Poultry veterinarians in health and production

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What are the roles played by poultry veterinarians and why do we need them? As a North Vancouver native, this is a question I find myself answering all too often to my family and friends. As I am not from a farming background, when I say "poultry veterinarian" they immediately picture me performing turkey brain surgery or doing CPR on a pheasant, and while I am sure there is a vet somewhere out there who has attempted these procedures, this of course is not my role as a poultry veterinarian. I am a first-year poultry veterinarian who graduated from the Western College of Veterinary Medicine in 2020. The following is an outline of the role that I and others play in the poultry industry as avian pathologists, poultry vets, and chicken masters.

Overview

Poultry is the fastest growing food animal commodity in the world, with chicken meat estimated to be the most consumed meat in the world in 2019, due in part to changes in the pig supply attributable to African Swine Fever (1). In 2018, Canadian poultry farmers produced a record 1.465 billion kg of poultry (2). While everyone understands that this meat does not simply appear in the grocery store fridges and freezers, practically, this is what most people experience, and this is about as far as the relationship extends between most people and poultry production. In reality, poultry production is a complicated relationship between primary breeder companies, hatcheries, producers, feed mills, and processing plants, all intertwined with biology, industry, public health, welfare, and politics. The fun part, and the challenging part of being a poultry veterinarian is that we are trained to have our hands in it all.

Working with producers

Producers are the backbone of our supply management system in Canada. These are the farmers, the professionals who produce the meat and the eggs that we eat. Now, usually at this point when I explain to family and friends that I work with poultry farmers, the next thought is that I live on, or in, a chicken farm. While this is not the case, poultry vets do work very closely with producers, but usually in a consulting fashion. We help with diagnostics when there are disease outbreaks on the farm, and more importantly, with preventative medicine to help stop diseases such as coccidiosis and necrotic enteritis before they happen. On the veterinary side this is accomplished by working with producers to implement good husbandry and biosecurity practices and to develop vaccination and medication programs, as well as performing routine disease surveillance on the farm. This is done with the help of trained management field technicians and nutritionists who work with producers to provide the best feed and environment for chicks to keep them healthy. Veterinarians work with poultry nutritionists and feed mills to design economical nutrition programs that maximize performance and poultry welfare. The ability to work with experts in a variety of fields is a great benefit of working in the poultry industry, a benefit that many veterinarians are not afforded. Professional input on disease prevention is especially important since the Chicken Farmers of Canada have voluntarily discontinued the prophylactic use of category I and category II antibiotics and are currently working on the removal of category III antibiotics, while the Turkey Farmers of Canada have eliminated the prophylactic use of category I, II, and III antibiotics. Disease prevention is important for the welfare of the birds, economics of production, and efficiency of growth (feed conversion) which reduces overall land and energy use.

Working in the hatchery

Many poultry veterinarians work directly with a hatchery or consult for one or several. The successful incubation and hatching of baby chicks is an extremely important aspect of raising healthy flocks. Veterinarians assist hatchery teams with routine analysis of unhatched eggs, vaccination programs, biosecurity, sanitation, hatchability issues, or egg/chick quality issues. Our work in the field monitoring flocks is also valuable for hatchery operators as issues in the field can sometimes be informative for potential problems in the hatchery or with supply flocks. Veterinarians as well as industry service technicians act as intermediaries, facilitating communication on diagnostics and outbreaks between hatcheries and farmers. Awareness of the importance of hatcheries is continuing to grow and innovations are constantly in development and becoming available to these facilities. Thanks to research and development by scientists and engineers we are seeing improvements in areas such as *in ovo*

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chick sexing, embryo vaccination, use of more sophisticated single stage incubators, automated handling systems, provision of feed and water in hatchers, and increased sophistication in trucks for shipping chicks to farms. All these changes have implications for chick health and welfare which will continue to benefit from veterinary support.

Working at the plant

It is inevitable that birds need to be slaughtered and processed before making it to the grocery store or dinner plate. An efficiently functioning processing plant is essential for bird welfare and to produce safe food for consumers. From a welfare perspective, a veterinarian's goal during a processing plant visit is to ensure that equipment is running correctly to make certain birds are stunned before slaughter, are as comfortable as possible in loading bays prior to stunning, and that slaughter is rapid and accurate every time. While processing plant operators and managers already have these aspects dialed in, vets can play a supportive role by working with crews to prevent oversights. Vets also play a role in the plant by investigating cases in which birds are found dead on arrival or are condemned at slaughter. Our goal in these cases is to determine the cause of the issue and prevent a repeat of this issue in the future. Finally, we also play a role in performing diagnostics within the plant itself pertaining to food quality.

Public health

An area closely intertwined with plant work, the importance of which cannot be overstated, is human health. Food safety is something that is taken very seriously in production animal medicine. Canada's On-Farm Food Safety Assurance Program (OFSAP), for example, has been developed with input from veterinarians, farmers, provincial boards national biosecurity guidelines, and other specialists (3). These guides provide recommendations on personnel training, farm access, feed/water provision, cleaning and disinfection, and other management practices. Our role as veterinarians is to help producers meet program guidelines and ensure birds are healthy on the farm and when they arrive at the plant. This is accomplished partly through routine diagnostics and treatment, but also through mandated surveillance programs such as the Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) and the Canadian Notifiable Avian Influenza Surveillance System (CanNAISS). In addition, we play a role in preventing product contamination by ensuring that proper feed and medication withdrawal times are followed. Routine diagnostics that take place in the lab include testing for *Salmonella* and *Campylobacter* and product shelf life.

Emergencies

Occasionally, chicken emergencies do happen. In the case of a flipped truck or collapsed barn, veterinarians need to be available to ensure that the birds are depopulated in the most humane and timely manner possible. In an avian influenza or Newcastle disease outbreak, our role is to minimize the spread of these diseases which can have devastating impacts on the industry, and in rare cases, risks to human health.

Research

As with every aspect of veterinary medicine, there is considerable research that is undertaken by veterinarians in the field of poultry. Developments in genetics, vaccines, nutraceuticals, diagnostics, and welfare are constantly evolving. The world is working to reduce our dependence on antibiotic use due to the fear of continued selection for multi-drug resistant pathogens that are affecting human medicine. The hunt is on for alternative types of medicine for our animals, stimulating a great deal of research in the field to find innovative new approaches.

Research and development of poultry genetics is a huge industry: Cobb, Aviagen, and Hybrid, being some of the larger primary breeding names in the game. While in the past a large part of genetic research was focused on increased carcass yield, now geneticists are focused on including a far more diverse array of characteristics into their birds such as bone strength, feed efficiency, fertility, livability, and disease resistance which could help limit the need for treatment.

Poultry veterinarians are directly involved with many aspects of vaccine development. We are the only industry that currently vaccinates embryos. This is done using robotic *in ovo* vaccination technology in the hatchery at a mass scale on billions of chicks every year. In addition, autogenous vaccine programs are becoming more well-established, which allow us to produce tailor-made vaccines targeted at pathogens specific to certain farms or geographic regions. Veterinarians and lab technicians are directly involved in this process through strain identification, isolation, and selection.

Nutraceuticals are another antibiotic alternative that are being heavily researched. Essential oils, yeasts, probiotics, and other products are showing promise in field studies that veterinarians may play a role in facilitating. This is only a small subset of research that is performed by veterinarians. Other avenues include diagnostics, disease epidemiology, welfare, and much more.

Education

Whether it is through workshops, articles, conferences, or through direct communication on the farm or in the lab, poultry vets, like many other vets, spend a great deal of time teaching. A common practice is holding workshops for producers to teach approved on-farm euthanasia techniques, basic post-mortem techniques, as well as new innovations and management practices. Teaching others and learning from producers, technicians, nutritionists, academics, and other vets is one of my favorite aspects of the job, which I guess is only natural when one spends 25 years of their life in the education system. One of the nice things about this industry is that there is no shortage of good mentors.

The future

The poultry industry will continue to change and evolve. Advancements in automation and machinery, improved disease diagnostics and treatments, new disease strains, changes to bird genetics, and changing welfare standards will continue to change the industry in unforeseen ways that will pose new challenges

for veterinarians and other professionals in the industry. For example, there is currently a lot of pressure from retailers, restaurants, and grass roots organizations to improve living standards for egg-laying birds. This has resulted in the development of new Codes of Practice for the Care and Handling of Pullets and Laying Hens and the Code of Practice for the Care and Handling of Hatching Eggs, Breeders, Chickens, and Turkeys (4,5). These were made with input from multiple stakeholders, including veterinarians. Changes such as these require millions of dollars invested by farmers. Barns need to be re-invented, which requires new training and adjustments to management practices. The new codes of practice will lead to the abolition of traditional cages in place of enriched cages, free-run, and free-range systems. These changes will undoubtedly lead to an increased frequency of disease challenge within our flocks, which combined with the gradual move away from the use of prophylactic antibiotics will result in increased demand for veterinary oversight in the future.

What I love about this job so far

While my career is only in its infancy, I am really enjoying where I am so far. I am meeting great people, with ambition and passion, who take pride in what they do. I am reaping the benefit of good mentorship from individuals with specialized experience, skills, and knowledge to help me grow professionally. I enjoy the ability to get outside, work with animals in the field, and travel, without having to always be outside and travelling. The work is interesting in that I get to perform research, teach, work directly with farmers, problem solve, help people and animals, perform diagnostics, learn about business, and be paid for what I know, not just what I do. Working full time in addition to fulfilling my master's degree requirements keeps me very busy, but I do feel that I have entered a career in which work/life balance is valued. Overall, I am excited about my future prospects in this career, and I hope that through this article I have been able to shed some light into a small part of what we do as avian pathologists, poultry vets, and chicken masters.

References

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