BC BROILER HATCHING EGG COMMISSION

NOVEMBER 2020 NEWSLETTER

INDUSTRY STATISTICS

YTD Hatchability

83.7 %

Average Lay Cycle End

55 weeks

Average Breeder Price

Female: $10.96

Male: $14.75

2020 Audit Stats

Total Premises to Audit: 57

Premises Completed: 48 / 57

Hatching Egg Tip

Click the link below to find a helpful cleaning and disinfection poster for you to utilize on-farm.

https://en.aviagen.com/assets/Tech_Center/BB_Resources_Tools/Poster-Aviagen-Cleaning-Disinfection-19-EN.pdf

ANIMAL CARE PROGRAM LIMITING FACTOR PLANNING GUIDE

Please see the attached memo and excel guide from Joshua Crossett, Manager, Finance & Production.

BC CHICKEN SECTOR PRICING REVIEW

Please see the following link for current updates on the BC Chicken Sector Pricing Review.
http://bcchickensectorpricingreview.com/

CANADIAN POULTRY RESEARCH COUNCIL

Please see the attached articles from Canadian Poultry Research Council.

FLU SHOT REMINDER

Please see the attached letter from the BC Poultry Association.

SARS CORONAVIRUS 2 IN LIVESTOCK

Please see the attached rapid qualitative risk assessment.

FURTHER PROTECTION FOR FARM WORKERS DURING COVID-19

Please see the following link from the Government of Canada regarding farm worker protection during COVID-19.
https://www.canada.ca/en/agriculture-agri-food/news/2020/10/government-of-canada-invests-49-million-to-further-protect-british-columbia-farm-workers-during-covid-19.html

LETTER TO BCFIRB RE: PROCESSING AGE AND STATUS OF THE LINKAGE

Please see the attached letter from Jim Collins, Chair of the BC Broiler Hatching Egg Commission.

WE HAVE MOVED!

Please see the attached flyer for the new address.
Due to COVID-19 we are not currently accepting visitors.

AUDITS: CYCLE, RECORDS & RECERTIFICATION STICKERS

Please see the attached memo from the On-Farm staff.

BCBHEC STAFF CHANGES

We would like to welcome Sara Redekop to the Hatching Egg team. Sara will be taking over part-time for Naylene Thompson as she goes on maternity leave this month. Sara's contact information is: admin@bcbhec.com or 604-850-1854 ext. 105

Pricing Orders

Period	Live Chicken	Hatching Eggs	Saleable Chicks	Day-Old Broiler Chicks
A-161	1.694 $/kg	600.92 ¢/doz	62.55 ¢/chick	81.49 ¢/chick
A-162	1.694 $/kg	602.95 ¢/doz	62.76 ¢/chick	81.70 ¢/chick
A-163	1.697 $/kg	605.64 ¢/doz	63.03 ¢/chick	81.97 ¢/chick
A-164	1.707 $/kg	610.09 ¢/doz	63.49 ¢/chick	82.43 ¢/chick
A-165	1.684 $/kg	608.26 ¢/doz	63.30 ¢/chick	82.24 ¢/chick
A-166	1.690 $/kg	617.98 ¢/doz	64.31 ¢/chick	83.25 ¢/chick

Production Cycles

Period	Start Date	End Date
A-161	Jan 19, 2020	Mar 14, 2020
A-162	Mar 15, 2020	May 9, 2020
A-163	Mar 10, 2020	Jul 4, 2020
A-164	Jul 5, 2020	Aug 29, 2020
A-165	Aug 30, 2020	Oct 24, 2020
A-166	Oct 25, 2020	Dec 19, 2020

BC BROILER HATCHING EGG COMMISSION

BCBHEC

established 1988

MEMO

TO: **Hatching Egg Producers**

FROM: **Joshua Crossett**

DATE: **September 4, 2020**

SUBJECT: **ACP Limiting Factor Planning Guide**

Commission staff have prepared a guide (spreadsheet) to help producers in determining what their barn's limiting factor(s) may be with respect to the CHEP Animal Care Program.

This spreadsheet has been posted to the producer side of the website.

It allows you to enter in key information such as type of barn, transfer date, types and numbers of feeders, waterers, and number of nest boxes if applicable.

- Orange cells are pulldown lists.
- Blue cells are for numbers.

A summary of the limiting factors is at the bottom.

Use this guide to help in any planning decisions, but we highly encourage each producer to ask on-farm staff to review their planned specs to ensure accuracy.

Please call the office if you have questions about using the guide; we will also provide a brief overview at our next set of Coffee Meetings.

Regards,

Joshua Crossett
Manager, Finance & Production

Immune-boosting options show promise for AI protection

Shayan Sharif

The parallels between the current covid-19 pandemic and past avian influenza (AI) outbreaks are not lost on Shayan Sharif. "In any pandemic, swift and measured actions are needed to contain and control the imminent spread. When a vaccine is available, the options change. And when a vaccine can be made more effective, progress is made," says Sharif, associate dean of research and graduate studies at the Ontario Veterinary College (OVC) at the University of Guelph.

Sharif led a multi-year research project looking at novel ways to prevent future AI outbreaks by boosting the immune response of the bird. The premise was that if the bird's own immune system can rally to work in concert with a vaccine, then the level of disease protection provided will be stronger and more effective.

With no commercial AI vaccine currently available in Canada – and culling the only "treatment" option – the push for effective ways to protect birds is desperately needed. That's where some of Sharif's latest research comes in. He looked at immune-enhancing activities to protect birds against AI. His research holds promise for a solution for Canadian poultry producers to prevent AI. It also offers vital insights into technology that can boost a bird's own immune system to be better equipped to fight off AI and other diseases.

Testing the potential of PAMPs

Sharif's research looked at two avenues for helping birds build a stronger defence against disease, particularly AI. The first part of the study looked at how PAMPs – pathogen associated molecular patterns – could be used to boost immune response.

PAMPs are naturally-occurring microbes that have been extensively studied for more than 20 years. They act as an adjuvant (or immune booster) and can be used with a vaccine or on their own to trigger a stronger response in birds. When PAMPs are used with a vaccine, the vaccine must be a killed form, and that poses some challenges for the route of administration. Killed vaccines don't always induce enough immune response on their own, and are most effective when injected – an impractical proposition in poultry production.

The search for a better solution led Sharif to nanoparticles as an effective carrier to administer killed vaccines with or without PAMPs.

> "If many of the poultry vaccines we use could be packaged in nanoparticles, we could deliver better efficacy."

"Nanoparticles are like tiny cages that can carry vaccine and PAMP molecules directly to target cells in the bird – respiratory or intestinal in the case of AI," says Sharif. "They have been shown to boost the efficacy of vaccines and PAMPs, and are an effective vehicle for penetrating and integrating into target cells faster and more directly, delivering a better immune response for the bird."

Sharif's team searched for a PAMP that could deliver the best immunity. "We identified PAMPs with varying degrees of potency and efficacy, and found one called CpG – which is microbial DNA – was the best for efficacy and immune response."

Sharif's work confirmed that nanoparticles work well to boost immune response and reduce virus shedding in birds. "There is a lot of promise for nanoparticles and vaccines in poultry and in people," says Sharif. "In fact it's a technology that is being investigated in the current work on a coronavirus vaccine."

Adenovirus as effective delivery vector

The second technology investigated for boosting immune response was the use of adenovirus as a biological carrier for AI vaccine. Sharif's colleague Eva Nagy, avian virologist at OVC, led the team that discovered the efficacy of two particular adenoviruses as potential vehicles for delivering the vaccine antigen for AI and a variety of other vaccines.

> "My hope is that in the near future we will be able to use vectors like adenovirus to carry bits and pieces of AI virus to be used as a vaccine."

Adenovirus works as a vector or delivery vehicle for vaccine. "A vector is like a car that can carry different passengers. In this case, an adenovirus vector may carry the key genes of avian influenza virus that when given to a chicken could confer immunity against the virus," says Sharif. Through the course of this research project, adenovirus 4 and 9 were licensed and commercialized with a Mexican vaccine company. While there has yet to be a commercial application for Canadian poultry producers, the opportunity is there. "My hope is that in the near future we will be able to use vectors like adenovirus to carry bits and pieces of AI virus to be used as a vaccine," says Sharif. The technology also has potential as a carrier for Newcastle and infectious bronchitis vaccines.

The commercialization question

Sharif knows nanotechnology holds tremendous promise for the Canadian poultry industry as a way to package killed vaccines. "If many of the poultry vaccines we use could be packaged in nanoparticles, we could deliver better efficacy," says Sharif. "And if we can commercialize adjuvants like PAMPs we can further enhance the immunity caused by vaccines." And the routine use of nasal vaccines in Canada gives Sharif confidence that the nanotechnology would be an effective means to administer AI protection.

The hope for Sharif is getting the technology to market. Commercialization wasn't part of this research project but the goal is to get it to market because of the tremendous potential it shows as an effective option for dealing with AI protection.

An exciting part of Sharif's work on nanoparticles is that it doesn't start and stop with protecting birds against another AI pandemic. It has potential for Newcastle, infectious bronchitis, Marek's disease, Campylobacter and *Clostridium perfringens* – the latter microbe being the causal agent for necrotic enteritis.

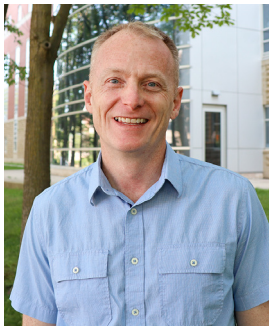
For Sharif, the big question is how to move this work forward. "This is an open avenue for commercialization opportunities and I wish there were more options already available for Canadian poultry producers because we know that pandemics are a certainty. We can't let our guard down. Influenza could have a comeback and we have to be ready."

Sharif's research was funded by the Canadian Poultry Research Council as part of the Poultry Science Cluster 2 which was supported by AAFC as part of Growing Forward 2, a federal-provincial-territorial initiative. Additional funding was provided by the Ontario Ministry of Agriculture, Food and Rural Affairs, and Canada's First Research Excellence Funds.

Ventilation at a cost

Research looks at how new tools impact air quality on poultry operations

Air quality can be difficult to manage in Canadian poultry operations because two main challenges – ammonia levels and particulate matter – are often at opposite ends of the ventilation spectrum. Ammonia, which typically builds up when poultry manure in litter stays wet, can be alleviated by drying it out through better ventilation. But drier conditions – along with natural bird activities such as dust bathing – contribute to more particulate matter in the air, an issue the World Health Organization ranks among its top environmental issues.



Bill Van Heyst

Bill Van Heyst, professor of environmental engineering in the School of Engineering at the University of Guelph, says each type of poultry operation has its unique environmental challenges, and there are a number of tools available to help balance acceptable levels of ammonia and particulate matter in barns.

"Producers are interested in trying new things to save on costs, and anecdotally we hear they are noticing improvements in air quality and other factors," says Van Heyst. "It's important to study these practices so we understand what the implications down the road will be – does it make sense environmentally as well?"

In 2017 and 2018, Van Heyst's team conducted the first scientific study to evaluate the impact of a centralized heat exchanger (Clima+ 200), installed for use under minimum ventilation conditions, had on the air quality within a broiler chicken facility.

"Heat exchangers were coming in from Europe, and broiler producers were using them to recover some of the heat that is typically exhausted at the start of a cycle," says Van Heyst. "Early adopters were using them, and anecdotal evidence suggested they were reducing ammonia production.

Van Heyst's research examines how various options available to Canadian poultry producers impact air quality, taking factors such as barn size, age and design into account.

We were able to scientifically assess air quality levels in their barns, compared to the baseline we had built up over years of research."

The team sampled four crops of broilers with detailed ammonia and particulate matter measurements taken along with litter samples. They found that in comparison to similar Ontario broiler facilities, the centralized air exchange system does control ammonia emissions better, but at the cost of higher particulate matter emissions.

Each type of poultry operation has its unique environmental challenges, and there are a number of tools available to help balance acceptable levels of ammonia and particulate matter in barns.

"Typically newer barns are getting centralized heat exchangers," he says. "Older barns tend to be leakier, and when you do a heat exchange, they're losing heat through walls that may not be insulated as well as they could have been. For older barns, there's probably better bang for your buck if you're looking to save energy."

Van Heyst's team continues to build air quality base information on other poultry flocks, including turkeys, layers and broiler breeders. He notes as Canada's egg industry transitions from battery housing to cage-free systems, there is important work to be done to understand the environmental implications in barns.

"With cage-free systems and lower stocking densities, producers need to look at the entire structure to make sure that ventilation and heating is appropriate."

"A lot of barns are being retrofitted, but that's not always the best option," says Van Heyst. "Some older barns may not have heaters because with higher stocking densities, the birds would heat it themselves. With cage-free systems and lower stocking densities, producers need to look at the entire structure to make sure that ventilation and heating is appropriate."

As his team continues to do the baseline work for various poultry operations, he says they're building important data to allow them to test what technologies have the best environmental impact.

"We need to keep doing the baseline work so we can scientifically prove what technologies make the most environmental and economic sense as an industry, together," Van Heyst says.

Van Heyst's research was funded by the Canadian Poultry Research Council as part of the Poultry Science Cluster 2 which was supported by AAFC as part of Growing Forward 2, a federal-provincial-territorial initiative. Additional funding was provided by Egg Farmers of Canada, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) / University of Guelph Partnership Agreement, and the School of Engineering, University of Guelph.

Phages show promising potential to improve safety of poultry products

Bacteria "eaters" are antimicrobial option to reduce the risk of key foodborne pathogens

Campylobacter and *Salmonella* continue to top the list of troublesome foodborne pathogens in Canada. They live in the intestines of many food producing animals, including poultry, and commonly contaminate raw meat products during slaughtering and processing. An Ontario researcher is looking at bacteriophage – bacteria "eaters" – viruses that specifically attack target bacteria to improve food safety that could reduce the use of conventional antimicrobials.

Dr. Hany Anany, research scientist, Guelph Research and Development Centre, Agriculture and Agri-Food Canada

There are many points along the path from farm to table where contamination can occur. "Research clearly indicates that cross contamination during processing and chilling steps is taking place and represents a significant food safety risk during poultry processing," says Dr. Hany Anany, research scientist with Agriculture and Agri-Food Canada, and lead investigator on a three-year research project looking at the use of bacteriophage to reduce the risk of foodborne pathogen contamination on poultry products during processing.

New interventions needed

Studies over the last decade at provincial and federally inspected poultry processing plants confirm the ongoing issue of pathogen contamination, and highlight the need for new strategies and tools to reduce the risk and improve overall food safety. An Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) study looked at the prevalence of *Campylobacter* and *Salmonella* in broilers at processing plants and found the pathogens were more prevalent after chilling (including rinsing), compared to when live birds arrived at the plant.

A study at federally inspected plants in Canada had similar findings, examining the prevalence of the pathogens in whole carcasses and cut-up chicken parts. The National Microbiological Baseline Study (2012-2013) reported that *Salmonella* showed up on 16.9% of whole carcasses and 29.6% of cut-up parts, *Campylobacter* was on 27.4% of whole carcasses and 39% of cut-up parts.

"There is clear evidence that *Campylobacter* and *Salmonella* are ongoing and unresolved challenges for the poultry industry and Canadian consumers."

Anany has been studying the use of phages as a way to mitigate the risk of different foodborne pathogens to improve food safety for the past 16 years. "There is clear evidence that *Campylobacter* and *Salmonella* are ongoing and unresolved challenges for the poultry industry and Canadian consumers," he says. "We need to explore various innovative and cost-effective interventions that can be applied during processing to reduce the pathogen burden without affecting the quality of the final poultry product." He is partway through a research project to use phages – a green, environmentally- friendly technology – as a novel antimicrobial option during poultry processing. His research – with funding through the Canadian Poultry Research Council's poultry science cluster – is exploring the use of bacteriophages during poultry carcass chilling and packaging as a novel new way to control *Campylobacter* and *Salmonella* contamination.

The promise of phages

Lytic phages are bacterial viruses designed to only infect a specific host – e.g. *Campylobacter* or *Salmonella* – to disrupt the pathogen's regular metabolism and effectively kill it. Several studies have shown the efficiency of phages to control the growth of different bacterial pathogens.

"Phages are a promising antimicrobial intervention that could be used before, during and after the water-based chilling step of poultry product processing," says Anany. "Although phages aren't yet being used in the poultry industry, post-chill use shows promise."

In Canada and the U.S., some phage products have been approved and are used during food processing and on ready-to-eat food products. Phages can be implemented at various stages of the food chain," says Anany. "I see phages as one of the available tools we can use to mitigate the bacterial pathogen risk. We need to include phages as part of the hurdle technology to improve food safety through alternative antimicrobial options. And we have to understand the biology of phages and host interaction to implement them at the right stage of the processing chain using appropriate application approaches (encapsulation, spraying, immersion) to ensure their efficacy."

> "I see phages as one of the available tools we can use to mitigate the bacterial pathogen risk."

Anany's research is looking at two application approaches of phages – free and immobilized – at two critical points during poultry processing, as a means to improve food safety without impacting the quality of the poultry products.

"Free" phages can be applied to whole carcasses and cut-up parts by dipping or spraying a phage suspension before packaging to significantly reduce contamination of target pathogens – *Campylobacter* and *Salmonella* in this case – in the final consumer product.

"Immobilized" phages could be used in the absorbent pads within poultry product packaging to further minimize contamination during the product's shelf life. "Phage-based bioactive packaging would be a controlled release to ensure added phages would be able to tackle any existing and post-processing contamination during the shelf life of the product. This would extend product shelf life and improve food safety while maintaining the quality of the packaged food, including poultry products," says Anany.

Commercial potential

While phages are not currently used in poultry production in Canada, Anany believes this is because cost may be the biggest barrier for poultry processors. "It would be ideal if there was an integrated production system that includes phages throughout the production chain from farm to retail. Phages could be added to feed and water for poultry on the farm, sprayed before and during processing and in absorbent pads for in-store packaging." Anany also points to the need for more, large scale experiments to support results found at the laboratory level.

Anany's research began by screening poultry samples from commercial processing facilities to isolate *Campylobacter* and *Salmonella* specific bacteriophages. "We already have some promising phage candidates to be used in biocontrol experiments," he says. "Our hope is to ultimately deliver a cost-effective and environmentally-friendly strategy for commercial processing poultry facilities to help mitigate two of the top foodborne pathogens – improving safety of whole carcasses and cut-up parts without compromising food quality."

Anany's research is funded by the Canadian Poultry Research Council as part of the Poultry Science Cluster which is supported by Agriculture and Agri-Food Canada as part of the Canadian Agricultural Partnership, a federal-provincial-territorial initiative. Additional funding has been provided by Maple Leaf Foods and Exceldore Foods.

The fresh factor

Research suggests clean air, and litter, matter to poultry

Air quality is a common concern on Canadian poultry operations, due mainly to ammonia emissions from manure. But until recently, scientists had little understanding of how exposure to manure and manure gas impacts the health and behaviour of poultry flocks.

Alexandra Harlander

Professor Alexandra Harlander, Department of Animal Biosciences, University of Guelph, embarked on a variety of experiments to improve her team's understanding of poultry birds' behavioural preferences toward manure and manure gas. Her study is the first of its kind to provide important insights into these behavioural preferences.

"In general, farm animals are kept on litter substrate that, over time, becomes increasingly soiled, leading to the production of manure gas," says Harlander, who holds the Burnbrae Farms Professorship in Animal Welfare. "We know herbivores and large ruminants avoid foraging in the dung areas, and some wild birds develop strategies to avoid feces in their nests. We wanted to know – do chickens and turkeys differentiate between ammoniated and non-ammoniated environments? And how does exposure to ammonia affect natural behaviours such as foraging?"

Harlander's team worked with the school of engineering at the University of Guelph (Professor Bill Van Heyst) to develop a high-tech environmental chamber for accurate gas measurements. They produced manure gas in various concentrations, using naturally sourced and artificially sourced ammonia, and allowed birds access to a foraging area containing raisins, mealworms and feed mix.

While all birds demonstrated a preference for fresh air, Harlander says they could also discriminate between artificially and naturally sourced ammonia. She suggests the presence of other gases from excreta samples may have acted as a more familiar stimulus.

"Laying hens in particular were more likely to forage for longer periods in naturally sourced ammonia," says Harlander.

She notes birds have sensitive respiratory systems, and high ammonia is irritating to their eyes, nose and lungs. "Extremely high ammonia levels are a stressor for animals, and in poultry it can trigger feather pecking," she says.

To assess bird preferences for litter substrates, Harlander's team offered a variety of options, including fresh litter, soiled litter, litter that had been treated to reduce ammonia content and no litter substrate. Laying hens did not express a preference for any litter, but Harlander says when it came to litter versus no litter, litter won out.

"All the birds were interested in foraging," says Harlander. "They avoided barren areas where there was no litter available to them."

Hen houses used in Harlander's research were covered verandas where birds were kept inside in an aviary, but had access to fresh air.

Harlander says another strategy to manage ammonia production in laying hens is through diet. Her team tested behaviour and cognitive abilities of birds fed various diets, including low protein/high energy diets thought to reduce ammonia in excrement. They found no cognitive differences between birds fed various rations.

"Additionally, we wanted to see if a high or low protein diet had an impact on the birds' excretive composition, and also how it impacted liver metabolism," says Harlander. "Birds bred for production are very young and they have high metabolisms, and all of the birds we tested had liver problems, no matter what their diet."

"All birds are interested in foraging, and they avoided barren areas where there was no litter available to them."

She notes birds' livers are fragile, and fatty liver is a condition that is common among poultry raised in commercial housing systems as well as backyard chickens. The condition can lead to bleeding and sudden death.

Harlander's work in this area began with investigating the impact of ammonia on animal welfare of laying hens and continued with follow-up studies on broiler chickens and turkeys. The results they observed in laying hens were consistent in turkeys and broilers. All birds studied expressed a preference for naturally-produced ammonia, and laying hens foraged more in the clean litter. And, while nitrogen-reduced diets did not impact their behavioural or cognitive abilities, all birds studied – regardless of diet – showed signs of liver damage. She sees further opportunities for similar studies in other species, including animals in laboratory settings and small animals in home settings.

"An animal's environment – when air conditions and housing are acceptable – makes a difference," says Harlander. "In the case of poultry, stressors lead to feather pecking, irritation, cannibalism and mortalities. By giving them conditions they prefer, we remove some of those stressors."

Harlander's research was funded by the Canadian Poultry Research Council as part of the Poultry Science Cluster 2 which was supported by AAFC as part of Growing Forward 2, a federal-provincial-territorial initiative.

BC Poultry Association
Unit #1 – 2650 Progressive Way
Abbotsford, BC V2T 6H9

October 27, 2020

Dear fellow poultry producers;

The BCPA's Emergency Operations Centre (EOC) and the Rapid Response Committee have been working together with the BC Ministry of Agriculture and the CFIA to develop procedures and teams to deal more effectively with and to reduce the impact of any future AI outbreaks. It is even more complicated this year because all our procedures and SOPs must be modified to meet COVID restrictions.

The rapid and coordinated approach to containing AI is dependent upon poultry producers, allied trade and association staff being able to participate in the process. We have been advised by several health experts that our involvement in an AI outbreak will hinge upon individual producers having gotten their annual flu shot.

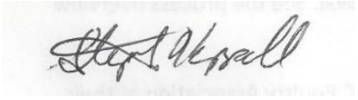
The BCPA urges all poultry producers to get their annual flu shot this fall when they become available. There are several reasons:

1. They are free to all poultry producers and their families
2. It takes two weeks for the flu shot immunity to develop. During an outbreak, the lack of flu shots may result in a two week delay before producers can help with the outbreak.
3. Anyone working on a rapid response team (humane destruction, biocontainment, surveillance, movement control) is under the jurisdiction of the CFIA and requires a flu shot.
4. With the COVID outbreak, it is even more important to get the shot.

I urge you and your family to take advantage of the annual flu shot this fall. Have the shot for your family health and so we can all be prepared to take a strong and rapid response in a future AI outbreak.

Please contact me if you have any questions.

Sincerely,



Steve Heppell, Chair, BC Poultry Association

RAPID QUALITATIVE RISK ASSESSMENT (RQRA):
SARS Coronavirus 2 (SARS-CoV-2) in Livestock

Iteration #2: September 30, 2020

Summary

The primary route for exposure of humans to SARS-CoV-2 is via other humans. It is unlikely that livestock animals play a major role in the spread of this predominantly human disease. However, there is currently a lot of uncertainty related to infection in animals other than humans. For the purpose of this assessment, "livestock" has been defined as: pigs, poultry, ruminants and horses.

Several experimental studies have been conducted on pigs, poultry, and cattle (Berhane et al., 2020; Meekins et al., 2020; Pickering et al., 2020; Schlottau et al., 2020; Shi et al., 2020; Suarez et al., 2020; Ulrich et al., 2020), and some field surveys have included livestock species (Agence Fédérale pour la Sécurité de la Chaîne Alimentaire, 2020; Deng et al., 2020). All studies on poultry have found that they are not susceptible to SARS-CoV-2. Some studies have shown limited susceptibility in experimentally-infected pigs and cattle, but with no shedding of live virus or transmission to in-contact animals.

It is likely that additional evidence related to infection in livestock, whether positive or negative, will be forthcoming. As a result, this iterative rapid qualitative risk assessment (RQRA) process was initiated. It is intended to inform immediate decisions regarding guidance for producers, and the development of infection prevention, control and response policies. An Emergency Collective Expert Appraisal Group was formed, consisting of volunteers from federal, provincial and territorial departments of public and animal health, veterinary associations and academia. The group meets regularly to discuss updated information and its effect on the risk.

The assessment makes a number of assumptions, including that the source of exposure of livestock would be an infected human, and that the context for the assessment is the current pandemic situation. The animal health component focusses on the risks associated with animal infection and does not evaluate potential animal health and welfare impacts associated with the pandemic in general, such as possible disruptions to the industry. The assessment results could be updated as more information becomes available.

[This assessment was conducted by a multi-jurisdictional Emergency Collective Expert Appraisal Group. The methodology is intended to be used in situations where policy decisions need to be made in the face of high uncertainty. Given the minimal data available on surveillance, research, epidemiology and risk behaviours specifically related to SARS-CoV-2 in animals, the assessment was primarily informed by the group's collective professional knowledge on such topics as infectious diseases, virology, epidemiology, industry practices, and human-animal interactions. Assumptions, and sources of variability and uncertainty are detailed in the document. The findings and conclusions represent the consensual, but not necessarily unanimous, opinions of the group participants, and do not represent the views of the participants' respective organizations.]

Figure 1 describes the scenario pathway for this assessment:

1. In order to become infected, livestock must first be exposed to an infectious dose of the virus through direct or indirect contact with an infected human, and the animal must be susceptible to developing infection.
2. If livestock are exposed and infected, transmission of the virus to a susceptible human via contact is dependent on the infected animal shedding a sufficient amount of the virus in respiratory secretions, vomit, feces, or other bodily fluids, and then having sufficient direct or indirect contact with a non-infected human.
3. Transmission via food, in this scenario, requires that infectious virus be present in the meat, edible tissues, milk or eggs of an infected animal. This is not a complete food safety assessment, and the scope does not include other downstream factors, such as production or consumer controls, or other scenarios, such as cross-contamination from infected food workers.

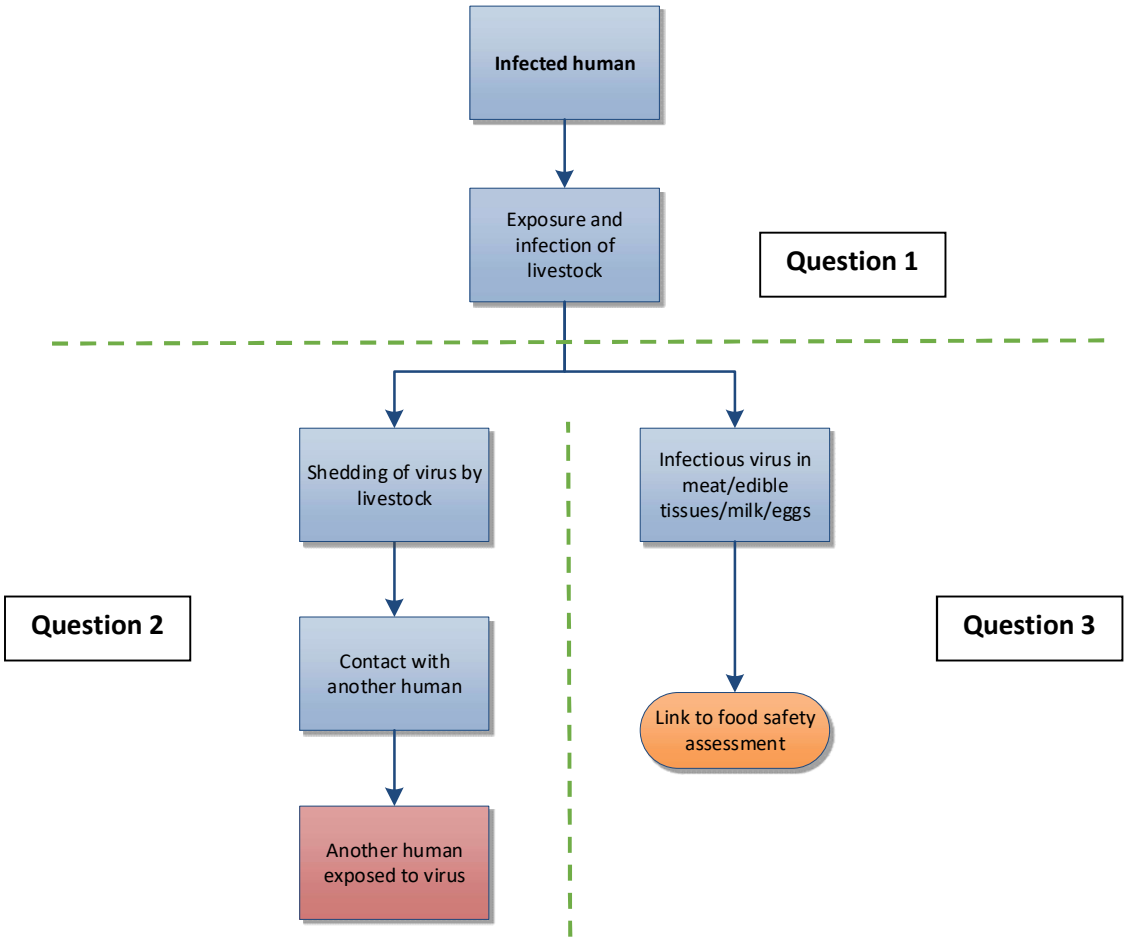


Figure 1: Scenario pathway illustrating the potential infection of livestock with SARS-CoV-2, and potential subsequent exposure of susceptible humans. The dashed lines indicate the focus of different risk questions.

This assessment addresses the following specific risk questions:

Question 1: What is the probability of exposure of Canadian livestock to SARS-CoV-2, and subsequent infection, through direct or indirect contact with infected humans (i.e., human-livestock transmission), and what is the resulting animal health impact at the national level?

The probability of the exposure and infection of Canadian livestock to SARS-CoV-2 from infected humans is:

- **Most likely very low for pigs**, but ranging from negligible to low due to variability. Experimental studies suggest no or very little susceptibility, and the lack of reports of natural infection in the face of the ongoing pandemic supports these experimental findings. The uncertainty is moderate.
- **Most likely negligible for poultry**. All studies conducted so far are in agreement that birds are not susceptible to infection, and the lack of reports of natural infection in the face of the ongoing pandemic supports these experimental findings. The uncertainty is low.
- **Most likely very low for ruminants**, but ranging from negligible to low due to variability. There are very few experimental study results with SARS-CoV-2 in these animals, but there has been a lack of reports of natural infection in the face of the ongoing pandemic and some field testing has revealed negative results. Studies with the related virus, SARS-CoV, also suggested a lack of susceptibility of ruminants. The uncertainty is high.
- **Most likely very low for horses**, but ranging from negligible to low due to variability. There have not yet been any experimental study results with SARS-CoV-2 in these animals, but there has been a lack of reports of natural infection in the face of the ongoing pandemic. The uncertainty is high.

If one of these animals were to become infected, they are unlikely to spread infection to a large number of animals because they are unlikely to shed any significant amount of virus. In addition, clinical signs, if any, would likely be mild. **The overall national-scale impact on animal health of this scenario is therefore considered to be negligible to very low**.

Variability in the estimate is dependent on risk factors, such as: type of farm and level of biosecurity, use of the animal (in the case of horses), exposure dose and host-related factors. Commercial farms typically have limited human-to-animal contact. Key uncertainties that will affect the probability estimate include: infectious dose, and the probability of infection of the animal.

Question 2: What is the probability of exposure of humans to SARS-CoV-2 in Canada through direct or indirect contact with livestock (i.e., human-livestock-human transmission), and what is the resulting human health impact at the national level?

SARS-CoV-2 is primarily a human disease. The probability of human exposure to SARS-CoV-2 from infected livestock in Canada is first dependent on the livestock becoming infected from exposure to an infected human, as in question 1. The animal must then shed sufficient virus, and have sufficient exposure to a susceptible human, to transmit the infection. The probability of this overall pathway (i.e., human-animal-human transmission) is:

- **Most likely very low for pigs**, but ranging from negligible to very low due to variability. In one study, some pigs shed low levels of viral RNA for short periods of time, but no live virus was detected. Even studies with SARS-CoV suggest very little, if any, shedding . The uncertainty is moderate.
- **Most likely negligible for poultry**. All studies conducted so far are in agreement that birds are not susceptible to infection; therefore, the probability of shedding and infectious contact were considered not applicable. The uncertainty is low.
- **Most likely very low for ruminants**, but ranging from negligible to low due to variability. There are very few experimental study results related to shedding of SARS-CoV-2 in these animals, but the likelihood of infection is considered very low as mentioned in question 1. The uncertainty is high.
- **Most likely very low for horses**, but ranging from negligible to low due to variability. There have not yet been any experimental study results related to shedding of SARS-CoV-2 in these animals, but the likelihood of infection is considered very low as mentioned in question 1. The uncertainty is high.

Given the current context of a global pandemic, with a vast number of cases resulting from exposure to sources other than livestock, **the overall national-scale impact on human health associated with this hazard is considered to be negligible to low**. The impact could be higher in cases involving highly susceptible individuals, though, on average, these individuals are less likely to have contact with livestock than with companion animals.

Variability in the estimate is dependent on risk factors, such as: type of farm and level of biosecurity, use of the animal (in the case of horses), exposure dose, host-related factors, and the occupation of the person (i.e., general public versus veterinarians). The probability of a person being infected by another person is notably higher than any probability of being infected via livestock. Key uncertainties that will affect the probability estimate include: infectious dose, and the probability of infection and shedding of an infectious dose by the animal.

Question 3: What is the probability of the presence of infectious (SARS-CoV-2) virus in the meat, edible tissues, milk or eggs of livestock at the beginning of processing?

In order to inform food safety risk assessments, the probability of SARS-CoV-2 presence in meat, edible tissues, milk or eggs at the beginning of processing was examined. As with question 2, this is first dependent on the livestock becoming infected from exposure to an infected human. The virus must then be present in sufficient quantities in certain parts of the infected animal. The probability of this scenario is:

- **Most likely negligible for pigs**, but ranging from negligible to very low due to variability. Even if one of these animals becomes infected, systemic infection and spread beyond respiratory and gastrointestinal tracts is unlikely. The uncertainty is moderate.
- **Most likely negligible for poultry**. All studies conducted so far are in agreement that birds are not susceptible to infection; therefore, the probability of virus being present in meat, edible tissues or eggs was considered not applicable. The uncertainty is low.

- **Most likely very low for ruminants**, but ranging from negligible to low due to variability. Even if one of these animals becomes infected, systemic infection and spread beyond respiratory and gastrointestinal tracts is unlikely. The uncertainty is high.

In addition to the sources of variability and uncertainty listed above, there is uncertainty associated with the pathophysiology of infection in these species, especially ruminants.

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Appendix: Definitions of qualitative estimates

Table 1 - Likelihood Definitions

Likelihood of event occurring	Descriptive Definition	Likelihood of event NOT occurring
Negligible	The likelihood of the event is virtually zero	High
Very low	The event is very unlikely	Moderate
Low	The event is unlikely	Low
Moderate	The event is fairly likely	Very low
High	The event is likely	Negligible

Table 2 – Uncertainty categories[1]

Uncertainty category	Interpretation
Low	There are solid and complete data available; strong evidence is provided in multiple references; authors report similar conclusions. Several experts have multiple experiences of the event, and there is a high level of agreement between experts.
Moderate	There are some but not complete data available; evidence is provided in a small number of references; authors report conclusions that vary from one another. Experts have limited experience of the event and/or there is a moderate level of agreement between experts.
High	There are scarce or no data available; evidence is not provided in references but rather in unpublished reports or based on observations, or personal communication; authors report conclusions that vary considerably between them. Very few experts have experience of the event and/or there is a very low level of agreement between experts.

Table 3. Description of the magnitude of the effects

Magnitude of the effect	Description of the effect
Indiscernible	Not usually distinguishable from normal day-to-day variation
Minor	Recognisable, but minor and/or reversible
Significant	Serious and substantive, but usually reversible
Severe	Extremely serious and/or irreversible

[1] Source: Fournie G, Jones BA, Beauvais W, Lubroth J, Njeumi F, Cameron A & Pfeiffer DU, 2014. The risk of rinderpest re-introduction in post-eradication era. *Prev Vet Med* 113 (2): 175-184.

Table 4. Guidelines for determining the overall, national-scale impact of establishment and/or spread[2]

Overall impact	Description of impact
Extreme	The effects are likely to be severe at the national level. Implies that economic stability, societal values or social well-being would be significantly affected.
High	The effects are likely to be significant at the national level and severe within affected zones. Implies that the effects would be of national concern. However, significant effects on economic stability, societal values or social well-being would be limited to a given zone.
Moderate	The effects are likely to be minor on a national level and significant within affected zones. The effects are likely to be severe for directly affected parties.
Low	The effects are likely to be minor within affected zones and significant to directly affected parties. The effects are likely to be minor at the national level.
Very low	The effects are likely to be minor to directly affected parties. The effects are likely to be indiscernible at any other level.
Negligible	The effects are likely to be indiscernible at any level within Canada.

[2] Modified from: Biosecurity Australia, 2009. Draft Import risk analysis report for horses from approved countries: final policy review [Internet]. Available at: http://www.daff.gov.au/__data/assets/pdf_file/0018/1410651/2009_28_Horses_draft_IRA_report.pdf (last accessed 2014-04-04).

BC BROILER HATCHING EGG COMMISSION
BCBHEC
established 1988

November 4, 2020 **VIA EMAIL**

Peter Donkers, Chair
BC Farm Industry Review Board
PO Box 9129 Stn Prov Govt
Victoria, BC V8W 9B5

Dear Mr. Donkers,

PROCESSING AGE AND STATUS OF THE LINKAGE

The following is in response to the October 30, 2020 decision of the BC Farm Industry Review Board (BCFIRB) regarding a decision of the BC Broiler Hatching Egg Commission about a change to the breeder processing age.

First, the BCFIRB statement that the "Panel and other stakeholders received the Decision from the Commission following BCFIRB's request on October 23, 2020" must be corrected for the record. As already communicated to BCFIRB, the Commission's decision on October 21 was issued principally because of the immediate requirement to adjust complicated processing schedules to accommodate the necessary reduction in processing age. As also already communicated to BCFIRB, and which stakeholders should know, there was no urgency with respect to pricing as the actual effect on chick pricing would not occur until approximately three weeks after the commencement of Period A-166 on October 25, 2020.

The October 21 decision was communicated to all hatching egg producers and hatcheries as soon as it was finalized. In addition, as instructed, the chair of the Commission's Pricing and Production Advisory Committee (PPAC) immediately relayed the decision to the individual members of the PPAC and the BC Chicken Marketing Board's PPAC. Representatives of the Primary Poultry Processors Association of BC and the BC Chicken Growers' Association are members of the Chicken Board PPAC. These and other stakeholders knew of the decision on October 21 and that it was to be followed by a "detailed rationale". That same distribution process, in which BCFIRB had no role, was followed for the release of the October 23 rationale as soon as it was finalized.

Further, the Commission had earlier instructed its PPAC chair (also chair of the Chicken Board PPAC) to notify the latter's PPAC members of the upcoming processing age issue. The Chicken Board (a director of which is also a member of the Commission PPAC), hatching egg sector and chicken sector stakeholders were all aware of the processing age issue before the Commission and had opportunity to raise their concerns directly. All were aware that given the ongoing reductions to Chicken Farmers of Canada

allocations due to COVID-19 that an increase in imports by the hatcheries likely would replace domestic production. Without a reduction in the processing age and a linkage adjustment, the cost of removing domestic production would be at the further and sole cost of the Commission and hatching egg producers; who have already experienced significant product removal costs due to COVID-19. Again, all stakeholders were aware of these matters as they applied here and through Commission reporting during COVID-19. These stakeholders were provided with the Commission's decision and rationale as soon as each was finalized.

Second, the Commission was unaware that it was a requirement for "all parties" to agree with a decision of a regulatory agency. The Commission's decision was made in accordance with section 9 of the British Columbia Broiler Hatching Egg Scheme and "all parties" had an opportunity to provide input; contrary to what seems to be BCFIRB's impression. It would have been an abrogation of the Commission's statutory decision-making responsibility to, as suggested by BCFIRB, present the Panel with a prior approval request following the October 14, 2020 hatchery request to reduce the processing age without due diligence and consultation with all stakeholders by the Commission. Nor could BCFIRB have reached a decision of its own without due process.

As will be discussed below, even though this decision – supported by reasons – was focused on determining the appropriate processing age, the Commission did turn its mind to the question of pricing and determined that it was entirely in accordance with the linkage (i.e., the current "pricing structure"). Consequently, the price change which followed from the application of the linkage formula was compliant with BCFIRB's direction of July 3, 2020. To be clear, without the pricing implication involved through the linkage (unless the decision was to increase the age and reduce the chick price), most other stakeholders would have been less concerned about the Commission's processing age decision. The exceptions would be hatching egg producers and hatcheries facing an oversupply situation, with the latter triggering that oversupply by increasing its imports even though penalties had been waived.

Third, as the Commission has not been copied on all the stakeholder submissions referenced in the BCFIRB decision it is not able to address those submissions and issues arising. The Commission is prepared to do so if and as required once it is in receipt of the information upon which BCFIRB has relied.

Fourth, and most critically, the BCFIRB decision amounts to a complete rejection of the existing linkage between the Commission and Chicken Board. In a February 11, 2020 letter to BCFIRB and stakeholders involved in the processing age appeal, counsel for the Commission advised that it was the expert opinion of Serecon Inc. – which manages the linkage on behalf of the boards – that the processing age was an input factor in the linkage calculation.

Attached is a letter from Serecon provided to the Commission on October 30, 2020 reiterating that this is the case. It is also important to note that the Chicken Board's July 15, 2015 letter expressly confirmed in writing that it agreed to the inclusion of the processing age as a factor in the linkage calculation. It was after that letter that Serecon began "formally requesting information" on the processing age in support of its linkage calculations.

By way of illustration, BCFIRB's direction that the Commission provide a "statement of economic impact" demonstrates a fundamental misunderstanding of the linkage. The Commission's due process outlined

above was for the purposes of determining whether a reduction to the processing age was required. The Commission determined that one was required as outlined in its October 3, 2020 reasons. It was not a pricing decision as the resulting input change to the linkage was automatic, as is the case for other changes to input costs such as feed pricing and breeder chick pricing by hatcheries. This standard operation of the linkage notwithstanding, the Commission did turn its mind to the July 3, 2020 direction of BCFIRB and determined that the processing age decision was in compliance and that no exceptional circumstances were present.

In a January 27, 2020 appeal submission to BCFIRB, and in reference to linkage-related issues including the processing age, counsel for the Commission advised that "(t)hese issues speak to the futility of a linkage agreement in circumstances where the (Chicken Board) and other stakeholders engage in conduct that has the effect of frustrating and subverting the agreement's original intent and purpose." The effect of BCFIRB's October 30, 2020 decision is to provide formal recognition that pricing is no longer linkage based.

The Commission remains fully supportive of BCFIRB's overall objective of resolving chicken sector pricing in BC. Similarly, the Commission will continue to work closely with the Chicken Board in the regulation of our respective sectors. However, given the demonstrated futility of working within a linkage, which has now been followed by BCFIRB's decision to depart entirely from the existing linkage system, the Commission has determined that it is in the best interests of the BC hatching egg sector to ensure that in the current supervisory review, the pricing concerns of the sector are separate and distinct from pricing issues between the Chicken Board, chicken growers and processors.

1. As communicated since April 2018, the Commission is of the view that pricing for supply management producers should be based on a cost of production formula (COPF). This is the case for hatching egg producers in other Canadian jurisdictions and the Commission has been working with its Alberta and Saskatchewan counterparts in establishing a joint COPF in support of a consistent approach to hatching egg pricing across western Canada. (Manitoba has been included in these discussions but presently prefers to continue pricing off its own COPF.)

   As a result of the ongoing problems with the linkage and a lack of transparency and accountability in chicken sector pricing, the Commission has now determined that its primary focus during the review will be hatching egg sector pricing.

   One component will be establishing a western-based COPF for BC hatching egg producers. This will be accomplished in the following stages (detailed work plan to follow):

   a. a full updated survey of BC hatching egg producers currently being conducted by Serecon;

   b. the publishing of a draft COPF for BC hatching egg producers for comment by stakeholders;

c. submission of the draft COPF and stakeholder comments to a third-party for verification; and,

d. submission of the new COPF to BCFIRB for approval.

This will ensure BC hatching egg producers are treated the same as hatching egg producers in other Canadian jurisdictions, provide clarity and consistency to hatching egg pricing and remove current pricing pressure points such as the processing age and spent fowl as they will be automatically factored into the COPF.

2. In October 2019, a committee comprised of Commission and BC Egg Hatchery Association representatives concluded negotiations – conducted in good faith by both parties – regarding the establishment of hatchery margin, breeder chick pricing and vaccine pricing formulae. The Commission released those formulae to stakeholders but deferred establishing an implementation process due to issues arising from the linkage and the current live price formula of the Chicken Board.

   The Commission will be establishing a distinct workplan within the review to confirm this second component of hatching egg sector pricing with stakeholders. Following which these formulae will be submitted to BCFIRB for approval. This will again provide clarity and certainty in pricing and by using formulae, further reduce current pricing pressure points in the system.

   The Commission will continue to work with the Chicken Board in attempting to establish conditions for a three-way linkage. However, that discussion will now be based on the hatching egg COPF and the October 2019 hatchery margin, breeder chick and vaccine pricing formulae.

In conclusion, the Commission again notes corrections were needed to the BCFIRB October 30, 2020 letter and that BCFIRB's direction that prior approval of the processing age is required conflicts with, and indeed, decisively breaks the current linkage.

As laid out in the Commission's October 23, 2020 reasons, not changing the processing age will result in additional costs (removing domestic eggs from the market) borne solely by hatching egg producers. Not respecting the current linkage – intended to balance costs of production between hatching egg producers and growers – negatively impacts BC hatching egg producers to the benefit of chicken growers (who seem to be again receiving premiums) and processors (which corporately benefit economically from their hatcheries increased use of imports). Again, it is unlikely that those parties would have objected to a decision by the Commission to maintain the processing age at 56 weeks (with hatching egg producers bearing any removal costs) or an increase the processing age that would have reduced the chick price.

This and other issues have proven the Commission was correct in saying that it should withdraw from the linkage. It is flawed in several ways, including with respect to premiums and in forestalling the hatcheries receiving a margin increase. Pricing through the linkage has proven untenable for the BC hatching egg sector. The Commission's focus now is on establishing separate and distinct pricing formulae for that sector that provides for consistency and clarity in pricing while reducing pricing pressure points.

The Commission has developed a pricing framework for its sector that supports the structural complexity and long-term planning requirements of its stakeholders. It also supports a larger, strategic approach to hatching egg pricing in the west and, potentially, nationally. We leave to the Chicken Board the issues of a reasonable return for chicken growers and determining processor competitiveness. Other matters such as addressing assurance of supply, premiums (pricing transparency) and processor ownership of broiler quota are not at issue in the hatching egg sector. The Commission appreciates that the scope of issues facing the Chicken Board is far greater than determining a live price. Resolving these complicated issues, combined with the clarity and certainty of hatching egg sector pricing formulae, will enable the Chicken Board to establish an appropriate pricing framework for BC chicken growers and processors.

In the meantime, the Commission respectfully requests that BCFIRB recognize that the processing age production decision was made by the Commission following due process and supported by reasons. It remains the Commission's view that the existing pricing linkage should continue to operate in accordance with its "original intent and purpose" until COPF pricing is brought into effect.

Yours truly,

Jim Collins, Chair
BC Broiler Hatching Egg Commission

Attachment

cc:
Stephanie Nelson, Executive Director
BC Broiler Hatching Egg Commission

Harvey Sasaki, Chair
BC Chicken Marketing Board

Bill Vanderspek, Executive Director
BC Chicken Marketing Board

Bryan Brandsma, President
BC Broiler Hatching Egg Producers' Association

Ryan Whitmore, President
BC Egg Hatchery Association

Dale Krahn, President
BC Chicken Growers' Association

Blair Shier, President
Primary Poultry Processors Association of BC

Wendy Holm
BCFIRB Pricing Liaison

Art DeRuiter, Director
BCBHEC PPAC

Ernie Silveri,
BC Egg Hatchery Association

Craig Evans
Primary Poultry Producers Association

Jennifer Curtis, Executive Director
BC Chicken Growers' Association

Commission website

We Have Moved!

BC BROILER HATCHING EGG COMMISSION

BCBHEC

established 1988

As of July 22, 2020

BC Broiler Hatching Egg Commission's New Office is located at:

#210 – 1848 McCallum Road, Abbotsford BC, V2S 0H9

Due to COVID-19 we are not currently accepting visitors

Phone: 604-850-1854
Website: www.bcbhec.com
Email: naylene@bcbhec.com

BC BROILER HATCHING EGG COMMISSION

BCBHEC established 1988

MEMO

TO: **Mainstream, Specialty, and Pullet Growing Producers**

FROM: **Commission On-Farm Staff**

DATE: **November 2, 2020**

SUBJECT: **Audits: Cycle, Records & Recertification Stickers**

Audit Cycle

With the addition of the Animal Care Program the audit cycle has shifted to a 15-month rotation.

Historically, at the beginning of the year, On-Farm staff sent out reminder emails to producers on their upcoming audit month. With the new 15-month rotation, the On-Farm Staff will be sending out reminder emails 2 months before the start of a new audit cycle starting immediately.

Audit Records

If you would like to access all audit program records, please log into the producer's side of the BCBHEC website (www.bcbhec.com) and click on the 'Producer Docs' tab.

Audit Recertification Stickers

You will continue to receive a recertification letter for the three schedule 5 audit programs. Audit stickers with the applicable year will be sent to you with your recertification letter once you have passed all three audits. You will receive the sticker with the year that you passed each specific audit, and these stickers should be placed on your specific audit program certificate.

Please direct any questions to Kaitlyn in the On-Farm department.

Regards,

Commission On-Farm Staff
BC Broiler Hatching Egg Commission