



## BC Sustainable Poultry Farming Group (SPFG)

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### Status Summary for the November 13, 2018 SPFG Committee Meeting

One research proposal was reviewed:

#### **2018-05 Aerobic Digestion of Spent Hen Hydrosylate**

They are proposing the aerobic digestion of spent hen hydrosylate (from thermal hydrolysis) to produce microbiologically-rich field and greenhouse plant nutrient solutions.

Thermal hydrolysis is a Canadian technology developed to process risk animal by-products and carcasses, and is designed to destroy all pathogens, diseases, viruses and TSE's, (transmissible spongiform encephalopathy) including bovine spongiform encephalopathy aka mad cow disease.

The easily scalable technology is approved by the OIE (World Organization for Animal Health) and is certified by CFIA (Canadian Food Inspection Agency). A commercial biorefining plant in Lethbridge, AB, processes 30 tonnes per day of primarily bovine material, and the technology holder, Biosphere Technologies, has a mobile pilot unit which processes half tonne batches. The process involves grinding the feedstock (the project would utilize spent hens) then processing for 40 minutes at 180° C and 1,200 kPa in a high pressure reactor thereby destroying all pathogenic agents but retaining the valuable nutrients.

The end result is a liquefied hydrolysate version of the starting feedstock [where fats, muscle, connective tissue and bones are broken down into complex calcium rich solutions of proteins, carbohydrates and lipids]. To create organic fertilizers for hydroponic growers, these complex solutions must first be aerobically (microbially) digested in order for plants to use them as a nutrient source. The project will utilize the aerobic digestion process developed by Alberta Agriculture and Forestry that was funded in part by SPFG funds.

The complex nature of the hydrosylate solutions requires modifications of the existing aerobic digestion process. The project will demonstrate greenhouse techniques to utilize the resulting nutrient solutions to grow plants with and without water recycling. The project will also pursue organic certification of the nutrient solutions.

- *The project was funded on the condition the researcher provide a project plan & secures funding from other sources*

#### **Updates on other SPFG projects:**

#### **2018-04 Optimization of vaccination treatment to eliminate *Salmonella* and *Campylobacter* contamination of poultry.**

His previous project funded by IAFBC and SPFG was to reduce *Salmonella* and *Campylobacter* contamination of poultry. Specifically, they isolated lactobacillus strains from poultry and

environment as well as design engineered lactobacillus vaccines along with some natural antimicrobials to feed chickens and reduce the loads of Campylobacter and Salmonella in chicken GI tract. By the end of this 2-YR project (December 2017), they identified that the synergistic treatment of the encapsulated lactobacillus and cinnamon oil could significantly reduce the colonization of both Campylobacter and Salmonella in chickens. The reduction level was about 100 times compared to the positive control group. However, this synergy treatment was unable to completely eliminate the colonized pathogens in chicken GI tract.

They would like to optimize the synergistic treatment and eventually eliminate all the Campylobacter and Salmonella in chicken GI tract.

They would like to apply to the Agri-Innovation Program and to continue to work on this research project to optimize the vaccine treatment. IAFBC is very interested about the proposed idea because: 1) the program only lasts for 6 months – IAFBC is expecting to fund some projects with a solid preliminary foundation, such as the extension of a previously funded IAFBC project; 2) the deliverable is clear and expected to be achievable; 3) has a significant impact on agri-food industry and business.

His group will conduct the following experiments within 6-month time window 1) Introduce another natural antimicrobial compound (e.g. curcumin and diallyl trisulfide) to the current synergy treatment (encapsulated lactobacillus and cinnamon oil) to form a triple treatment. They expect this novel triple treatment will be more effective than can further reduce the load of Campylobacter and Salmonella in chicken GI tract. 2) We have constructed 2 more lactobacillus vaccines, both of which show good antimicrobial effect against Campylobacter and Salmonella in vitro. They will encapsulate these two vaccines separately and then mix with the aforementioned natural antimicrobial compounds (e.g. cinnamon oil, curcumin and diallyl trisulfide) and test the effect on the elimination of Campylobacter and Salmonella in chickens. Their goal is to identify the best synergistic treatment strategy that can completely eliminate the load of Campylobacter and Salmonella in chickens.

**2016-02** *One-day knowledge translation workshop in April 2017 on Wetland Sediment testing as a Tool for Avian Influenza Virus Surveillance* – the project has been delayed to later in 2018.

**2016-06 BCAC's Public Trust Initiative** – See attached table

The next SPFG meeting is scheduled for February/March 2019.