

WEST COAST VETERINARIAN

DECEMBER 2018 | Nº 33

FISH STORY—THE LIFE OF AN AQUACULTURE VETERINARIAN

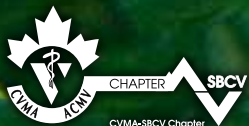


CARING FOR AN ORPHANED CARIBOU CALF

CANNABIS AND VETERINARY MEDICINE

OPHTHALMIC EXAMINATION OF THE ADULT PATIENT

WHAT IS COOPERATIVE VETERINARY CARE?



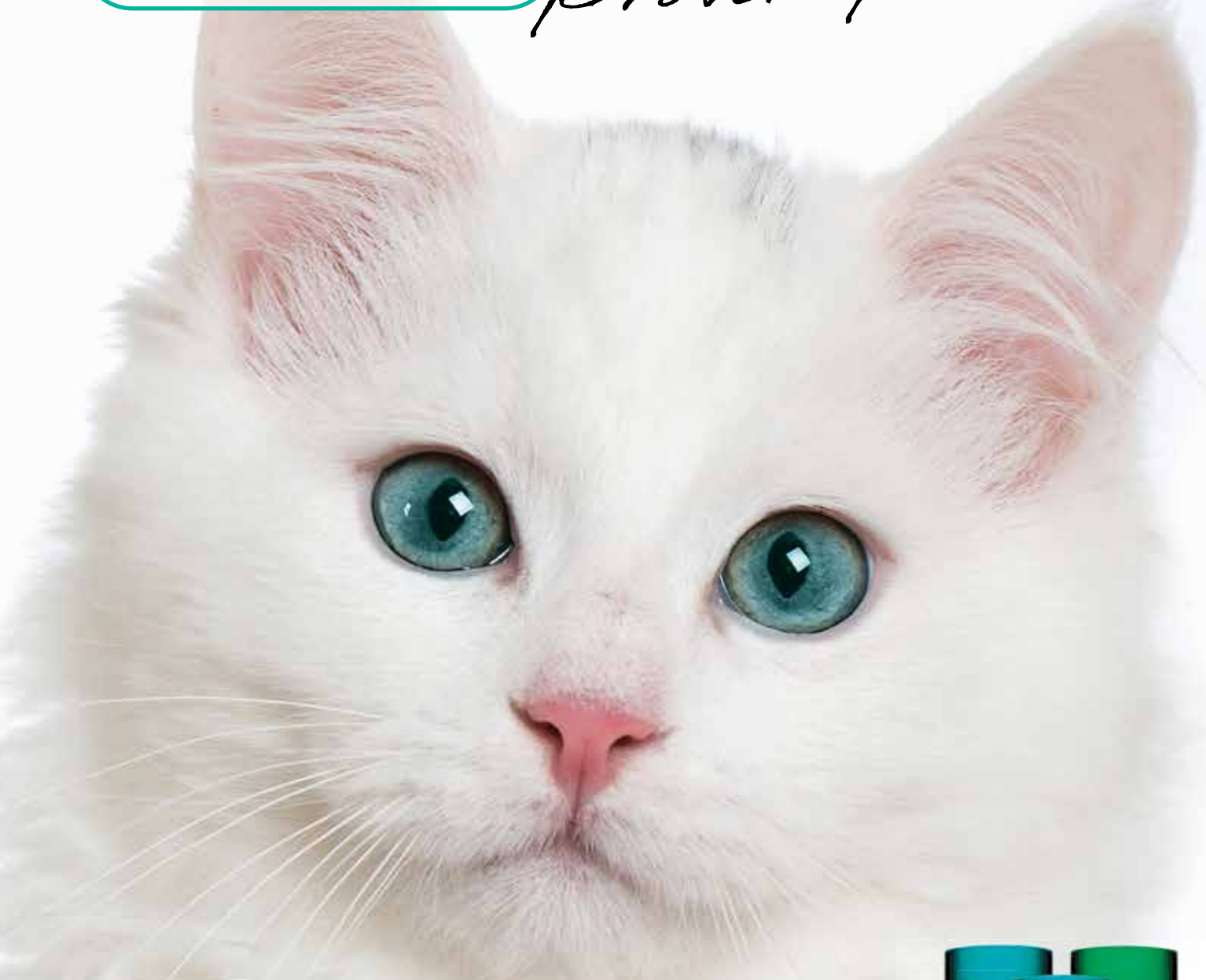
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Editor Corey Van't Haaff at the CVMA-SBCV Chapter Fall Conference and Trade Show holding Bunny, a Bengal cat, which belongs to Samirah, one of the Conference's registration table volunteers.

» TO THE EDITOR

Letters from members are welcome. They may be edited for length and clarity. Email us at wceditor@gmail.com.

» ON THE COVER

Newly ponded smolts at a sea site. Courtesy of the BC Salmon Farmers Association.

I've had a long history with veterinarians. As a small child, I always went with my mom when we (rarely) took our dogs to see our veterinarian. Then, as an adult, I began taking my dogs and cat regularly, and built a relationship, not just with my personal veterinarian but also with the veterinary community. By the 1990s, the provincial government had appointed me as the first public representative on the Board of the regulator (now the CVBC), and I had a role to play and a voice in determining the future of regulation of veterinarians in BC.

Fast forward a few decades, and my interaction continues, first as editor of *West Coast Veterinarian* magazine, then shortly thereafter as Executive Director of the CVMA-SBCV Chapter. And here's the funny thing. It was only in these last handful of years that I came to see veterinarians as far more than their professional role as animal doctors. Recognizing this balancing act every veterinarian must manage—participating in their personal, family, and business lives; then donning a lab coat and being required to know absolutely everything about the animal in front of them—is not something I would bet most clients give a lot of thought to.

And yet in this issue, we read about a veterinarian who kept reminders of a business failure when her clients likely considered her a success. We read about our WCVM student liaison who talks about the relationships she has forged with individuals on the faculty there; real personal relationships built on social interaction and tradition. And moments before writing this, I hung an original painting of some colourful cats on the wall in my Chapter office, having purchased it online, then learning it was painted by a fabulous RVT right here in BC. It's clear to me that veterinarians have full lives outside of their clinics, and helping veterinarians protect themselves to improve and support their daily balancing acts should be job one for us all. [WCV](http://wcv.com)

Email: wceditor@gmail.com

BC STUDENTS AT THE WCVM'S WHITE COAT CEREMONY

The WCVM Class of 2022 includes 22 BC students (and one student from Yellowknife, Northwest Territories). The WCVM officially welcomed all 79 members of the first-year class to the veterinary college and to the profession on September 21 during a white coat ceremony in Saskatoon.

WCVM CLASS OF 2022

- Angela Cheng, Fraser Heights, BC
- Olivia Ciccozzi, Richmond, BC
- Taylor Davies, Langley, BC
- Blossom De Bruin, Abbotsford, BC
- Maeghan Forster, Prince George, BC
- Cameron Hughes, Denman Island, BC
- Elina Kalamkarova, Vancouver, BC
- Ashlyn Ketterer, Enderby, BC
- Jeneva Ledding, North Vancouver, BC
- Glory Leung, Richmond, BC
- Emily Lieuwen, Ladner, BC
- Velina Milova, Victoria, BC
- Olivia Rad, Invermere, BC
- Katie Radcliffe, Duncan, BC
- Joselyn Reynolds, Rossland, BC
- Kristi Schroeder, Langley, BC
- Colin Smith, Victoria, BC
- Samantha Tait, Canim Lake, BC
- Amy Taylor, Abbotsford, BC
- Victoria Wallace, Chilliwack, BC
- Zoe Walter, Kamloops, BC
- Anna Wilkins, Victoria, BC



CVMA-SBCV CHAPTER 2018 SCHOLARSHIP WINNERS

The CVMA-SBCV Chapter's two \$2,500 scholarship winners for 2018 are BC students Emma Thomson and Juliet Cao.

CVMA-SBCV CHAPTER PRESIDENT DR. SARAH ARMSTRONG (CENTRE) WITH AWARD RECIPIENTS EMMA THOMSON (LEFT) AND JULIET CAO (RIGHT).



PHOTOS BY CHRISTINA WEESE

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CAROLINE BROOKFIELD, DVM, provokes professionals to find joy in the margins of convention. She encourages science professionals to embrace the uncertainty of creativity and to find fulfillment through trial and error. She lives in Calgary with her family and loves to travel, garden, hike, and perform stand-up comedy.



MARNIE FORD, DVM, PhD, Dipl. ACVO, graduated from the Ontario Veterinary College in 2000 after completing a Bachelors in Zoology at the University of British Columbia and a PhD in Physiology at Monash University in Australia. Her research interests have focused primarily on retinal function and toxicological retinal degeneration. In 2004, she moved back to Vancouver and opened West Coast Veterinary Eye Specialists.



HEATHER FRASER, DVM, graduated from WCV in 2002. After almost three years in a mixed animal practice in Williams Lake, in 2006 she moved to Riverside Small Animal Hospital in Kamloops where she was a full-time associate until 2016. She is now an instructor at Thompson Rivers University in the Animal Health Technology Department.



LAUREN FRASER, CHBC, is an IAABC-certified horse behaviour consultant. She helps horse owners address behaviour problems, using evidence-based, low-stress techniques. Currently enrolled in an MSc program in Clinical Animal Behaviour through the University of Edinburgh, she is also an educator, offering monthly work-shops for horse owners, and RACE-certified online courses for equine veterinarians.



NICOLETTE JOOSTING, BSc, BVSc, DVM, graduated from Univ. Pretoria (Onderstepoort), South Africa, in 1998. She owned Vancouver Feline Hospital and



MYKOLAS KAMAITIS, BSc, DVM, graduated from OVC in 2016, having completed his BSc in Biomedical Sciences in 2011 at the University of Guelph. He is the veterinarian for Marine Harvest and president of the Association of Aquaculture Veterinarians of BC.



MARINA VON KEYSERLINGK, PhD, grew up on a cattle ranch in British Columbia. She joined UBC's Animal Welfare Program in 2002 and was appointed as a NSERC Industrial Research Chair in 2008. She is recognized internationally for her research on the care and housing of dairy cows and calves.



EVY VAN NOBELEN, DVM, graduated from the University of Utrecht, in the Netherlands, in 2013. She moved to Canada to live and work as a small animal veterinarian immediately after graduation. She loves travelling, knitting, and urban sketching.



CHRISTINE L. SUMNER, PhD, winner of UBC's 2017-2018 Killam Graduate Teaching Assistant award, completed her PhD at UBC in 2018. Her research focused on engaging farmers as stakeholders in developing and implementing interventions that affect on-farm animal welfare. Christine is now the scientific officer at SPCA New Zealand.



KATHRYN WELSMAN, DVM, graduated from OVC in 2007 and practised emergency medicine in the Lower Mainland until she moved to the Interior of BC and started working as a locum.

Vancouver Feline Veterinary Housecall Service. She is a member of the Animal Welfare Committee of the CVMA-SBCV Chapter and currently enjoys semi-retirement in Harrison Hot Springs.

WCV

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Three years have absolutely flown by, and I can't believe I am at the end of my journey as President of your Chapter. When I was asked to step up as President three years ago, it was a terrifying concept. I wasn't sure how I would do it, or what would be involved. I am happy to report that it has been an awesome journey, and I have loved every minute of it. I have learned a lot, been able to fly to the western provinces for other VMA meetings, attended CVMA conferences nationally and, above all, made new friends and connections.

Our annual Fall Conference and Trade Show in November was a success again. We heard from Dr. Marty Becker on Fear Free™ practices. I will admit I was sad to learn that my striped shirts, which I covet, are not considered fear-free. We also heard from other speakers on pathology, cardiology, renal disease, and ophthalmology. Dr. Arman and I came back to our practice at Cats Only loaded with lots of new things to try. Our Continuing Education committee strives to put forward world-class CE sessions for our members and always welcome any feedback from you. We are also continuing to offer our Regional Spring CE seminars in Surrey, Victoria, Kelowna, and Cranbrook in May 2019. We will keep you posted on the dates and topics.

In October, we met with the Minister of Agriculture Lana Popham to discuss the changes in the BC veterinary workplace and the need for more veterinarians. We also spoke on behalf of BC veterinarians about the current and expected shortage of veterinarians in BC and the time-sensitive opportunity right now to expand the number of BC seats at WCV. We have asked for, and are continuing to pursue, increased funding for more BC students—who, more often than not, return to BC to practice. We strongly believe this is a super opportunity for the BC government to address the deficit of BC veterinarians and give BC students the chance to go to school more locally and with less student debt, and to allow 20 more students to attend BC's official veterinary college without having to leave the country for an education.

Our CVMA-SBCV Chapter 2019 Print Directory of BC Veterinarians was also recently created and distributed. The directory was created in response to demand from our membership and produced by two Canada Summer Jobs grants students. This was a large undertaking, and we aim to continue to produce this directory yearly for our members.

We have been approached by the WCV to help conduct student interviews for admissions. 2019 will be the first year that we will take this on, and we are honoured to be a part of this process.

I have now passed the torch to Dr. Al Longair, who took over as President after our AGM in November. I have no doubt he will fill my shoes (well, only figuratively as he is a very tall man) and then some. He is an experienced small animal practitioner, working in Duncan, and has been a member of the Chapter's Board of Directors for the past seven years. In addition to bringing a wealth of knowledge to the Board table, he also always wears fun neckties.

I am proud to have helped serve our veterinary community and thank you all for your support. [WCV](#)



Dr. Sarah Armstrong and her dog Oscar part way along the Juan de Fuca Trail.

Sarah Armstrong, DVM, graduated from OVC in 2007. Following graduation, she worked full-time in general practice and worked part-time at a local emergency practice in Southern Ontario before moving to Vancouver, BC, where she currently works as a locum veterinarian.

THANK YOU, SARAH.

The Board of Directors, committees, and staff of the CVMA-SBCV Chapter extend their heartiest and most appreciative thanks to Dr. Sarah Armstrong for her leadership and guidance as President of the Chapter these past three years. Her enthusiasm, her championing of student mentorship, her leadership in *West Coast Veterinarian Magazine*, and her influence and encouragement at the White Coat Ceremony and the meeting with BC students each year in Saskatchewan are just a few of the areas where she has left her mark. We are not saying goodbye as Dr. Sarah Armstrong continues to serve on the Board as Past President, but we are taking this opportunity to say thank you.

For full details of the 2018-2019 CVMA-SBCV Chapter Board of Directors, please see the masthead on page 6.

The new Cannabis Act and Regulations came into effect on October 17, 2018. The CVMA continues to work closely with the Veterinary Drugs Directorate of Health Canada to advance our understanding of the implications of federal legislation. The CVMA will continue to share information as it becomes available. Find more information under the Impact of New Cannabis Legalization on Veterinarians and their Patients section of the Policy & Advocacy tab of [www.canadianveterinarians.net](#).

The CVMA, in conjunction with the Canadian Council of Veterinary Registrars, created a document to assist provincial/territorial veterinary statutory bodies with developing a common set of guidelines regarding the behaviour of registered veterinarians when working with beekeepers and honey producers, and prescribing treatment for bees. Visit the Veterinary Oversight of Antimicrobial Use in Animals in Canada section of our website for Providing Veterinary Oversight of Antimicrobial Treatment of Agricultural Bee Populations.

The Performance of Veterinary Services (PVS) evaluation of Canada Report was published by the World Organisation for Animal Health (OIE) in August 2018. Overall evaluation results are: Canadian veterinary services operate at the highest level with no major weaknesses; OIE commended Canada for its commitment to upholding the highest standards possible and seeking means for improvement; and OIE thanked Canada for its leadership in being one of the first developed countries to undertake a PVS Evaluation. Canada's assessment is among the highest achieved internationally. Find more information under the News & Events section of our website.

The following new and revised position statements are available under the Policy & Advocacy section of the CVMA website: Raw Meat-Based Diets for Pets; Housing Systems for Laying Hens; and The Welfare of Cull Dairy Cows.

Nominations for the 2019 CVMA Awards are being accepted until January 31, 2019. More information about the awards and criteria can be found at [www.canadianveterinarians.net/about/awards](#).

The CVMA and the World Small Animal Veterinary Association Joint Congress runs from July 16 to 19, 2019, in Toronto. Ten CE tracks per day

will include dentistry, dermatology, business management, equine welfare, and more (preview the scientific program at [www.wsava2019.com/scientific-program](#)). Take advantage of early-bird savings before April 10, 2019, at [www.canadianveterinarians.net/science-knowledge/annual-convention](#).

The CVMA offers [AnimalHealthCare.ca](#) to provide animal owners with general information on common animal health issues and conditions, emphasizing that veterinarians are still the best source of advice when it comes to a pet's health. Some of the new or revised articles include Cats and Essential Oils; Training is Important for Our Pets Around the Home; and Keeping Your Horse in Good Health for Life.

Contact the CVMA or consult the Member Benefits & Services section of our website to learn more about exclusive member benefits, including Moneris Payment Processing Solutions, CVMA and GoodLife Fitness Discounted Gym Memberships, and CVMA Mont Tremblant Discount. [WCV](#)



Terri Chotowetz, DVM, graduated from the Western College of Veterinary Medicine in 1990. She was elected to the SVMA in 2009, served as President from 2011 to 2012, and became the Saskatchewan representative on the CVMA Council in 2013. While on Council, she has served as the liaison for the Animal Welfare Committee and the Canadian Veterinary Reserve, and is the CVMA representative on the Western College of Veterinary Medicine Advisory Council. She lives outside Saskatoon with her husband and family and four very spoiled dogs and a cat.



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Simply visit our BC classified ads at www.canadianveterinarians.net/SBCV/classified-ad-form. This is just one more way the CVMA-SBCV Chapter helps its BC members.



PHOTO BY STEVE/FB/PIXABAY.COM

Recently, your CVMA-SBCV Chapter asked Dr. Jane Pritchard, BC's Chief Veterinary Officer, to share with our members and other veterinarians what all BC veterinarians need to know about the coming changes related to antimicrobial drugs. This is her complete response. Dr. Pritchard also brings us up to date on the Ministry of Agriculture's activities in that regard.

Effective December 1, 2018, Health Canada will be adding all medically important antimicrobial drugs to the federal veterinary Prescription Drug List (www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/prescription-drug-list/list.html). This is part of the federal initiative to address antimicrobial resistance. More information about this change and others related to combating antimicrobial resistance is available on the CVMA website (www.canadianveterinarians.net/policy-advocacy/veterinary-oversight-of-antimicrobial-use-in-canada).

In BC, this change will have implications for:

1. BC Ministry of Agriculture which oversees the BC Veterinary Drugs legislation and its licensing of lay retail outlets and feed mills to sell some veterinary medications;
2. the College of Pharmacists which oversees the BC Pharmacy Operations and Drug Scheduling Act and its inclusion of veterinary prescribers and dispensers;
3. the College of Veterinarians of BC which oversees the BC Veterinary Act and its regulatory oversight of licensed veterinarians and the practice of veterinary medicine.

Health Canada and the Canadian Food Inspection Agency (CFIA) have been in regular communication with the CVMA, the provincial veterinary regulatory colleges, the provincial Ministries of Agriculture and Health, veterinary pharmaceutical manufacturers and distributors, the Animal Nutrition Association of Canada, the national

livestock associations, and others about the pending changes. This article focuses on the BC Ministry of Agriculture's efforts to communicate the impacts of the coming federal legislation to livestock producers and licensees under the BC Veterinary Drugs Act.

Briefly, BC farm and ranch supply stores can be licensed under the BC Veterinary Drugs legislation to sell a variety of Over the Counter (OTC) animal health products, including antimicrobials. Most of these antimicrobials will be added to the federal veterinary Prescription Drug List and therefore, effective December 1, 2018, producers will require a veterinary prescription to access antimicrobials that formerly were sold through the licensed drug outlets in BC, and they can only be sold by a veterinarian or pharmacist.

The Ministry also issues licenses for the manufacture and sale of feeds medicated with prescription and OTC veterinary drugs under the BC Veterinary Drugs legislation. Effective December 1, 2018, most of the OTC antimicrobials used in medicated feeds will be added to the Prescription Drug List. As a result, the number of prescriptions written by BC veterinarians for medicated feed is expected to dramatically increase. The federal government is currently leading the development of species specific templates for feed prescriptions and a list of required items for veterinary feed prescriptions. It is expected these will be released to the CVMA, veterinarians and the feed industry, among others, within weeks.

Federal legislation allows commercial feed mills to purchase prescription pharmaceuticals and sell feeds medicated with prescription drugs subject to a veterinary prescription. Although commercial mills will sell medicated feed, they will not be able to outright sell the prescription drug that was added to the feed

to result in the medicated feed. The sale of prescription drugs, including those added to feed, are limited to veterinarians and pharmacists. The CFIA oversees operation of commercial feed mills, including their use of medications.

Over the past two years, Dr. Brian Radke of the BC Ministry of Agriculture has shared information and updates from the federal government about the federal policy change to licensees under the BC Veterinary Drugs legislation several times. Information provided to the licensees included a poster listing the December 1, 2018 prescription status of the various veterinary antimicrobials. Licensees are encouraged to display the poster in a prominent high traffic area of their business for the benefit of their staff and customers. It also pointed out to licensees that the majority of OTC antimicrobials are switching to prescription status as of December 1, 2018. Licensees are reminded that they are not authorized to sell prescription products; veterinary prescription drugs can be dispensed only by veterinarians or pharmacists under a veterinary prescription. In BC, a veterinarian-client-patient-relationship as defined by the CVBC must be in place to obtain a prescription. It is reiterated that commercial feed mills can continue to manufacture and sell medicated feeds. Feeds medicated with a veterinary prescription product continue to require a veterinary prescription prior to sale of the product as always, however most antimicrobials will require a prescription after December 1, 2018.

The CVBC and Ministry of Agriculture staff that specialize in the livestock industries have also been included in the communications to the

Veterinary Drugs licensees. In addition, the Ministry has responded to information requests from BC livestock industries and Veterinary Drugs licensees. This information to BC livestock industries supplements the information shared with the national livestock associations by the federal government. Although the increased prescribing will likely fall primarily to mixed or large animal vets, companion animal vets could also see new requests from hobby farmers, owners of urban chickens, and beekeepers. [WCV](#)



Jane Pritchard, DVM, M VetSc, graduated from OVC in 1977, and completed a Masters in Anatomic Pathology at WCV in 2000, continuing as an Associate Professor in the Department of Pathology for two years before embarking on a career with the BC Ministry of Agriculture in 2004. With the exception of a two-year international development project in China from 2007-2009, she has remained with the BC Government. In 2013, she was appointed to the role of Director of the Plant and Animal Health Branch, and Chief Veterinary Officer for the Province of British Columbia.

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PHOTO COURTESY OF WCVM PRODUCTION ANIMAL CLUB

A Saturday well spent: WCVM students learned about handling cattle at animal behaviour professor Dr. Joe Stookey's farm where they were able to practise their skills with his Speckle Park cattle.

LEADING BY EXAMPLE

BY CHLOE GUSTAVSON

As I walk down the halls at the Western College of Veterinary Medicine (WCVM), I pass by walls lined with graduation portraits dating back to the first students in the 1960s. From a then-majority of sepia-toned moustaches to today's colour photos featuring predominantly female students, we can spot the faces of our mentors, many of our teachers, and for some, even family members. Tradition is in these hallways. A few weeks into third year, our first lecturer of the morning opened with a rhetorical question: "We always hear that students want to learn from motivated teachers. What about the teachers wanting motivated students?" I believe that each side of the classroom shows up every day because both sides of the question are certainly true. When our teachers say to us that they have been in our seats and they know what it feels like, it is genuine.

This past summer, an internationally-trained veterinarian asked me what WCVM is known for. While we instinctively began discussing academic achievements and notable contributions to the veterinary profession at large, these merits should not be separated from the dedication that is shown within our own community. We are privileged to be learning from veterinarians who bring clinical experience to their lectures, highlighting its relevance, and engaging our interest. When learning about changes in the pregnant mare in equine theriogenology, our lecturer invites us down to the clinic to visit a foal born just the day before. When we consult the online Merck Veterinary Manual and see a familiar faculty name as contributing author, the impact resounds. Our teachers are devoted to our profession and our school, and their support to students extends outside of the lecture hall and beyond office hours.

Like us, our professors are animal people. Many bring their pets to school, and we benefit from their presence. Whether they are sport dogs volunteering in physiology labs, motivated cats participating in rehabilitation demonstrations, or simply the tail-wagging recipients of our affection, they enhance our learning while positively benefitting our mental health. For larger species, our teachers invite students off-campus to see their animals. There have been opportunities for experienced horse riders to get in the saddle, as well as handling labs offered to those seeking further experience around cattle.

When we take a break from learning, our teachers are there, too. Last year a group of musically talented students, harmonizing as the WCVM Orchestra, sought out to start a new tradition called Hootenanny. For the past two years, they have performed a fall concert in a barn loft belonging to a generous and admired professor. Later in the year, prior to the start of December final exams, another favourite student activity at the WCVM is holiday carolling. Each class arranges a school bus to drop us off outside the homes of a few of our professors (who have previously agreed to accommodate a choir of over 70 on their front lawns). Dressed in festive sweaters, we give our best effort at spreading cheer with enthusiastic carol singing and are then welcomed inside. The warmth of mulled wine on a Saskatchewan winter evening radiates the kindness we are shown by our teachers and their families (four-legged

"THE WARMTH OF MULLED WINE ON A SASKATCHEWAN WINTER EVENING RADIATES THE KINDNESS WE ARE SHOWN BY OUR TEACHERS AND THEIR FAMILIES."

members included, of course). It is heartening to hear that they also look forward to the annual event as a memorable start to the Christmas season.

I hope that as students we are effective in demonstrating our appreciation, abiding by the so-called golden rule of the classroom. Each April, when we are asked to reflect upon our curriculum and offer course feedback, we also take the opportunity to collectively recommend exceptional instructors for awards that recognize their commitment to our education. At the end of our first year, my class was successful in nominating our anatomy lab professor, Dr. Brent Bobick, for a Teaching Excellence Award in Instructional Support awarded by the University of Saskatchewan's Student Union. On our submissions, we referenced his encouraging enthusiasm, his proficiency in making complicated concepts easily understood, and—most admirably—that word of our nomination propelled him to make veterinary anatomy labs even better for the next year's class. The more time we spend here, the more aware we become of just how dedicated so many of our teachers are as true educators; they lead by example.

WCVM students come from the four western provinces, Yukon, and Northwest Territories; and Saskatoon and the WCVM become a home-away-from-home for many of us. We often hear that the WCVM community will continue to be here for us in our post-graduation lives. Our professional inquiries can turn into teaching material, and the support self-perpetuates. Here, we have many role-models to look up to as we make the transition from students to teachers ourselves. We see the emphasis placed on being part of a team. To the veterinary technicians, graduate students, interns, and residents who are patient with our questions and readily share their wealth of knowledge, we are so thankful for your help. In true holiday spirit, I would like to formally express gratitude to the faculty and staff at WCVM who go above and beyond.

To learn more about life at the WCVM with our #pawesomeprofessors, follow us throughout the year on student-run social media: @wcvsa #studentsoftheWCVSA, facebook.com/WCVSA. [WCV](#)



Chloe Gustavson obtained a BSc from the University of Victoria prior to coming to WCVM. She calls Vancouver's North Shore home, where she most enjoys spending time near the ocean with her dog, Leo. Upon graduation she plans to return to BC to work in small animal practice.

YOUR PIGS ARE VULNERABLE TO THE DEADLY AFRICAN SWINE FEVER VIRUS

A MESSAGE FROM THE CANADIAN PORK COUNCIL

DO NOT FEED HUMAN FOOD WASTE OR MEAT TO YOUR PIGS Although this virus cannot infect humans, even a trace amount from a contaminated pork product can kill your pigs and spread the disease. Be wary of where you dispose of your food waste so other animals, including wild boars, do not have access to it. If you feed your pig fruit and vegetables, make sure they have never entered a kitchen or been in contact with meat or products of animal origin.

The virus can survive in fresh pork; processed pork products including cured, air dried, salted or smoked products for up to 300 days; and even 1,000 days in frozen pork. The virus can kill pigs if ingested.

TRAVELLERS BEWARE

African swine fever can be transmitted to pigs through contaminated food and by contaminated items such as clothing and



PHOTO COURTESY OF THE CANADIAN PORK COUNCIL

footwear. When you travel, never bring back meat or pork products into Canada. Wash all clothing and footwear immediately after use in other countries. Even better, if you visit a farm or animals, don't bring your clothing or footwear back to Canada.

Although African swine fever is not currently present in Canada, wild boars can very easily spread a host of diseases to your pigs. If they have access to the outdoors, take the necessary precautions so your pigs never come into contact with wild pigs.

African swine fever is very contagious and is killing pigs and wild boars in Africa, Asia, and parts of Europe. No treatment is currently available. Let's work together so African swine fever does not make its way to Canada. For more information, visit www.cpc-ccp.com.



CANADIAN DAIRY CATTLE VETERINARIAN PERSPECTIVES ON CALF WELFARE

BY CHRISTINE L. SUMNER, PhD, AND MARINA VON KEYSERLINGK, PhD

Recent increased public concern about farm animal welfare has pressured farmers to adopt practices that lead to improvements in farm animal care. Despite these growing demands from the public, and a growing body of knowledge on what farm animals need and want, challenges remain in motivating farmers to adopt management practices to improve animal welfare. On dairy farms, calves face many welfare challenges including increased risk of sickness, hunger, and poor growth if they do not receive optimal care soon after birth and before weaning. Farmers are responsible for the calf care during this early stage of life; however, a potential barrier to achieving high standards of care is that farmers often manage calves without much input from their herd veterinarian. As advisors to dairy farmers for the health of the adult cows, veterinarians are well positioned to influence the health of the dairy calves. Additionally, dairy farmers consider the veterinarian to be an important advisor for animal welfare; therefore, it is worthwhile to consider how to motivate veterinarians to become more involved in calf management on dairy farms.

Motivating veterinarians to take a more active role in improving calf welfare requires an understanding of their attitudes, beliefs, and experiences related to this topic. One way to learn about how a group of individuals thinks about a topic is to have them participate in a group discussion where they are encouraged to share their own experiences and thoughts related to the topic. Using this focused discussion approach, a study was conducted by the Animal Welfare Program at the University of British Columbia to gain a better understanding of what Canadian dairy cattle veterinarians think about calf welfare and provide clarity on what they feel is their responsibility in improving the welfare of dairy calves. During our study, we asked 33 veterinarians from five Canadian provinces and different geographical regions to discuss calf welfare and found four major themes that summarize their views on dairy calf welfare.

First, participants had diverse concerns about calf welfare. These concerns unsurprisingly included preventing disease and treating pain during routine procedures such as dehorning, and also concerns about bull calf management, hunger, and inadequate nutrition. The participating veterinarians prioritized calf health over the calf's social needs leading to their support of individually housing calves. We believe that veterinarians

should reconsider welfare concerns such as health and social housing as trade-offs with each other. Additionally, concerns such as hunger and nutrition are not well reported elsewhere and worthy of further exploration from the veterinary perspective.

Second, participants see pressures external and internal to the dairy industry as primary drivers of change in calf management on farms. External pressures included negative public perceptions about the early separation of the cow and calf shortly after birth. Participants also felt that increased public awareness would alleviate these concerns, even though they acknowledged the public often empathizes with the mother-offspring relationship. Internal pressures from within the dairy industry were primarily viewed as coming from other farmers and veterinarians placing pressure on farmers to improve. The social pressure from veterinarians exerted on farmers to improve calf welfare remains underexplored, and learning more about this relationship may provide insight into how veterinarians can be more proactive in approaching their clients to improve calf welfare.

Third, participants described the different roles and strategies used to promote calf welfare improvements, most frequently as educators responsible for teaching their clients. Participants discussed the need for face-to-face interactions with their clients to discuss their overall farm goals indicating a shift towards tailored advisement approaches to help their clients improve calf welfare. Further work on identifying ways that veterinarians address the diverse aspects of calf welfare would provide needed description of practices that could be promoted in the dairy industry.

Finally, participants had a range of personal and professional values that inform how they view calf welfare, their clients, and the veterinary profession. Personal values included consideration that welfare is based on the production value of the calf and the intrinsic value of the calf as a living being. Participants believed they have professional obligations towards improving calf welfare and believed farmers most open to improving welfare should be held up as examples of good farmers. We suggest that understanding veterinarian judgments about calf welfare and their professional duties can help identify issues most amenable to change, for example, focusing on increasing veterinary advocacy for the use of pain relief during dehorning. Understanding veterinarian claims about farmers is needed to identify how these two stakeholders can cooperate to improve calf welfare.

Our discussions with Canadian dairy cattle veterinarians indicate they share many concerns about calf welfare and feel obligated to do more for the calves. They acknowledge calf

management practices are changing on farms, and they see their role as educating and motivating their clients, and holding them responsible for calf welfare improvements. We believe future use of guided discussions can improve our understanding of how to motivate veterinarians to take a more active role in improving calf welfare. [WCV](#)

This article is a summary of a recent publication – Sumner, C.L. and M.A.G. von Keyserlingk. In press. Canadian dairy cattle veterinarian perspectives on calf welfare. *J. Dairy Sci.* <https://doi.org/10.3168/jds.2018-14859>.

“THE SOCIAL PRESSURE FROM VETERINARIANS EXERTED ON FARMERS TO IMPROVE CALF WELFARE REMAINS UNDEREXPLORED, AND LEARNING MORE ABOUT THIS RELATIONSHIP MAY PROVIDE INSIGHT INTO HOW VETERINARIANS CAN BE MORE PROACTIVE IN APPROACHING THEIR CLIENTS TO IMPROVE CALF WELFARE.”

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A FAREWELL TO ARMS

BY VERONICA GVENTSADZE, MA, DVM, PhD

“FOR THE SAKE OF THE BEARS, DOES IT REALLY MATTER THAT A GOOD DECISION WAS MADE FOR EMOTIONAL RATHER THAN STRICTLY SCIENTIFIC REASONS?”

This fall marks the first season to see a ban on the grizzly bear trophy hunt in BC (hunting for food, social, or ceremonial purposes is still permitted for First Nations). Although this is an occasion for all animal lovers to celebrate, the joy is marred by the fact that hunting is not the biggest threat to the conservation of this iconic animal. Hunters and outfitters, disappointed by the ban, are quick to point out that habitat destruction is by far the greater threat to conservation of this species. It is true that hunting licenses account for only 2.5% of the overall bear population. Illegal hunting, the killing of “problem” bears by conservation officers, and bears hit by trains while foraging for spilled grain, should be taken into account for the sake of fairness. Doug Donaldson, BC’s Minister of Forests, Lands and Natural Resource Operations, has himself stated that the decision to end the trophy hunt was driven by public opinion rather than scientific reasons. Public opinion, while lacking the stern discipline of science, is not necessarily the same as mob mentality, and it has its rights and reasons. Grizzly bears are majestic if not terrifying animals, and hunting them is perceived as a secular form of sacrilege. Hunting bears for meat is largely seen as unnecessary even when it reflects a homesteading and survivalist lifestyle. (The implication is either that there are less noble and majestic animals that can be eaten, or that animals should not be eaten at all.) By contrast, trophy hunting does not even claim to contribute to survival, but rather to the hubris of the hunter who sees himself or herself as having conquered a highly prized animal, and who retains its body parts as a memento of the conquest. This

would have been a badge of courage in times when our existence was threatened by wild animals, and before the advent of firearms which have created a most unfair advantage. But since the blessings of civilization have insulated and protected us from wild animals, trophy hunting has become an insult to our human dignity and to the dignity of the land and its animals. A component of public opinion is resentment towards those who can afford to pay big money for a hunting license. But for the sake of the bears, does it really matter that a good decision was made for emotional rather than strictly scientific reasons?

There are an estimated 15,000 grizzly bears living in BC, and despite their impressive image, these animals are a paradoxically vulnerable species. In response to hunters’ and outfitters’ claims that the bear hunt contributes to their conservation, one can rightly ask how on earth the bears managed before the advent of humans, and in areas such as the Khatzeymateen Grizzly Bear Sanctuary. Wild animals die violent deaths all the time, but it matters greatly which of them die, and by whose hand. While it remains to be seen how ending the trophy hunt will affect the overall number of bears, their demographic will most likely change. Grizzly bears are not particularly nice to each other. Males will kill cubs if they believe them to be the offspring of other males. They will then seek to mate with the female who goes into heat after losing her cubs, thereby eliminating genetic competition while passing on their own genes. It is therefore possible that the end of the hunt will lead to more older males surviving, and in turn killing more young who will not reach maturity. Will this result in fewer bears overall, and

“WILD ANIMALS DIE VIOLENT DEATHS ALL THE TIME, BUT IT MATTERS GREATLY WHICH OF THEM DIE, AND BY WHOSE HAND.”

thus in the further decline of this species? Will it lead to fewer young bears looking for new territory and thereby running into trouble with each other and with humans? The questions are endless, and only time will bring answers. Intuitively, it seems that natural selection can do a good enough job of maintaining optimal quality and quantity of a species, at least as good as the hunters have been doing.

Speaking of quality, there is nothing like a grizzled old patriarch of a grizzly bear to supply material for endless stories. The boonies of Rosswood in the Nass Valley north of Terrace are rich in such stories. Preparing to forage for pine mushrooms one fine September day, my husband received discouraging advice from a neighbour. “Don’t go there. Mile Two is in a bad mood today.” Mile Two is an old and notoriously morose grizzly named after the territory over which he reigns: two miles into the woods along an old logging road that branches off the Nisga’a Highway. The fact that he actually conveyed his bad mood reminds us that these animals, at least those who feel confident in their superiority, are incredibly fair: they give warning in various forms. In this case, the bear came up to a mature cedar, rose to his full height, and gave the tree a good shake for emphasis. Like other grizzlies, Mile Two huffs like a steam engine and pounds the ground with his front paws. On one occasion, he followed this demo by chasing a human intruder and smacking the door of the truck just as it closed behind the terrified man, who drove home with a handprint of a dent as a memento. Knowing that a large grizzly can easily turn a vehicle into scrap metal, it is obvious that Mile Two meant to send a message and not to kill the human who had angered him. Over the years, this bear and the people of neighbouring Rosswood have come to some sort of understanding, maybe because the bear is highly confident if given to tantrums, and the area is not visited by tourists who are often ignorant of bear etiquette.

Other bears have been known to show less forbearance, just as other people have been less respectful of a bear’s territory. Not all the bears of Rosswood have been fortunate, either. A bear who lived near the garbage dump became a local resident’s proclaimed friend. Together, they ripped open garbage bags or dug through the piles and helped themselves, without competition, to what each of them wanted. The man was warned many times by conservation officers to stop fraternizing with the animal, yet in his selfishness he believed that only his own safety was at stake. This bear did not live long enough to earn a name: eventually he was shot by a conservation officer for finding himself too close to people on garbage day. Yet another bear, having the misfortune to awaken during the February thaw, stumbled onto a resident’s porch and collapsed there from weakness and hunger. The resident left food next to the animal, afraid to approach it too closely even in its debilitated state. The next morning, both the food and the bear were gone, and this animal was not seen by humans again. If it

survived, it was smart enough not to mistake that one instance of help for an offer of friendship. Wild animals are not pets, and treating them as pets or friends may cost them their life. Neither are they circus animals under an open sky. After driving all the way to Stewart, on the border of Alaska, to view the grizzly bears at their salmon feast, from the newly constructed viewing platform we saw nothing but an empty river. Caring nothing for this investment, the bears simply would not show themselves once the first viewers arrived in the early hours of the morning. We later discovered that the bears had moved to the smaller streams in the forest to do their fishing and eating, and even here they operated under the cover of darkness, leaving only torn-up fish carcasses for humans to photograph in daylight hours. Perhaps they have what we would call a sense of humour. Be that as it may, these proud animals are best served by being left alone in every possible way. [WCV](#)



VERONICA GVENTSADZE, MA, DVM, PhD, graduated from Ontario Veterinary College in 2008. She moved to Squamish, BC, where she worked for two years as an associate veterinarian in a small animal practice. She currently travels across BC as a locum and enjoys learning something new from each practice.

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www.homewoodhealth.com

Additional mental health and wellness resources are listed at:
www.canadianveterinarians.net/documents/mental-health-support-resources

OPHTHALMIC EXAMINATION OF THE ADULT PATIENT

BY MARNIE FORD, DVM, PhD, Dipl. ACVO

West Coast Veterinarian is pleased to continue with part three of our new column. Each four-part column is written by one veterinary specialist about one topic that has four distinct life phases. The articles will appear over the course of one year, highlighting the topic and what veterinarians should know about the topic and the life stages of animals. For our first topic in this new column, we introduce the ophthalmic examination.



1 Early corneal dystrophy. Note the absence of corneal blood vessels and central location.

The adult patient (three to eight years) can present with a wide variety of genetically driven or acquired ophthalmic changes that commonly include cataracts, corneal dystrophy, glaucoma, keratoconjunctivitis sicca (KCS), and Golden Retriever Pigmentary Uveitis (GRPU). Most structural abnormalities (e.g., eyelid conformation and abnormal hairs) and third eyelid gland prolapses will most likely have been identified and corrected at an earlier age. Age-related changes (indolent ulcers, lenticular sclerosis, and benign eyelid masses) begin to emerge in later adulthood and will be discussed in more detail in the final issue addressing senior dogs. An overview of GRPU has already been published in the September 2011 issue of *West Coast Veterinarian*.

Cataracts may be inherited or acquired. Inherited cataracts can arise at any age and may vary in extent between eyes. Acquired cataracts develop secondary to diabetes (dogs), trauma, or uveitis. Despite diligent glucose regulation, diabetic cataracts can develop very rapidly and risk lens capsule rupture. Evaluation by



2 Advanced corneal dystrophy. Note the large, white, bilateral, lipid or calcium crystalline circles with less dense centres.

an ophthalmologist for the rapid control of lens-induced uveitis (LIU) and/or surgical removal of the lenses is critical. Traumatic cataracts typically develop in one eye and may not progress to affect the entire lens. All cases of cataracts require continued monitoring for and treatment of LIU. Cataract removal is elective and highly successful, however surgical outcome is equally dependent upon the health of the eye, nature of the patient, and compliance of the owner. Cataract surgery requires strict adherence to the recommended post-operative medical regimen and recheck schedule to achieve the best outcome by minimizing the development of intraocular inflammation and its sequelae: scarring, glaucoma, and retinal detachment.

Corneal degeneration and corneal dystrophy refer to calcium or lipid deposits in the cornea(s) and can appear clinically identical. Corneal dystrophy [photo 1] is inherited, slowly progressive, typically bilateral and axial, and not associated with prior corneal ulceration or underlying disease. Corneal degeneration develops secondary to prior corneal injury or underlying disease



3 The glaucomatous eye illustrating diffuse cornea hazing, mydriasis, and conjunctival hyperemia.

(hypothyroidism, Cushing's, diabetes, pregnancy, hyperlipidemia, hypercalcemia, etc.) may be unilateral or bilateral, and occurs on any location of the cornea. To help rule out any systemic contribution to the lipid/calcium being deposited in the corneas, a 12-hour fasting blood sample is recommended and any abnormalities in triglyceride, cholesterol, or calcium levels investigated. The white spots on the dystrophic corneas typically become larger, however, as the spot size increases, so too does the clear centre—much like an expanding doughnut [photo 2]. Rarely will the deposits become vision threatening. While uncommon, irritation is more often associated with calcium deposition (spiky crystals versus the soft deposits of fat), and a medication can be prescribed to help blunt these sharp calcium points.

Glaucoma is defined as an elevation of intraocular pressure (IOP) that goes beyond the health of the eye. Glaucoma [photo 3] can be broadly classified as primary (inherited) or secondary (acquired). Early clinical signs associated with glaucoma are frequently missed and include persistent pupil dilation that is

“TO HELP RULE OUT ANY SYSTEMIC CONTRIBUTION TO THE LIPID/CALCIUM BEING DEPOSITED IN THE CORNEAS, A 12-HOUR FASTING BLOOD SAMPLE IS RECOMMENDED.”

not responsive or minimally responsive to a focal bright light source, and marked conjunctival hyperemia. Other signs include diffuse corneal hazing, vision deficits, rubbing, globe enlargement, lethargy, or social seclusion/inappetence. Most owners can be taught to check the pupillary light response when a red eye is seen and are instructed to have the IOP measured as quickly as possible if the pupil is found to be dilated with reduced response to light. Glaucoma is painful and very rapidly blinding. Following diagnosis of glaucoma, medication to rapidly lower eye pressure must be initiated to minimize retinal damage or blindness, and prompt referral to a veterinary ophthalmologist is recommended.

Sudden Acquired Retinal Degeneration (SARD) is typified by the rapid onset (1–3 weeks) of blindness with 65% of dogs reported as middle-aged to older, overweight, and female. Progressive Retinal Atrophy (PRA) is inherited (recessive), slowly progressive (~10–12 months), and typically develops in 3–5 year-old or 7–10 year-old age-groups of dog. The cause of SARD is unknown, but is often accompanied by PU/PD, PP, weight gain, and an initial rise in cortisol levels. The latter is interesting and suggests that hormone changes may have a role in its etiology. As cortisol is the only hormone commonly measured, I question if the adrenal glands (which also produce androgens and mineralocorticoids) are stimulated to produce more of all hormones, one or all of which may damage or short-circuit the retina. At the time vision deficits are noted, the retina of PRA has degenerative changes consistent with retinal thinning (tapetal hyperreflectivity) and vascular attenuation. The SARD retina initially looks normal but, over several months, becomes indistinguishable from other causes of retinal atrophy. While any breed of dog can be affected by SARD and PRA, Dachshunds and Mini Schnauzers are overrepresented. Diagnosis is confirmed via electroretinography. [WCV](#)

PHOTOS COURTESY OF MARNIE FORD

CANNABIS LEGALIZATION AND THE PRACTICE OF VETERINARY MEDICINE—IN CANADA & IN BC

The College of Veterinarians of Ontario (CVO) has published several documents that, together, thoroughly address the current realities of the use of cannabis and its derivatives in veterinary medicine, in the face of the legalization of cannabis last month. The CVBC encourages registrants to review them all, as the rules and limitations facing veterinarians are based on Federal regulations and therefore apply to all Canadian veterinarians, rather than being the result of policy by the individual provincial regulatory body.

- Informative Article: The Cannabis Act in Effect October 17, 2018 (CVO) (<https://cvo.org/Utility-Pages/Cannabis-Act-Article.aspx>)
 - includes a helpful discussion on Extra-Label Drug Use of Phytocannabinoid products available as Human Prescription Drugs (as it may be expected that Human Prescription products will be seen before Veterinary Prescription products)
- Understanding the Impact of the Cannabis Act on Animal Welfare (CVO, Oct. 17, 2018) (<https://cvo.org/About-CVO/News/Understanding-the-impact-of-the-Cannabis-Act-on-an.aspx>)
 - Cannabis FAQs (CVO) (<https://cvo.org/Utility-Pages/Cannabis-FAQs.aspx>)

THE LEGALIZATION OF CANNABIS HAS TWO PARTS FOR CONSIDERATION:

1. Legal access to cannabis (dried and fresh marijuana plant, and cannabis oil) for human medicinal or recreational purposes.

The recreational products, though intended for human use, are not prescription products and therefore do not constitute “Extra-Label Drug Use”. However, it is important to convey to clients the risks that these products pose to their animals, due to undetermined (and potentially toxic) levels of THC of the marijuana plant. Any guidance provided to clients on the use of these products in their animals should include:

- Cautions that these products are *not intended* for animal use; safety and efficacy is not known; and there is limited research of their use in animals
- Discussions on risks of and signs of toxicity; warnings to keep their personal supply out of reach of their pets; increased toxicity of any oil-based edibles

2. Phytocannabinoid-containing products

Health Canada has placed all phytocannabinoids (natural and synthetic) on the Human and Veterinary Prescription Drug Lists. This means that legal access to any products containing phytocannabinoids for animals must be through a proper veterinary prescription for a Health Canada-approved product.

Exempt from the Prescription Drug List are products that have marginal levels of THC or CBD (often those that are Hemp Seed derivatives)—

these will be available as Health Canada-approved Veterinary Health Products (VHPs), identifiable by a Notification Number (NN). VHPs are considered to have a limited potential for risk, and may not make any label claims to health benefits. There are already some cannabis-based VHPs available on the market.

The practical effect of this classification by Health Canada is that a veterinarian may not sell/dispense, prescribe or even recommend non-Health Canada-approved products to the public. If a client presents you with a product that has neither a DIN nor a NN, you should be educating them about the lack of any certainty of safety, efficacy, or quality of the product, and the inherent risks they assume with using it.

The legalization of cannabis in Canada means that, to everyone’s benefit, much-needed research that will lead to a greater understanding of phytocannabinoids and their effects on body systems of various species is now being conducted. But, until that research is completed and published, the veterinary profession will continue to be hampered by everything that is not yet known, and it is a veterinarian’s professional responsibility to educate their clients about the limitations of our current knowledge and the practical implications of those limitations. ^{WCV}

“MUCH-NEEDED RESEARCH THAT WILL LEAD TO A GREATER UNDERSTANDING OF PHYTOCANNABINOIDS AND THEIR EFFECTS ON BODY SYSTEMS OF VARIOUS SPECIES IS NOW BEING CONDUCTED. BUT, UNTIL THAT RESEARCH IS COMPLETED AND PUBLISHED, THE VETERINARY PROFESSION WILL CONTINUE TO BE HAMPERED BY EVERYTHING THAT IS NOT YET KNOWN.”

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FISH STORY—THE LIFE OF AN AQUACULTURE VETERINARIAN

BY MYKOLAS KAMAITIS, BSc, DVM

If the question is what is BC's number one agricultural export, the answer might surprise you. It's salmon. Given that, it is no surprise that aquaculture, the production of aquatic or marine organisms, continues to grow at an exponential rate in order to meet global seafood demands.

NEWLY EMERGED SAC-FRY PHOTO COURTESY OF THE BC SALMON FARMERS ASSOCIATION.



“I AM RESPONSIBLE FOR THE HEALTH AND WELL-BEING OF MILLIONS OF FARMED FISH, FROM EGG TO HARVEST.”

Conducting a routine sea lice count at a farm site in the Campbell River area.

In BC, the primary fish species being cultured is Atlantic salmon (*Salmo salar*). Aquaculture employs thousands of people in BC, many of whom live in small coastal communities on Vancouver Island and the Central Coast. Fish production occurs in sea cages as well as land-based facilities that are primarily used for early rearing. As in all livestock production, animal health and welfare are key components to a successful and sustainable aquaculture industry and provide an important role for veterinarians to play.

The lifecycle of a typical farmed Atlantic salmon is two-and-a-half to three years from egg to plate. This includes one year in fresh water and one-and-a-half to two years in salt water. Broodstock, or those fish used to produce eggs for the next generation of fish, live one more year at sea before they are spawned. The first year of life is spent in a hatchery, where eggs are fertilized, incubated, and hatched. The newly hatched fish, called alevin or sac-fry, develop into parr, receive a number of vaccinations against various bacterial and viral pathogens, and are then transported to net pens out in the ocean as they develop into smolts. While hatcheries allow producers the ability to regulate rearing and water quality parameters, particularly in recirculating aquaculture systems, little can be done to control or regulate environmental factors and water quality at sea. However, various tools and technology have helped fish producers mitigate the potentially devastating impacts of poor environmental conditions; air diffusers and oxygenation systems have helped manage challenges such as low dissolved oxygen levels or harmful plankton blooms that may occur at certain times of the year.

Farmed salmon are incredibly efficient livestock, with feed conversion rates close to 1:1 (1 kg of fish is produced with a little over 1 kg of feed). Salmon are fed specialized pelleted diets at different sizes and life stages; in addition to marine fish oil and protein, feeds are being developed to incorporate an increasingly higher proportion of land-based ingredients, including plant-based products as well as by-products of other livestock industries such as feather meal. Salmon feed also includes the carotenoids astaxanthin and

canthaxanthin which, in addition to adding nutritional value to the feed, also give salmon flesh its distinctive colour.

As an aquaculture veterinarian working in the BC salmon industry, I am responsible for the health and well-being of millions of farmed fish, from egg to harvest. I also have the responsibility to minimize any risk to wild fish populations and the ecosystem as a whole. My job includes on-site fish health visits as well as analyzing fish health and production data. I need to apply the principles of biosecurity, preventative health management, production data analysis, and client relationships to promote the health and welfare of our patients. I also ensure our customers receive a healthy, nutritious, and safe product, and help drive continual improvement in all aspects of production and processing.

The Association of Aquaculture Veterinarians of BC (AAVBC) includes around twenty veterinarians involved in the BC aquaculture industry, including both the private and public sectors. This association meets and corresponds to discuss current fish health and veterinary issues, and to respond to questions, comments, and

“LARGER AQUACULTURE COMPANIES IN BC EMPLOY VETERINARIANS TO MANAGE THE HEALTH OF THEIR FISH ON A FULL-TIME BASIS, WHILE SMALLER OPERATIONS HIRE VETERINARIANS WHEN THEIR SERVICES ARE REQUIRED.”

concerns from the industry, regulators, and the public. Larger aquaculture companies in BC employ veterinarians to manage the health of their fish on a full-time basis, while smaller operations hire veterinarians when

their services are required. In addition to on-farm veterinarians, there are also many veterinarians who work in ancillary fields, including diagnostics and pathology and research, as well as government and regulatory affairs.

Aquaculture veterinarians must possess a broad and extensive knowledge of fish health, both wild and farmed; we must put into action on a regular basis our knowledge and training in clinical medicine, herd health, food safety, virology, bacteriology, parasitology, physiology, pathology, toxicology, pharmacology, epidemiology, and ecosystem health, among others. Within the AAVBC, individual veterinarians have developed specialty interests in one or more of these disciplines.

Part of being an aquaculture veterinarian includes visiting fish farms. In addition to observing the fish themselves, we observe the farm facility, environmental and water quality parameters, fish husbandry practices, and biosecurity measures in place. Many of BC’s farm sites are located around the north and west of Vancouver Island, and the drive up from Campbell River usually takes two to three hours depending on where we’re headed, followed by a boat ride which may be over an hour. A typical site visit day starts around 6 AM, sometimes earlier depending on the boat schedule. We load up our fish health gear at our lab, including equipment for performing post-mortems and collecting samples, as well as anything else needed for current research and development (R&D) projects. Many of our visits are done solo, but it’s also common to be accompanied by one of our fish health technicians. At a minimum during a site visit, we’ll perform post-mortem examinations on fresh mortalities which are pumped up daily from all pens; we will collect diagnostic samples depending on what we observe on the post-mortem exam, including bacteriology, PCR tests for specific pathogens, and histology. We also routinely catch fish with a seine net and anesthetize some to check for sea lice numbers and gill health status. During sea lice counts, we also have the opportunity to collect non-lethal samples including blood for CBC and biochemistry, gill swabs for PCR testing, as well as gill clips and skin scrapes for microscopic examination. As part of the Aquaculture Conditions of License, each farm has to conduct a minimum number of sea lice counts per month, depending on the time of year. Depending on company policy, and to improve our ability to monitor and manage sea lice, many producers exceed this minimum requirement, counting sea lice biweekly or even weekly year-round. If the

Routinely picking out eggs from a hatch tray.

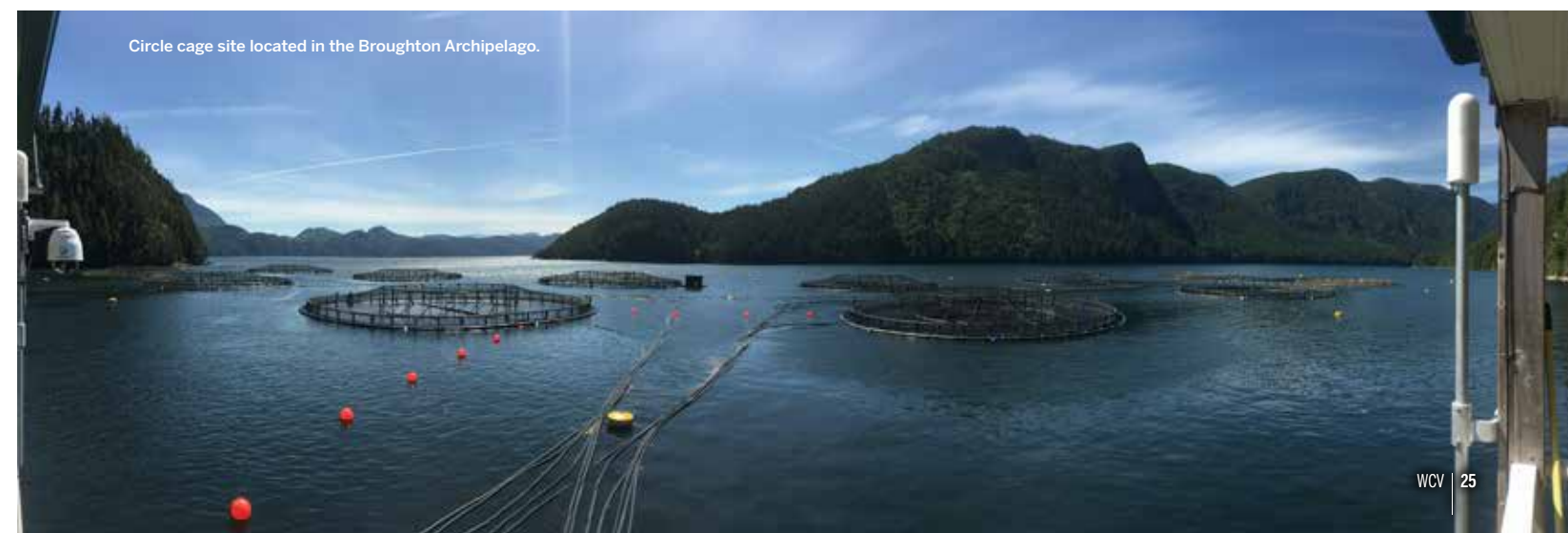


PHOTO COURTESY OF THE BC SALMON FARMERS ASSOCIATION

established threshold (farm average of three motile sea lice per fish) is exceeded during certain times of the year, we have to take actions to reduce this number.

Sea lice are certainly a hot topic, both in BC and around the world. In truth, sea lice rarely pose a significant health concern for our fish. The thresholds established are precautionary, and largely in place for the protection of out-migrating juvenile salmon to ensure sea lice do not impact their survivability. The out-migration period is from March 1 to June 30 of any given year, and if sea lice numbers reach the established threshold during this time, a plan must be communicated to the Department of Fisheries and Ocean, and action must be taken to decrease the sea lice load. If fish are large enough in size, the action may be to harvest them. If they are not, several treatment options are currently available to us which we use as part of our integrative pest-management (IPM) strategy. The longest used treatment in BC has been emamectin benzoate (SLICE®), an in-feed product with residual activity for six to eight weeks post-treatment. BC is one of the last places in the world where emamectin benzoate can be used as an effective treatment for motile sea lice, as resistance has developed in other areas from inappropriate use or the lack of effective IPM. In BC, a concerted effort has been made to limit the

Circle cage site located in the Broughton Archipelago.





Aerial view of a farm site in the Broughton Archipelago.

“IN CASES WHEN THERE IS A MORE SERIOUS FISH HEALTH CONCERN AT THE POPULATION LEVEL, FISH MAY BE TREATED IF DEEMED APPROPRIATE, OR MAY BE HARVESTED OUT OR CULLED DEPENDING ON THE LIFE STAGE AND EXTENT OF DISEASE.”

development of resistance to this product with the use of alternative treatments, the most common of which are hydrogen peroxide baths; others include freshwater baths, as well as new mechanical removal technology such as the Hydrolicer, which uses high pressure jets to remove sea lice. Bath treatments are generally performed with a wellboat (a vessel with a well for storage and transport of live fish), but can also be performed in a tarpaulin; fish are pumped onto the boat or into the tarpaulin, treated for a set period of time, then returned to their pen. Bioassays are routinely performed on sea lice pre- and post-treatment to assess the level of sensitivity to different treatments.

Wild salmon, which are often covered in sea lice upon their return from the open ocean, are a blessing in disguise for sea lice management. Although on-farm sea lice numbers tend to spike when wild salmon return, passing sea lice to our farmed salmon, this also introduces to the population naïve sea lice which have never undergone any treatment, therefore propagating their genetics and helping keep the sea lice on our farms sensitive to the treatments we use.

“FOR THE MOST PART, ANTIBIOTIC USE ON BC FISH FARMS IS MINIMAL.”

For the most part, antibiotic use on BC fish farms is minimal. The vast majority of treatments are for tenacibaculosis (also known as mouth rot, bacterial stomatitis, or yellow mouth), a disease affecting smolts under 400 grams in size and occurring in the first few months post-saltwater entry. There is an active effort to develop a vaccine against this bacterial disease, which

has already been successfully developed for some other species of fish in other parts of the world. Other diseases and fish health issues sometimes encountered include Progressive Gill Damage and Amoebic Gill Disease, as well as some bacterial diseases such as Winter Ulcers (caused by the bacteria *Moritella viscosa*), Bacterial Kidney Disease (BKD), Salmonid Rickettsial Septicemia, and Furunculosis. Most of these diseases occur sporadically in a few fish here and there. In cases when there is a more serious fish health concern at the population level, fish may be treated if deemed appropriate, or may be harvested out or culled depending on the life stage and extent of disease. Broodstock are screened for BKD, as well as a number of other pathogens including notifiable viral pathogens such as Infectious Hematopoietic Necrosis, Infectious Salmon Anemia (never identified in BC) and Viral Hemorrhagic Septicemia. The eggs of any broodstock which tests positive are discarded to limit any chance of vertical transmission of pathogens.

R&D is another important component of what aquaculture veterinarians do. Although R&D is an important part of all veterinary medicine, the overall lack of information and understanding regarding fish health when compared to other livestock species makes it all the more important in our line of work. We often collaborate with various researchers and academic institutions to improve our understanding of fish health and welfare, health management strategies and technologies including vaccine

development, and environmental impacts, as well as other relevant areas.

As in any area of veterinary medicine, being an aquaculture veterinarian comes with its

challenges. There are always new or changing fish health issues which we have to address and deal with. It's important for us to stay current and engage in new R&D to try to better understand these issues. The aquaculture and fish health community is quite tight-knit, and members from BC, Canada, and around the world often correspond and collaborate; often the problem you're facing has been encountered by someone elsewhere. The aquaculture industry does an excellent job of capturing

“ANOTHER CHALLENGE WE FACE IS COMMUNICATING THE SCIENCE AND FACTS OF OUR INDUSTRY.”

fish health and production data, which can be analysed to identify patterns or clues as to what the source of a given challenge may be. Another challenge we face is communicating the science and facts of our industry. There is a great deal of public interest in the aquaculture and fisheries sciences, particularly in the interactions between wild and farmed salmon. We have a responsibility to be transparent about our operations, and we take that very seriously.

The aquaculture industry is constantly advancing and evolving. Improved farming technology, such as remote feeding systems, underwater cameras, and mortality removal systems have helped us better manage the health, welfare, and productivity of our fish. The reality is that there is an increasing demand for healthy and nutritious sources of food. The BC salmon industry and the veterinarians who care for the fish we grow are a vital part of ensuring that people of BC and the world are able to eat healthy nutritious food to nourish our bodies. [WCV](#)



Sea lice at different stages of development.



Fish in an anesthetic bath prior to routine sea lice counts and gill scoring.



Aerial view of a square cage farm site in the Campbell River area.

CARING FOR AN ORPHANED CARIBOU CALF

BY KATHRYN WELSMAN, DVM

Feed the horses. Check. Drop off kids. Check. Get milk. Check. Examine caribou calf. Check. Wait a second ... examine a caribou calf? Yep. A few months ago, when I was volunteering at the BC Wildlife Park (BCWP) in Kamloops, we got a call from Dr. Helen Schwantje, the provincial wildlife veterinarian, asking if we could raise an orphaned caribou calf. My initial reaction was, “Heck yeah, how cool is that?” but that was then tempered by “What do I know about caribou?” and a whole host of other logistical issues. During the ensuing conversations, I was introduced to Dr. Caeley Thacker, the veterinarian responsible for the health of the animals at the caribou maternity pen where this calf was located.

To understand why there is a maternity pen for caribou and why it is staffed by a veterinarian, you have to understand a few things about the state of the caribou in the area around Revelstoke. Southern Mountain Caribou, a subpopulation of the Woodland Caribou, are listed as a threatened species under the Species at Risk Act, and populations continue to decline. This definition means the species will become endangered if nothing is done to reverse



The calf, a few days old.

the factors leading to their extinction. The Columbia South herd, located next to Revelstoke, is almost gone, and the Columbia North subpopulation, north of Revelstoke, has declined substantially since the 1990s from over 200 caribou to 147, as of the 2017 census, but has been stable from 2004 to 2017. Current threats to the caribou, according to the Revelstoke Caribou Rearing in the Wild Society (RCRW), are habitat loss, small population effects, predator-prey dynamics, and indirect disturbances. The caribou, other species, and their habitats in the area have been researched for years but, according to the RCRW team, one factor—pregnancy rate—is usually high, but the number of calves surviving to one year has declined. So, the RCRW Society, in

“THE NUMBER OF CALVES SURVIVING TO ONE YEAR HAS DECLINED.”

conjunction with many partners including the provincial government and First Nations, launched a five-year

“IF I THOUGHT HANDLING ONE CARIBOU CALF WAS EXCITING, DR. THACKER’S JOB WINS THE PRIZE FOR THE COOL FACTOR.”

pilot project in 2014 that involved maternity penning, with the goal of improving survival of both calves and mothers. In a huge undertaking with participants from many agencies and groups, pregnant cows are captured from the wild by netguns shot from helicopters in late spring. Each animal is examined and, if considered healthy, is blindfolded, hobbled, sedated, placed in a body bag, and moved inside a helicopter to the nine-hectare maternity pen. Each cow is again examined, weighed, sampled using a standard protocol, and given several prophylactic medications. The sedation is reversed, and the cow remains in the pen. The pen is completely predator proof, thus eliminating this pressure on calf survival. The cows are transitioned from a full lichen diet onto specific caribou pellets and, after a period of six or more weeks, calving occurs. Cow-calf pairs are released when calves are about a month old, at which time they are likely to be more successful at evading predators. After the initial capture, things get relatively quieter at the pen. Two shepherds working in shifts follow set protocols developed by the RCRW team to monitor the group. Dr. Thacker joins for the calving period to provide health oversight, including monitoring of the cows leading up to calving, and is there to intervene in an emergency. If I thought handling one caribou calf was exciting, Dr. Thacker’s job wins the prize for the cool factor.

This is a unique experience, so I wanted to know what a typical day looks like for Dr. Thacker. She says, “We are fortunate to be accommodated in a log cabin very close to the pen. Days typically start with a 5:30 AM wake-up.” She says that over coffee in the wee hours of the morning, she and the shepherds review video footage from a motion-sensor infrared camera that records activity constantly, as well as several cameras around the perimeter of the pen. They are looking for behaviour changes leading up to labour as well as monitoring for predators, the likes of which are wolverine, cougar, black bear, grizzlies, and wolves. It certainly makes my neighbourhood deer and skunk look pretty tame.

Once the team is fully caffeinated and updated on the pen events, they would head up to the pen where the shepherds feed the animals and the fencing is checked. Dr. Thacker continued. “We check that all the cows and calf radio collars are transmitting normally. Then we divide up and position ourselves in one of the six tree-stands or blinds around the pen. We visually confirm and record the activity of each individual cow and calf—this often takes several hours as some areas of the pen are densely forested and the cows with calves are often quite secretive.”



A sedated cow being moved by helicopter to the maternity pen.



A view from the tree stands at the maternity pen.



A helicopter waiting while its crew captures a pregnant cow in pristine snow.

PHOTOS COURTESY OF KATHRYN WELSMAN

She explained to me that calves are radio-collared when they are less than two days old. If there are calves to collar, Dr. Thacker is responsible for getting the equipment ready to enter the pen. She said, "We need to be extremely efficient and spend as little time as possible inside the pen and handling the calf. When we catch the calf, we determine its gender and weight, and we ear-tag it, collect a hair sample, and fit an expandable radio-collar. If we find that we are disturbing other animals, we abort the mission and wait for another opportunity. The reason we collar at this age is because when the calves are a few days old, the cow and calf pair tends to rejoin the rest of the herd, and we risk disturbing more animals. Also, the calves get too fast to catch!"

Their afternoons consist of maintenance tasks around the pen and recordkeeping, followed by another time in the tree-stands or blinds to try to observe the animals especially those that were collared that day. When I asked how often her veterinary skills have been used this year, Dr. Thacker explained that no C-sections were required, but that darting for chemical immobilization was used to assist with several dystocias, a dislocated hip needed to be reduced in a calf, and an ear wound on one of the mothers sustained in the wild required ongoing treatment. All in a day's work. Some of us like dealing with blocked cats, others enjoy a juicy abscess, some like looking down microscopes, and some of us, apparently, help calve out caribou. This seems like a far cry from her normal job—she practices mixed animal medicine in New Zealand. She has spent five to seven weeks at the pen over the past several years. She explained that wildlife is a passion, and she hopes to be able to continue to be involved in wildlife as the experience is amazing. In fact, she is making the move back to Canada this year, to pursue a Master's degree focusing on her wildlife research.

So, after learning about the normal routine at the maternity pen, I needed to know more about the orphaned calf that was soon to arrive at the BCWP. Dr. Thacker described the loss of the mother as "unfortunate from an individual point-of-view, but also for the population as reproductively active cows have the greatest potential to grow the population." Because of their vigorous monitoring, she says the cow had appeared normal the day prior to calving. She calved during the night, and they saw her with her calf in the morning. "The following morning we prepared to collar the calf. We entered the pen and used the radio receiver to locate the cow.

"WE FOLLOWED THE CALF AND FOUND THE DEAD COW. AFTER A MOMENT OF PANIC, WE QUICKLY CAME UP WITH A PLAN—WE HAD PREPARED FOR THIS SITUATION."

We saw an un-collared calf approaching another cow-calf pair, but the cow chased it away. We determined the un-collared calf to be the one we were after, but we did not see its mother which is very unusual with such a young calf. We followed the calf and found the dead cow. After a moment of panic, we quickly came up with a plan—we had prepared for this situation."

They knew the mother had probably been dead for less than four hours because their radio collars will signal if the animal hasn't moved in four hours. Dr. Thacker assessed the calf, found it to be dehydrated and weak with a swollen umbilicus, and treated it accordingly once it was recovered from the pen. Dr. Thacker consulted with the RCRW team who advised them to keep the human interaction to a minimum with the initial thought of being able to release him back to the wild, given how important each of these animals is to the overall population of the herd. However, when he was four days old, the calf rapidly declined, refused to drink, and



The calf at the Calgary Zoo.

was pyrexia. He was treated again, and he improved. He improved to the point where transport and relocation to a different facility was warranted to be able to provide ongoing care.

At this point, the BCWP became involved. When we were asked to take on the calf, we had to figure out a lot of logistics, but we had help from the crew at the RCRW, and the veterinary staff at the Calgary Zoo provided valuable knowledge. When the calf was a week old, an AHT and zookeeper from the BCWP drove to Revelstoke to pick him up and provided round-the-clock care while he settled in. It was then that I got my hands on the little guy, and it felt like an honour to be involved in his care, even for a short period of time. However, the BCWP couldn't be his final destination as the climate in Kamloops isn't conducive for caribou and there is no herd at the park, and the team at the RCRW continued to work on a long-term solution for this calf. Because he had become very habituated to humans during his treatments, his release to the wild was not to be, so he found a home at the Calgary Zoo, where he has joined a herd of adult caribou and is doing extremely well.

Even though this one calf has an interesting story, the bigger story really is how a group of mainly volunteers at RCRW have come together to try to make a difference. The executive director, Bill Beard, said it very well, "I am always impressed how so many people with diverse interests can set aside differences and come together on this project. It makes me very hopeful that our community can come together and work together to solve other environmental challenges." From a veterinary point of view, the work that Dr. Thacker has taken on the last few years is impressive. I personally felt the pressure of keeping that one calf alive, so I can only imagine what she must feel, being immersed with these animals for weeks on end. Certainly, it must be humbling, maybe stressful at times, and probably very rewarding. As she said, "The orphaned calf was a challenge for everyone involved, but the team was amazing and successful on many levels." ^{WCV}

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WHAT IS COOPERATIVE VETERINARY CARE?

BY LAUREN FRASER, CHBC

PHOTO BY DAVID TAYLOR

While it may seem counterintuitive, teaching a horse they have choice and control during aversive veterinary procedures can yield positive results.

Trailblazers such as Dr. Marty Becker and the late Dr. Sophia Yin introduced the veterinary community to low-stress handling practices in hospital. Such approaches reduce fear and stress felt by patients, enabling veterinary staff to safely perform procedures. Building on Dr. Yin and Dr. Becker's great work, protocols for cooperative veterinary care—wherein animals willingly participate in their own treatment—are becoming more commonplace in small animal veterinary clinics, thanks to a growing number of proponents.

Benefits of this patient-centered treatment approach include increased staff safety, reduced stress for animals and people, increased accuracy of diagnostic test results, and decreased iatrogenic behavioral injury. Such benefits can also be enjoyed by the equine veterinary community.

“THE CONDITIONED EMOTIONAL RESPONSES OF HORSES THAT HAVE LEARNED TO FEAR HANDLING AND TREATMENT CAN BE CHANGED.”

CHOICE AND CONTROL FOR COOPERATION

While it may seem counter-intuitive, giving an animal choice and control during what may be an aversive procedure can result in increased, even willing, compliance. Hard evidence of this can be seen in readily available YouTube videos of zoo veterinarians safely drawing blood from lions, doing dental exams on open-mouthed and unrestrained hyenas, or performing cardiac ultrasounds on gorillas.

The training approaches used to teach potentially dangerous apex predators and powerful great apes can also be used to teach horses to participate in their care. For naïve horses, who have not yet experienced fear conditioning about specific stimuli, shaping,

desensitization, and positive reinforcement can be utilized to quickly teach a range of cooperative care procedures. Shaping is the process of teaching a new behaviour, such as touching a target with the nose while a jugular venipuncture occurs, by progressively reinforcing small steps towards the end goal. Systematic desensitization is exposure to a stimulus in a gradual manner that does not trigger fear. Positive reinforcement is the addition of a stimulus, usually morsels of highly palatable food, to increase the likelihood a behaviour is repeated.

While engaging a horse in cooperative veterinary care is decidedly easier with the naïve horse than it is with a horse who has previously learned to fear handling and treatment, the conditioned emotional responses of horses that have learned to fear handling and treatment can be changed. For these horses, systematic desensitization and counter-conditioning should be utilized to change the horse's response

to the stimulus, before teaching the horse how to behave instead when faced with the aversive procedure. Counter-conditioning is changing an animal's involuntary emotional or physiological response to a stimulus, replacing it with a new response to the same stimulus. For example, counter-conditioning can be used to change the response of a horse from fear at the appearance of the farrier to pleasure. Once the emotional response has been changed, the horse can then be taught to perform a new behaviour more compatible with being shod, such as lifting and holding a hoof when cued, using shaping and positive reinforcement.

“AS SOON AS THE HORSE SHOWS SIGNS OF ATTENTION WITH TENSION, THE FOCUS SHOULD SWITCH BACK TO REDUCING AROUSAL, UTILIZING LOW-STRESS HANDLING PRACTICES.”

APPLICATIONS

While true medical emergencies temporarily require that the horse-veterinary staff relationship becomes one more of procedure-centered treatment, patient-centered treatment approaches can easily be incorporated into daily practice. Horses can be readily taught to cooperate and participate in their own treatment, such as ocular exams/treatment, stationing on the wooden blocks for hoof radiographs, or standing calmly for jugular venipuncture.

In addition to facilitating daily treatment, such training provides valuable cognitive enrichment for in-hospital horses who may be struggling with confinement. It also facilitates easier follow-up care for clients, once the patient has been transferred back home.

All training should occur when the horse is showing signs of attention without tension: the horse shows relaxed body language, is engaged with handlers and the environment, and is not showing signs of escape or avoidance behaviours. As soon as the horse shows signs of attention with tension, the focus should switch back to reducing arousal, utilizing low-stress handling practices.

INSTILLING EYE MEDS

Teaching a naïve horse to willingly accept eye medications doesn't take long, and can help ensure that the owner is successful in continuing any additional treatment at home. For the horse who has already inadvertently been taught that receiving eye medications is an unpleasant experience, the process is slightly different, and the use of counter-conditioning to change conditioned emotional responses should occur prior to retraining.

WHAT YOU NEED

- a horse that is, at minimum, halter-broke, has been desensitized to facial touches, and that will maintain a relaxed head and neck posture/height when the head is touched

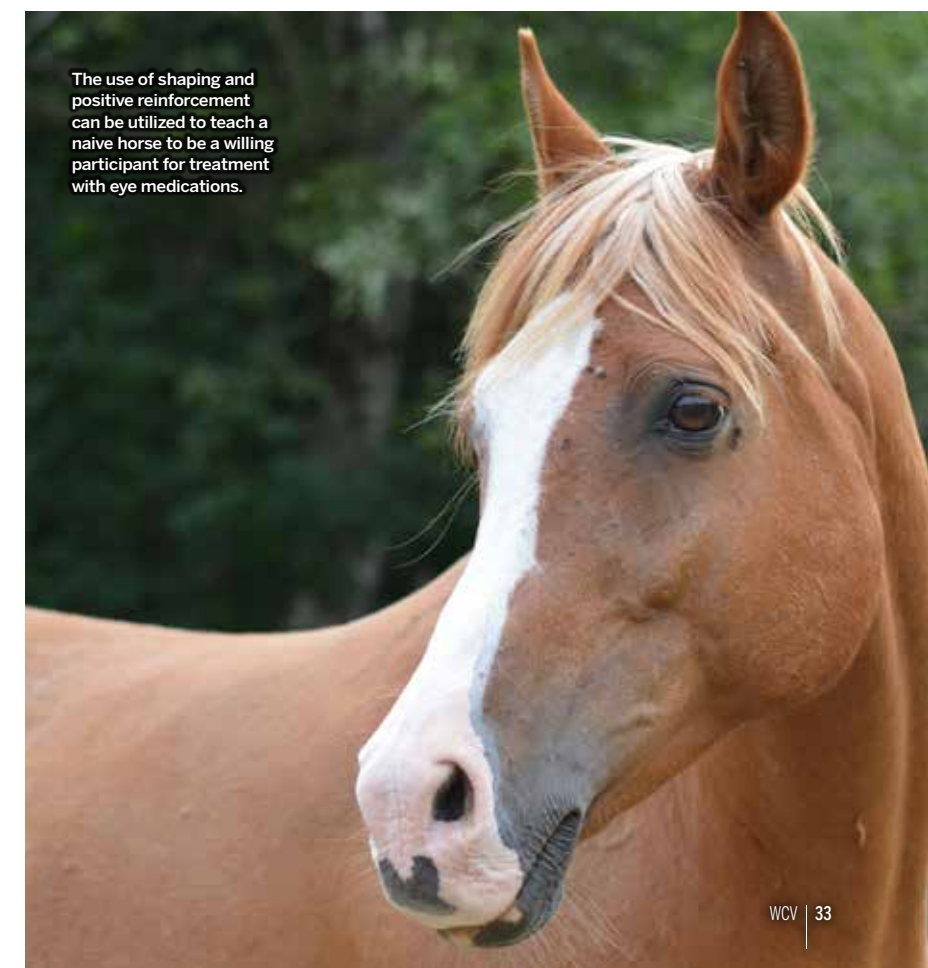
- small (~1-cm) pieces of high value treats, e.g., carrots, apple, mints, 'Stud Muffin' type cookies
- an experienced handler, practicing minimal restraint (e.g., maintaining a 'smile' in the leadrope) when the horse is standing calmly, utilizing negative reinforcement, 'pressure and release', to reposition the horse as needed)

The purpose is to instill eye ointment/drops into eye. The end goal is that each step of the process predicts treats for the horse. The horse stands calmly when the affected eye is held open with one hand by the person medicating the horse, while the other hand applies the eye medication.

STEPS

1. Remove lid from medication tube/bottle
2. Put 'karate chop' side of non-dominant hand on horse's face, about 6 cm from tear duct
3. Put index finger on upper lid above lashes
4. With light pressure, push upper eyelid up under bony orbit of eye
5. Place thumb of same hand just below lower lid's lashes, and roll lid down, exposing conjunctival shelf
6. Using dominant hand, bring medication tube up to eye
7. Dispense prescribed volume of medication onto conjunctival shelf

Begin at the first step. Upon successful completion of a step, immediately say "Yes" and offer the horse a treat. Repeat each step two to five times, or until the horse readily accepts the step without any signs of evasion (elevating the head, avoiding touch, etc.) before proceeding to the next step. If the horse displays signs of evasion, go back a step or two, and work there before moving forward again or make the step smaller. For example, step 2: bring 'karate chop' side of hand to within 15 cm of horse's face; step 3: bring 'karate chop' side of hand to within 6 cm of horse's face.



The use of shaping and positive reinforcement can be utilized to teach a naïve horse to be a willing participant for treatment with eye medications.

PHOTOS COURTESY OF LAUREN FRASER



Jugular venipuncture or IM injections need not be an unpleasant experience for horses.

TEACHING VOLUNTARY JUGULAR VENIPUNCTURE

As with instilling eye medications, teaching a naïve horse to willingly accept jugular venipuncture takes a fraction of the time required to change the conditioned emotional response of the horse who has experienced particularly aversive venipuncture.

WHAT YOU NEED

- a horse that is, at minimum, halter-broke, that has been desensitized to neck touches, that will stand calmly when handled
- small (~1-cm) pieces of high value treats
- an experienced handler, practicing minimal restraint as above

The purpose is jugular venipuncture. The end goal is that each step of the process predicts treats for the horse. The horse stand calmly when the jugular is occluded, the vein is punctured, and blood is withdrawn or medication is injected.

STEPS

1. Prepare capped needle and syringe for venipuncture, place in dominant hand
2. Stand facing horse's neck
3. Stroke neck with non-dominant hand
4. Occlude jugular with non-dominant hand
5. Bring dominant hand with capped needle towards jugular
6. Lightly pinch jugular
7. Remove hands, uncap needle; repeat steps 1 to 5
8. Puncture jugular and proceed with blood draw or medication administration

Begin at the first step. Upon successful completion of a step, immediately say “Yes” and offer the horse a treat. Repeat each step two to five times, or until the horse readily accepts the step without any signs of evasion (elevating the head, avoiding touch, etc.) before proceeding to the next step. If the horse displays signs of evasion, go back a step or two, and work there before moving forward again or make the step smaller. For example, step 4: lightly touch the jugular with thumb; step 5: occlude jugular for one second; step 6: occlude jugular for three seconds.

Practicing low-stress handling and implementing cooperative veterinary care in-clinic benefits both veterinary staff and equine patients. Reduced risk of injury; more accurate diagnostics; increased patient compliance; faster, more efficient treatment times; and satisfied horse owners are just some of the many benefits that result when practitioners utilize cooperative veterinary care, and a patient-centered treatment approach to horses. [WCV](#)

WHAT IS THE ROLE OF THE VETERINARY COMMUNITY IN PRODUCING AN AHT OR RVT?

BY HEATHER FRASER, DVM

“EXAMPLES OF CAREER PATHS MAY INCLUDE TRADITIONAL PRACTICE IN SMALL, MIXED, AND LARGE ANIMAL PRACTICES. LESS COMMON CAREER OPTIONS INCLUDE LABORATORY ANIMAL, WILDLIFE, OR INDUSTRY POSITIONS.”

During my years in general practice, I recall myriad individuals passing through the clinics as either volunteers or practicum students. Looking back, I realize I often didn't know just why each person was there—I admittedly didn't engage much with some as I went about my daily business. In retrospect, I really did not understand the vital role the clinic had in the educational process and the difference I could have made for the ones who were standing back not saying much. I realize now that those who were pre-tech students weren't there just to make their application stronger, they were required to spend time in clinic. I had never been to “Tech School,” until now, as a faculty member of Thompson Rivers University (TRU).

For over a decade prior to working at TRU, I worked as an associate in a multi-doctor small animal practice. Prior to that, I worked in mixed animal practice and even did some stints as a locum. It goes without saying that I have worked with some amazing technicians, but how did they become so amazing?

Veterinary Technologists are an integral part of the success of most veterinary practices: they do more dirty work than many of us; they share our triumphs and disappointments; they care about our patients, our clients, and our clinics. They are highly skilled members of our team, but have you ever questioned just what it takes to earn an Animal Health Technology or Veterinary Technologist diploma in BC? When do they become a Registered Veterinary Technologist (RVT)? What is the role of the veterinary community in producing the Animal Health Technologist (AHT) or RVT?

Before a student can apply to either of the programs in BC (Thompson Rivers University Animal Health Technology and Douglas College Veterinary Technology), they have to spend observation hours in a veterinary practice. Currently, both two-year programs require a minimum of 80 hours. Those students standing back watching may in fact be doing more than kicking the tires. I realize it's partially our duty as veterinarians to get them engaged in what's happening. Generally, as volunteers, they are not permitted to perform hands-on tasks, but we can, however, get them thinking and asking questions to make their experience much more worthwhile. We want RVTs who choose and stick with the profession because they not only care about animals, they also see a rewarding career option before them. This observation time is not only for them, it is the time for us as a veterinary community to steer them in the appropriate direction. This steering can't be done unless we take a few extra minutes to strike up a conversation, find out why that student is spending time in the facility, explain to them what we are doing when we look down the ear of a dog with otitis or why we take blood from a patient with yellow sclera.

Once the student is accepted into the diploma program, the next point of required clinic time falls upon these students in the form of practicums. It



CLOCKWISE FROM TOP LEFT: Second-year cattle handling lab; first-year off-campus visit; second-year equine bandaging lab; second-year small ruminant handling lab.

is mandated by the CVMA that to qualify for graduation each student needs a minimum of 240 hours in veterinary practice as a practicum student. This practicum is to be completed while working with one or multiple RVTs. If we do the math, that's 6 weeks or nearly 13,000 hours annually for students in BC alone. This time is typically split into blocks and spread over both years of study. The only way those numbers can be achieved is by the active participation of veterinary clinics throughout the province in offering quality practicum experiences.

Only after completing all of their education—which is a tough two years—can these diploma earners go on to write (and hopefully pass) the Veterinary Technician National Exam. If they pass, they can apply to their provincial associations to become a RVT.

For RVTs, there are ever-expanding job opportunities available. Examples of career paths may include traditional practice in small, mixed, and large animal practices. Less common career options include laboratory animal, wildlife, or industry positions. Hopefully, some of those students observing from the back might remember the great volunteer or practicum experience they had, maybe share that with a colleague, and put your clinic at the top of the long list of clinics looking to grow their RVT team. It takes a village to raise an RVT too.

If you are currently involved in hosting students, the profession thanks you. If you are not, please consider the benefits that having observation students or practicum students may provide to you or to the profession. If you want to become part of this educational community, please contact Thompson Rivers University Animal Health Technology at www.tru.ca/science/programs/aht.html or Douglas College Veterinary Technology www.douglascollege.ca/programs-courses/faculties/science-technology/veterinary-technology. [WCV](#)

ANIMAL WELFARE COMMITTEE EXOTIC PET TRADE CONFERENCE

BY NICOLETTE JOOSTING, BSc, BVSc, DVM

The World Animal Protection (www.worldanimalprotection.ca), in partnership with Zoocheck (www.zoocheck.com), presented three seminars in Canada, intended to introduce veterinarians, public health staff, policy makers, humane society staff, regulation and bylaw enforcement officers, wildlife conservation, and other animal trade workers to the issues involved in the exotic pet trade. On behalf of the AWC, I attended the Vancouver seminar in early October.

The exotic pet trade is a booming industry valued at hundreds of billions of US dollars worldwide. The numbers are staggering (table 1), with massive implications for human health and safety, animal suffering and welfare, environmental destruction, animal population depletion and extinction, agricultural losses with invasive species and disease transmission, enforcement costs, and illegal trade masquerading as legal trade (table 2).

In Canada, 57% of households (7.5 million)¹ have pets, with about 10% of households (1.3 million) admitting to owning an exotic pet (table 3). Many of these owners say they watched a YouTube video or got advice from family and friends,

acquiring the pet with no knowledge of how to look after it and with the belief that these animals are easy to care for. Pet stores and traders selling these animals are rarely advising veterinary care, preferring to dispense folklore husbandry² and perpetuating suffering by selling products related to the care of these animals that do not meet even the most basic of welfare standards. The Canadian Association of Zoos and Aquariums (www.caza.ca) among others, states that exotic pets are not easy to care for, requiring species-specific knowledge, as well as special environmental conditions and equipment, all of which can be very expensive, and that most people will not be able to meet the needs of wildlife kept as pets. Given the nature of the trade, with up to 90% loss of life before the animals reach the pet store, and with many of the animals harbouring serious illness and the effects of severe psychological and physical harm, it is not surprising then that the majority of them do not survive their first year in the new home.

Exotic animals kept as pets expose the household to injuries and diseases from a number of pathogens transmitted in all the ways possible. Bites and scratches are the inevitable consequence of wild animal defensive behaviour. Many infections may not be diagnosed, since their symptoms superficially resemble everyday illness and may be self-limiting. The BC Centre for Disease Control recommends that young children or anyone with a compromised immune system should not handle reptile pets, due to the serious nature of Salmonella infections.³ The contribution of the trade to antimicrobial resistance, largely involving the excessive use by the ornamental fish trade, is of concern, as well as the global spread of antibiotic-resistant E. coli with the global trade in reptiles.⁴ The international trade provides a diverse reservoir and a lethal, often untraceable, mixing pot for potential pathogens. A single reptile wholesaler may import

“A SINGLE REPTILE WHOLESALER MAY IMPORT FROM OVER 20 COUNTRIES, WAREHOUSING THE ANIMALS WITHOUT CONCERN FOR DISEASE PREVENTION OR BASIC WELFARE, AND EXPORT TO 20 DIFFERENT COUNTRIES.”

from over 20 countries, warehousing the animals without concern for disease prevention or basic welfare, and export to 20 different countries.⁵

The only pragmatic way to avoid contamination and infection is not to get an exotic pet, but for the millions of people that are already exposed, a pamphlet^{6,7} given out to participants states that “Hygiene measures, such as hand-washing, where performed thoroughly and with correct chemicals, can significantly reduce the amount of germs on your hands but does not guarantee protection against becoming sick or remove the possibility of passing germs directly or indirectly to others.”

For exotic animal welfare and husbandry, there are a number of assessment tools⁸ that range from handy to impractical. “Enrichment is an active process. Just providing a rubber ball once is not enough.” Michele Hamers, MSc Animal Biology and Welfare, pointed out in her discussion on her experience and methodology in inspecting zoos and other exotic animal facilities. Despite our overall lack of knowledge in the specifics of the needs of each of the species, we can make certain generalizations that are grounded in scientific evidence. “The importance of such objective, independent, scientific peer-reviewed and published tools is that

PHOTO COURTESY OF WORLD ANIMAL PROTECTION

ADAPTED FROM ROB LAIDLAW, ZOOCHECK

TABLE 1

CLASS	NUMBER OF SPECIES (not individual animals)	VALUE (estimated) GLOBAL	VALUE (estimated) USA (not necessarily the biggest market)
MAMMALS	5,600	\$20-250 BILLION USD	\$15 BILLION USD (2004)
BIRDS	10,500		
REPTILES	10,800		
AMPHIBIANS	6,200		
FISH	31,500		
OTHER	UNKNOWN		
MILLIONS OF ANIMALS AFFECTED			
THOUSANDS OF SPECIES INVOLVED			

TABLE 2

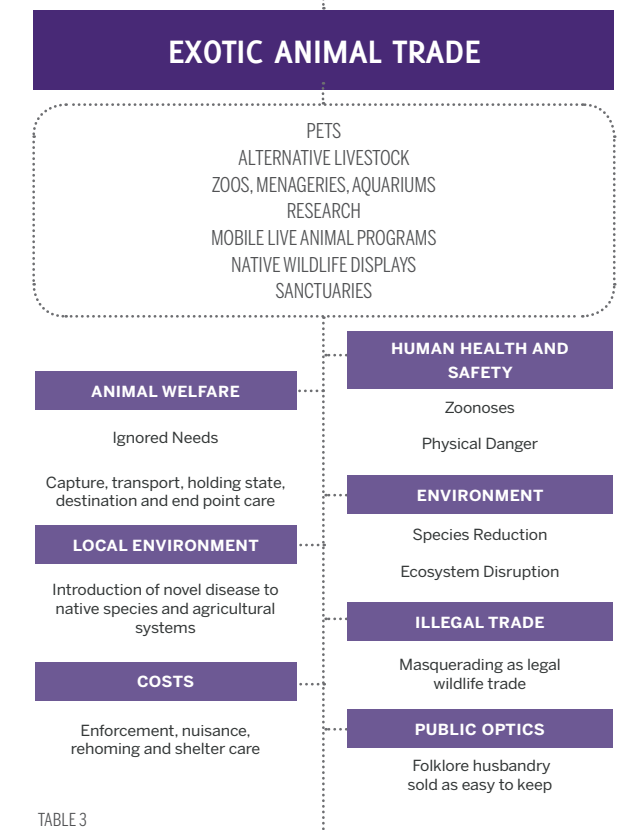


TABLE 3

CANADA 10% HOUSEHOLDS (1.3 MILLION HOUSEHOLDS)

CLASS	%	NUMBER OF HOMES
MAMMALS	17%	221,000
BIRDS	27%	351,000
REPTILES	13%	170,000
AMPHIBIANS	?	
FISH	43%	560,000

MULTIPLE ANIMALS IN A HOME COMMON

¹ [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sis14914](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sis14914).

² Clifford Warwick's term.

³ <http://www.bccdc.ca/health-info/diseases-conditions/salmonella-infection>.

⁴ Imported reptiles as a risk factor for the global distribution of Escherichia coli harbouring the colistin resistance gene mcr-1. Unger, F., Eisenberg, T., Prenger-Berninghoff, E., Leidner, U., Ludwig, M.L., Rothe, M., Semmler, T., and Ewers, C. Int. J. Antimicrob. Agents. (2017); 49: 122-123.

⁵ Morbidity and mortality of invertebrates, amphibians, reptiles and mammals at a major exotic companion animal wholesaler. Ashley, S., Brown, S., Ledford, J., Martin, J., Nash, A.E., Terry, A., Tristan, T., and Warwick, C. J. Appl. Anim. Welf. Sci. (2014); 17: 1-14.

⁶ Exotic Pets – reducing the risk of contamination; Emergent Disease foundation; mail@emergentdisease.org.

⁷ A review of captive exotic animal-linked zoonoses. Warwick, C., Arena, P.C., Steedman, C., and Jessop, M. J. Environ. Health Res. (2012); 12: 9-24 (Available at: <http://www.cieh.org/jehr/default.aspx?id=41594>).

⁸ Exotic pet suitability: Understanding some problems and using a labeling system to aid animal welfare, environment, and consumer protection, Clifford Warwick, Catrina Steedman, Mike Jessop, Phillip Arena, Anthony Pilny, Emma Nicholas (2018). J Vet Behaviour, 26, p17-26 OPEN ACCESS.

it can be used to promote informed decision-making and allows authorities to set their own challenge standard,” says Clifford Warwick, a prolific producer of peer-reviewed publications in animal science and human medicine. In discussing the recently published Guidelines for Inspection of Companion and Commercial Animal Establishments,⁹ he highlighted the minimum space calculation. Roll the animal in a ball, measure its diameter, and multiply that by ten, to give the minimum length and height of the enclosure. Applied to an adult domestic cat, this would be roughly 300 centimetres. An 8-metre long room would be sufficient to house an agile 6-foot tall human. To prevent a 1-cm fish being kept in a 10-cm diameter cup, the guidelines imposed a minimum space requirement for all animals at 100 centimetres. The minimum space allows an animal to do one very necessary thing—stretch out to its full length. Additionally, the minimum space requirements would require that all animals in the enclosure must be able to access any of the facilities (e.g., food, water, ponds, perches, hides, heat) at any one time, noting also that some species require additional exercise areas. The guidelines are packed with practical “safety net” environmental parameters, as well as behaviour and physical welfare signs for each of the animal classes, making it useful for owners, veterinarians, and animal welfare enforcement officers.

The free, easy-to-use EMODE tool,^{10,11} can be used to determine if an animal can be considered a suitable pet. It was suggested that EMODE could be used as a labelling system in pet stores, and for consumers to assess and realise that there is nothing easy about keeping a small mammal, reptile, amphibian, or bird as a pet.

Dr. Anthony Pliny, DVM, DABVP, called birds unusual victims, explaining that while we can easily recognise what constitutes abuse and substandard care in our domestic animals, little is available to prosecutors and humane enforcement officials on non-traditional pets. Lack of specific knowledge makes it difficult to recognise suffering in these animals. Birds are not domesticated, he says, noting that the physical and behavioural needs of wild birds remain for birds bred in captivity. They lack the coping mechanisms that may evolve from thousands of years of acclimatization and domestication. The same is true for reptiles, amphibians, and non-domesticated mammals. From the presentations reviewing the known needs and care requirements of birds and reptiles, the industry standard falls so far short that it can only be described as routinely cruel, failing in every aspect to meet even the basic needs of these animals.

Given the numbers of species involved, the general consensus was that it is unrealistic to expect

enforcement officers, veterinarians, and humane societies to have the expertise to deal with each species. Consideration needs to be given to not only the rules and regulations, but also the costs of enforcement, humane society care, and rehoming. Enforcement was compared to a game of whack-a-mole—as soon as one species is placed on the prohibited list, the laws and regulations are exploited to trade in another species.

“The one legal solution is to simply ban the keeping and the selling of exotic animals,” said Rebeka Breder, an animal rights lawyer in BC. She went on to describe the current federal and provincial laws relating to animals, exotic pet trade, and animal cruelty enforcement. “The fines seem significant, but they are seen as a cost of doing business in this multibillion dollar industry,” Breder pointed out, going on to explain that recent cases in BC show that despite shortcomings in the current laws, it is possible to obtain convictions for animal cruelty based on evidence of emotional and psychological harm, rather than relying on evidence of physical harm.

According to Michele Hamers, negative or prohibitive lists have a number of shortcomings. Such lists tend to focus on mammals, do not consider the needs of the animals, result in astronomical numbers of animals people are allowed to keep, fail to address habitat threats, trail behind the pet industry trends, are confusing, require expert knowledge of taxonomy, contain classification errors, place the burden on municipalities, and rely on proof that the animal has a negative impact on humans.

For this reason, Belgium, the Netherlands, and other countries have introduced or are considering positive lists. These are lists of animals that one is allowed to keep. The list is thus short, and if the animal is not on the list, it is illegal. They rely on an evidence-based approach (science, not industry standards), established criteria for suitability as a pet, and they apply the precautionary principle. The general criteria used include science-based techniques to determine if the animal makes a suitable pet, has the potential to cause harm; risks of zoonoses, requirements that the animals come from a self-sustaining captive population, and the ability to rehome unwanted pets. The effect is to protect consumers, the community, the animals, and the environment, making enforcement easier and cheaper and placing the burden of proof on the pet industry rather than the municipality.

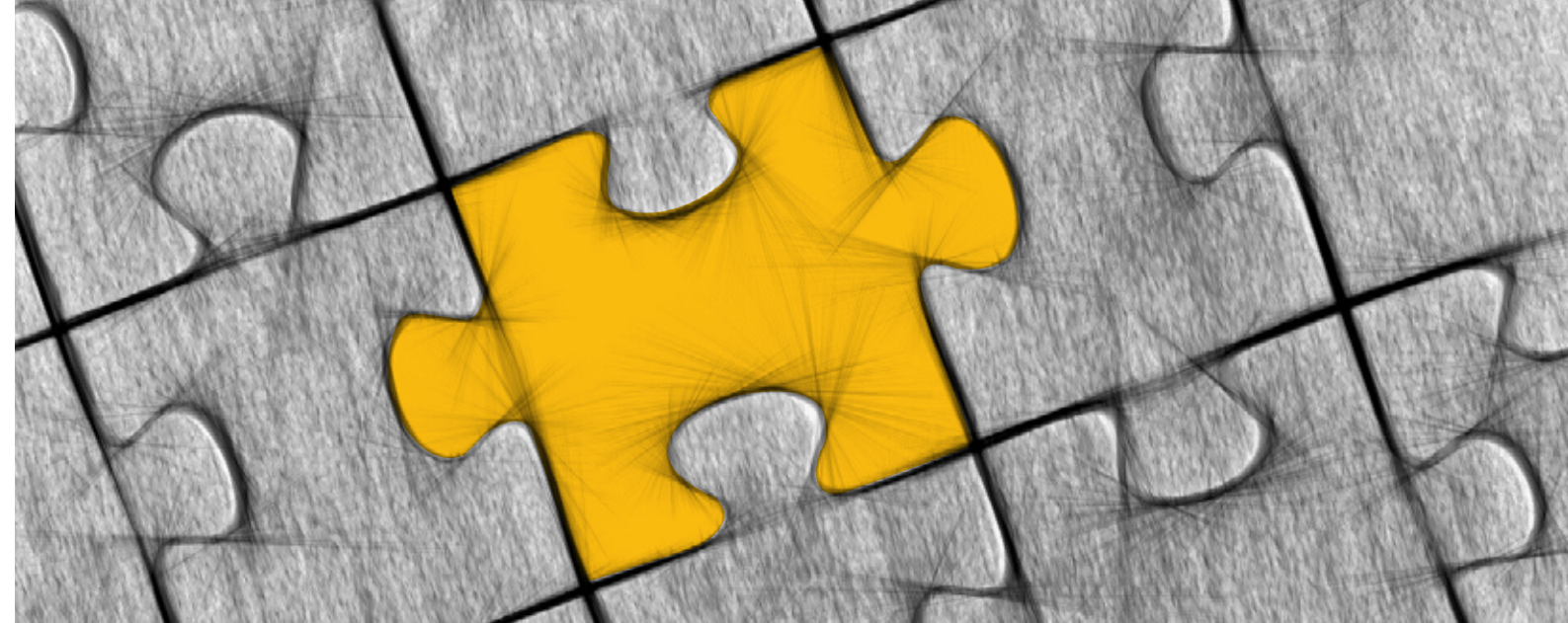
Whether you think that the solution requires a total ban on any animal except for domesticated species, or places importance on enforcing welfare and husbandry standards, or that positive lists are the way to go, it is necessary to realize that this is a global problem, requiring effort from the municipal to the national level, including international trade agreements.

Veterinarians are exposed to this pet trade as professionals and as consumers. Our training is in the well-known domesticated species. When dealing with traded wildlife—as none of the exotic species can be considered domesticated in any way, even if captive-bred—we need resources that enable us to care for and help these patients and their owners, to be able to assess and report abuse and cruelty, and to get involved so that we can somehow reduce or prevent the many problems involved with this trade. Online resources may contain misleading or incorrect folklore. Veterinarians should rely on scientific publications, of which there are many. Colleagues and animal scientists with special interest are invaluable sources of distilled scientific information and can be of immense help in particular cases. **WCV**

⁹ <https://www.frontiersin.org/articles/10.3389/fvets.2018.00151/full>.

¹⁰ For more information and to get the pamphlet, contact mail@emergentdisease.org.

¹¹ Assigning Degrees of Ease or Difficulty for Pet Animal Maintenance: The EMODE System Concept, Warwick, C. et al. *J Agric Environ Ethics*, (2013) DOI 10.1007/s10806-013-9455-x. et al. *J Agric Environ Ethics*, (2013) DOI 10.1007/s10806-013-9455-x.



MY VIEW OF THE EMERGING LEADERS PROGRAM

EVY VAN NOBELEN, DVM

Before attending the Emerging Leaders Program (ELP) at the CVMA convention in Vancouver this summer, I felt disillusioned about veterinary medicine.

Emotional blackmail by clients and team members, lack of mentorship from the start, case competitions, and toxic work environments that I personally had experienced had finally affected my well-being. At the same time, I lost my admiration for my veterinarian role model who no longer inspired me. I decided to observe veterinarians and their teams during small local workshops and in their clinics through shadowing. Sadly enough, I concluded through my own observations that there is a lot of competition and fear

out there, both between clinics, and within clinics between various positions. A few veterinarians I met were candid about their reluctance in providing mentorship or sharing their skills and knowledge. They seemed, to me, to fear that they would lose their niche and income. All of these personal observations made me cynical and disappointed in the part of the veterinary community that I have met thus far. Thankfully, ELP and Dr. Rick DeBowes, came in the nick of time.

Dr. DeBowes is a very motivating speaker. He gave us tasks and pieces of puzzles, which required teamwork in order to solve them. They were great lessons in communication and human behaviour and showed me what a healthy team is and how it performs. The keys are respect, good communication between each team member, and a good leader. During the sessions,

we also discussed what leadership is about and which characteristics of an effective leader are crucial for the team’s performance. Dr. DeBowes pointed out that good leaders are made and not born. Having the prerogative to lead does not mean one is automatically a good leader. Being a leader does not mean that one only gives directions to others, but that one also needs to be able to inspire people to think outside the box and give the team accountability. A good leader appreciates and acknowledges the contribution of each team member. Leadership is a skill that can be learned through training and needs to be practiced.

As veterinarians, we are all leaders. We lead our team, and it is important to also lead ourselves through practicing self-awareness and self-management. With regard to self-leadership, Dr. DeBowes taught us that having core values and sticking to them in the workplace will help us to create boundaries and find fulfillment. My core values define me and my chosen environment. Dr.

DeBowes also encouraged us to keep an open mind, look for possibilities, and take risks in order to grow. He explained that our mindset impacts our thinking and action. As most people fear change, our own beliefs can limit possibilities. I took his advice to heart and took the risk. Now, I have

found fulfillment in a healthier work environment.

The Emerging Leaders Program has given me an amazing experience and knowledge on leadership. It has renewed my enthusiasm, motivation, and aspirations as a veterinarian. In my opinion, veterinarians of all levels and practice managers should participate in leadership training to help them build a productive, healthy, and sustainable workplace. **WCV**

From the CVMA-SBCV Chapter: Each year, the Chapter joins efforts with the CVMA to co-sponsor two ELP students from BC. These two less-than-10-year grads attend the ELP program, and the Chapter and the CVMA share their travel and lodging expenses, in return for this write-up. Applications are sought between December and March each year. Please contact the Chapter if you are interested in applying.

“ALL OF THESE PERSONAL OBSERVATIONS MADE ME CYNICAL AND DISAPPOINTED IN THE PART OF THE VETERINARY COMMUNITY THAT I HAVE MET THUS FAR. THANKFULLY, ELP AND DR. RICK DEBOWES, CAME IN THE NICK OF TIME.”

PERCEIVED FAILURE AND THE JOYFUL DISCOMFORT OF GROWTH

CAROLINE BROOKFIELD, DVM

My relationship with failure started out like a nefarious affair—I could not seem to help myself. I kept it hidden away, but then I felt shame and denial when I was caught in public.

After getting my veterinary degree and working for a while, I decided, confidently, to become an entrepreneur. My plan was to build a business that afforded me a smaller salary than I was used to, but which would allow me to spend time at home with my young kids. My life mantra was “If someone else can do it, so can I.” I jumped in optimistically and enthusiastically, with dogged determination. Most businesses fail? Nah, not me.

I closed that business nine years after I started it. I had tried to let it go, numerous times, but my ego persisted in egging me on, just to try one more thing. I did not want to admit that the business was unsustainable, despite making very little profit in any year. I did not want to admit failure, let alone what was, by all accounts, a spectacular failure.

When I closed my business, I felt deflated and embarrassed. I also felt extremely relieved.

Looking back to when I closed the business, I see that my failure was also my blessing. The platitudes of “fail forward” and “there is no failure, only feed-back” make so much more sense to me now. Through failure, I learned what makes me unique, what I need to outsource, and how to get up and move on. I learned that failure is not so bad, and when I openly talked about my secret affair with failure, others opened up and shared their own stories.

Failure is blissfully liberating. Accepting failure feels like embracing the fullness of life, being human, in all of its imperfections. And, like anything,

the more you practice, the better you get. I was greatly impacted by an interview with Sara Blakely (founder of Spanx) who said that her father used to ask her daily, “How did you fail today?” He believed that if you’re not failing, you’re not trying.

In veterinary medicine, failure often means there is a consequence to a patient. Medical errors are the worst kinds of failures, because they often impact the health and welfare of another being. As a veterinarian, I am terrified of medical errors, but I have made them. I know you have too. For all our preparation and thoroughness, we are human, and we make mistakes. If we cannot eliminate failure, then we can prepare ourselves to handle it better, through practice. Embracing failure, even seeking it out, can lead to better resiliency. I don’t need to remind you of the crisis we are facing in veterinary medicine. We talk about work-life balance, salary, client stress, and student loans. While these factors are important, forgetting how to fail is a core dysfunction.

I have moved on to other pursuits, but at dinner each evening, I now ask my kids, “How did you fail today?” instead of “What did you do today?” I believe that if I can teach my kids how to fail, then I have not failed at all. **WCV**



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INDUSTRY NEWS

→ Nestlé Purina PetCare recently launched the Purina Institute to put nutrition at the forefront of conversations about pet health. For more information, visit www.purina.com.

→ Vetstream has extended its Vetlexicon service with the launch of Bovis, a practical, peer-reviewed online clinical resource for veterinarians working with cattle. Bovis contains more than 750 articles and 1,500 images, videos and sounds from more than 120 of the world’s leading experts in cattle medicine to help veterinarians deliver best practice care. For more information, visit www.vetstream.com/treat/bovis.

→ Vetstream has added reptiles to Vetlexicon Exotis, its practical, peer-reviewed online clinical reference resource for veterinarians working with exotic species. More than 898 items to assist the care and treatment of reptiles, chelonians, and snakes, including 285 peer-reviewed articles, 22 videos, 504 images, and 87 owner fact sheets have been created for Exotis. The service already contains detailed information on the veterinary care of guinea pigs and ferrets, and content on other species, including rodents and psittacine birds, is in development. For more information, visit www.vetstream.com/treat/exotis.

CVMA-SBCV Chapter Spring Sunday CE Sessions are coming to Surrey, Victoria, Kelowna, and Cranbrook. Please stay tuned for emails about these exciting educational opportunities.

JANUARY

17 – 19 Western Canadian Association Bovine Practitioners 2019 Conference
Saskatoon, SK
www.wcabp.com/events/2019-conference-information-1

20 Washington State VMA Conference
Renton, WA
www.wsvma.org/i-have-a-headache-ce/

31 – FEB 2 2019 OVMA Conference and Trade Show
Toronto, ON
www.ovma.org/veterinarians/continuing-education/ovma-conference-trade-show/

Government of BC Bee courses
Introductory Beekeeping (online) & Bee Master Course (classroom)
www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/animal-production/bees/bee-courses

FEBRUARY

2 – 16 SVMA 59th Annual Ski Meeting and Continuing Education Program
Durango, CO
<https://skisvma.org/>

MARCH

8 – 10 2019 American Association of Veterinary Medical Colleges Annual Conference and Iverson Bell Symposium
Washington, DC
www.aavmc.org

APRIL

28 – 30 35th World Veterinary Association Congress
San Jose, Costa Rica
www.wvac2019.com/index_eng.html

AS REPORTED IN THE MEDIA

CANADIAN VETERINARIANS PUSH FOR PET WARNING LABELS ON CANNABIS PRODUCTS
www.veterinarypracticenews.com/canadian-veterinarians-push-for-pet-warning-labels-on-cannabis-products/?ads=disable

CHANGE IS UPON US; ANIMAL HEALTH WITH DR. RON CLARKE
www.canadiancattlemen.ca/2018/10/01/animal-health-debunking-myths-on-antimicrobial-resistance/

WHISTLER PET OWNER WARNS OF HOUSEHOLD DANGERS AFTER FRENCH BULLDOG SUFFOCATES ON COMMON ITEM
www.globalnews.ca/news/4502172/dog-suffocate-chip-bag/

NEW WEST POOCH BECOMES ILL AFTER EATING CANNABIS-LACED POOP AT LOCAL PARK
www.newwestrecord.ca/news/new-west-pooch-becomes-ill-after-eating-cannabis-laced-poop-at-local-park-1.23443670

CVMA AWARD RECIPIENTS LISTED UNDER “PEOPLE IN THE NEWS” VETERINARY PRACTICE NEWS CANADA
www.veterinarypracticenews.ca/publications/de/201809/?page=1

DOCTORS SAY MEDICINAL CANNABIS MAY BE THE ANSWER TO AILING PETS
www.globalnews.ca/news/4483176/doctors-say-medicinal-cannabis-may-be-the-answer-to-ailing-pets/

DESPITE GOVERNMENT REPORT SHOWING ‘SIGNIFICANT’ REDUCTION IN PTSD, VETERANS DENIED SERVICE DOGS
www.globalnews.ca/video/4464041/veterans-denied-service-dogs-despite-govt-report-showing-significant-reduction-in-ptsd

BIOLOGIST, FIRST NATION TAKE FISHERIES AND OCEANS CANADA TO COURT OVER FARMED-SALMON CONCERNS
www.thestar.com/vancouver/2018/09/10/a-biologist-and-a-first-nation-take-fisheries-and-oceans-canada-to-court-over-farmed-salmon-concerns.html

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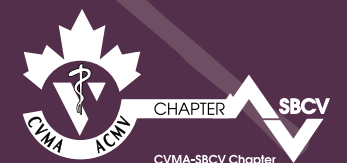
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