

# The Nutritious Pond Project

*Newsletter #5, April 2017*

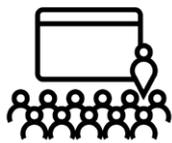
## *Recent and Future Activities*



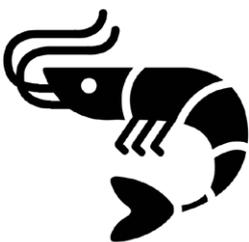
Nutritious Pond Design Workshop – Co-design of new farm trials  
Farm survey: How shrimp farmers perceived and address risk in the Mekong Delta?



Fundamental Research looking at the effect of carbohydrate addition at different shrimp culture intensity



The Nutritious Pond Project is going to South Africa!



On February 21<sup>st</sup> 2017, the College of Aquaculture of Can Tho University organised a Design Workshop to reflect on the results of the first year of trials. This reflexion led to the design of the next farm trials.

The workshop included 20 participants, from different horizons: rice-shrimp and extensive shrimp farmers involved in the 2016 trials, extension services from 3 provinces (Bac Lieu, Ca Mau and Soc Trang). The private sector was also represented with Skretting and Bureau Veritas (ASC and GAAP certification body). Researchers from Wageningen University and Research and Can Tho University as well as representatives of International NGOs (WWF, SNV and IUCN) involved in shrimp farming development completed the participants.

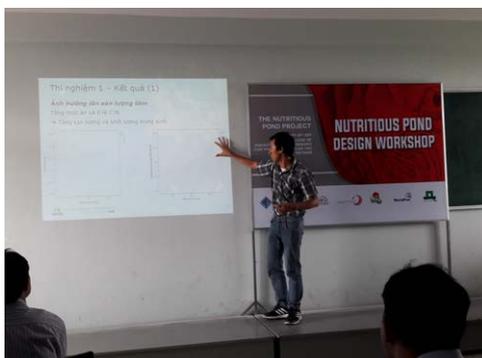
## In 2016, the objective trials were:



- To test new type of feeding system, where recommended feed load is reduced by 25%, assuming that natural feed will contribute to the shrimp diet, without a reduction of productivity.
- Natural productivity of the pond will be enhanced by daily addition of carbohydrates (made of rice bran and cassava). This system was tested in extensive, rice-shrimp and intensive *P. vannamei* ponds.
- Results of the trials were presented in the [Newsletter #4](#).

## Main feedback about 2016 trials

- Farmers questioned the effect of carbohydrate addition on dissolved oxygen (D.O). They also questioned the schedule of carbohydrate application during the day as well as the use of aeration.
- One central concern was the non-linear effect of the nutritious pond system, with fast grow of the shrimp during early stage and a slower grow after 35-40 days and the accumulation of waste at the pond bottom. Farmers found that the use of natural food by the shrimp is more important in the early stage of culture.
- We observed in the trial ponds that FCR was low (down to 0.3-0.6 in some ponds), survival rate was high (>90% in one pond) and the size of shrimp at harvest was not satisfactory (70 - 100 pcs per kg). In addition to those indicators, the un-even size of the shrimp at harvest indicate a possible lack of food during the grow-out period.
- Farmers and other participants discussed the effect of the carbohydrate application on algae and bacterial communities and highlighted that monitoring the bacterial community is required in the next trials.



- Pellet consumption by the shrimp was questioned in the case of extensive trials, with limited number of feeding trays to monitor it;
- The composition and conditioning of the carbohydrate was discussed. Participants decided to exclude the rice bran, to facilitate mineralization of the amendment and avoid insect infestation during the storage phase.



## What will change in 2017 experiments?

- Composition of carbohydrate tested in 2017 is now changed to 100% cassava, compare to 70% cassava and 30% rice bran used in 2016;
- In rice-shrimp system (stocking density of 30 PL/m<sup>2</sup>), the amount of feed provided is now 85% of the recommended amount (compared to 75% in 2016), in order to increase growth rate and reach larger size of shrimp at harvest;
- In extensive ponds stocked at 9 PL/m<sup>2</sup>, the amount of feed will vary during the grow-out period, starting at 75% of the recommended amount during the first 56 days and increased to 85% after that and until harvest (110 days);
- To prepare the pond before stocking and provide natural food in the early step of the shrimp grow, DAP and carbohydrate will be applied daily during one week;
- Similar parameters as in 2016 will be monitored (growth rate, water quality and financial results). In addition to those, D.O measurement will be included as well as total bacterial counts and vibrio counts in both control and trials ponds. In extensive system, all aquatic animal production (crab, fish and shrimp) will be monitored to calculate the pond biomass production.
- Viet uc Company support those trials, providing high quality *P. vannamei* post larvae to farmers at discounted rates



## Targets and Planning

In both systems stocking started at the end of April 2017 and expected harvest is planned end of July, early August. Earlier stocking was not possible in rice- shrimp system due to low salinity levels.

### Extensive system

2 trials ponds with the following characteristics and targets:

- Culture period 110 days
- Reduction of 25% of the pelleted feed volume for the first 56 days, then a reduction of 15% only. Natural feed contribute to more than 15% to shrimp growth
- A yield of 600 kg/ha & survival rate of 37% and a FCR of 1.2

### Rice-shrimp system

4 trials ponds characteristics and targets :

- Reduction of 15 % of the pelleted feed volume and natural feed contribute to more than 15% to shrimp growth
- Target yield of 3,700 kg/ha and survival rate of 63%
- FCR of 1.3

In addition, 5 control ponds in both rice-shrimp and extensive systems using conventional feeding practices will be monitored for water quality, productivity and financial results.

## Upcoming activity

### Survey on farmers risk taking behaviour

In the coming weeks, the Nutritious Pond Project will implement a farm survey in the Mekong Delta to investigate how farmers perceive and manage risk and how these relate to adoption of new practices.

The survey protocol was designed in collaboration with Marijn Poortvliet from Strategic Communication group and Laurens Klerkx from the Knowledge, Technology and Innovation group from WUR. We intend to survey 240 shrimp farms, and include 3 main types of production system (extensive, rice-shrimp and intensive farms).

We propose to explore the relations between risk perception by farmers, the characteristics of a practice (or a technology and its riskiness), the source and quality of knowledge received by farmers, with the current and intended adoption of new practices by farmers.

This analysis will provide insight on how farmers determine their choice of adoption (or not) of novelty and it will inform communication strategy for the deployment of the Nutritious Pond system to farmers.



## Fundamental Research



### Tran Huu Tinh, Vietnam

From March until the end of May 2017, Tinh is looking at the effects of feed and CH addition at different culture densities and if the same principles of feed and carbohydrate addition apply to different culture densities.

The protocol used is similar as for the first experiment, except that the culture density is reduced to 26 individual per m<sup>3</sup> instead of 120 individual per m<sup>3</sup> in the first experiment. Shrimp (*P.vannamei*) of 0.1g are grown in 500l tanks and fed with 3 different feeding rates. At each feeding rates, CH is added to maintain C:N ratio at 3 different values, making up in total 9 treatments in triplicate.

Shrimp growth is checked at the beginning, every two weeks onward, and at the end of the experiment (84 days). Water quality (NH<sub>4</sub>, NH<sub>3</sub>, NO<sub>2</sub>, NO<sub>3</sub>, temp., pH, alkalinity, O<sub>2</sub>) is monitored weekly. Bacterial and chlorophylla concentration is checked at the middle and the end of the experiment.

Preliminary results are expected in Quarter 3 of 2017 and will inform the next round of farm trials.





The Nutritious Pond Project is going to South Africa

Devi will present the first results of her research on Omega-3 transfer in the pond compartment at the [World Aquaculture Forum](#) in Cape Town South Africa in June 26-30<sup>th</sup>.



## Next issue August 2017

- Preliminary results of 2017 farm trials
- Effects of feed and CH addition at different culture densities

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