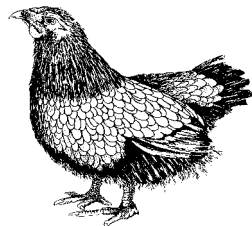
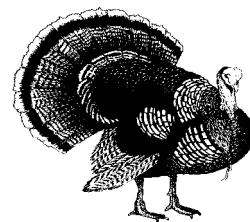


# Sustainable Poultry Farming Group



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## Newsletter

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## Project Summary—Evaluation of Options for Fraser Valley Poultry Manure Utilization

Beginning in fall 2002, all four supply-managed feather associations, along with the Sustainable Poultry Farming Group, cooperatively initiated a study with Timmenga and Associates to evaluate:

- ⇒ The balance between the amount of nutrients in the Fraser Valley from live stock and poultry manure and inorganic fertilizer and available land-base for utilizing those nutrients;
- ⇒ Suitable options for the utilization of those nutrients which exceed the capacity of Fraser Valley crops and present non-crop need for nutrients

Funding for this study was provided by the Agriculture Environment Partnership Initiative and by the BC Chicken Growers' Assn., BC Turkey Assn., FV Egg Producers' Assn., and BC Broiler Hatching Egg Producers' Assn.

*the livestock and poultry manure nutrient supply in the Fraser Valley currently exceeds the needs of the local land-base*

### **Report Highlights**

Poultry industry growth projections suggest that an additional 80,000 tonnes of manure will be produced by the year 2010. From the 240,000 tonnes (745,000 cubic yards) produced in 2001, the total for 2010 would then be 320,000 tonnes (or close to 1 million cubic yards) annually.

## 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, Fisheries, and Food
B.C. Broiler Hatching Egg Producers' Assn.	BC Ministry of Water, Land, and Air Protection
Greater Vancouver Regional District	
Environment Canada	

### ***At A Glance ... What's Inside***

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## *Pou-l-try in Motion* .....

### **You've Seen the Movie Now Eat the Cast**

A couple of years ago my daughter and I watched a British claymation movie called "Chicken Run." From the entertainment perspective it was a remake of "The Great Escape" and amusing to watch. However, I couldn't help but think of the *Disneyesque* angle of giving the poultry actors human qualities and names. After all, this is little more than a food group staring in its own full length movie.

It reminded me of the kid who asked a cowboy what his horses' name was. "Name?" the cowboy questioned. "Listen kid, never name anything that you might have to eat." The remoteness and slow travel years ago meant that survival may have consisted of eating the mode of transport. The Inuit knew that lesson, too.

So the question remains.... Will the population of tomorrow lean towards being vegetarians because every "edible" animal species is identified with a popular movie and human qualities? Or if that same species is boxed in a toy spinoff will it be acceptable then to consider eating?

Remember kids, never make a negative comment about the cruelty shown in "Chicken Run" with a mouthful of chicken nuggets!

By:

Jim Elliott

SPFG Technical Assistant

P.S. If poultry consumption drops in the next month I have nothing to do with it

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### **Evaluation of Options Report Cont'd ...**

Based on available data on livestock numbers and crop acreage and fertility needs, nutrient balances were constructed for the Lower Mainland and Thompson-Okanagan Regions. The nutrient budget indicated that:

- the livestock and poultry manure nutrient supply in the Fraser Valley currently exceeds the needs of the local land-base
- the poultry industry is currently the largest source of manure-based nitrogen and phosphorus in the Fraser Valley, while the dairy industry remains the largest source of potassium
- the poultry manure nutrient surplus is expected to grow by 37% for nitrogen, 23% for phosphorus, and 2% for potassium by the year 2010.
- The Thompson-Okanagan Region had a manure-based nutrient deficit in 2001, primarily in phosphorus and potassium
- The largest crop grown, Alfalfa/grass forage could utilize large amounts of manure-based nutrients as fertilizer if marketed in a convenient form at an acceptable price
- The perceived value of poultry manure is important to potential buyers and if this value does not match the true cost of getting the manure product to the interior market, transportation subsidies may be required. The Thompson-Okanagan Region could absorb between 15,000 and 125,000 tonnes of raw and pelletized poultry manure, depending on perceived product value.

#### ***Factors affecting manure utilization***

The development of Environmental Farm Plan (EFP) program (led by BC Agriculture Council) is likely to affect the application of manure-based nutrients in BC. The adoption of EFP recommendations would de-

**Evaluation of Options Report Cont'd ...**

crease the amount of nutrients applied to fertilize crops by as much as 50%. Furthermore, such a decrease in applied nutrients would result in the need for twice as much land to absorb the present level of manure production. With this scenario, the development of alternatives to local land spreading seem imperative.

Feed additives have the potential to reduce nitrogen and phosphorus content of manure by 20 – 30%. Phytase is already used as a feed supplement in about 60% of laying hen flocks. Amino acid enriched feed could also be made available. However, birds for meat production generally ingest feeds with a makeup that is not amenable to the addition of phytase and possibly amino acid enrichment. As well, large-scale adoption would require sufficient feed testing capacity for analysis of amino acids in feed ingredients which does not presently exist.

**Local markets for value-added product**

The further growth of the mushroom industry and the ‘organic’ crop industry would increase its need for poultry manure by about 60,000 tonnes from the year 2001 to 2010. As well, local demand for a pelletized product has potential, but size of this market is small at 2,000 - 3,000 tonnes annually.

**Solutions**

***Technological***

Technologies that remove manure nutrients from production areas would be preferred in “solving the manure challenge”. Large-scale operations for generation of electrical power or for the production of manure-based pellets are probably not economically viable in the Lower Mainland.

Where such facilities exist, significant financial support and relaxed regulations are given that are not available in BC.

Small-scale technologies such as on-farm manure gasification of raw or processed poultry manure are possible. Such technology may be a cost-effective solution to transform manure into heat and energy rich products such as charcoal when installed in conjunction with agricultural facilities requiring large amounts of heat such as

**Trends in nutrient utilization due to Environmental Regulation**

Developed countries around the world are increasingly regulating the amount of nutrient applied to land. A brief summary can be seen below:

**Netherlands** – nutrient application strictly regulated by the maximum amount allowed on the land. Each load of manure from a barn is sampled and amount of nutrients calculated. If nutrient allowance is exceeded, then a charge is levied on the exceedance.

**Germany** – a ceiling of fertilizer/manure nutrient application is set based on balanced nutrient application calculation

**France** – a levy on excess nitrogen at the farm level is being discussed. A scaled system is expected to be introduced in which nitrogen production in excess of farm needs will be taxed at 0.20 to 0.23 Euro per kg of excess nitrogen.

**United States** — environmental issues related to poultry production generally centre along the Eastern Seaboard States. Maryland Dept. of Agriculture estimates if/when phosphorus based management practices are implemented, 50% of current poultry litter production would be affected.

**Alberta** — a newly increased regulatory presence, the Natural Resources Conservation Board, has taken shape in the last 2 years. The agricultural industry supports more government regulation as it is seen as allowing the industry to grow with less political intervention and more scientifically-based scrutiny.

**Sources of Funding for Environmental Initiatives in U.S.**

- ⇒ Funding sources in the United States include:
- ⇒ Bond financing at the County level
- ⇒ Operating subsidies at the State level
- ⇒ Public sector ownership and involvement (providing land, etc.)
- ⇒ Manure transportation subsidies
- ⇒ Federal and State electricity production rebates
- ⇒ Green energy purchase agreements
- ⇒ Carbon credits
- ⇒ Deployment grants, and
- ⇒ Environmental Quality Incentive Programs

## **Evaluation of Options Report Cont'd ...**

greenhouses. The amount of manure that could be used in this approach is substantial and could potentially absorb all of the surplus if many small-scale plants (about 24,000 tonnes each) are built throughout the Lower Mainland. The main challenge to this approach is that further testing is required to evaluate its ability to meet strict air emission standards and perform efficiently when gasifying poultry manure. Adequate performance on its abilities to deliver on both accounts will be required if it is to be economically viable.

### ***Suitable Options***

Based on the review of Timmenga and Assoc., several options are available to absorb the additional quantities of manure generated between now and 2010 (about 80,000 tonnes), and also to absorb some of the poultry manure produced in 2001 (about 240,000 tonnes). In order to make any option(s) work, a definitive plan will be required and a “business as usual” strategy will not be an option that leads to a reduction of poultry manure being applied to the local land-base in the Lower Mainland.

Selected options are combined into a multi-pronged approach comprised of:

- Basket Approach—the progressive phasing in of many of the options mentioned in this report, namely composting, granulating/palletizing, supplying local markets, further growth in the mushroom Industry, and value-added designer fertilizer products.
- Continue to supply smaller market volumes such as demand from the mushroom industry, manure composting, and small-scale manure pelletizing or granulation
- Ship manure to the Thompson-Okanagan Region of either raw or processed (pelletized or granulated) manure
- Develop on-farm or small scale gasification
- Market designer fertilizers through custom blending and manure processing.

The report suggests that several selected options can potentially be utilized to reduce the surplus of manure nutrients applied in the Fraser Valley. Depending on the manure nutrient surplus present, the volume required to be handled by each option can be escalated at any time determined by practical considerations and the cost-effectiveness of the option. At this time, the full cost of all options are difficult to estimate, however rough figures are known (see Table 1). The cost/benefits of shipment to the Thompson-Okanagan Region are fairly well known and will likely require some financial support from the industry or consumers. The other options appear to be either cost neutral or are expected to create revenue.

### ***Recommendations for further evaluation***

Timmenga and Assoc. recommends for further investigation:

- Shipment to the Thompson-Okanagan Region of both raw and processed poultry manure
- Small scale gasification to support the heating needs of greenhouses
- Establishing a pelletizing mill or granulating plant in the Lower Mainland to produce custom fertilizer blends;
- Introducing amino acids and phytase to poultry feed to lower or alter the nutrient content of poultry manure in light of the needs of the three options for manure disposal; and  
Developing funding sources to support the development of options, and revenue streams including carbon credits, support for research and demonstration, industry funding and ‘eco-fee’ funding.

### ***Present Situation on Report Recommendation***

The Sustainable Poultry Farming Group is continuing to develop manure fertilizer markets mainly for alfalfa/grass in the BC interior. Markets range from Merritt, Princeton and Lillooet to areas such as 150 Mile House, Vancouver Island, and Pemberton.

JF Bioenergy is seeking to locate a manure gasification plant in the Fraser Valley. Initially, JF Bioenergy

<b>Table 1</b>	<b>Potential Tonnage</b>	<b>Estimated Cost</b>	<b>Estimated Revenue</b>	<b>Estimated Net Revenue for Option</b>
<b>Option</b>				
	<b>tonnes</b>	<b>\$ per tonne</b>		
<b>Basket Option</b>	20,000-35,000	12-60	12-250	0-190
<b>Raw Manure to Thompson-Okanagan</b>	15,000-25,000	18-36	14-28	(22)-10
<b>Pelleted Manure to Thompson-Okanagan</b>	25,000-125,000	73	30-118	(43)-45
<b>Raw Manure in Gasifier (one or more)</b>	24,000-245,000	12	12-62	0-50
<b>Ganulated fortified manure (designer fertilizer, specialty market, local and distant market locations)</b>	10,000-125,000	160-210	250-350	90-140

needs to assess the ability of the plant to utilize poultry litter in the gasification process. The next step would be to develop an intensive air emissions testing project using poultry litter to identify whether emissions are within acceptable limits. At this time, the SPFG and JF Bioenergy are developing a proposal to further evaluate the gasification option for poultry litter.

The manure processing plant proposal as envisioned by YK Assoc. to be built near Agassiz, BC has been discontinued due to a lack of sufficient market size for the large volume of finished product. This report is available from the SPFG Office either on a floppy disc, or a copy can be emailed to your computer. Limited print versions are available.

Dust is ever present in our rural environment – whether from a farm tillage operation, a beef feedlot, or

### **SPFG Investigates Dust Emission issues—Initial trial looks into Diffusion of Dust from Broiler Barn Fan**

poultry barns. Modern poultry farming operations produce varying levels of dust as well as odour both in and outside the barn. Depending on the type of poultry farm, dust particle size and amount produced will differ. Also, as poultry farming intensity increases so does the amount of dust generated from poultry farms.

#### ***Dust Emission Project***

In the September 2002 version of the SPFG newsletter, an article entitled “Dust on Poultry Farms” gave an overview of dust issues as well as a possible alternative for controlling dust on poultry farms – the use of trees strategically placed on farms to filter dust from barn fans.

Dust has a full range of particle size from the visible to those that cannot be seen by the naked eye. In this study, particles of 10 microns in size and smaller are being examined separately from those larger in size. Since smaller particles will travel farther from their point of origin – in this case a barn fan – it is advantageous to understand the amount of dust particles in each size range to appreciate the potential for dust to move greater distances.

An important piece of information missing in the relationship of poultry barn dust with the surrounding en-

## Environmental Strategic Plan Cont'd ...

Environment is how quickly the natural settling action occurs after dust leaves a poultry barn. With such information, a study can determine the best location for the placement of trees to have optimal dust filtering effects.

Furthering the potential of this concept, the SPFG initiated a project during March 2003 that would evaluate the air filtering effects of trees (and various configurations of trees) on poultry farm dust and pollutant emissions. Vic Redekop has generously provided the use of his broiler farm on 16<sup>th</sup> Ave. in Aldergrove for this purpose.

The project has been set up with 2 dust monitoring tunnels (wind tunnels if you like), one at each end of a broiler barn. Each tunnel has a 24" and 36" fan exhausting air down its length of 50 feet. Dust measurements are being taken at 15, 30 and 45 feet 3 times per week during the production cycle. Reference samplers have also been placed outside the tunnels located at 70 feet.

The first 2 production cycles are being tested without the fan hoods, while the third cycle will be set up to look at the fan hood effect on dust leaving the barn fan. During October-November 2003, after enough information is collected to present a sufficiently clear picture and understanding of the nature and diffusion of dust as it leaves the barn fan, trees will be placed at the end of the tunnel to examine their effect as filters.

At a later date, it is intended that data from this project, along with projects initiated in the U.S. could be integrated into general guidelines for the planting of tree windbreaks to reduce pollutant emissions from Fraser Valley poultry farms. The effectiveness of various tree configurations to reduce emissions will potentially be explored in the future.

The SPFG gratefully acknowledges funding for this project from the following sources:

Agriculture Environmental Partnership Initiative	Environment Canada
BC Ministry of Water, Land, and Air Protection	Fraser Valley poultry producers
Greater Vancouver Regional District (in-king through loan of equipment)	

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## ***GPP Conveyor Use and Hauling Rates*** ***- 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 to load these trucks through the use of producer owned 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 (**\$1.25 per cubic yard + conveyor delivery fee**). A **discount of \$0.50 per cubic yard** is now 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. The 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 #2** is conveyor rental only. The charge for conveyor rental is \$0.90 per cubic yard conveyed + conveyor delivery fee. The poultry producer is responsible for all arrangements involving manure transportation and marketing.