Marketing program were \$90,325. Online education tuition returned a total of \$189,680, a substantial increase from the previous year (\$112,464).

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 \$35,000, a decrease of \$5,450 from the previous year. 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. While funding has increased since the previous year, 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 2020 – April 2021

Welcome to our highlight reel. If you would like to know more about any of the following press releases, click on the titles to follow the web link to the full story.



MAY6

[7 Tips on Equine Conditioning with Biomechanics Expert Dr. Hilary Clayton](#)

There are many important questions pertaining to equine conditioning and fitness as we all look forward to returning to work. Dr. Hilary Clayton recently shared some cautions and considerations in a Skype interview with Equine Guelph. Dr. Clayton is a veterinarian, researcher and horsewoman. For the past 40 years she has been conducting amazing research...



MAY6

[Lameness Research and Prevention Tips with Dr. Judith Koenig at OVC](#)

Lameness is a huge focus for Dr. Judith Koenig as a clinician, researcher and instructor at the Ontario Veterinary College (OVC). Koenig is also a rider with a keen interest in helping grass roots riders and upcoming high-performance athletes. In the accompanying video Dr. Koenig explains her current research endeavoring to heal tendon injuries faster and also...



JUN2

[Racing-Exclusive Online Courses a Win!](#)

Ontario racing industry provides feedback on Equine Guelph's Pilot Project 100% positive feedback has been received for the new TheHorsePortal.ca online courses, developed exclusively for Ontario Racing industry members! Respiratory health, lameness prevention and gut health prove to be a priority. In 2016, Equine Guelph conducted a major Ontario Horse Racing Industry Survey and learned that...



JUN2

[Innovative Research on Equine Lameness & Equine Conditioning Tips](#)

Could biologic therapies be the future for treating joint disease? Ontario Veterinary College researcher, Dr. Mark Hurtig and his team are investigating novel new methods to potentially repair tissue rather than just suppressing the signs of joint disease. Hurtig also explains the mechanism and contributing factors to fetlock chip fractures stating they can be related to the...



JUN18

Equine Guelph Supports Ontario Equestrian's 'For the Herd' with Learning Community

In two short months, just over 30% of the \$500,000 fundraising goal has been raised to help school horses that lost their jobs in March. In April, Ontario Equestrian launched For the Herd, an emergency fundraising initiative to support lesson horses and riding school facilities in Ontario, many of whom are facing the harsh realities of...



JUN29

Cryopreservation of Equine Stem Cells for Cartilage Repair

Cryopreservation is the next exciting stage of research in stem cell therapy. Dr. Thomas Koch and his team are working to preserve cartilage chips for long-term storage, which would enable off-the-shelf use to treat localized cartilage defects. Defects that very often shorten or end horses athletic careers. Cryopreservation (or vitrification) is the formation of a solid from



JUN30

Patron Determined to Help Equine Guelph "Survive and Thrive" with a Generous Donation

A generous donation of \$100,000 to Equine Guelph has been made by the Kerr family to establish an equine education and community outreach endowment. A portion of the Kerr Fund for Equine Education and Community Outreach will support much needed ongoing operational funding for the University of Guelph's not-for-profit Centre for the horse owner. Sheryl Kerr...



JUL14

Fuelling Wellness

A one-day online symposium where you can learn more about equine or pet nutrition! Equine Guelph is co-hosting a one-day online symposium on August 15th, 2020 where you can learn more about horse nutrition from the comfort of your own home! Co-hosted by the Canadian Academy of Veterinary Nutrition, participants can spend the whole day...



JUL22

Equine Guelph Celebrates 18 Years of Online Studies

Now is the time to further your horse knowledge or take your business to the next level. One can only binge watch for so long. While horse-related outings are sparse at the moment, there is a perfect way to increase your equine savvy, connect socially with peers, guest speakers, expert instructors and stay physically distant.



AUG3

Fuelling Wellness Symposium is Approaching Fast – Join us to learn about equine and pet nutrition!

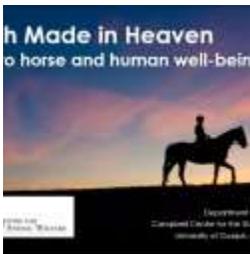
Interested in learning more about horse or pet nutrition? Join us at the one-day online Fuelling Wellness Symposium co-hosted by Equine Guelph and the Canadian Academy of Veterinary Nutrition, August 15th, 2020. Participants can choose to spend the day on equine specific topics or choose from other pet nutrition seminars running concurrently. Watch the promo video below...



AUG4

3-D Printing Research Creates Model of Equine Neck for Veterinary Training

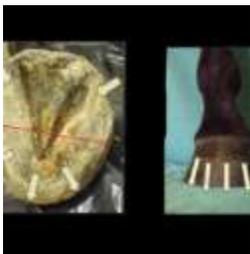
Practice makes perfect and veterinarians spend countless hours honing their skills in laboratories before graduating and applying that knowledge in the field. Anatomical models of the equine neck, created by 3-D printing, are revolutionizing how veterinary students and graduates will practice the precise placement required in ultrasound-guided injections. Dr. Alex zur Linden...



AUG26

Horse human interaction studies

Horse human interaction studies were discussed in a talk presented by Dr. Katrina Merkies, Ontario Agricultural College at the three day virtual conference hosted by the International Society for Equitation Science (ISES). With around 50 recent horse behavior studies referenced in the 40 minute presentation (and apologies for the many not mentioned), there is an undeniable growing...



SEP1

Hoof Care – Top Tips, Myth Busters and Finding the Balance

The importance of a good farrier is well understood by knowledgeable horse owners who reap the benefits of diligent, routine care. In an interview with Certified Journeyman Farrier, Sean Elliott, we gained some great tips for promoting hoof health and learned some pitfalls to avoid. Top tips for hoof health are nutrition, a dry environment and balance. Nutrition:



SEP1

Horse Care During Covid Video Series & Positive Community Stories

Videos on Covid-19 specific health topics, such as saddle fit, farrier work and financial tips have been created by University of Guelph students. Bachelor of Bio-Resource Management (BBRM) degree program students, majoring in Equine Management have been working with Dr. Katrina Merkies to provide helpful information for horse communities across Canada during the Covid...



SEP2

Racing-Exclusive Online Courses a Win!

Ontario racing industry provides feedback on Equine Guelph's Pilot Project and looks forward to Fall Offerings 100% positive feedback has been received for the new TheHorsePortal.ca online courses, developed exclusively for Ontario Racing industry members! Respiratory health, lameness prevention and gut health prove to be a priority and AGCO licence holders that completed ...



SEP9

Role of Telemedicine in the 'New Normal' for Equine Veterinary Care

Equine Guelph has been getting questions on access to their equine veterinarian. The new COVID-19: A Guide to Reopening Veterinary Medicine in Ontario, Stage 3, prepared by Dr. Scott Weese, DVM, DVSc, DACVIM University of Guelph and the Ontario Veterinary Medical Association was released August 24, 2020. It is meant to be a useful guide and the following...



SEP23

Apply Now For 2020 Ontario Racing Industry Scholarships

Hundreds of Ontario Racing industry members have discovered ways to optimize the health and performance of their racehorses by taking online short courses through TheHorsePortal.ca. For those ready to take that learning to the next level, Equine Guelph offers two tuition awards for two free 12-week online university-accredited courses, donated by families passionate about the

racing industry and the welfare...



SEP24

Free Youth Horse Behaviour and Safety Course to begin this November!

Missing the excitement leading up to the Royal Winter Fair? Us too! Equine Guelph and its safety partners have come up with a way for all the horse crazy youth to keep fuelling their passion to learn more about their favourite animal. Instead of setting up the immensely popular EquiMania! display this November, Equine Guelph is setting up...



SEP28

Practice Preparedness and Prevention – Resources on Barn Fire Prevention from Equine Guelph

Waiting until the wildfire approaches dangerously close is no time to draw up a disaster preparedness plan. Learning the hazards of storing hay is too late after the barn is reduced to ashes and all is lost. It is not a scenario that one fathoms will ever happen to them, until it does. Equine Guelph's October healthcare tool



SEP29

Research Study on Diagnostics for Equine Osteoarthritis of the Neck

Radiographs have been found to be insufficient evidence for diagnosing Cervical Facet disease according to a research study by Dr. Judith Koenig and a team of researchers at the Ontario Veterinary College. In a video interview, Koenig explains some of the complexities of equine osteoarthritis and cervical facet disease. "Osteoarthritis is common in any athlete," explains...



SEP29

Equine Financial Futures Webinar Series

2020 is a year the equine industry would like to flush away, along with all the unexpected business restrictions and financial challenges. First wave, second wave and now a tidal wave of online information is inundating your inbox, but there is a free webinar series you are going to want to add to your e-calendar. Equine Guelph...



OCT13

Fuelling Wellness Symposium was a Hit

"Part one of a three-part video series" on digestion from Equine Guelph now available! Equine and pet nutrition enthusiasts came together on August 15th, 2020 to learn more about nutrition topics from experts around the world at the virtual Fuelling Wellness Symposium, co-hosted by Equine Guelph and the Canadian Academy of Veterinary Nutrition. The event was a success...



OCT21

Do equestrians know how their horses learn?

By Tanja Bornmann (MSc Equine Science, Academic Equitation). Why is it so important for equestrians to become educated about learning theory and its practical application? Because, knowingly or not, in each single encounter with horses we use learning theory tools from our training toolbox. Sometimes, equestrians pick the wrong tools from the toolbox, or do not know...



OCT29

Equine Industry Symposium 2020 Goes Virtual!

Agents of Change Host 5th Annual Event Since its inception in 2016, the Equine Industry Symposium hosts and participants have set out to be agents of change. As the organizers, preparing for the 5th annual event this November, the students of the Bachelor of Bio-Resource Management degree program in Equine Management are embodying change. Amidst a pandemic...



NOV3

Tour the horse's digestive system with new videos from Equine Guelph

The second Equine Guelph video about the horse's digestive system will be launched in Equine Guelph's November E-news (November 5, 2020). Sign up for the free monthly E-news and watch as Jack, a rising Standardbred film star, shows off what organs, like the large colon, really look like. You'll learn more about how horses break down their...



NOV4

Caring for our Seniors' Hooves

As we age, jumping out of bed ready and raring to go may cease to be the norm. It is often replaced by a few groans, moans, creaks, cracks and slow maneuvers before we kick into gear! The same may be true for your senior horse; challenges with stiff joints, laminitis and hoof issues are all more...



NOV23

Comparing Equid Skulls for Insight into Behavioural Differences

In a recent study, researchers literally get inside the heads of horses and donkeys, looking for relationships between skull morphology and temperament. Such studies have been conducted in different dog breeds, but little is known when it comes to equids. Associate professor and University of Guelph researcher Dr. Katrina Merckies collaborated on a project with professor

of animal behaviour and animal welfare science at the University of Sydney, Paul McGreevy and Georgios Paraschou, veterinary pathologist at the Donkey Sanctuary in the UK

NOV24

Learn practical nutrition tips with new Equine Guelph videos



Part 3 of the digestive journey coming to your screen Dec 2020! Why are forage and/or forage-based feeds or alternatives so important for a horse's digestive system? If you subscribe to Equine Guelph's monthly E-news, you will find out

in part three of their three-part video series on equine digestion. Watch as we take what we've...



NOV30

FREE Equine Behaviour & Safety Online Course Offered to Kids around the World!

Equine Guelph, the horse centre at the University of Guelph in Canada, has announced it is setting up a free virtual classroom for English-speaking youth around the world. Horse-crazy teenagers (ages 13-17) will ...



DEC1

If You Build It, They Will Come....Or Will They?

By Tracy Dopko, BA, DipEqS There is an old saying, "How do you make a million dollars in the horse world? Start with two million." Anyone who is active in the equine industry can definitely vouch for this statement. But why is this statement true? Why is the equine industry notorious for high-effort, low-profit?



DEC10

The silver lining of COVID-19 for horse communities

Looking back on the 2020 Equine Industry Symposium & Webinar Replays by Kaitlyn Graff, Equine Management student. Over the course of the last nine months, COVID-19 has proved to be challenging for everyone. People in the equine industry have faced significant hardship, isolation and financial impacts. These unforeseen circumstances provided an opportunity for horse ...



DEC14

Equine Guelph ready to deliver more training for racing

HAVE YOUR SAY ON FUTURE PROGRAMS! Equine Guelph needs to know what YOU need to know and is calling on you to participate in the Ontario Horse Racing Industry Survey. We all know that a healthy horse is a top performer and Equine Guelph wants to help you achieve maximum health for your racehorses and...



DEC15

Equine Guelph Acknowledges our Amazing 2020 Partners!

Online Tools & Other Education Programs BOEHRINGER INGELHEIM – EG E-Newsletter + senior horse tool CAPRI INSURANCE – colic tool, Colic online course, portal PTSO partner pages, Hoofprints program MERCK – Equine Guelph HEALTHflash + Sickness prevention online short course HORSEMAN'S BENEVOLENT PROTECTIVE ASSOCIATION – JobTrack redevelopment & grant partner ONTARIO RACING – JobTrack redevelopment & grant partner EquiMania! Program KUBOTA – online behavior & safety course (youth & adult offerings) SSG GLOVES...



JAN4

OVC Researcher Contributes to Global Paper on Equine Asthma

Not long after the 2019 Havemeyer Workshop on Equine Asthma, Dr. Dorothee Bienzle, Ontario Veterinary College, contributed to a large collaborative research paper – The current understanding and future directions of Equine Asthma research. The air was thick with ideas at the 2019 Havemeyer Workshop, with a broad group of approximately 50 participants made up of microbiologists, clinicians,...



JAN5

New Year – New Webinars to Improve Your Equine Financial Future

Register for this free series and enter a raffle draw! Make 2021 a year where you see green – not just in your hayloft and pastures come springtime, but also in your profits! The first half of the Equine Financial Futures webinar series are now posted as replays, focusing on current challenges like increasing your financial health now, balancing the...



JAN18

Winter Water Woes and Colic Prevention

Nothing can drain the colour from a horse owner's face quicker than hearing the word COLIC! Winter is an important season to focus on colic prevention and ward off water woes that can lead to impaction in the equine gut. Equine Guelph has many resources to reduce your horse's risk of colic, including a FREE interactive...



JAN25

Evacuation Infographics added to Equine Guelph Barn Fire Prevention Resources

Equine Guelph has created a set of downloadable infographics to aid in barn evacuation plans, thanks to generous sponsorship by Workplace Safety & Prevention Services. Investing in emergency preparedness...



JAN26

2020 Racing Industry Scholarship Winners Announced

Equine Guelph has announced the recipients of its 2020 tuition awards. Victoria Chellew is the recipient of the Roger L'Heureux Memorial Equine Award and Jason Copeman has received the Stuart Stocks Memorial Equine Award. Selected for their love of horses, commitment to their welfare and desire to learn, both winners will receive two online courses through...



FEB16

Introducing Large Animal Emergency Rescue Webinars

Equine Guelph's Large Animal Emergency Rescue awareness level workshop is being offered for the first time virtually! Registrants can choose between 3 dates: Thursday March 4, 11 & 12, For \$50+HST. Registrants will receive an introduction to Large Animal Rescue equipment and techniques, as well as, livestock behaviour and handling. These 90 minute online sessions provide...



FEB24

JobTrack Relunched!

A Free service linking employers and job seekers in the Equine Industry. Equine Guelph has announced the reboot of JobTrack, its free online equine employment matching service. Serving the Ontario horse community for nearly 20 years, JobTrack has been a popular job-matching service for thousands of employers and job seekers. After undergoing many updates...



MAR10

The Healthy Horse: Understanding the Role of Equine Digestion & Nutrition Webinar

Take a journey through the horse's digestive system in a free webinar April 14, 7pm-8:15pm EST. Equine Guelph's life size model of the digestive system will be featured so participants can identify what the entire tract looks like, how it works, and what this means for feeding horses. This interactive webinar will help viewers understand strategies and...



MAR16

Stop Think Act this Canadian Agricultural Safety Week!

The third week of March (Mar 14 – 20, 2021) is Canadian Agricultural Safety Week (CASW) – a public awareness campaign focusing on the importance of farm safety. #AgSafeCanada. Workplace Safety & Prevention Services has many ways to help you promote farm safety in your community with its range of programs to help farm-related organizations,...



APR5

Coughing? The time to take action is now!

Prevention of airway problems is the best way to protect your horse, but when not successful, what is next? Early intervention is paramount when dealing with the irreversible disease, equine asthma, commonly referred to as heaves, RAO or IAD. Equine asthma starts off with a hypersensitivity reaction to particles in the air (e.g., dust, mould)...



APR7

New Large Animal Emergency Rescue Webinars Announce 4th offering of 2021

The first three Equine Guelph's Large Animal Emergency Rescue awareness level workshop webinars launched this year sold out quickly! A fourth date has been announced for April 28 in response to the huge demand for this important knowledge. For \$50+HST a small group of registrants will receive an introduction to Large Animal Rescue equipment and...



APR20

Equine Guelph Offers New Industry Certificate

Equine Guelph has announced it will offer a new Equine Emergency Preparedness Certificate. Requirements for the new certificate program include completion of two of Equine Guelph's online short courses: Equine First Aid and Fire & Emergency Preparedness. In recognition of Emergency Preparedness Week (May 2-8, 2021), a national event supported by Public Safety Canada...

APR26



Recent UofG Grad Joins Research to Improve Survival of Horses with Diarrhea and Critically Ill Foals

Dr. Diego Gomez completed his Ph.D. at the University of Guelph in 2017 under Dr. Scott Weese and Dr. Luis Arroyo working on infectious diseases. With a keen interest to reduce mortality rates in critically ill horses, Gomez is now in the midst of three important studies – two involving fluid therapies for foals...

Summary of Highlights

As Equine Guelph celebrates 18 years of annual programming for the equine industry in partnership with the equine associations of Ontario and Canada. While many challenges exist with funding and opportunity for outreach, progress continues in the face of the ongoing challenges of 2021.

Equine Guelph has been “developed by the industry and for the industry” and it is a role we are dedicated to develop and sustain in support of the equine industry. With a look back over the last 10 years, it is rewarding to see the ongoing growth of programs that are of benefit to horse owners and caretakers. That progress has been achieved with the partnerships created over that time has been created with equine associations, organizations and individuals of the Ontario industry and those beyond the provincial borders to help the Equine Guelph programs of research and education on industry-identified priorities.

With further world changes as we continue through 2021, there is still a need for up-to-date information provided by a strong research program and the training of specialists and veterinary students. Evidence-based information continues to be a priority for health, welfare and safety for our industry participants at all levels by distributing that through education and training programs as we have done with our racing-specific courses and continue with the Equine Business courses on the ever-developing Horse Portal. This unique platform continues to offer new learning opportunities as short, affordable programs and the capacity to develop customized programs for industry priorities as we have done for the customized racing programs and important topics such as biosecurity, fire safety and emergency preparedness, and health and welfare.

This works together to increase awareness and knowledge to support best practices for health, performance and welfare. Our research, communications and education programs work together to advance the knowledge of our industry through our partnerships.

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, welfare and safety of the horses and the industry remain the focus of programs for Equine Guelph.

Appendices

Appendix 1: Current Equine Guelph Advisory Council

Al Patterson, Co-Chair
Industry Member at Large
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Millgrove ON, L0R 1V0
qtfarm@allstream.net

Gayle Ecker, Co-Chair, Ex-officio
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Jean Szkotnicki &
Tracey McCague-McElrea
Ontario Equestrian
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Quarter Racing Owners of Ontario, Inc.
Industry Development Program
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**E.P Taylor Equine
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Appendix 4: Research Projects for 2020-2021

New Projects in 2020-21:

Investigator	Title
Arroyo, L.	Investigation of Clostridium innocuum in horses with diarrhea
Beeler-Marfisi, J.	Identification of putative exercise-induced pulmonary hemorrhage causing variants in Ontario's Thoroughbred racehorses
Gomez, D.	Fecal Microbiota of Surviving and Non-surviving Horses with Acute Diarrhea
Gomez, D..	Hypotonic versus isotonic maintenance fluids in critically ill foals
Gomez, D.	Endothelial glycocalyx degradation in critically ill foals
Koch, T.	Assessment of safety of encapsulated MSC and pooled MSC in fetlock joints
Koch, T.	Assessment of safety and potential of antisense miRNA-181 to treat fetlock OA
Koenig, J.	Cone beam CT technique development to image the standing horse cervical spine
Weese, S.	Molecular epidemiology of Streptococcus equi subsp equi in Ontario horses

Continuing Projects:

Investigator	Title
Arroyo, L.	Hyperimmune plasma transfusion for the prevention of R. equi infections in foals
Arroyo, L.	The association of Equine Parvovirus-Hepatitis (EqPV-H) with Theiler's disease and the prevalence of EqPV-H DNA and antibodies in horses in Ontario
Arroyo, L.	Dynamics of vitamin D metabolites in healthy and hospitalized horses with enterocolitis
Beeler-Marfisi, J.	The relationship between EIPH and exposure to ambient air pollution in Thoroughbred and Standardbred racehorses
Chenier, T.	Do mast cells play a role in persistent breeding-induced endometritis in the mare?
Hurtig, M.	The Safety and Efficacy of Intra-Articular Therapies
Koch, T.	Enhancement of Immune-Modulatory Properties of eCB-MSCs
Koch, T.	Vitrified equine MSC cartilage for cartilage repair
Koenig, J.	Effect of Extracorporeal Shock Wave Therapy on Intracellular Stress and Immunomodulatory Function of Equine Umbilical Cord Blood Mesenchymal Stromal Cell in vitro

Continuing Projects:

Investigator	Title
Arroyo, L.	Improving Fecal Microbiota Transplantation in Horses
Arroyo, L.	Culture-Based Molecular Profiling of the Colonic Bacteria of Horses with Typhlocolitis
Arroyo, L.	Improving Fecal Microbiota Transplantation in Horses
Arroyo, L.	Effects of exercise and Lasix on the pulmonary artery hemodynamics of EIPH affected horses
Barta, J. and Zeldenrust, E.	Detecting <i>Klossiella equi</i> , a potential cause of renal disease, in Ontario horses
Beeler-Marfisi, J.	Pathogenesis and characterization of inflammatory airway disease in Ontario Thoroughbred and Standardbred racehorses
Bienzle, D.	Ciliary function in horses with inflammatory lung disease
Cribb, N.	Ultrasound examination for assessment of closure of the nephrosplenic space in horses
Koch, T.	Isolation and Culture of Equine Mesenchymal Stromal Cells in Serum-Free Conditions
Koch, T.	Equine Mesenchymal Stromal Cells Ability to Help Fight Bacterial Infections
Koch, T.	Development of Osteochondral Constructs Using Equine MSCs
Koch, T.	Allogeneic Equine Umbilical Cord Blood Mesenchymal Stem Cells for Treatment of EIPH
Koch, T.	MicroRNAs as Equine Joint Health Biomarkers
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
Weese, S.	Characterization of the epidemiology and clinical impact of <i>Clostridium difficile</i> 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 2020-2021

New Projects:

EG2021-01 – Luis Arroyo - Investigation of Clostridium innocuum in horses with diarrhea

Typhlocolitis in horses is, by definition, inflammation of the cecum and colon, and diarrhea is the hallmark clinical sign of this intestinal disorder. Despite comprehensive microbiological investigative efforts to determine the cause of colitis, an etiological agent cannot be established for a large proportion (>60%) of these cases.

A recent study reported Clostridium innocuum as a potential causative agent of antibiotic associated (AAD) diarrhea in human patients. Clinically, in people it is characterized by diarrhea or severe colitis, including the most severe pseudomembranous colitis form. C. innocuum has been also associated with recurrent diarrhea in patients with prior C. difficile infection, and other forms of severe disease including bacteremia, endocarditis, and abscesses.

The isolation of C. innocuum from stool samples of human patients with suspected C. difficile infection led to the hypothesis that this organism may play a similar role as C. difficile in causing antibiotic associated diarrhea. Therefore, the aim of this study to investigate whether C. innocuum is present in fecal or intestinal contents of horse with colitis.

EG2021-08 – Janet Beeler-Marfisi - Identification of putative exercise-induced pulmonary hemorrhage causing variants in Ontario's Thoroughbred racehorses

Exercise-induced pulmonary hemorrhage (EIPH) is a common disease affecting up to 80% of training and racing Thoroughbreds (TBs). EIPH refers to bleeding within the lung during exercise and is diagnosed by visualizing blood in the trachea by endoscopic examination after work. The disease is caused by stress failure of the lung's capillaries during intense exercise from increased capillary pressures in what should otherwise be a low-pressure organ. Additionally, for unknown reasons, severely affected horses can suffer fatal bleeding into the lungs during high-intensity work.

In 2001, the Alcohol and Gaming Commission of Ontario, developed the Equine Incidences in Ontario Racing program, and mandated that any horse dying during or within 60 days of a race must undergo post-mortem examination. From 2003-2015, pulmonary hemorrhage and EIPH were determined as the cause of death in 76% of all sudden death cases, representing 37% of all sudden deaths in TB racehorses. Therefore, the disease is important to the racing industry not only as a cause of poor performance but also for its negative impact on the health and welfare of the horse, and the distress it causes to the general public and the people involved with the affected animal. Genetics were shown to have a moderate to high role in determining whether a TB will develop EIPH. As such, there may be genetic markers, or variants, within the TB genome that are associated with the development of EIPH. These variants could be used to identify horses at high risk of developing EIPH or fatal EIPH; however, these variants have yet to be discovered. In this study, we will identify genetic markers of EIPH using whole-genome sequencing of DNA from TBs with fatal EIPH. Our long-term goal is to identify and verify these EIPH-causing variants, with the aim of developing a genetic test, which could be used to inform breeding and training decisions in genetically predisposed TBs.

EG2021-09 – Diego Gomez – Fecal Microbiota of Surviving and Non-surviving Horses with Acute Diarrhea

Acute diarrhea is a major cause of morbidity and mortality in horses worldwide. In Ontario, the mortality rate of diarrheic horses hospitalized at the Ontario Veterinary College is 35% (n = 75/216) from which Thoroughbred and Standardbred breeds represented approximately 50% of the cases. Several pathogens are associated with acute diarrhea in horses, however the final

cause of the diarrhea is commonly not identified. Some studies showed that the bacterial communities of the gut are distorted in horses with diarrhea, those studies included a small number of cases, and therefore the impact of gut bacteria changes on clinical outcomes such as mortality and the key bacteria associated with a healthy gut or diarrhea remains generally unidentified. Therefore, larger clinical studies using newly developed statistical methods are needed to address these knowledge gaps, and better understand the bacterial changes that occur during diarrhea in horses. This study aims to investigate the differences in the gut bacterial communities between healthy and horses with acute diarrhea. Additionally, this study will examine the gut bacterial communities of surviving and non-surviving diarrheic horses. We hypothesize that the gut bacterial communities are significantly different in horses with colitis compared to healthy control horses, and that the gut bacterial communities are particularly distinct in diarrheic non-surviving horses. Elucidating the importance of the gut microbiota in the development of diarrhea and subsequent mortality of horses have clinical implications.

EG2021-10 – Diego Gomez – Hypotonic versus isotonic maintenance fluids in critically ill foals

Critically ill foals often receive maintenance intravenous fluids (IVFs) to correct and maintain normal hydration once the initial fluid resuscitation therapy has finished. Historically, administration of low-sodium (hypotonic) fluids as opposed to fluids with sodium concentration similar to those in the blood (isotonic fluids) was recommended. This practice was extrapolated from guidelines developed for healthy children in 1950s. However, this recommendation has recently been questioned in human medicine because some children can develop life-threatening low blood sodium levels. Thus, the use of isotonic fluids has increased for maintenance of hydration in ill children while the use of hypotonic fluids declined. Despite this, the current veterinary literature continues recommending hypotonic solution for maintenance IVFs in sick foals. This approach can be adequate in some cases because anecdotal reports suggest that administration of isotonic fluids to foals could lead to complications such as high levels of sodium in blood, fluid accumulation in the body, and increased blood pressure. However, these recommendations lack of evidence-based support. The objective of this study is to compare the effect of isotonic versus hypotonic maintenance fluid therapy on blood sodium concentrations, cardiovascular variables, sodium-regulating hormones, and urine production in critically ill foals. Results of this study are expected to provide data to support evidence-based protocols and the development of guidelines for fluid therapy in critically ill foals.

EG2021-11 – Diego Gomez – Endothelial glycocalyx degradation in critically ill foals

The endothelial glycocalyx (EG) is a thin gel-like layer covering the internal surface of blood vessels that regulates the transport of fluids, proteins oxygen and nutrients to the tissues. The EG also provides anticoagulant effects and protects the blood vessels from toxic insults. Damage to the EG occurs when the blood supply to the tissue is compromised, in inflammation, and in patients with localized or blood-borne infections. In human medicine, there is increasing evidence that administration of large volume of fluids during resuscitation of critically ill patients damage the EG, even more than the disease itself. Increased blood levels of markers associated with EG damage are also associated with increased risk of death. Administration of resuscitation intravenous fluid is one of the most important interventions in the management of critically ill foals presented to referring hospitals. However, no information is available regarding the blood levels of markers associated with EG damage in critically ill foals, their association with mortality and the impact of resuscitation fluid on the EG degradation. Therefore, the objective of this study is to determine the blood levels of EG damage markers in critically ill foals, before and after fluid resuscitation to determine whether this practice can worsen the integrity of the blood vessels. We hypothesise that the blood levels EG degradation markers will be associated with disease

severity, degree of inflammation, as well as volume and speed of intravenous fluids administered during early resuscitation.

EG2021-12 – Thomas Koch – Assessment of safety of encapsulated MSC and pooled MSC in fetlock joints

Mesenchymal Stromal Cells (MSC) has been shown to alleviate pain in mild to moderate osteoarthritis (OA) of the fetlock joint. To date, these cells have been from single donor animals which makes the therapeutic response less standardized. Furthermore, the injected cells are often removed from the joint quickly, which likely limits their efficacy. We hypothesize that injection of pooled MSCs from multiple donors within a hydrogel formulation into normal fetlock joints is safe and comparable to injection of non-encapsulated single donor MSCs. Our objectives are: 1) To compare and contrast the safety of single donor MSCs and pooled MSCs in normal fetlock joints; 2) To compare and contrast the safety of encapsulated MSCs and non-encapsulated MSCs in normal fetlock joints. These feasibility studies will be conducted in research horses, and the horses will be returned to the research herd upon completion of the study. Through our industry partner, we have access to a novel way to inject MSCs into joints and trap them there by first mixing them with a gelatin that hardens into microspheres small enough to go through a needle. The product is analogous to a slow-release capsule for medication but developed for cells. We expect that the tested cell formulation will not trigger significant adverse reactions following multiple injections. These results will set the stage for testing in horses with lameness due to fetlock OA.

EG2021-13 – Thomas Koch – Assessment of safety and potential of antisense miRNA-181 to treat fetlock OA

Osteoarthritis (OA) of the fetlock joint is a major equine welfare problem across breeds and disciplines leading to loss of training days, pre-mature retirement, or reduced performance. No therapies exist that delay progression of fetlock OA. MicroRNAs are small molecules that control gene expression; increased microRNA levels reduce expression of selected proteins. MicroRNA number 181 has been shown to be overexpressed in human facet joint OA. Injection of microRNA 181 into lab animal joints resulted in joint disease suggesting a critical role of microRNA 181 in joint health. Moreover, injection of antisense miR-181, which binds to and inactivates the effect of microRNA 181 in mice and rat models of joint disease, prevented the expected joint damage. This suggests that antisense miR-181 may be a useful therapy to treat OA.

We hypothesize that injection of antisense miR-181 into equine fetlock joints is safe and associated with reduced joint inflammation and pain. Our objectives are: 1) To determine the safety of antisense miR-181 in normal equine fetlock joints 2) To determine the safety, anti-inflammatory properties and analgesic effects of antisense-miR-181 in fetlock joints with documented OA and pain. 3) To determine if antisense miR-181 injected into the fetlock joint is detectable in the bloodstream. We expect that multiple injections of antisense miR-181 will not be associated with significant adverse reactions in normal or OA fetlock joints. We expect that multiple injections of antisense miR-181 will lead to a reduction of miR-181 concentrations within the fetlock joint, reduced lameness, and reduced joint inflammation.

EG2021-14 – Judith Koenig – Cone beam CT technique development to image the standing horse cervical spine.

Using computed tomography (CT) to diagnose diseases of vertebra and associated structures of the neck in people and other species is common. In horses we rely largely on radiographs to diagnose diseases of the neck. In a recently published study we showed that diagnosing osteoarthritis in neck joints on radiographs is not reliable and not repeatable. Misdiagnosis of compressive lesions with survey radiography alone occurs in 61% of cases compared with necropsy. CT evaluation of the neck in horses enables more accurate identification of bone and

soft tissue lesions than traditional laterolateral radiography. Currently, to perform CT general anesthesia is required and complete cervical vertebral column examination has been limited by horse size and CT scanner gantry size. Development of a standing CT technique will avoid the expense and risk of general anesthesia and the cone beam CT is better able to image the caudal cervical spine. Development of this technique may also allow for CT myelography of the standing horse as the soft tissue differentiation with cone beam CT is limited, but excellent for bone. We hypothesize that cone beam CT will allow evaluation of the cervical spine in standing horses that is comparable to that of a standard helical CT scanner for bones, and the procedure can be safely performed with reproducible results, and will identify bony abnormalities in clinical horses that are not fully characterized or seen with radiographs.

EG2021-17 – Scott Weese - Molecular epidemiology of *Streptococcus equi subsp equi* in Ontario horses

Streptococcus equi is the cause of 'strangles', an important and highly contagious equine disease. In addition to the impact on individual horses, identification of *S. equi* in a horse may lead to voluntary quarantine of entire facilities or restriction of horses from affected facilities from competition. The costs of disruptions in training and competition can be substantial, as can the healthcare costs for affected horses and testing costs required for disease control.

Despite its importance in Ontario, little is known about the epidemiology of disease, such as reservoirs and transmission patterns. Molecular typing involves evaluation of part of the bacterium's gene sequence (in this case, the SeM gene) to identify different strains, and is a key component of studying disease spread. However, there has been limited typing performed internationally, and none reported in Canada. Development of a typing database will facilitate future research and infection control efforts. As a database of strains grows, more refined information about the role of different strains in disease and spread, and better understanding of how this bacterium circulates in the horse population will be obtained.

The objectives are to molecularly characterize *S. equi* from horses in Ontario, from sporadic disease and outbreaks, and to develop an Ontario *S. equi* typing database for future study and surveillance.

For this study, *S. equi* will be isolated from horses in Ontario through collaboration with the Animal Health Laboratory, OMAFRA and the Ontario Racing Commission. Information about the clinical disease, herd-level disease, transmission on farm and presumed source will be collected. Isolates will be typed by sequence analysis of the SeM gene.

Strangles is an important equine disease and can be severely disruptive to farms or facilities. Greater understanding of the transmission of this bacterium will be useful for infection prevention and control, on facilities and more broadly.

Continuing 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 decreased in microbial richness and diversity occurs humans and animal 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.

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. 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.

Arroyo, L. Hyperimmune plasma transfusion for the prevention of *R. equi* infections in foals

Rhodococcus equi causes severe pneumonia in foals worldwide as well as other forms of extrapulmonary infections that are also severe. Foals acquire the infection shortly after being born which makes prevention of this disease difficult. Administration of *R. equi*-specific hyperimmune plasma (HIP) intravenously is the only form of prophylaxis available, as a vaccine does not currently exist. While it does not prevent infection, HIP administration has been shown to decrease severity of pneumonia in newborn foals experimentally challenged, although the protective mechanism of HIP remains poorly understood. The aim of this study is to determine the clinical usefulness of HIP administration under field conditions in Canada, as this has not been previously evaluated.

Arroyo, L. The association of Equine Parvovirus-Hepatitis (EqPV-H) with Theiler's disease and the prevalence of EqPV-H DNA and antibodies in horses in Ontario.

Theiler's disease (TD) (aka: equine serum hepatitis) is an acute or subacute hepatitis of horses and is one of the most commonly recognized causes of acute hepatic failure in adult horses. The disease is sudden in onset and rapidly progresses with death occurring within 24-48 hours. Up to 80% of affected horses show signs of hepatic encephalopathy (head pressing, aimless walking, yawning). Horses that develop hepatic encephalopathy have a grave prognosis. The majority of cases occur 4-10 weeks after the administration of an equine biologic ("biologic-associated TD") with the most common biologic being tetanus antitoxin. The administration of equine serum or plasma has also been implicated. In some cases, it has been observed there are horses affected that have not been treated with any equine biologic ("non-biologic associated TD"), and this led to the suggestion that an infectious and possibly contagious agent may be involved. A virus similar to the human hepatitis viruses was considered to be the most likely cause. Since 2011, three novel flaviviruses have been reported to be associated with equine hepatic disease. These include non-primate hepacivirus (NPHV), also known as equine hepacivirus (EqHV), equine pegivirus (EPgV) and Theiler's disease-associated virus (TDAV). Of these viruses only NPHV has been shown to be hepatotropic in the horse. In 2018, a novel equine parvovirus, designated equine parvovirus-hepatitis (EqPV-H) was identified in the serum and liver of a horse that died of

Theiler's disease 65 days after treatment with equine origin tetanus antitoxin (TAT). This virus was also found in the administered TAT and it has been suggested that EqPV-H can cause Theiler's disease in horses. EqPV-H had been detected in horses suffering from liver disease in Ontario, therefore, the objective of this study is to determine the prevalence of the virus in a subset of horses in Ontario.

Arroyo, L. Dynamics of vitamin D metabolites in healthy and hospitalized horses with enterocolitis

Equine enterocolitis (diarrhea, colitis) is a major cause of morbidity and mortality worldwide. Consequences of equine colitis include loss of hormonal control, metabolic/ electrolyte / fluid derangements, and organ failure. Vitamin D has a multitude of functions, including regulation of calcium and phosphorus, promotes bone health, controls the immune system, and reduces inflammation. Low vitamin D levels have been linked to mortality in sick people. There is no information on how the blood levels of vitamin D change in sick and healthy adult horses and whether these changes are associated with other hormones, inflammatory factors, and mortality in hospitalized horses with colitis. The goal of this study is to determine whether changes in vitamin D during hospitalization of horses with colitis are associated with laboratory abnormalities, disease severity and outcome.

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 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.

Beeler-Marfisi, J. The relationship between EIPH and exposure to ambient air pollution in Thoroughbred and Standardbred racehorses

Worldwide, the prevalence of exercise induced pulmonary hemorrhage (EIPH) is estimated between 44% to 85% of Thoroughbred (TB), and up to 87% in Standardbreds (SB) racehorses. The condition is important to Ontario racing because affected horses are suspected to have shortened racing careers, and in rare instances, may suffer sudden death from massive hemorrhage. EIPH is caused by stress failure of capillaries in the caudodorsal lung, secondary to repeated high-intensity work. However, Veterinarians who regularly assess racehorses by tracheobronchoscopy at Woodbine and Woodbine-Mohawk Park (Mohawk) racetracks in Ontario,

Canada are concerned that their proximity, respectively, to Lester B. Pearson Airport and a major highway is exposing racehorses to excessive air pollution, which might contribute to development of EIPH. Two previous studies showed a relationship with EIPH and cooler temperature, but studies on air pollution and EIPH are lacking. The provincial and federal governments have air quality monitoring stations and weather stations located close to Woodbine and Mohawk. These collect air pollution data including nitrogen dioxide (NO₂), ozone (O₃) fine particulate matter less than 2.5 microns in diameter (PM_{2.5}), and temperature data.

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.

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.

Chenier, T. Do mast cells play a role in persistent breeding-induced endometritis in the mare?

Over 18% of Ontario’s 212,000 horses are designated as breeding stock, and reproductive health is critical to the economic success of the industry. Reproductive efficiency in horses is generally low, for a variety of reasons, including infertility caused by uterine disease such as endometritis. Endometritis is the third most common medical condition encountered overall in equine veterinary practice and approximately 60% of mares affected by endometritis are barren. One type of endometritis, persistent breeding induced endometritis, or PBIE, occurs in mares that have an abnormal inflammatory response after breeding. Up to 43% of broodmares suffer from this condition, depending upon the study and the definition used. Given the large number of horses in the breeding sector in Ontario, endometritis and more specifically PBIE, causes a significant economic impact to the breeding industry. One type of inflammatory cell, the mast cell, may play a role in PBIE. While mast cells are generally thought of as inducing allergic reactions, they are also involved in many chronic inflammatory conditions and can induce fibrosis. Both of these occur in PBIE-affected mares. This study will determine the number of mast cells in the endometrium of PBIE- affected and unaffected mares and evaluate whether cell numbers change in response to artificial insemination. A better understanding of the abnormal inflammation that occurs in PBIE-affected mares will lead to new and improved treatments for this important condition that causes infertility.

Cribb, N. Ultrasound examination for assessment of closure of the nephrosplenic space in horses

Currently, preventative laparoscopic surgery for nephrosplenic entrapment colic is the recommendation for horses to reduce the risk of disease of this type. The technique is well established but 2 recent reports in the scientific literature have highlighted our lack of knowledge of aspects of this surgery. The papers have highlighted that firstly, we currently do not know how long the preventative effects from the surgery last, and, secondly, we do not know whether the outcome from the surgery can be evaluated by ultrasound examination. In our research herd, there are 12 horses that have recently undergone closure of the nephrosplenic space by the PI. It is our aim to follow these horses for up to 3 years following their surgery to determine whether the adhesions last this length of time. These findings will be correlated with a concurrent ultrasonographic examination to see if this imaging modality can be used to determine closure of the space.

Hurtig, M. The Safety and Efficacy of Intra-Articular Therapies

We intend to compare the efficacy of mesenchymal stromal cells (MSCs) - previously known as mesenchymal stem cells - versus steroid injections in the equine fetlock for treatment of joint injury and osteoarthritis. This project also addresses the safety of steroid injections in joints which continue to be widely debated in the racing and sporting industry. We know from human studies that injection of MSCs result in better and longer results in the human knee than steroids. Also, preliminary studies in equine stifle and fetlock lameness seem to indicate the MSC therapies improve the recovery of the horses. Our own work has shown that we can identify the best MSCs

from the specific donors and use these cells in joints to reduce inflammation. In addition, the co-investigators in this proposal have shown that MSCs can be thawed, handled and injected without damaging the cells, and that a single injection of similar MSCs can reduce or stop the progress of osteoarthritis in the knee of sheep. Since chip fractures in the fetlock joint are relatively common source of lameness and contribute to cartilage damage, we will create a small chip fracture in the fetlock joint of research horses and follow the progress of physical and metabolic cartilage injury in horses that receive MSCs or steroids. In order make this model more aligned with real-life management of these injuries we propose to exercise the horses in the form of galloping and jumping during the evaluation of the treatments.

Koch, T. Enhancement of Immune-Modulatory Properties of eCB-MSCs

Horses are multi-use livestock that contribute more than \$19 billion annually to the Canadian economy. Joint inflammation due to osteoarthritis or injury is among the most common causes of lost training days or premature retirement in equine athletes. Stem cells hold the promise of novel therapeutic approaches to these difficult-to-treat problems. Mesenchymal stromal cells (MSCs) can be expanded in culture to achieve the desired number for treatment and are capable of modulating cells of the immune system even after long-term storage, which makes them desirable for treatment of immune and inflammatory disorders. We expect that equine cord blood-derived (CB-) MSCs can be enhanced to have improved anti-inflammatory and immunomodulatory properties for future use as treatment of a variety of inflammatory or immune related disorders in horses. Our sole objective of this study is to determine possible in vitro enhancement of equine CB-MSCs using a novel proprietary culture engineering method to improve these immunomodulatory properties. The work will generate pivotal data to support the clinical evaluation of enhanced allogenic equine CBMSCs to treat joint inflammation in research horses. Upon proving the concept in research horses with induced inflammation, the enhanced equine CB-MSC would be tested in a randomized clinical trial for the treatment of joint inflammation in client-owned horses suffering from osteoarthritis. Fully implemented, this therapy would provide a safe, efficacious, and technically simple treatment for selected inflammatory or immune-related disorders in horses.

Koch, T. Vitrified Equine MSC Cartilage for Cartilage Repair

Horses are multi-use livestock that contribute more than \$19 billion annually to the Canadian economy. Injuries to joints are among the most common causes of lost training days or premature retirement in equine athletes. Stem cells hold the promise of novel therapeutic approaches to these difficult-to-treat problems. Large cartilage defects >4cm² are a challenge to treat, but so-called cartilage chips (1x1x1 mm) have shown significant clinical promise in human medicine, regardless of whether the cartilage was sourced from juvenile human cadavers, unrelated adult cadavers, or from the patient. Preclinical work in the horse model has also shown promising results using cartilage harvested from the joints of horses. However, current cartilage chip methods are hampered by a limited supply of donor material, risk of disease transmission, suboptimal graft tissue, and donor site morbidity. Donor age, comorbidities, and harvest site may also negatively influence the biological potency of present cartilage and cell grafting methods. We propose to solve these issues by using cartilage generated in the laboratory from equine cord blood mesenchymal stromal cells (eCB-MSC). We will vitrify (cryopreserve) the cartilage tissue for indefinite storage and availability as an off-the-shelf live-cell cartilage graft that can be implanted using standard surgical methods. We are seeking support to establish a robust vitrification protocol for eCB-MSC-derived neocartilage. The work will generate pivotal data to support the clinical evaluation of cryopreserved allogenic eCBMSC cartilage chips to repair focal cartilage defects in research horses. Fully implemented, this therapy would provide a safe, efficacious, and technically simple treatment for horses as well as provide an opportunity for a

Canadian biotechnology business to bank and distribute vitrified cartilage tissue in unlimited quantities to the world market.

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.

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 racehorses 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. 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. Effect of Extracorporeal Shock Wave Therapy on Intracellular Stress and Immunomodulatory Function of Equine Umbilical Cord Blood Mesenchymal Stromal Cells

Electrohydraulic shock wave (ESWT) has been shown to increase proliferation and differentiation of equine umbilical cord blood derived mesenchymal cells (CB-MSCs). The mechanism of this effect is unknown. It could be the result of cell stress or alternatively, due to production of cytokines or other secreted substances. Further evaluation of this mechanism is needed to develop a combined shockwave-CB-MSC treatment to enhance tissue healing.

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 spines 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.

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.

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

Gomez DE, **Arroyo LG**, Lillie B, Weese JS. Nasal bacterial microbiota during an equine herpes virus 1 outbreak at a farm in Southern Ontario. *Can J Vet Res.* 2021;85(1):3-11.

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

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.

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

Dr. Janet Beeler-Marfisi

Increased Weekly Mean PM_{2.5}, and NO₂ Are Associated With Increased Proportions of Lower Airway Granulocytes in Ontario Horses. Brankston G, Greer AL, Marshall Q*, Lang B*, Moore K*, Hodgins D, Hennessey JTG, Beeler-Marfisi J. *Front Vet Sci.* 2020 May 5;7:185. doi: 10.3389/fvets.2020.00185. eCollection 2020.PMID: 32432128

Kang H*, Bienzle D, Lee G*, Piché E, Viel L, Beeler-Marfisi J. Flow cytometric analysis of equine bronchoalveolar lavage fluid cells in horses with and without severe equine asthma. *Vet Pathol.* VET-21-FLM-0035

Exercise-Induced Pulmonary Hemorrhage and Air Pollution, Beeler-Marfisi’s interview with Jackie Bellamy-Zions for “Equine Guelph Research Annual News”, January 2020 was picked up by: Standardbred Canada, Canadian Thoroughbred, Horsetalk in New Zealand, and Paulick Report.

Dr. Dorothee Bienzle

OVC Researcher Contributes to Global Paper on Equine Asthma, <https://thehorseportal.ca/2021/01/ovc-researcher-contributes-to-global-paper-on-equine-asthma/> Press release and YouTube Video <https://youtu.be/zZtkGCvRhd8> , Jan 4, 2021

OVC Researcher Contributes to Global Paper on Equine Asthma – Feature story in Equine Guelph Annual Research Update Volume 18 – Jan, 2021

OVC Researcher Contributes to Global Paper on Equine Asthma, <https://www.horsetalk.co.nz/2021/01/11/researchers-look-for-early-predictors-of-equine-asthma/> , Jan-11-2021

OVC Researcher Contributes to Global Paper on Equine Asthma, <https://www.americanhorsepubs.org/newsgroup/27641/21565/> , Jan-12-2021

OVC Researcher Contributes to Global Paper on Equine Asthma, <https://horse-canada.com/horse-news/equine-guelph-research-update-equine-asthma-heaves/> , Jan-14-2021

OVC Researcher Contributes to Global Paper on Equine Asthma, OVC Bulletin, Jan 18, 2021. <https://bulletin.ovc.uoguelph.ca/post/640683303678148608/ovc-people-in-the-news> , Jan-18-2021

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OVC Researcher Contributes to Global Paper on Equine Asthma
OVC bulletin, Apr-12-2021

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Dr. Tracey Chenier

The Effects of treatment with N-acetyl cysteine on clinical signs in persistent breeding-induced endometritis in susceptible mares. *Journal of Equine Veterinary Science*, 92: May 30, 2020.

Authors: Michelle Caissie, Cathy Gartley, Elizabeth Scholtz, Joanne Hewson, Ronald Johnson and Tracey Chenier

link: <https://pubmed.ncbi.nlm.nih.gov/32797774/>

OVC Researchers to Conduct First Study in Canada Investigating a Parasite that May Cause Equine Abortions June 2019 <https://www.equineguelph.ca/news/index.php?content=624>

Dr. Nicola C. Cribb

Delli-Rocili M, Cribb NC, Trout DR, Thomason J, Valverde A. Effectiveness of a paravertebral block versus local portal blocks for laparoscopic closure of the nephrosplenic space: A pilot study. *Veterinary Surgery* 2020;1-8. Early View.

Dr. Diego Gomez

Martin de Bustamante M, Plummer C, MacNicol J, Gomez D. Impact of Ambient Temperature Sample Storage on the Equine Fecal Microbiota. *Animals (Basel)*. 2021;11(3):819. doi: 10.3390/ani11030819.

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Further distributed by: <https://www.horsetalk.co.nz/2020/08/06/3d-printed-neck-bones-equine-vet-training/>, <https://horse-canada.com/magazine/health/how-3-d-printing-helping-equine-veterinarians/>, OVC Bulletin Aug 24, 2020, <http://www.equinechronicle.com/3-d-printing-research-creates-model-of-equine-neck-for-vet-training/>, <https://standardbredcanada.ca/notices/8-19-20/3-d-printing-research-creates-model-equine-neck-veterinary-training.html>, TheRider.com, <https://www.americanhorsepubs.org/newsgroup/26129/24075/>, <https://www.cosaonline.com/news/3-d-printing-research-creates-model-of-equine-neck-for-veterinary-training/>, <https://equimed.com/news/general/3-d-printing-research-creates-model-of-equine-neck-for-veterinary-training>, <http://www.harnesslink.com/News/3-D-Printing-for-Veterinary-Training?highlight=guelph>, <https://www.quarterhorsenews.com/2020/08/3-d-printing-research-creates-model-of-equine-neck-for-veterinary-training/>

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Dr. Amy Greer

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Dr. Mark Hurtig

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<https://thehorseportal.ca/2020/06/innovative-research-on-equine-lameness-equine-conditioning-tips/>, and Equine Guelph YouTube Video <https://youtu.be/9ubYv7xExIM> , June-2-2020

Equine lameness & Equine conditioning tips, <http://www.harnesslink.com/News/Equine-lameness-Equine-conditioning-tips>, Jun-12-2020

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<https://www.horsetalk.co.nz/2020/06/13/biologic-therapies-joint-horses/>, June-13-2020

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<http://www.equinechronicle.com/innovative-research-on-equine-lameness-and-conditioning-tips/>, June-14-2020

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Dr. Thomas Koch

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Dr. Judith Koenig

J. Koenig, *Equine Guelph Article: Research Study on Diagnostics for Equine Osteoarthritis of the Neck* <https://thehorseportal.ca/2020/09/research-study-on-diagnostics-for-equine-osteoarthritis-of-the-neck/>, and You Tube Video: <https://www.youtube.com/watch?v=dMHav84T-xg>, Sept, 29, 2020.

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J. Koenig, Equine Guelph Article: Lameness Research and Prevention Tips with Dr. Judith Koenig at OVC <https://thehorseportal.ca/2020/05/lameness-research-and-prevention-tips-with-dr-judith-koenig-at-ovc/> and YouTube Video released by Equine Guelph <https://youtu.be/PIXuq43EtvC>, May, 6, 2020

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J Koenig, Amy Westlund, S Nykamp, D Kenney, L Melville, N Cribb, D Oberbichler
Case-control comparison of cervical spine radiographs from horses with a clinical diagnosis of cervical facet disease, with normal horses. *Journal of Equine Veterinary Science* accepted for publication June 2020

J Koenig, Amy Westlund, S Nykamp, D Kenney, L Melville, N Cribb, D Oberbichler. Cervical facet disease: Data of Sports horses with diagnosis of cervical facet disease, compared with normal horses *Data in Brief*, *accepted for publication June 2020*

Ramés Salcedo-Jiménez¹, Judith B. Koenig^{1*}, Olivia Lee², Thomas W.G. Gibson¹, Pavneesh Madan², Thomas G. Koch² Effect of extracorporeal shock wave therapy on equine umbilical cord blood mesenchymal stromal cells in vitro; *Vet Surgery* (abstract) 2018; Dec & *Vet Surgery* (abstract) 2020 July

Ramés Salcedo-Jiménez¹, Judith B. Koenig^{1*}, Olivia Lee², Thomas W.G. Gibson¹, Pavneesh Madan², Thomas G. Koch² Extracorporeal shock wave therapy enhances the in vitro metabolic activity and differentiation of equine umbilical cord blood mesenchymal stromal cells. *Frontiers* under review

Rames Salcedo-Jimenez: Effect of extracorporeal shock wave therapy on equine umbilical cord blood mesenchymal stromal cells in vitro DVSc thesis 2019

Dr. Brandon Lillie

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Dr. Katrina Merkies

Merkies K. 2020. Welfare of horses and humans in animal-assisted interventions. In: Driscoll C (Ed), Animal-Assisted Interventions for Health & Human Service Professionals. Nova Science Publishers, NY

Merkies K, Copelin C, Crouchman E, St-Onge A. 2020. The effect of the COVID-19 pandemic on riding lesson barns and summer camps in Ontario. *Animals* 10(12):2412.
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Merkies K, Aug, 26, 2020, Equine Guelph article: Horse human interaction studies, <https://thehorseportal.ca/2020/08/horse-human-interactions-studied/>
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<https://doi.org/10.3920/CEP190025>

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.

Dr. Peter 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.

Dr. Jeff Thomason

D. Halucha, W. Sears, J. Thomason. Future Footing & Training Decisions, <https://equineguelph.ca/news/index.php?content=633>, Equine Guelph Press Release, August 2019

Dr. Scott Weese

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

Dr. Alex zur Linden

Alexandra Beaulieu, Alex zur Linden, John Phillips, Luis G. Arroyo, Judith Koenig, Gabrielle Monteith. Various 3D printed materials mimic bone ultrasonographically: 3D printed models of the equine cervical articular process joints as a simulator for ultrasound guided intra-articular injections. *PLOS ONE* | <https://doi.org/10.1371/journal.pone.0220332> August 6, 2019

Appendix 7: Research Presentations:

Dr. Janet Beeler-Marfisi

Abbinash Sanmugam, Heng Kang, Janet Beeler-Marfisi. Alveolar macrophage expression of CD163 in healthy and mildly asthmatic horses. Summer CORE Program poster presentation. August 2020

Kang H, Bienzle D, Lee G, Piché E, Viel L, Beeler-Marfisi J. Flow cytometric analysis of equine bronchoalveolar lavage fluid cells in horses with and without severe equine asthma. Graduate Student Research Symposium August 25, 2020

Kang H, Bienzle D, Lee G, Piché E, Viel L, Beeler-Marfisi J. Flow cytometric analysis of equine bronchoalveolar lavage fluid cells in horses with and without severe equine asthma. ACVP/ASVCP Annual Meeting October 30-November 1, 2020 (Proceedings abstract & platform presentation)

Lee KCG, Beeler-Marfisi J, Viel L, Piché É, Kang H, Sears W, Bienzle D. Bronchial brush cytology, endobronchial biopsy, and immunohistochemical measurement of salsa as diagnostic tools for severe equine asthma. ACVP/ASVCP Annual Meeting October 30-November 1, 2020 (Proceedings abstract & platform presentation) - first author won the Young Investigator Award for this presentation

Fatima K, Kang H, Hammermüller J, Beeler-Marfisi J. Development of an in vitro model of equine lung tissue for the study of pathogenesis of mild equine asthma. December 4, 2020. BIOM4521 Course Presentation.

Sarjeant R, Kang H, Hammermüller J, Beeler-Marfisi J. Effects of fungal spores versus yeast-derived 1,3-beta glucan on monocyte-derived macrophages. ANSC4700. Poster Presentation, December 4, 2020

ACVP/ASVCP Annual Meeting 2020: Abstract being submitted on flow cytometric analysis of equine BALF cells, supported in part by EG 2017-01

January-February 2020: primary literature-supported content, visuals, and lecturer in Equine Guelph's "Respiratory Health – Exclusive to Racing" course

April 2019 on behalf of Equine Guelph: Can-Am All Breeds Equine Expo – Build Your Own Equine Upper Airway

August 2018: Bronchoalveolar lavage in horses to equine vet members of the Central Canadian Veterinary Association in Kemptville, ON.

2017 & 2018 Four CORE platform & poster presentations – Quinn Marshall & Sylvie Becker – 2017, Brittany Lang & Kai Moore – 2018

Dr. Keith Betteridge

Raeside, 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

Dr. Dorothee Bienzle

Lee GKC, Beeler-Marfisi J, Viel L, Piché E, Kang H, Sears W, Bienzle D. Bronchial brush cytology, endobronchial biopsy, and immunohistochemical measurement of SALSA as diagnostic tools for severe equine asthma. Ann Meet Am Coll Vet Pathol, Virtual, Oct. 2020

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

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

Dr. Nicola C. Cribb

Massimo Delli-Rocili, DVSc candidate, presented the following research in a poster competition and won first place! Delli-Rocili M, Cribb NC, Trout DR, Thomason J, Valverde A. Effectiveness of a paravertebral block versus local portal blocks for laparoscopic closure of the nephrosplenic space: A pilot study. Veterinary Surgery 2020:1-8. Early View. Presented at 2019 ACVS symposium.

Dr. Tracey Chenier

The seroprevalence of Neospora caninum in Ontario broodmares: accepted for Oral presentation at the 28th Conference of the World Association for the Advancement of Veterinary Parasitology, May 2021 (Online Conference this year). Authors: Olivia Johns, David Pearl, Robert Foster, John Barta and Tracey Chenier.

Dr. Diego Gomez

Jaramillo C, Arias MP, Renaud D, Gomez DE. Comparison of blood gas analysis, electrolytes and plasma protein concentrations in horses at different altitudes. American College of Veterinary Internal Medicine (ACVIM) Forum, online format, 2020.

Gomez DE, Buczinski S, Darby S, Palmisano M, Mackay R. Comparison of different methods for measurement of electrolytes and detection of acid-base disorders in horses. American College of Veterinary Internal Medicine (ACVIM) Forum, online format, 2020.

Gomez DE, Buczinski S, Palmisano M, Darby S, Mackay R. Methodologic comparison of two analyzers for measurement of glucose and creatinine concentrations in sick horses. American College of Veterinary Internal Medicine (ACVIM) Forum, online format, 2020

Dr. Amy Greer

Rossi, T.M., T.L. O'Sullivan, and A.L. Greer. Descriptive network analysis of Ontario equine competitions: implications for disease control. Equestrian Canada Health and Welfare Committee, March 10, 2021

Greer, A.L., Preparing Equine Facilities for Shelter in Place Orders. Equestrian Canada. March, 2020

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.

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. Judith Koenig

Evaluation of the significance of arthropathy of the caudal facet joints in horses J Koenig, Amy Westlund, S Nykamp, D Oberbichler, D Kenney, L Melville: ECVS Annual Scientific Meeting 2019, Budapest, Hungary (abstract in *Veterinary Surgery* August 2019)

Outcome of the evaluation of the significance of arthropathy of the caudal facet joints in horses Amy Westlund, J Koenig, S Nykamp, D Oberbichler, D Kenney, L Melville: CORE @ Ontario Veterinary College, Guelph, Ontario, 2018

Evaluation of the significance of arthropathy of the caudal facet joints in horses. J Koenig, Amy Westlund, S Nykamp, D Oberbichler, D Kenney, L Melville: ACVS Annual Scientific Meeting 2018 (abstract in *Veterinary Surgery* December 2018)

Dr. Brandon Lillie

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.

Dr. Katrina Merkies

Merkies K. A match made in heaven: the road to horse and human well-being. International Society for Equitation Science virtual summer meeting. August 2020

Hodder A, Merkies K. Can Ponies (*Equus caballus*) Distinguish Human Facial Expressions? Animal Behaviour Science Virtual Conference. July 2020
https://www.animalbehaviorsociety.org/virtual/?page=presentation&session_id=51&presentation_id=665

Merkies K. Euthanasia – a difficult decision. OVC Vet Club. Jan 9, 2020

Dr. Jeff Thomason

Asymmetrical limb loading in Thoroughbred racehorses as a possible cause for injury, D. Halucha, W. Sears, J. Thomason. 15th Annual (ISES) Conference, University of Guelph, August 19 - 21, 2020

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: Presentations and Talks Given by Equine Guelph

Presentations & Talks by Gayle Ecker

November 18, 2020 The Canadian Code of Practice, online presentation, Equine Industry Symposium Day 3: Welfare of the Horse

March 8, 2021 International Women's Day Conference, online presentation on The Change Makers in Equine Welfare

March 23, 2021 "Career Pathways in the Equine Industry", online presentation for the Royal Agricultural Virtual Experience.

Presentations & Talks by Susan Raymond

S. Raymond, V. MacPherson, B. Kelly, R. Gimenez-Husted, and G. Ecker, "Large Animal Rescue and Livestock Emergency Response Training – Best Practices", February 23, 2021, Global Animal Disaster Management Conference (online)

V. MacPherson and S. Raymond, "Large Animal Rescue – Awareness Level Virtual Workshop", March 4, 2021, University of Guelph, Guelph, ON (repeated March 11, 12 and April 28, 2021)

V. MacPherson and S. Raymond, "Large Animal Rescue – Case Studies Virtual Workshop", Special session for McKee Pownall Veterinary Clinic, March 12, 2021, University of Guelph, Guelph, ON

S. Raymond, "Large Animal Rescue - Introduction", Undergraduate degree BBRM, April 8, 2021, University of Guelph, Guelph, ON

S. Raymond, "Fire Prevention and Emergency Preparedness", Undergraduate degree BBRM, April 8, 2021, University of Guelph, Guelph, ON

Presentations & Talks by Nicole Weidner, PhD Candidate

"The Horse's Digestive System", August 15, 2020 - Fuelling Wellness Symposium

"A Journey through the Horse's Digestive System", February 24, 2021

"The Healthy Horse: Understanding the Role of Equine Digestion & Nutrition", April 14, 2021

Events and Seminars

Talks and events continued to be restricted for the 2020-21 year.

Prominent Events, Training and Updating Attended by Equine Guelph

2020/2021

G. Ecker and J. Zions, World Horse Welfare 2020 Virtual Conference, November, 12, 2020

J. Zions, International Society for Equitation Science Virtual Summer meeting, August 12-14, 2020

S. Raymond, Animal Technical Rescue Awareness Training, Certificate of Completion, University of Florida Veterinary Emergency Treatment Service, March 17, 2021

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: Dr. Robin Foster PhD)
Advanced Functional Anatomy (Instructor: Dr. Jeff Thomason, PhD)
Equine Behaviour (Instructor: Lindsay Nakonechny, MSc and Zoe Thorbergson MSc)
Equine Business Finance and Risk Management (Instructor: Dr. Julie Fischer MBA, D.M.)
Equine Business Management (Instructors: Rachael Hunter & Christine Polhkamp)
Equine Event Management (Instructor: Shelby Pennington)
Equine Genetics (Instructor: Dr. Dianne Winkelman-Sim, PhD)
Equine Nutrition (Instructor: Nicole Weidner, MSc)
Equine Welfare (Instructor: Gayle Ecker, MSc)
Exercise Physiology (Instructor: Dr. Amanda Waller, PhD)
Functional Anatomy (Instructors: Dr. Jeff Thomason, PhD, Dr. Janet Douglas, PhD, Cathy Wentworth Stanley MSc)
Global Perspectives in Equine Welfare (Instructor: Dr. Tamara Tadich, PhD, DVM)
Management of the Broodmare, Stallion and Foal (Instructor: Catherine McMeeking)
Health & Disease Prevention (Instructor: Dr. Ev Post)
Management of the Equine Environment (Instructors: Dr. Susan Raymond & Kathy Fremes)
Marketing & Communications (Instructor: Tracy Dopko)
Stewardship of the Equine Environment (Instructor: Dr. Susan Raymond, PhD)
The Equine Industry (Instructor: Gayle Ecker, MSc)
Equine Journalism: (Emily Esterson, MFA)

Short Online course offered by Equine Guelph on TheHorsePortal.ca

Equine First Aid (Instructor: Dr. Laura Frost, DVM)
Fire and Emergency Preparedness (Instructor: Dr. Susan Raymond, PhD)
Gut Health and Colic (Instructor: Nicole Weidner, MSc)
Horse Behaviour and Safety (Instructor: Dr. Susan Raymond, PhD)
Horse Behaviour and Safety for Youth (Instructor: Jackie Bellamy-Zions)
Horse Care and Welfare (Instructor: Gayle Ecker, MSc)
Racehorse Respiratory Health (Instructor: Dr. Melissa McKee, DVM)
Sickness Prevention (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 37 diplomas awarded in 2020/21, the total number of diplomas awarded has increased to 346.

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 18 Equine Science Certificates awarded in 2020/21, to date 467 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 2020/21, to date 85 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 3 Certificates in Equine Welfare awarded in 2020/21, to date 28 Equine Welfare Certificates have been awarded.

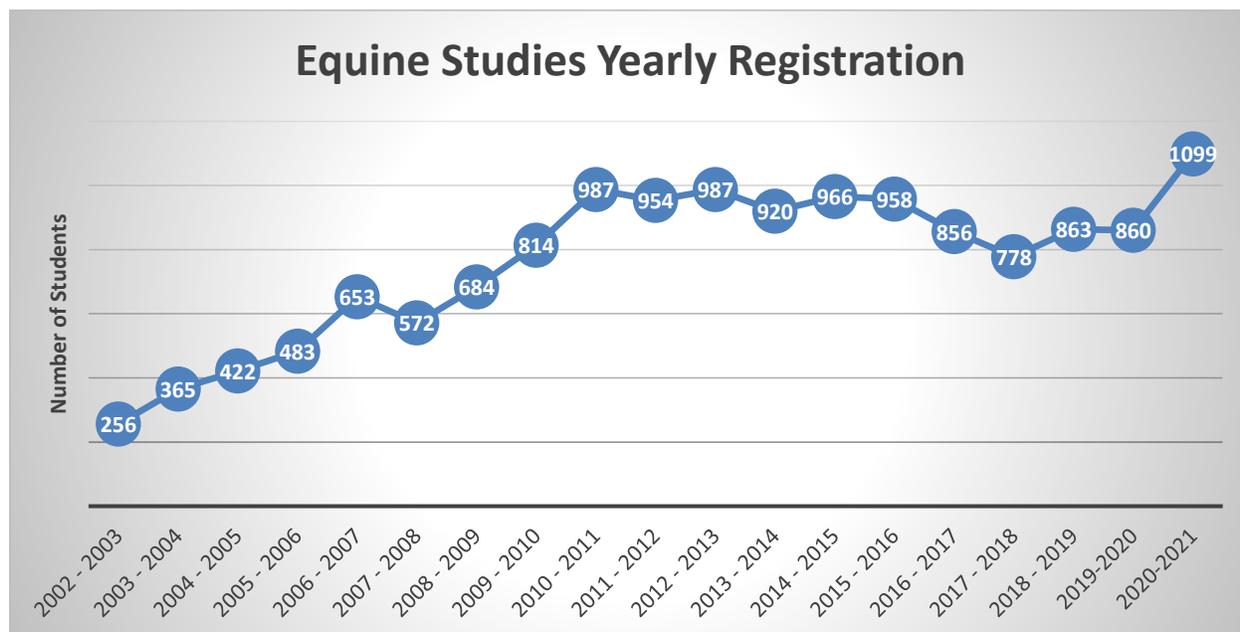
Program Requirements:

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

2020 – 2021 Student Registration Profile

Number of individual students	607
Total number of registrations	1099

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
2019 - 2020	860	920	516
2020 - 2021	1099	1000	607

Student Enrollment Numbers 2020 - 2021
 New Students - 213
 Individual Students - 607

Enrollment Registrations by Course 2020-2021

Summer 2020.

2200000	Management of the Equine Environment	55
2200002	Equine Behaviour	50
2200004	Equine Health and Disease Prevention	47
2200001	Equine Exercise Physiology	69
2200012	Equine Business Finance and Risk Management	44
2200013	Equine Welfare	31

Fall 2020

2200000	Management of the Equine Environment	62
2200002	Equine Behaviour	62
2200004	Equine Health and Disease Prevention	55
2200006	Equine Nutrition	66
2200010	Stewardship of the Equine Environment	50
2200015	Advanced Equine Behaviour	31
2210002	Equine Business Management	47

Winter 2021

2200000	Management of the Equine Environment	59
2200002	Equine Behaviour	65
2200005	Equine Functional Anatomy	55
2200008	Equine Genetics	62
2200018	Management of the Broodmare, Stallion & Foal	65
2200011	The Equine Industry	35
2200017	Global Perspectives in Equine Welfare	15
2200014	Advanced Equine Health through Nutrition	29
2240000	Marketing & Communications in Equine Industry	42
Total Enrollments		1099

Advanced Courses

Course	Semester	# of reg
Advanced Equine Behaviour	F20	31
Advanced Equine Health through Nutrition	W21	29
	Total	60

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	W21	15
Equine Welfare	S20	31
	Total	46

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
2016 - 2017	23
2017 - 2018	21
2018 - 2019	26
2019 - 2020	22
2021 - 2021	22

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
2016 - 2017	17
2017 - 2018	16
2018 - 2019	17
2019 - 2020	14
2020 - 2021	17

Where are our students coming from?

Canadian Students

Student numbers	
AB	79
BC	68
MB	9
NB	10
NL	3
NS	17
NU	0
NT	2
ON	231
PE	7
PQ	37
SK	6
YT	0
TOTAL	469

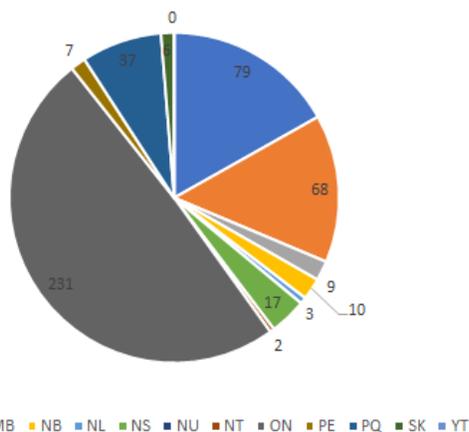
International Students

Student numbers	
Australia	8
Austria	1
Belgium	1
Cayman Isl.	1
Columbia	1
Denmark	1
Ecuador	1
Egypt	1
France	1
Finland	1
Germany	2
India	1
Kazakhstan	1
Mexico	2
Netherlands	2
New Zealand	3
Portugal	1
Qatar	1
Russia	1
Saudi Arabia	1
South Africa	6
Sweden	1
Switzerland	2
Taiwan	1
UAE	2
UK	6
TOTAL	50

US Students

Student Numbers	
AK	1
AZ	3
CA	15
CO	4
DC	1
FL	2
GA	1
IA	2
IL	2
IN	4
KS	2
MD	3
ME	3
MI	2
MO	3
NC	1
NH	1
NJ	3
NV	1
NY	1
OK	1
OR	2
PA	4
SC	2
TN	1
TX	9
UT	1
VA	5
WA	5
WI	2
TOTAL	88

Canadian Student Distribution by Province



Year to Year Comparison by student geographic location

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CAN	451	459	442	461	451	442	428	428	387	469
US	19	31	54	38	44	56	40	40	94	88
INT	17	13	20	23	45	45	80	94	50	50
	487	503	516	522	540	525	548	562	572	607

Year by Year Comparison of the geographic location of Canadian Students

	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
AB	39	49	54	48	49	48	61	50	58	46	79
BC	47	48	64	63	66	70	60	67	70	49	68
MB	10	13	10	4	7	14	10	11	13	7	9
NB	4	8	7	5	4	6	9	8	10	10	10
NF	2	2	3	4	4	7	4	6	4	3	3
NS	11	10	15	18	16	13	7	11	11	13	17
NU	0	1	0	0	0	0	0	0	0	0	0
NT	0	0	0	3	3	1	0	2	2	2	2
ON	338	296	275	259	275	249	229	223	208	221	231
PI	0	0	4	3	1	2	0	2	2	3	7
PQ	19	18	12	21	20	22	29	30	32	29	37
SK	10	6	14	14	16	17	15	13	18	4	6
YT	2	0	1	0	0	2	0	2	0	0	0
	482	451	459	442	461	451	424	425	428	387	469

Graduates of our Certificates and Diploma Program of Studies

	ESC	CEBM	DipES	WEL
2004/05	36	n/a	n/a	n/a
2005/06	27	n/a	n/a	n/a
2006/07	32	n/a	n/a	n/a
2007/08	25	n/a	n/a	n/a
2008/09	38	n/a	n/a	n/a
2009/10	20	n/a	22	n/a
2010/11	30	2	13	n/a
2011/12	30	6	23	n/a
2012/13	28	7	29	n/a
2013/14	19	9	25	n/a
2014/15	21	6	20	n/a
2015/16	50	14	38	3
2016/17	27	6	34	3
2017/18	15	8	29	4
2018/19	20	10	27	8
2019/20	31	13	49	7
2020/21	18	4	37	3
	467	85	346	28

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

The Horse Portal 2020 – 2021

Course Offering Overview 2020-2021

Course	Enrollment Total	Enrollment PTSO	# Paid Students	% Paid Enrollment	Revenue
Equine First Aid – F20	84	38	80	95%	\$6073.25
Fire and Emergency Preparedness – F20*	94	8	14	15%	\$1100.75
Horse Care and Welfare – F20*	99	19	41	41%	\$3458.00
Sickness Prevention in Horses – F20*	66	10	20	30%	\$1572.50
Horse Behaviour and Safety – Youth – F20**	867	/	/	/	/
Horse Behaviour and Safety – F20	36	15	34	94%	\$3044.75
Nova Scotia Foundations Judge – F20†	8	8	8	100%	\$1200.00
Equine First Aid - W21	124	31	104	84%	\$8189.75
Gut Health & Colic Prevention – W21	74	38	68	92%	\$5861.00
Fire and Emergency Preparedness – W21	30	14	30	100%	\$2248.25
Racehorse Respiratory Health – W21††	144	2	13	9%	\$3520.75
Total	1626	182	412	60%	\$36,269.00

* Free coupons offered to AGCO licence holders as part of AGCO Pilot Project

** Free course thanks to partnership with EquiMania! Sponsors

† Course offered exclusively to NSEF members

†† Free coupons offered to Standardbred Canada members

Course Enrollment Stats

Year	Total Enrollment	Federation Enrollment	% Federation Enrollment
2016-2017	58	35	60%
2017-2018	434	207	48%
2018-2019	681	333	49%
2019-2020	1153	155	13%
2020-2021	1626	182	11%

Provincial Breakdown

PTSO	Registered Students – 2020-21
Alberta (AEF)	34
British Columbia (HCBC)	16
Manitoba (MCH)	3
New Brunswick (NBEA)	7
Newfoundland (NEA)	1
Nova Scotia (NSEF)	24
Ontario (OE)	86
Prince Edward Island (IHC)	-
Saskatchewan (SHF)	7
Yukon (EAY)	4
Totals	182
% of Registrations:	11%

What our students are saying

I did not know many of the issues discussed during the Stewardship of the Equine Environment even existed. I wish I had taken the course earlier (if not first) in my Equine Diploma Studies, as I feel it gives a great basis for all the other courses. Although the Equine Guelph Courses are complete in themselves, I have found that many of the courses dovetail into each other, one course may just touch on a subject introducing it, and then later in another course that same information (which has been already introduced) will lead to an in-depth discussion on it.
Jennifer Olley.

The Equine Business Management course has given me the tools to start an equine business, with a solid understanding of the requirements and a business plan to use. Analyzing the costs



beforehand, during operation, and projecting income really opened my eyes to what was needed to be successful and profitable. This course is so thorough in dissecting all the details – market research to financials to the human resources side. My focus during the course was on opening a boarding facility; I can use the principles I learned to open any type of equine venture.
Monica Laane-Fralick

Completing a Diploma in Equine Studies through the University of Guelph allowed me to remain on our family farm in Saskatchewan while furthering my knowledge regarding the welfare and care of

horses. The knowledge I gained through this program has assisted me in personal and professional environments. I am thankful that I now have the skill set and confidence to make sound decisions for the horses in my care.

Erin van Stuyvenberg Grenfell, Saskatchewan.

It has been a great journey, from a first horse to a commercial breeding operation. And I learned what I needed through Guelph online, without leaving home or my horse. Thank you for your part in the offering of these courses. Everyone provided a piece that I needed along with many other details that have turned out to be quite useful. I'm sure we have saved money, time and injury through my online study.

Laureen at Bar TT Cowhorse

This has been absolutely the best class I have taken online! I've taught and taken courses online over many years. This course far outweighs all of them not only in ease of online access but, most importantly, in content. Thank you!

Gail Staines, Management of the Equine Environment Course Participant

Appendix 11: Equine Guelph's Promotional Events

Covid did not stop the messages of education, lifelong learning, career pathways, safety and horse welfare. Equine Guelph reached out to the equine community with numerous virtual events.

Displays and Events for Equine Guelph programs

Events Calendar – 2020

Open Learning and Educational Support webinar: Six Steps to Better Horse Pasture Management. Presenter – Paul Sharpe, Apr, 28.

Open Learning and Educational Support webinar: Online Coaching: Getting Started with Virtual Coaching and Training, Presenter – Tracy Dopko, May 12,

Open Learning and Educational Support webinar: Why Your Horse Does the Things He Does, Presenter – Shawna Karrasch, May, 26

Open Learning and Educational Support webinar: Manure Happens: Manure Management and Composting, Presenter – Shannon Stephens, June 23

Open Learning and Educational Support webinar: An Introduction to How Horses Learn. Presenter – Zoë Thorbergson, July 7.

Global Animal Nutrition Summit (Virtual) Aug 11 -15

Equine Financial Futures Webinar: Creating your financial roadmap - Oct 5

Equine Financial Futures Webinar: Five steps to boost your financial health now- Oct 19

Royal Agricultural Virtual Experience – Nov 10 - 14

5th Annual Equine Industry Symposium, University of Guelph Online Conference - Nov 16 – 20, 2020

Events Calendar – 2021

Equine Financial Futures Webinar: Your health AND wealth - how they correlate for your business - January 18

Equine Financial Futures Webinar: Building wealth – investing in yourself and your business - January 25

Equine Financial Futures Webinar: Advanced retirement income – planning your exit strategy - February 01

Equine Financial Futures Webinar: Financial considerations for women in the equine industry
February 08

Global Animal Disaster Management Conference - February 14 – 24

Large Animal Rescue-Awareness Level Virtual Workshop - March 04

Large Animal Rescue-Awareness Level Virtual Workshop - March 11

Large Animal Rescue: Awareness Level Virtual Workshop - March 12

The Healthy Horse – Nutrition Webinar - April 14th

Large Animal Rescue: Awareness Level Virtual Workshop - April 28

Appendix 12: Media Coverage Summary

Topic	Articles (May 1, 2020-April 30, 2021)
Research	83
Education	80
Special Projects	169
EquiMania!	1

Coverage of Special Events, Programs or Research Projects

Topic	Articles (May 1, 2020- April 30, 2021)
AGCO Racing Pilot Program	29
*Nutrition – Digestive Tract	27
*Equine Industry Symposium	19
*Lameness Research	17
Fire Safety	16
Colic Prevention	13
*3-D Printing Research	12
Equine Asthma	11
*Equine Conditioning - Clayton	10
* Equine Osteoarthritis Neck	10
*Stem Cells Cartilage Repair	10
Equine & Animal Welfare	9
*Financial Futures Webinars	9
*Large Animal Emergency Rescue Webinars	9
18 Years of Online Studies	8
Free Horse Behavior for Youth	8
Equine Job Track	8

* Many 2020/2021 features included video footage

Total Features: 333

Equine Guelph's media pick up is up 5% from last 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. 47 of the 48 media releases sent out by Equine Guelph this fiscal year 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, Twitter, LinkedIn, Instagram and YouTube. Followers include: many equine media associations, Woodbine Entertainment Group, 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, American Farriers Journal, Tack shops, 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 368 tweets garnering 175,124 impressions. Equine Guelph shared 385 posts on Facebook and those posts resulted in a collective reach of 134,980.

Of the traffic to visit the Equine Guelph and Horse Portal websites from social media channels, over 90% came from Facebook.

The Equine Guelph Instagram channel has quickly grown to just over 860 followers since it was created in late in 2019.

In 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. The launch of the Racing Pilot program in 2019, created in partnership with the Alcohol and Gaming Corporation of Ontario (AGCO), received exceptional distribution by racing media outlets. In 2020 they were our most redistributed press releases!

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

Date	Magazine or Website	Article Title
20-May	HorseSport.ca	Canada's Top 50 Influencers in Equestrian Sport 2020: Equine Guelph
20-May	Harnesslink.com	Colic is the #1 killer of horses
20-May	HorseJournals.com	Lameness Research and Prevention Tips with Dr. Judith Koenig at OVC
20-May	WoodstockSentinalReview.com	Coronavirus: Equestrian centres seek help for horses as income dries up (EG mention donation options)
20-May	HorseTalk.co.nz	New season, new grass: Colic alert for horse owners
20-May	HorseSport.com	Virtual Coaching The Socially Distanced Lesson Solution (Dopko Webinar mention)
20-May	Horse-Canada.com	Equine Guelph Updated Fire & Emergency Preparedness Online Course
20-May	Harnesslink.com	7 tips on Equine Conditioning
20-May	Horse-Canada.com	Equine Guelph presents 7 Tips on Equine Conditioning
20-May	ScienceSupplements.com	7 tips on Equine Conditioning
20-May	HorseTalk.co.nz	Top conditioning tips from equine biomechanics expert
20-May	AmericanHorsePubs.org	7 Tips on Equine Conditioning with Biomechanics Expert Dr. Hilary Clayton
20-May	EquiMed.com	7 Tips on Equine Conditioning with Biomechanics Expert Dr. Hilary Clayton
20-May	HolisticHorse.com	7 Tips on Equine Conditioning with Biomechanics Expert Dr. Hilary Clayton
20-May	Harnesslink.com	Talking Horse Welfare in Canada
20-May	OVC Bulletin	Lameness research and prevention tips – HarnessLink
20-May	Harnesslink.com	Lameness research and prevention tips
20-May	Horse-Canada.com	How Industry Participants Rate Horse Welfare in Canada
20-May	HorseIllustrated.com	Are you Concerned about Colic During Covid?
20-May	AmericanFarriers.com	Equine Guelph Interviews Dr. Hilary Clayton
20-May	Harnesslink.com	Canada's Youth-friendly heart of racing (mention of Somebeachsomewhere film fundraiser for Equine Guelph)
20-May	EquineChronicle.com	Lameness Research and Prevention Tips with Dr. Judith Koenig at OVC
20-May	AmericanHorsePubs.org	Lameness Research and Prevention Tips with Dr. Judith Koenig at OVC

20-Jun	AmericanFarriers.com	Equine Guelph Interviews Dr. Judith Koenig at Ontario Veterinary College About Lameness
20-Jun	Horse-Canada.com	Equine Guelph presents must see health & welfare videos
20-Jun	Equestrian.ca	EC- Insider. - Mention of Youth course prize winner in EC drawing contest
20-Jun	Equestrian.ca	BBRM students talk about EG Covid resources in EC National Equine Disease and Welfare Surveillance Call - June 2020
20-Jun	EquiMed.com	For Safe Horseback Riding and for Working with Horses, Wear that Helmet
20-Jun	AmericanFarriers.com	Innovative Lameness Therapies (Hurtig)
20-Jun	HarnessLink.com	Equine lameness & Equine conditioning tips
20-Jun	AmericanHorsePubs.org	Innovative Research on Equine Lameness & Equine Conditioning Tips (Hurtig)
20-Jun	OVC Bulletin	Equine lameness & Equine conditioning tips (Hurtig)
20-Jun	OVC Bulletin	Stem Cells focus on lameness research (Koenig)
20-Jun	HorseTalk.co.nz	Shock wave therapy on stem cells focus of lameness research
20-Jun	TheRider.com	Talking Horse Welfare in Canada: How Do We See Our Industry?
20-Jun	TheRiderMagazine	Talking Horse Welfare in Canada: How Do We See Our Industry?
20-Jun	TheRider.com	Racing Exclusive Online Courses a Win
20-Jun	Horse-Canada.com	EC's Virtual Horse Day 2020 Drawing Contest Winners Announced-(EG youth behaviour prize)
20-Jun	HorseJournals.com	Colic Prevention - Introduce Spring Pasture Slowly
20-Jun	HorseTalk.co.nz	New treatment explores biologic therapies to repair joint tissue in horses (Hurtig)
20-Jun	HolisticHorse.com	Innovative Research on Equine Lameness & Equine Conditioning Tips (Hurtig)
20-Jun	EquineChronicle.com	Innovative Research on Equine Lameness and Conditioning Tips
20-Jun	HorseTalk.co.nz	Equine Education Centre Wins Equestrian Canada Award
20-Jun	Horse-Canada.com	Equine Guelph provides For the Herd applicants free learning opportunity
20-Jun	OVC Bulletin	Equine Guelph provides For the Herd applicants free learning opportunity
20-Jun	OVC Bulletin	Equine education centre wins Equestrian Canada award
20-Jun	TheHorse.com	Equine Guelph - A Leader in Online Education - AD in Equinomical Shopper

20-Jun	TheHorse.com	Equine Guelph - A Leader in Online Education - AD in Magazine
20-Jun	Horse-Canada.com	Happy Hoofers: New Scanning Tool Available for Farriers- EG Hoof info sheet mention
20-Jul	AmericanFarriers.com	Repairing Equine Cartilage Using Stem Cells via Cryopreservation
20-Jul	HorseTalk.co.nz	Can cryopreservation of equine stem cells work for cartilage repair?
20-Jul	OVC Bulletin	Can cryopreservation of equine stem cells work for cartilage repair?
20-Jul	AmericanHorsePubs.org	Patron Determined to Help Equine Guelph "Survive and Thrive" with a Generous Donation
20-Jul	HorseJournals.com	Equine Guelph receives a generous donation
20-Jul	TheRider.com	Equine Guelph Supports Ontario Equestrian's For The Herd Learning Community
20-Jul	TheRiderMagazine	Equine Guelph Supports Ontario Equestrian's For The Herd Learning Community
20-Jul	TheRiderMagazine	Fuelling Wellness
20-Jul	TheRider.com	Fuelling Wellness
20-Jul	TheRider.com	Innovative Research on Equine Lameness & Equine Conditioning Tips
20-Jul	HorseTalk.co.nz	Day-long symposium focuses on equine nutrition (Fuelling Wellness)
20-Jul	Horse-Canada.com	Equine Stem Cells Cryopreserved for Cartilage Repair
20-Jul	HarnessLink.com	Cryopreservation cartilage repair
20-Jul	TheHorse.com	Top 5 Signs Your Horse Is Stressed Out, Right Now. (Dr. Merkies)
20-Jul	StandardbredCanada.ca	Fuelling Wellness Symposium
20-Jul	Horse-Canada.com	Learn About Equine and Pet Nutrition at Fuelling Wellness Symposium
20-Jul	HorseIllustrated.com	7 Tips on Equine Conditioning
20-Jul	HorseSport.com	Generous Donation Made to Help Equine Guelph "Survive and Thrive"
20-Jul	HarnessLink.com	Patron donates \$100,000 to Equine Guelph
20-Jul	StandardbredCanada.ca	Kerrs donate \$100,000 to Equine Guelph
20-Jul	StableManagement.com	Equine Stem Cells Cryopreserved for Cartilage Repair
20-Jul	WellingtonAdvertiser.com	Experts say COVID-19 & hot weather impacting horse breeding this year
20-Jul	AmericanHorsePubs.org	Cryopreservation of Equine Stem Cells for Cartilage Repair
20-Jul	CosaOnline.com	Stem Cell Cryopreservation Discussed

20-Jul	EliteEquestrianMagazine.com	The Real Cost of Horse Ownership
20-Aug	OVC Bulletin	Experts say COVID-19 & hot weather impacting horse breeding this year
20-Aug	OVC Bulletin	OVC Researchers Awarded \$1.3 Million in Federal Funding (Amy Greer - Equine Biosecurity)
20-Aug	EquiMed.com	Fuelling Wellness Symposium Related to Equine and Pet Health Is Approaching Fast
20-Aug	HorseTalk.co.nz	3D printed neck bones a revolution in equine vet training
20-Aug	Horse-Canada.com	How 3-D Printing is Helping Equine Veterinarians and Students
20-Aug	HorseTalk.co.nz	Online horse uni marks 18 years of equine studies
20-Aug	StandardbredCanada.ca	Celebrate with Equine Guelph
20-Aug	HorseJournals.com	Get Ticked off - Horses and Ticks
20-Aug	OVC Bulletin	3-D Print Research Creates Model of Equine Neck for Veterinary Training
20-Aug	TheRider.com	Equine Guelph Celebrates 18 years of Online Studies
20-Aug	TheRider.com	Patron determined to help Equine Guelph "Survive & Thrive" with a generous donation
20-Aug	TheRider.com	Fuelling Wellness
20-Aug	HorseSport.ca	Trailer Loading Tips: Keep it Calm, Safe and Uncomplicated (Link to EG Trailering w/ Safety in Mind)
20-Aug	Horse-Canada.com	Interaction and the Road to Horse and Human Well-Being
20-Aug	HarnessLink.com	Horse human interaction studies
20-Aug	OVC Bulletin	Equine Guelph Celebrates 18 Years of Online Studies – The Rider
20-Aug	HolisticHorse.com	Equine Guelph Celebrates 18 Years of Online Studies
20-Aug	AmericanHorsePubs.com	Equine Guelph Celebrates 18 Years of Online Studies
20-Aug	StandardbredCanada.ca	3-D Printing Research Creates Model of Equine Neck for Vet Training
20-Aug	CosaOnline.com	3-D Printing Research Creates Model of Equine Neck for Vet Training
20-Aug	EquineChronicle.com	3-D Printing Research Creates Model of Equine Neck for Vet Training
20-Aug	QuarterHorseNews.com	3-D Printing Research Creates Model of Equine Neck for Vet Training
20-Aug	HarnessLink.com	3-D Printing for Veterinary Training
20-Aug	CosaOnline.com	Celebrate with Equine Guelph
20-Aug	AmericanHorsePubs.com	3-D Printing Research Creates Model of Equine Neck for Veterinary Training

20-Aug	OVC Bulletin	Equine Guelph Celebrates 18 Years of Online Studies
20-Aug	AmericanFarriers.com	A Review: Equine Lower Leg Anatomy and Arthritis
20-Aug	EquineChronicle.com	Cryopreservation of Equine Stem Cells for Cartilage Repair
20-Sep	CanadianThoroughbred.com	Equine Guelph 2020 Online Tuition Award Applications Being Accepted
20-Sep	HorseJournals.com	When Accidents Happen. (EG resources mentioned & Gayle quoted)
20-Sep	NickerNews.net	Equine Guelph published overview of studies on Horse-Human interactions
20-Sep	Horse-Canada.com	Hoof Care Top Tips, Myth Busters and Finding the Balance
20-Sep	CanadianThoroughbredcom	Barn Fire Prevention Interactive Tools from Equine Guelph
20-Sep	HorseSport.com	Missed the Fuelling Wellness Symposium? Watch the Videos!
20-Sep	StandardbredCanada.ca	Rave Reviews For TheHorsePortal.ca
20-Sep	CosaOnline.com	Rave Reviews For TheHorsePortal.ca
20-Sep	TheRider.com	3-D Printing Research Creates Model of Equine Neck for Vet Training
20-Sep	TheRider.com	Cryopreservation of Equine Stem Cells for Cartilage Repair
20-Sep	TheRider.com	Racing-Exclusive Online Courses a Win!
20-Sep	TheRider.com	Horse-Human Interaction Studies
20-Sep	TheRider.com	The Positive Side - Covid... (EG For the Herd course mention)
20-Sep	StandardbredCanada.ca	Caretakers: The Foundation Of The Industry (EG courses mention)
20-Sep	CosaOnline.com	Last Call - Free Fire Preparedness course
20-Sep	AmericanHorsePubs.org	Equine Financial Futures Webinar Series
20-Sep	HolisticHorse.com	Equine Financial Futures Webinar Series
20-Sep	HorseJournals.com	Equine Wound Care - Five Things Not To Do
20-Sep	HorseNation.com	Practice Preparedness and Prevention: Resources on Barn Fire Prevention from Equine Guelph
20-Sep	AmericanHorsePubs.org	Practice Preparedness and Prevention: Resources on Barn Fire Prevention from Equine Guelph
20-Sep	HorseTalk.co.nz	The three things a horse hoof needs: Top farrier shares his secrets
20-Sep	StandardbredCanada.ca	Last Call - Free Fire Preparedness course
20-Sep	ARIA - American Riding Instructors Association	Equine Financial Futures Webinar Series
20-Sep	ARIA - American Riding Instructors Association	Practice Preparedness and Prevention

20-Sep	EquiMed.com	Practice Preparedness and Prevention
20-Oct	AmericanHorsePubs.org	Fuelling Wellness Symposium a Hit
20-Oct	HolisticHorse.com	Fuelling Wellness "Part One of a Three-Part Video Series" on Digestion from Equine Guelph Now Available!
20-Oct	Western Ontario Pony Club Newsletter	Free Youth Horse Behaviour and Safety Course
20-Oct	EquineInfoExchange.com	Practice Preparedness and Prevention: Resources on Barn Fire Prevention from Equine Guelph
20-Oct	Producer.com	Increased awareness of equine code sought (EG Survey mentioned)
20-Oct	StandardbredCanada.ca	Equine Financial Futures Webinar Series
20-Oct	HorseTalk.co.nz	More than imaging needed to diagnose cervical facet disease in horses, study finds
20-Oct	StandardbredCanada.ca	Free 'Horse Care & Welfare' Course
20-Oct	QuarterHorseNews.com	University Offers Free Financial Management Series for Horse Businesses
20-Oct	CanadianThoroughbredcom	Apply Now For 2020 Ontario Racing Industry Scholarships
20-Oct	AmericanHorsePubs.com	Research Study on Diagnostics for Equine Osteoarthritis of the Neck
20-Oct	NickerNews.net	Equine Guelph does the Digestive Tract (free video)
20-Oct	StandardbredCanada.ca	Fuelling Wellness Symposium a Hit
20-Oct	CosaOnline.com	Fuelling Wellness Symposium a Hit
20-Oct	CosaOnline.com	Free 'Horse Care & Welfare' Course
20-Oct	Horse-Canada.com	Research Finds X-rays May Misdiagnose Osteoarthritis of the Neck
20-Oct	HorseSport.ca	Research Finds X-rays May Misdiagnose Osteoarthritis of the Neck
20-Oct	HorseSafetyTips.com	Practice Preparedness and Prevention: Resources on Barn Fire Prevention from Equine Guelph
20-Oct	HolisticHorse.com	Practice Preparedness and Prevention
20-Oct	CosaOnline.com	Equine Industry Symposium Goes Virtual
20-Oct	StandardbredCanada.ca	Equine Industry Symposium Goes Virtual
20-Oct	Horse-Canada.com	Free Equine Guelph Youth Horse Behaviour and Safety Course
20-Oct	EquiMed.com	Free Youth Horse Behaviour and Safety Course to Begin this November
20-Oct	StandardbredCanada.ca	Equine Guelph Offering Free Youth Course
20-Oct	StandardbredCanada.ca	Equine Guelph Webinar Series Continues
20-Oct	EquusMagazine.com	A New Way to Spot Stress In Horses (Merkies Blink research)

20-Oct	Horse Sport	Free Equine Guelph Youth Horse Behaviour and Safety Course
20-Oct	SystemEquine.com	HealthFlash
20-Oct	EquiMed.com	Research Study on Diagnostics for Equine Osteoarthritis of the Neck
20-Oct	sonomacountyhorsecouncil.org	Check out those eyes (Merkies blink research)
20-Oct	HorseJournals.com	Fuelling Wellness Symposium was a Hit
20-Oct	HorseJournal.com	Research Study on Diagnostics for Equine Osteoarthritis of the Neck
20-Oct	HarnessLink.com	Equine Industry Symposium 2020 goes Virtual
20-Nov	EquineChronicle.com	Research Study on Diagnostics For Equine Osteoarthritis of the Neck
20-Nov	StableManagement.com	Research Study on Diagnostics For Equine Osteoarthritis of the Neck
20-Nov	AmericanFarriers.com	Shoeing senior horses
20-Nov	CosaOnline.com	Last Call: Free Online Short Course (Sickness Prevention - Racing Pilot)
20-Nov	Horse-Canada.com	Watch Part 2 of the Horse's Digestive System Tour
20-Nov	Horse-Canada.com	Winter Blanketing Guide: Yes, No, and if So, How Much? (EG Blanket tool)
20-Nov	Horse-Canada.com	Agents of Change Host 5th Annual Event, Virtually This Year
20-Nov	Horse-Canada.com	Equine Guelph Presents Resource for Caring for Seniors' Hooves
20-Nov	AmericanHorsePubs.org	Caring for our Seniors' Hooves
20-Nov	Horse Sport	Equine Guelph Presents Resource for Caring for Seniors' Hooves
20-Nov	StandardbredCanada.ca	Last Call: Free Online Short Course (Sickness Prevention - Racing Pilot)
20-Nov	HorseTalk.co.nz	Be the change - Equine Industry Symposium goes virtual
20-Nov	EquusMagazine.com	University of Guelph Equine Industry Symposium Begins November 16
20-Nov	HarnessLink.com	5th Equine Industry Symposium begins Nov 16
20-Nov	EverythingHorseUK.co.uk	2020 Equine Industry Symposium
20-Nov	EquiMed.com	Horse Behaviour & Safety Course Coming Nov 30
20-Nov	StandardbredCanada.ca	Caring for Seniors Hooves
20-Nov	StableManagement.com	Caring for Seniors Hooves
20-Nov	RaceLine	Equine Guelph 2020 Fall Course Lineup
20-Nov	RaceLine	2020 Equine Guelph Tuition Awards
20-Nov	StandardbredCanada.ca	Equine Guelph Needs Your Input (Pilot Survey)

20-Nov	CosaOnline.com	Equine Guelph Needs Your Input (Pilot Survey)
20-Nov	StandardbredCanada.ca	Equine Guelph Moves Symposium Online
20-Nov	HorseTalk.co.nz	Farrier gives top tips for hoof care in older horses
20-Nov	OVC Bulletin	Ontario creates advisory group to improve animal welfare (Gayle Ecker Mention)
20-Nov	CTVNews.ca	Ontario creates advisory group to improve animal welfare (Gayle Ecker Mention)
20-Nov	News.Ontario.ca	Ontario creates advisory group to improve animal welfare (Gayle Ecker Mention)
20-Nov	RoyalFair.org	RAWF teachers kits (EquiMania! & TheHorsePortal resources)
20-Nov	AmericanHorsePubs.org	Learn Practical Nutrition Tips with New Equine Guelph Videos
20-Nov	HolisticHorse.com	Learn Practical Nutrition Tips with New Equine Guelph Videos
20-Nov	TheRider.com	FREE Youth Horse Behaviour and Safety Course to begin this November!
20-Nov	TheRider.com	Apply Now for 2020 Racing Industry Scholarships
20-Nov	TheRider.com	Research Study on Diagnostics for Equine Osteoarthritis of the Neck
20-Nov	TheRider.com	Practice Preparedness and Prevention
20-Nov	TheRider.com	Equine Industry Symposium 2020 - Agents of Change
20-Nov	TheRider.com	Conquering Covid one Hoofprint at a time
20-Nov	TheRider.com	Equine Industry Symposium Ad
20-Dec	EquiMed.com	Learn Practical Nutrition Tips with New Equine Guelph Videos
20-Dec	EquiMed.com	The Importance of Equine Learning Theory and Its Application in Real Life
20-Dec	AmericanHorsePubs.com	The Silver Lining of COVID-19 for Horse Communities
20-Dec	EquineChronicle.com	The Silver Lining of COVID-19 for Horse Communities
20-Dec	University of Guelph Newslinks	Ontario creates advisory group to improve animal welfare (Gayle Ecker Mention)
20-Dec	EquineInfoExchange.com	Equine Guelph at the University of Guelph in Canada presents "Journey of the Digestive Tract"
20-Dec	EquiMed.com	Comparing Equid Skulls for Insight into Behavioral Differences
20-Dec	EquusMagazine.com	Comparing Equid Skulls for Insight into Behavioral Differences
20-Dec	EquineChronicle.com	Free Equine Behavior and Safety Online Course Offered to Kids Around the World
20-Dec	CosaOnline.com	Equine Guelph Survey - Have your say! (Pilot survey)

20-Dec	HBPA.on.ca	Equine Guelph Survey - Have your say! (Pilot survey)
20-Dec	HorseTalk.co.nz	Video: Take a journey through the horse's digestive tract
20-Dec	EquineChronicle.com	Journey through the horses' digestive tract
20-Dec	StandardbredCanada.ca	Have your Say (Racing Pilot survey)
20-Dec	AmericanHorsePubs.org	FREE Equine Behaviour & Safety Online Course Offered to Kids Around the World!
20-Dec	StableManagement.com	Equine Guelph Offers Free Equine Behavior and Safety Online Courses
20-Dec	HarnessLink.com	Free course offered to kids around the World!
20-Dec	EquusMagazine.com	University of Guelph offers free equine behavior and safety online course for kids
20-Dec	HorseTalk.co.nz	Horse industry leaders converge for post-Covid-19 'rethink'
20-Dec	HarnessLink.com	If you build it they will come... or will they?
20-Dec	SystemEquine.com	Boxing week deals with EG HEALTHflash link at bottom (4 emails to their database)
20-Dec	TheRider.com	Ontario Horse Racing Online Courses Survey 2.0
20-Dec	CanadianThoroughbred.com	Participate in Equine Guelph's Ontario Racing Survey
20-Dec	TheRider.com	Do Equestrians know how their horses learn?
20-Dec	AmericanFarriers.com	Identifying Signs of Lameness
20-Dec	StableManagement.com	Equine Guelph Online Equine Behavior Safety Course Kids Teens 2020
21-Jan	CosaOnline.com	Equine First Aid course
21-Jan	AmericanHorsePubs.org	Equine Guelph Research Annual Update – Volume 18
21-Jan	OVC Bulletin	The silver lining of COVID-19 for horse communities
21-Jan	AmericanFarriers.com	Understanding Equine Asthma
21-Jan	Horse-Canada.com	Improve Your Equine Financial Future with this Free Series
21-Jan	StandardbredCanada.com	SC, Equine Guelph Announce Online Training Partnership
21-Jan	HorseTalk.co.nz	Researchers seek early predictors to combat equine asthma
21-Jan	OVC Bulletin	Researchers seek early predictors to combat equine asthma
21-Jan	OVC Bulletin	Welcome to Equine Guelph's Digital Newsletter
21-Jan	Canadian Horse Journal 2021 Equine Guide	2020 Equine Industry Symposium Summary. (13 page feature)
21-Jan	HorseTalk.co.nz	Water key to preventing winter colic in horses

21-Jan	EquiMed.com	Studies Investigate Human Impact on Physiological and Behavioural States of Equine Partners (Merkies)
21-Jan	AmericanHorsePubs.org	Winter Water Woes and Colic Prevention
21-Jan	EquineMonthly.com	Winter Water Woes and Colic Prevention
21-Jan	Horse-Canada.com	Equine Guelph Research Update: Equine Asthma (Heaves)
21-Jan	CosaOnline.com	Equine Guelph – Horse Racing Survey
21-Jan	StandardbredCanada.ca	Last Call for Equine Guelph Racing Survey
21-Jan	StandardbredCanada.ca	Chellew, Copeman Win Guelph Scholarships
21-Jan	EquiMed.com	Why It Is Important for Equestrians To Be Educated about Learning Theory and Its Practical Application
21-Jan	Quarter Racing Owners Of Ontario	Last Call for Equine First Aid
21-Jan	Quarter Racing Owners Of Ontario	Equine Guelph ready to deliver more training for racing - LAST DAY to take the survey!!!
21-Jan	CosaOnline.com	SC, Equine Guelph Announce Online Training Partnership
21-Jan	SystemEquine.com	Equine Guelph Winter HealthFlash
21-Jan	StandardbredCanada.ca	Take Part in the Virtual Obriens. (EG education partnership mentioned in Silent Auction)
21-Jan	st georg magazine (Germany)	Winter Water Woes
21-Jan	HarnessLink.com	Winter water woes and Colic prevention
21-Jan	uoguelph.ca/ccsaw/news/	Equine Industry Resilience: Rethinking, Restructuring, Re-evaluating in the age of COVID-19
21-Jan	EquiMed.com	3-D Printing Research Creates Model of Equine Neck for Veterinary Training
21-Feb	AmericanHorsePubs.org	Evacuation Infographics Added to Equine Guelph Barn Fire Prevention Resources
21-Feb	HBPA.com	Evacuation Infographics Added to Equine Guelph Barn Fire Prevention Resources
21-Feb	HarnessLink.com	Webinars to improve your Equine financial future
21-Feb	EquineChronicle.com	Legs - Common Injuries and How We Treat Them
21-Feb	TheRider.com	Winter Water Woes and Colic Prevention
21-Feb	TheRider.com	Winter Management of the Outdoor Horse
21-Feb	TheRider.com	OVC Researcher Contributes to Global Paper on Equine Asthma
21-Feb	EquineChronicle.com	Winter Water Woes and Colic Prevention
21-Feb	Elite Equestrian Magazine	Journey through the horse's digestive tract

21-Feb	Cayuse Communications	Cayuse Communications Volume 12 - Issue 8 - Announcing podcast of Gayle
21-Feb	BestHorsePractices.com	Best Horse Practices Podcast 17 - Gayle Ecker
21-Feb	CosaOnline.com	Experts Featured in Respiratory Course
21-Feb	EquineChronicle.com	Two Online Equine Courses- Fire and Emergency Preparedness and Large Animal Rescue
21-Feb	StandardbredCanada.ca	Experts Featured in Respiratory Course
21-Feb	EquiMed.com	Evacuation infographics added to Equine Guelph barn fire prevention resources
21-Feb	HolisticHorse.com	Evacuation infographics added to Equine Guelph barn fire prevention resources
21-Feb	HorseTalk.co.nz	A Fire in the Horse barn - Do you know what to do?
21-Feb	EquusMagazine.com	Evacuation infographics added to Equine Guelph barn fire prevention resources
21-Feb	HBPA.com	Equine Guelph Large Animal Rescue Webinars
21-Feb	HorseTalk.co.nz	Horse rescue workshops a sellout, but more on the way
21-Feb	HarnessLink.com	Large Animal Emergency Rescue Webinars
21-Feb	OVC Bulletin	OVC in the News: Equine Guelph - Horse rescue workshops a sellout, but more on the way
21-Feb	OAVT.org	Equine Guelph Fire Emergency Preparedness course
21-Feb	EquineChronicle.com	If you build it, they will come – or will they? (EG Marketing course instructor)
21-Feb	Kitchener.ctvnews.ca	Deadly Virus hits Acton Farm (Dr. Arroyo mentioned)
21-Feb	CosaOnline.com	JobTrack Relaunch
21-Feb	StandardbredCanada.ca	JobTrack Relaunch
21-Feb	HarnessLink.com	Equine Jobtrack Back in Operation
21-Feb	CanadianThoroughbred.com	Equine Guelph Relaunches JobTrack Online Service
21-Feb	EquineChronicle.com	OVC Researcher Contributes to Global Paper on Equine Asthma
21-Feb	ASHA.ab.ca	Alberta Standardbred Horse Association Announces Equine Guelph Equine Jobtrack
21-Feb	HorseTalk.co.nz	Free webinars help horse businesses secure their 'equine financial future'
21-Feb	StandardbredCanada.ca	Barn Evacuation Infographics Available
21-Feb	HorseTalk.co.nz	Animal emergency experts to lead world-first conference (Dr Raymond a presenter)
21-Feb	CosaOnline.com	Last Call – Online Gut Health & Colic Prevention Course
21-Feb	StandardbredCanada.ca	Last Call Gut Health course

21-Feb	HorseJournals.com	Resilience: Rethinking, Restructuring, re-evaluating due to COVID-19
21-Feb	CosaOnline.com	Barn Evacuation Infographics Available
21-Feb	EquiMed.com	Comparing Horse and Donkey Skulls for Insight into Behavioral Differences
21-Mar	OVC bulletin	Jobtrack Relaunched
21-Mar	st georg magazine (Germany)	Ausreichend Wasser im Winter wichtig! (Winter Water Woes)
21-Mar	StandardbredCanada.ca	Limited spots in Racehorse Respiratory Health online course
21-Mar	CosaOnline.com	Last Call for the Racehorse Respiratory Health course
21-Mar	Race Line Issue 2 – March 2021	Controlling the spread of infectious disease (Equine Guelph Biosecurity Calculator)
21-Mar	OntarioEquestrian.ca	Connecting Employers & Job Seekers Across Canada with Equine JobTrack
21-Mar	HorseTalk.co.nz	Equine health researcher recognised for work amid Covid-19 pandemic
21-Mar	OVC bulletin	Equine health researcher recognised for work amid Covid-19 pandemic
21-Mar	CosaOnline.com	Last Call Fire Emergency Preparedness course
21-Mar	StandardbredCanada.ca	Equine Digestion & Nutrition Webinar Info
21-Mar	CosaOnline.com	Equine Digestion & Nutrition Webinar Info
21-Mar	EverythingHorseUK.co.uk	Free Webinar on Horse's Digestive System this April
21-Mar	EverythingHorseUK.co.uk	Equine Guelph Embraces Canadian Agricultural Safety Week
21-Mar	HarnessLink.com	Canadian Agricultural Safety Week kicks off
21-Mar	OVC bulletin	This week Equine Guelph kicks off Royal Agricultural Virtual Experience
21-Mar	EquusMagazine.com	Free Guelph webinar will take participants on a tour of the Equine Digestive Tract
21-Mar	Horse-Canada.com	Life Skills: Education and Training for Large Animal Rescue
21-Mar	OVC.uoguelph.ca	OVC Expert Contributes to Global Paper on Equine Asthma
21-Mar	HorseTalk.co.nz	Free webinar for horse owners to get to the guts of equine digestion
21-Mar	HorseJournals.com	Podcast Research Radio- Early Pregnancy Loss in Mares (Keith Betteridge)
21-Mar	EquusMagazine.com	Equine Jobtrack Relaunched
21-Mar	EquineMonthly.com	Equine Osteoarthritis Of The Neck
21-Apr	OVC bulletin	OVC Expert Contributes to Global Paper on Equine Asthma
21-Apr	EquiManagement.com	Guelph Offers April 28 Large Animal Emergency Rescue Webinar

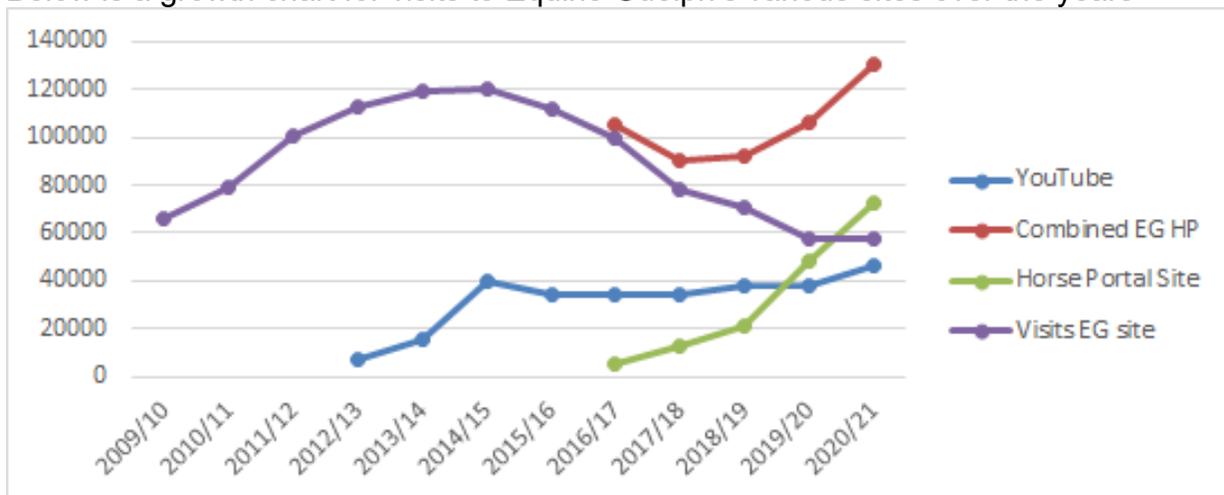
21-Apr	EverythingHorseUKco.uk	Equine Asthma - Is your horse coughing? The time to take action is now
21-Apr	HarnessLink.com	Coughing? Take action now!
21-Apr	Horse-Canada.com	Horse Coughing? It's time to take action
21-Apr	AmericanHorsePubs.org	New Large Animal Emergency Rescue Webinars Announce 4th Offering of 2021
21-Apr	AmericanHorsePubs.org	Equine Guelph offers new industry certificate
21-Apr	StandardbredCanada.ca	Special Offer On Equine Guelph Courses
21-Apr	ASHA.AB.ca	Special Offer On Equine Guelph Courses
21-Apr	CosaOnline.com	First Aid and Fire & Emergency Preparedness Courses
21-Apr	BestHorsePracticesSummit.org	Welcome 2021 Sponsors (Equine Guelph Mention)
21-Apr	CosaOnline.com	Special Offer On Equine Guelph Courses
21-Apr	CosaOnline.com	Strong Start To Educational Partnership
21-Apr	EquiMed.com	Spring 21 Equine First Aid Course Coming - May 3 - 10
21-Apr	EquusMagazine.com	Equine Guelph offers new industry certificate
21-Apr	EquusMagazine.com	Large Animal Emergency Rescue webinar added due to overwhelming demand

Appendix 13: Web Site Report

May 1, 2020 – April 30, 2021

	Equine Guelph	TheHorsePortal	YouTube	Combined Total
Visits/Sessions	57,629	72,641	46,851	177,121
Page Views	114,919	303,478		418,397
New Users	38,431	44,784		83,215
Avg. Session Time	01:37	04:25	02:29	

Below is a growth chart for visits to Equine Guelph's various sites over the years



TECHNOLOGY OVERVIEW

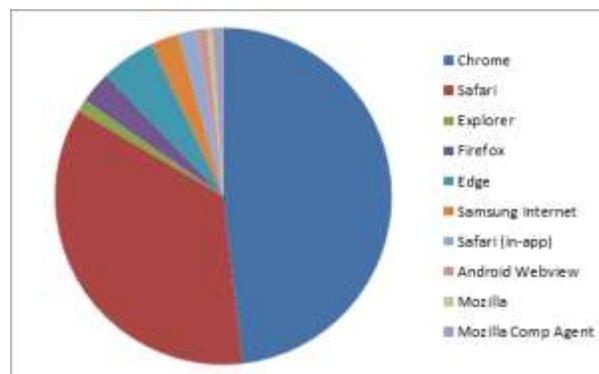
(Audience – Mobile – Overview)

Device	EquineGuelph.ca		TheHorsePortal.ca		YouTube.ca	
	Sessions	Percentage	Sessions	Percentage	Views	Percentage
Mobile	16,257	54.70%	32,068	(44.15%)	12,873	27.5%
Desktop	21,226	41.89%	37,168	(51.17%)	29,615	63.2%
Tablet	1,324	3.41%	3,405	(4.69%)	2,617	5.6%

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

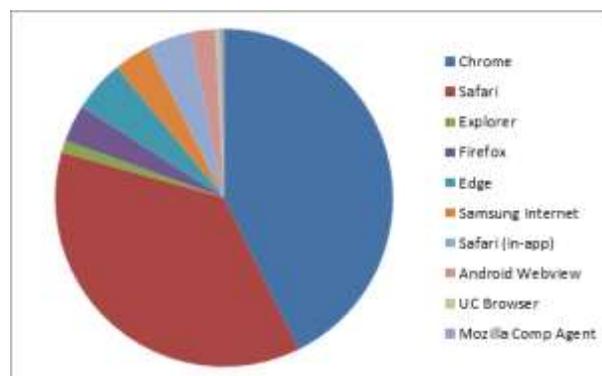
Equine Guelph.ca

Operating system	Sessions	Percentage
Chrome	27,648	(47.98%)
Safari	20,242	(35.12%)
Edge	3,002	(5.21%)
Firefox	1,769	(3.07%)
Samsung Internet	1,547	(2.68%)
Safari (in-app)	1,017	(1.76%)
Mozilla Comp. Agent	589	(1.02%)
Android Webview	586	(1.02%)
Internet Explorer	681	(1.18%)
Mozilla	300	(0.52%)



HorsePortal.ca

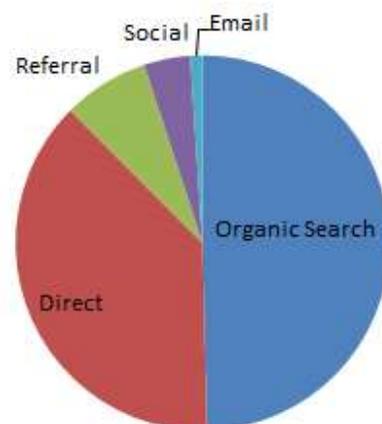
Browser	Users	Sessions
Chrome	30,788	(42.38%)
Safari	26,362	(36.29%)
Edge	3,587	(4.94%)
Safari (in-app)	3,066	(4.22%)
Firefox	2,559	(3.52%)
Samsung Internet	2,490	(3.43%)
Android Webview	1,730	(2.38%)
Internet Explorer	842	(1.16%)
Mozilla Comp. Agent	302	(0.42%)
UC Browser	295	(0.41%)



ACQUISITION CHANNELS (Acquisition – All Traffic – Channels)

EquineGuelph.ca

	Channel	Sessions	Percentage
1	Organic Search	28,598	(49.62%)
2	Direct	21,813	(37.85%)
3	Referral	4,302	(7.46%)
4	Social	2,302	(3.99%)
5	Email	610	(1.06%)



YouTube

	Channel	Views	Percentage
1	External	25,702	54.9%
2	YouTube Search	4,452	9.5%
3	Direct	4,013	8.6%
4	Playlists	3,731	8.0%
5	Browse Features	3,050	6.5%

TheHorsePortal.ca

	Channel	Sessions	Percentage
1	Organic Search	28,687	(39.49%)
2	Direct	22,436	(30.89%)
3	Referral	14,585	(20.08%)
4	Social	6,762	(9.31%)
5	Email	169	(0.23%)
6	(Other)	2	(0.00%)



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

EquineGuelph.ca - Source	Sessions	Percent
1. google/organic	27,396	(47.54%)
2. direct	21,813	(37.85%)
3. m.facebook.com/referral	1,650	(2.86%)
4. bing / organic	895	(1.55%)
5. courselink.uoguelph.ca / referral	799	(1.39%)
6. equineguelph.ca / referral	625	(1.08%)
7. standardbredcanada.ca / referral	537	(0.93%)
8. horseportal.ca/referral	301	(0.52%)
9. Press Release The Real Cost of Horse Ownership / email	270	(0.47%)
10. l.facebook.com / referral	269	(0.47%)

	The HorsePortal.ca - Source / Medium	Sessions	Percentage
1	google / organic	27,482	(37.83%)
2	(direct) / (none)	22,436	(30.89%)
3	equineguelph.ca / referral	5,004	(6.89%)
4	m.facebook.com / referral	4,845	(6.67%)
5	standardbredcanada.ca / referral	2,086	(2.87%)
6	courses.opened.uoguelph.ca / referral	1,752	(2.41%)
7	Equusmagazine.com / referral	1,004	(1.38%)
8	l.facebook.com / referral	923	(1.27%)
9	albertaequestrian.com / referral	875	(1.20%)
10	bing / organic	814	(1.12%)

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

EquineGuelph.ca

Social Network	Sessions	Percentage
1. Facebook	2,029	(88.14%)
2. YouTube	91	(3.95%)
3. Twitter	89	(3.87%)
4. Pinterest	37	(1.61%)
5. Instagram Stories	23	(1.00%)
6. Instagram	19	(0.83%)
7. LinkedIn	14	(0.61%)

HorsePortal.ca

	Social Network	Sessions	Percentage
1	Facebook	6,227	(92.09%)
2	Twitter	160	(2.37%)
3	LinkedIn	128	(1.89%)
4	Instagram	91	(1.35%)
5	Instagram Stories	60	(0.89%)
6	YouTube	50	(0.74%)
7	WordPress	18	(0.27%)
8	Pinterest	12	(0.18%)
9	Snapchat	8	(0.12%)
10	Weebly	8	(0.12%)

CONTENT

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

EquineGuelph.ca Pages		Sessions	Percentage
1.	/jobtrack/jobs.php	10,878	(18.88%)
2.	/education/programs_list.php	3,746	(6.50%)
3.	/jobtrack/index.php	2,449	(4.25%)
4.	/education/indiv_courses.php	2,152	(3.73%)
5.	/Tools/lameness_lab.php	1,412	(2.45%)
6.	/Tools/fireprevention.php	1,381	(2.40%)
7.	/Tools/HorseBlanketingTool.php	1,359	(2.36%)
8.	/Tools/lameness_checklist.php	1,297	(2.25%)
9.	/education/index.php	1,264	(2.19%)
10.	/education/store.php	1,040	(1.80%)
TheHorsePortal.ca Pages		Sessions	Percentage
1	/ (home page)	9,316	(12.82%)
2	/covid-19-updates-resources/	8,427	(11.60%)
3	/courses/	4,789	(6.59%)
4	/12-week-courses/	4,550	(6.26%)
5	/course/horse-behaviour-safety-youth-course-f20-2/	3,285	(4.52%)
6	/my-account/	2,303	(3.17%)
7	/partner/racingpilotproject/	1,515	(2.09%)
8	/2016/11/winter-waterers-for-horses-cattle-and-livestock /	1,354	(1.86%)
9	/stop-think-act/	1,168	(1.61%)
10	/log-in/	962	(1.32%)
YouTube Top Videos		Views	Percentage
1	Lameness Lab - Case 1 - Assessment	1,956	4.2%
2	Equine Conditioning - Dr. Hilary Clayton	1,662	3.6%
3	Foaling How To's - Monitoring Foaling	1,321	2.8%
4	Equine Dental - The Tale of the Teeth	1,089	2.3%
5	The Basics of Infection Control - How To	1,058	2.3%
6	Roaring Research - What is Roaring?	818	1.8%
7	Dehydration Tests - Horse Health Tracker app	803	1.7%
8	What are the signs a horse may be lame? - Dr. Nicola Cribb	772	1.7%
9	Foaling How-To's - Predicting Foaling - Dr. Tracey Chenier	740	1.6%
10	Journey through the Digestive Tract Part 1	655	1.4%

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
- Equine Guelph E-News



- EquiMania! Youth Safety Initiative



- EquiMania! Exhibit



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



- National Training Partner



- EquiMania! Youth Safety Initiative



- EquiMania! Youth Safety Initiative



- HEALTHflash
- Short Course on The Horse Portal



- EquiMania! Youth Safety Initiative



- EquiMania! Exhibit



- Nutrition Webinar



- EquiMania! Youth Safety Initiative



- Industry Education Partner
- Short Course on The Horse Portal



- EquiMania! Youth Safety Initiative
- HEALTHflash



- EquiMania! Youth Safety Initiative
- Fire Prevention

Equine Guelph Financial Report 2020-21
As at April 30, 2021

	Holding Accounts				To Program Support	Programs				Total Equine Guelph	
	E. P. Taylor	HIP/QH	HBPA	General Research		Education	Communi-cations	Research Support	Sponsorship		
	710655	045878	046071	022298	022298-800001	022201	022202	022299	022203		
FUND BALANCE, Previous Year-end	81,829	99,473	-	50,000	(910)	-	247,891	10,845	15,132	238,797	743,057
REVENUE											
Funds Received from Funding Agencies	102,449	-	-	65,000	-	-	-	-	-	-	167,449
HIP/QH Funds	-	110,000	-	-	-	-	-	-	-	-	110,000
Alumni House Donations (individuals)	-	-	-	-	-	-	-	-	-	-	-
Tuition & Workshops (S20, F20, W21)	-	-	-	-	-	189,680	-	-	-	-	189,680
Other University Contributions	-	-	-	-	-	-	-	-	-	-	-
External Contributions ¹	-	-	-	-	3,069	90,841	20,622	-	103,625	-	218,157
TOTAL REVENUE	102,449	110,000	-	65,000	3,069	280,521	20,622	-	103,625	-	685,285
INTERNAL TRANSFERS:											
From Agency Fund to Support ²	-	(22,000)	-	(13,000)	-	35,000	-	-	-	-	-
From Agency Fund to Program	-	-	-	-	-	-	-	-	-	-	-
From Support to Program	-	-	-	-	-	(35,000)	23,450	11,550	-	-	-
Transfers b/w EG accounts	-	-	-	-	-	5,000	45,000	(14,000)	(36,000)	-	-
Transfer from Sponsorship	-	-	-	-	-	-	-	-	-	-	-
TOTAL TRANSFERS	-	(22,000)	-	(13,000)	-	5,000	68,450	(2,450)	(36,000)	-	-
PROGRAM EXPENDITURES											
Research Projects	(134,929) ³	(153,013)	-	(119,905)	-	-	-	-	-	-	(407,847)
Research Support	-	-	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	(412,525)	-	-	-	-	(412,525)
Communications	-	-	-	-	-	-	(90,325)	-	-	-	(90,325)
Sponsorship	-	-	-	-	-	-	-	-	(994)	-	(994)
TOTAL PROGRAM EXPENDITURES	(134,929)	(153,013)	-	(119,905)	-	(412,525)	(90,325)	-	(994)	-	(911,691)
FUND BALANCE as at April 30, 2021	49,349	34,460	-	(17,905) ⁴	2,159	-	120,887	9,592	12,682	305,428	516,651

1 - Education: Includes 64k from AGCO, 10k from AgriRisk, 16k from CCSAW.

2 - Represents total industry funding to EG programs.

3 - Includes honorariums for Peer Reviewers *(\$6500)

4 - Coding error for research project. Will be corrected in Q1, moving the cost to HIP/QH

Balance for HBPA should be \$0.