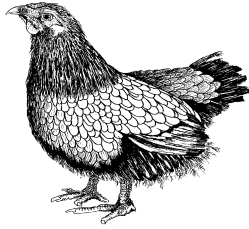
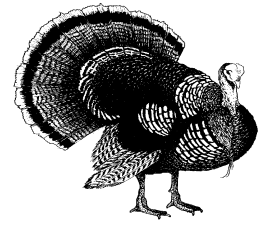


BC Sustainable Poultry Farming Group



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Newsletter

Members

President:

Ralph Volkmann
BC Turkey Assn.

Vice-President:

Dave Siemens
F.V.E.P. Assn.

Frank Flokstra
B.C.C.G. Assn.

Hester Mulder
B.C.H.E.P. Assn.

B.C.M.A.L.

Advisors:

Stewart Paulson, P.Ag.

Program Manager:

Kevin
Chipperfield, P.Ag.

Technical Assistant:

TBA

SPFG Office:

4582 Bell Rd.
Clayburn, B.C.
V3G 2M1

Tel: 604-556-7781

Fax: 604-556-7783

email: kchip@shaw.ca

Website :

www.sustainablepoultry.com

Your Top Fraser Valley Environmental Issues - a look at water & air quality impacts

The BC Sustainable Poultry Farming Group has been involved in researching and creating awareness for water quality issues related to the poultry industry for about 18 years. During the last five years, we have been involved in also addressing air quality issues, both in and outside the barns.

Generally speaking, water quality issues are relatively difficult to assess in terms of the contribution from poultry farming activities such as manure storage, handling, and application to cropland. These issues are considered to be non-point source due to the fact that while an individual source alone may not present a significant problem, the contamination of our groundwater is the result of cumulative stresses from many sources.

In contrast, air quality issues involving dust and odour tend to be perceived as more farm specific so that the influence is primarily confined to one neighbourhood. Certainly, air quality issues are important when considering their combined impact on the Fraser Valley air shed, but at this time, it is the

Initial concerns for the newly formed SPFG were specifically water quality related and focused mainly on the Abbotsford Aquifer

Current SPFG Program Partners

Agriculture Environment Partnership Initiative	B.C. Turkey Assn.
B.C. Chicken Growers' Assn.	Agriculture and Agri-Food Canada
F.V. Egg Producers' Assn.	B.C. Ministry of Agriculture and Lands
B.C. Broiler Hatching Egg Producers' Assn.	Environment Canada
Greater Vancouver Regional District	BC Ministry of Water, Land, and Air Protection

At A Glance ... What's Inside

Your Top Fraser Valley Environmental Issues	1
Director's Corner	2
Air Quality Options for Poultry Producers—New Trial Results	4
A New Workplan for the BC SPFG—beginning April 2009	5
Conveyor Use / Hauling Rates	6

Director's Corner

Hester Mulder is a relatively new director to the SPFG and gives her views on SPFG operations

The BC Sustainable Poultry Farming Group (SPFG) is a committee made up of members from the supply managed poultry associations in the Fraser Valley. They strive to meet the ongoing needs of each of the feather groups through various projects aimed at finding alternatives or solutions.

After becoming a member of the SPFG in the past few months, I have noticed that each member has a strong commitment and dedication towards making each of the feather groups work more efficiently. We meet monthly to discuss any ongoing projects and alternatives for improvements as well as any new items which need our attention.

One of the projects the SPFG is currently working on is a project to "Reduce Biological Particulate Matter in and Outside of Broilers Barns." This project involves obtaining air quality evaluation samples from

inside and outside of the broiler barn to see how the reduction of dust, etc. in the air has an effect on the performance of a broiler chick. Specialized equipment is required to gather samples of air quality.

In my opinion, the SPFG needs to continue to work with the four feather groups to ensure that solutions and alternatives are met. Each feather group working along-side each other within the SPFG will create a team atmosphere in which the poultry industry will be valued for its' environmental leadership in the future.

As we become more of a "green" earth, the SPFG is playing a major role in fighting for this cause. As the SPFG continues to explore and research ideas, we are leading the way in promoting a more "green" environment.

Hester Mulder
BC Broiler Hatching Egg Producers Assn. Director

Top Fraser Valley Environmental Issues Continued ...

individual source that generates the greatest public (i.e.,neighbour) concern about poultry farms.

Water Quality Issues

The most focused concern related to water quality has been the groundwater nitrate levels of the Abbotsford Aquifer. There are other aquifers of concern such as those in Chilliwack and Langley, but the presence of a large and dense poultry industry within Abbotsford, especially located over the Abbotsford Aquifer, presents the highest level of public concern.

The issue of groundwater quality within the Abbotsford Aquifer has been the target of at least two decades of research on causes and implications as well as educational programs aimed at changing behaviours that increase the risk of pollution. In fact, the BC Sustainable Poultry Farming Group began the Groundwater Protection Program in the fall of 1995 to reduce any risk that might be caused by current poultry waste management activities.

The City of Abbotsford recognizes that the water quality in the Abbotsford Aquifer is not suitable for large-scale use as a potable water supply. Certainly, there are limited areas of the Aquifer that have good water quality but there is an increasing interest in accessing larger amounts of water for community needs, especially in times of crisis or extraordinary community demand. One example of a crisis situation would be damage to the water supply lines where they lie on the riverbed of the Fraser River. Such a situation would put the community in dire need, especially if it occurred in the summer.

The City of Abbotsford recognizes that the water quality in the Abbotsford Aquifer is not suitable for large-scale use as a potable water supply.... At this time, there (City of Abbotsford) is a feeling that for a shift to occur in industry practices which affect groundwater quality, some sort of governance structure may be necessary....

The City has created a ‘stakeholders’ group which includes a large representation from agricultural interests. This group has examined the pollution issues surrounding the Abbotsford Aquifer for many years. At this time, there is a feeling that for a shift to occur in industry practices which affect groundwater quality, some sort of governance structure may be necessary. This governance body would then be charged with the responsibility of ensuring that groundwater nitrates for example would be reduced to acceptable levels for community consumption.

For further information and clarity on Abbotsford Aquifer issues, you are invited to attend a groundwater forum in Abbotsford which is scheduled for February 25, 2009. RSVP recommended. Further details are still being discussed but more information can be obtained from, and RSVP made to the SPFG office, or call Peter Andzans, Manager, Community Sustainability Division office at the City of Abbotsford 604-864-5529.

Air Quality Concerns

For many years, various levels of government have been concerned about particulate matter emitted from poultry farming operations. Generally, the present standard of measure is comprised of 3 categories: Total particulate matter (Total PM); particulate matter 10 microns or less in size (PM10); and particulates 2.5 microns in size or less (PM2.5). In the past, total PM and PM10 have been the standard measure. However, today, emphasis is being placed increasingly on the PM2.5 fraction.

Smaller particles, PM2.5 are considered to carry significant health risks when inhaled as they are capable of being deposited deep into the lungs which allows their potential absorption into the bloodstream. PM 10 is considered filterable by the human nose.

Total PM which not only includes the finer fraction, but also the coarse and more readily visible fraction is generally not measured in most research studies as this is not considered to be a health risk to the same extent as the finer fraction. However, this coarse fraction may be the more important issue related to complaints from neighbouring properties due to its highly visible characteristics. The good news is that

the coarse fraction is generally easier to capture and control than the finer fractions.

Several years ago, ammonia emission was also added as a concern. In fact, ammonia has been labeled as a toxic substance by Environment Canada. As such there is some interest in limiting its emission from agriculture, including sources from the poultry industry.

The BC Sustainable Poultry Farming Group recognizes that these environmental issues are important and has been at the forefront in working with the poultry industry and government researching the issues. SPFG accomplishments over the past five years are:

- ✦ Researching and developing ways to incorporate trees into the landscape around farm operations to effectively capture dust so that it does not leave the poultry farm. Trees can also be an effective tool to reduce the visual impact of poultry farms near densely populated areas.
- ✦ Working cooperatively with various government agencies to assess the relative contribution of ammonia and particulates from poultry farming operations in the Fraser Valley.
- ✦ Leading the research into reducing dust levels within the poultry barn environment through an innovative technique that ionizes the barn air with a technology called Electrostatic Space Charge System (see article next page on New ESCS Trial Results)
- ✦ Working with the BC Farm Industry Review Board to help poultry producers who require assistance to resolve air quality complaints against their farm operation. The SPFG has acted as intervenor through suggesting practical ways in which changes can be made to resolve issues to the satisfaction of all parties.

Did you know.... Today, dust in air to gauge quality is measured as:

- ⇒ Total PM (particulate matter sized greater than 10 microns)
- ⇒ PM10 (particles 10 microns and smaller which can be breathed in but are believed trapped in the nose)
- ⇒ PM2.5 (particles 2.5 microns and smaller which are respirable. Constituents may enter the bloodstream creating the greatest human health risk)

Air Quality Options for Poultry Producers—New ESCS Trial Results

The SPFG is working on several ways to reduce the impact of poultry farms on the air quality of adjoining properties. In the last SPFG newsletter (Fall 2007), research into the use of an in-barn electrostatic device called the Electrostatic Space Charge System, (or ESCS) to charge barn air was introduced. From the SPFG perspective, the overall purpose of this project is to find an affordable way for producers to reduce dust emissions from poultry farms. Since then, the SPFG and project partners have had a great deal of success with this technology.

Particulate Removal Effectiveness

Table 1 provides an overview of the percentage of particulate material that is removed from the in-barn environment of a typical broiler farm which housed 20,000 birds per cycle. From this table, it can be seen that greater removal is achieved in the first 14 days versus the end of the cycle (Days 26—end) for both larger PM10 and smaller PM2.5 particles. Of note is the observation that even the lowest mean removal rate at 38 % for PM 2.5 near the end of the cycle when the dust loading is the greatest is significant. As well, PM10 at 45 % removal is even greater. It is quite likely that particles greater than PM10 (10 microns) could be removed to even a greater extent, as the trend from the data may suggest. However, at the

present time the SPFG does not have the capability to test accurately for much larger particles.

Flock Performance Improvement Benefits

In carrying out this study, the SPFG recognized the importance of tying a better environment inside the barn with flock productivity gains.

Table 1 Effectiveness of ESCS—Dust Emission Reduction Statistics (% Particulate Removal over 8 broiler cycles)

	Days 1 - 14		Days 15 - 25		Days 26 - end	
	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10
High	78%	82%	67%	70%	44%	53%
Low	47%	41%	44%	40%	30%	28%
Mean	69%	69%	54%	58%	38%	45%
Median	72%	71%	53%	60%	41%	50%

With this in mind, Table 2 summarizes some of the flock productivity data collected for 5 broiler cycles. From this table, it can be seen that feed conversion gains have been achieved in the order of 0.04—0.07 or 3—4% improvement. In addition, body weights for the birds were greater for the ESCS treatment.

For this 20,000 bird per cycle barn, the value per bird per cycle was calculated to be \$0.06—\$0.09. This suggests the technology is economically feasible and has the potential for payback in less than 2 years.

Table 2 Preliminary Results—5 Cycle Broiler Flock Performance Evaluation of ESCS on Feed Conversion and Body Mass for Treatment Barns

Cycle #	Average Bird Density (ft ² /bird)		Feed Conversion		Body Mass (kg) ¹	
	Control	ESCS	Control	ESCS	Control	ESCS
1	0.88	0.78	2.00	1.94	37,979	39,076
2	0.82	0.80	1.73	1.69	36,771	37,792
3	0.93	0.91	1.59	1.55	42,777	44,246
4	0.99	0.92	1.76	1.69	39,875	40,209
5	0.92	0.92	1.75	1.69	39,145	41,140

¹ Calculations based on shipment weights to processing plant

How does this study strategically address dust and odour complaints when lodged against Fraser Valley poultry producers?

This study demonstrated and evaluated the ESCS technology which can be utilized on broiler farms to effectively reduce dust within barns and impacts outside of the broiler farming environments. This has positive implications for both flock and poultry farm worker health, though these aspects were not seriously examined within the study's parameters. A study is now underway to examine the microbiological effects of the technology on poultry pathogens and flock health.

In terms of large-scale adoption of this technology, financial calculations indicate that there would be

flock performance improvements of such nature that investment and use of the ESCS technology would be a prudent business decision.

The SPFG would like to thank its institutional partners identified below:

- ⇒ Dr. Shabtai Bittman, Agriculture Canada, Agassiz
- ⇒ Gustav Rogstrand, BC Minister of Agriculture and Lands, Abbotsford
- ⇒ Dr. Karen Bartlett, UBC School of Occupational & Environmental Hygiene

As well, thanks is given to the highly valued technical and supervisory assistance provided by David Poon and Raj Sangha.

New BC SPFG Workplan – an approach building on past success and creating value towards identifying solutions

Resolving environmental issues on poultry farms requires a creative and well-considered approach. Some of the issues, such as groundwater quality declines due to high nitrate levels are likely the result of cumulative increases in manure and fertilizer nutrients applied to land over many years from many different farm sources. Other issues such as air quality and pest management are more apparent on an individualized farm basis, but affect the industry image as a whole. The SPFG intends to embark on a course of action over the next three years that will work towards dealing with these issues in a cooperative, partnership based approach.

The identified areas for project development could be:

- ⇒ Air quality
- ⇒ Pest and manure management
- ⇒ Energy conservation options
- ⇒ Developing manure marketing and processing options

1/ Air Quality

The SPFG has had success with two technologies to reduce dust emissions from poultry farms: vegetative filters (used outside the barn at exhaust fan outlets) and an Electrostatic Space Charge System (ESCS)

for ionizing in-barn air. A final report is forthcoming on the potential use of these technologies on Fraser Valley poultry farms. Given the successes to date, the new workplan will seek to further research the application and optimal use of vegetative filters on poultry farms and increase the scope of tested production types from the present broiler farms

The SPFG intends to ... work towards dealing with these issues in a cooperative, partnership based approach over the next 3 years.

2/ Pest and Manure Management

In-barn manure composting (heat treatment) has shown significant potential for the control of flies and poultry disease. The commercial layer industry is frequently plagued by the necessity and associated costs of controlling flies. Chemical and/or biological control of flies can be a costly venture with outcomes that are not always guaranteed. For the broiler industry, costs for the cyclical addition of shavings, as well as manure storage in the fall and winter add significant operational costs.

The SPFG feels that there is an opportunity to investigate the use of new composting machinery for in-barn operation. For a broiler farm, research suggests

Air Quality Research Cont'd ...

that in-barn windrowing of manure for a relatively short period of time can reduce poultry pathogens, while increasing the number of microbes potentially antagonistic to poultry pathogens. The resultant 'heat treated' product could then be re-used in the barn or delivered to a field as a biosecure fertilizer product. For egg producers with a highrise barn situation, information suggests that in-barn turning of manure in the manure pit can reduce fly populations while reducing manure moisture. Wet manure can be a serious issue when poultry drinkers leak and provide ideal conditions for fly population explosions. Commercially available technology exists that can be added to a farm tractor or skid steer loader.

3/ Energy conservation options

The application of energy conserving technologies to reduce the carbon footprint of BC poultry farms requires serious consideration. This project will explore and possibly demonstrate ways in which available energy saving measures could be utilized on poultry farms.

4/ Developing Manure Marketing and Processing Options

Over the last three years, the SPFG has sought to develop manure markets in the BC interior and Vancouver Island. In addition, supporting the development of manure processing options and assuring manure supply has also been of prime importance. The SPFG intends to continue to develop and support manure options that will reduce the environmental footprint of the poultry industry in the Fraser Valley.

Your Input Is Appreciated

If you would like the SPFG to investigate possible solutions to an environmental concern facing the Fraser Valley poultry industry please call Kevin Chipperfield, or your Association representative on the SPFG directorship to discuss. It is in the interest of all SPFG members to ensure that the SPFG program is as relevant and effective as possible at meeting the environmental needs of today's Fraser Valley poultry producers.

GPP Conveyor Use and Hauling Rates for 2008 ***- Two Options for Fraser Valley Poultry Producers***

The GPP continues to offer poultry manure hauling services to 'distant markets' for 'dry' manure, and as the occasion presents, 'wet solid' manure. Two factors allow the SPFG to deliver to distant markets: use of large volume trucks and the ability of poultry farmers to load these trucks through the use of SPFG conveyors. To make this service convenient, the GPP offers the following conveyor usage fee options:

☛ **Option #1 Full Rate** is designed for producers who use full SPFG manure marketing and hauling services. Payment of fee in this scenario is on a straight user fee basis (**\$250 per load beginning August 1, 2008**). A **discount of \$50 per load** is possible for producers with a roofed manure storage facility. This discount is available to provide an incentive to producers with a covered manure storage facility large enough to store manure over a substantial period. This discount may be available during the winter or summer rate period at the discretion of the SPFG depending on market demand. However, since it is not likely that there will be a significant demand for manure during the late fall and winter period, manure will likely be scheduled for pick up during the summer rate period. Option #1 generally includes the conveyor delivery fee, depending on location.

☛ **Option #2** is conveyor rental only. The charge for conveyor rental is \$1.00 per cubic yard conveyed + conveyor delivery fee. The poultry producer is responsible for all arrangements involving manure transportation and marketing.