

## WI AQUAPONICS MULTI-AGENCY SUPPORT GROUP

October 20, 2015

WISLINE Call Facilitator – WDNR Chris Lilek  
Meeting Minutes

**Participants:** Chris Lilek – DNR Sustainable Business Section, Greg Lawless - Food System Development Program at UW Extension, Ken Semmens -Kentucky State University, Jeremiah Robinson, PE Design Engineer – Frosty Fish, Victoria Leung & Andrew Vickerson - Enterra Feed Corporation, Austin Stankus - consultant at United Nations Food and Agriculture Organization, and Cate Rahmlow – Wisconsin Economic Development Corporation.

The purpose of this call was to continue our discussion how Federal, State and County regulatory, funding & technical assistance staff can support aquaponic farming in Wisconsin. The next conference call is scheduled for **Tuesday, January 19, 2016 from 10am – 11am.** Conference call in number: (630) 424-2356, Passcode 6550444#

### **Aquaponics in the Cold Flowing Water System**

Ken Semmens -Kentucky State University

Ken described the cold water flow- through system at Reymann Memorial Farm (Wardensville, West Virginia), which produced trout and a variety of cool weather plants and salad greens. A summary of the presentation can be found at:

Aquaponics in a Cold Flowing Water System

<https://www.dropbox.com/s/bfa4fs5lrqim2dk/Semmens.%20Aquaponics%20in%20a%20Cold%20Flowing%20Water%20System.pdf?dl=0>

Combination of Methods for Waste Management at RMF

<https://www.dropbox.com/s/6am489sn3k7go61/Semmens.Combination%20of%20methods%20for%20waste%20management%20at%20RMF.%20short.pdf?dl=0>

Call participants were interested in hearing if plants were able to take up ammonia nitrogen directly. Ken explained that the system was nitrogen limited. Water from the spring contained 0.12 mg/L of Phosphate from the spring before the fish and 0.15 mg/L effluent leaving the raceway after the fish. The fish contributed about 0.3 mg/L as ammonia nitrogen. A 50% ammonia removal number was a target as I worked to determine what area would be required to treat the full flow of water from the trout facility (350 gpm). It was an exercise described in the presentation that has not been verified in practice.

### **Ken Semmens**

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**Highlights of Jeremiah's "Aquaponics in Wisconsin: A Farming Resurrection"** by Jeremiah Robinson, PE  
Design Engineer – Frosty Fish

Jeremiah provided the call participants with the highlights from five Wisconsin aquaponics farms: KP Simply Fresh, North Freedom | [kpsimplyfresh.com](http://kpsimplyfresh.com); Future Farm Food & Fuel Baldwin | [afuturefarm.com](http://afuturefarm.com); Nelson and Pade, Inc., Montello | [aquaponics.com](http://aquaponics.com); Growing Power, Inc., Milwaukee & Madison | [growingpower.org](http://growingpower.org); Clean Fresh Food, Belleville | [cleanfreshfood.com](http://cleanfreshfood.com)

All these aquaponics units are warm water systems and using Tilapia as the system fish. Jeremiah explained that none of the aquaponics farms are processing and selling the fish. Fish when harvested are being given to people for special events or private use. All facilities are selling the plants/greens.

The oldest in operation facility is KP Simply Fresh. Future Farms has decided to concentrate on hydroponics, since the fish portion of the operations was increasing the facility maintenance costs. Future Farms also uses heat and electricity generated by their Dairy farm bio digester unit. Nelson and Pade in partnership with UW Stevens Point have added a large educational facility to their property. Growing Power promotes Community outreach and Clean Fresh Foods is selling their greens to area restaurants and allows restaurants to order the type of greens grown in the facility.

The call participants discussed what it would take to make aquaponics fish sales economical. Jeremiah has only seen large East Coast aquaponics facilities with annual 100 to 200, 000 pounds/fish levels able to make fish sales economical. High value fish (trout, saugeye walleye, perch) may bring a higher sales value to fish grown in aquaponics systems, but they are harder to grow. Greg Lawless mentioned the interest in pen-raised fish (now in Lake Erie, potential for Lake Michigan), which reduces the cost of production and harvest.

Additional information on the five facilities visited by Jeremiah can be found at:

<http://ediblemadison.com/articles/view/aquaponics-farming-wisconsin>

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**Enterra Feed** Vancouver Company making insect-based feed  
Victoria Leung & Andrew Vickerson - Enterra Feed Corporation

Enterra has found through several years of research and development that black soldier fly (BSF) larvae products are an excellent source of protein and fat, perfect for inclusion in feed for fish, poultry, pets and zoo animals. Their ingredients provide a sustainable alternative to costly and resource-intensive ingredients like fishmeal, fish oil, soybean meal, palm kernel oil and coconut oil.

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Victoria said they are waiting on regulatory approvals in Canada (2016 hopefully) in order to sell the ingredients to commercial fish food manufacturers in Canada. They are currently selling their ingredients to pet food manufacturers, which are regulated differently. They are also selling into several US states where they have customers and approval from the State Department of Agriculture. They have an application with AAFCO/FDA that, when approved, will allow sale in every state.

Adult black soldier flies do not have complete mouth parts and are not a pest. The larvae consume 100 tons of food waste which produces 7 tons of dried larvae and 8 tons of fertilizer each day. Pre consumer food waste is used as a feedstock, which helps food processors deal with the organic landfill disposal ban in Vancouver.

The dried larvae consist of 40% protein and 40% fat. The dried larvae can be added to trout, salmon, catfish and tilapia fish foods.

Andrew said that the larvae were oven dried at 90 degrees Celsius, which kills all pathogens of concern and has not created furans (furans). There has been no loss of nutrients during the drying process. Bioaccumulation of metals has not been a problem. The only metal of potential concern in Canada (USA has higher risk levels) is Cadmium, which can occur if too much leafy greens grown in high cadmium soil are fed to the larvae. No pesticides were detected (750 pesticides tested) in dried larvae. All data has been supplied to Canada permitting staff and may be published as research papers in the future.

### **Victoria Leung**

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### **Highlights from Call Participants**

What are YOU doing this fall?

Chris Lilek shared that she had visited Clean Fresh Foods in Belleville, WI. They limit visitors in order to have a high level bio security. Clean Fresh Foods would like our support group to work on helping get local foods to hospitals & clinics and figure out how a CoOp-like group could do orders for aquaponics fish farm equipment orders to keep the shipping costs down.

Greg Lawless has not had a chance to bring UW Stevens Point and Milwaukee area aquaponics educators together for discussing options to share resources and training, but he is still interested in making those contacts.

Austin Stankus mentioned that he had done his Master's Thesis and using the Soldier Fly Larvae as Aquaculture feed and was interested in following future research and implementation.

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