

## Feeding trial on *L.vannamei* - experiment and results on novel feed from Planktonic

Feed used from Planktonic: “Sterimax” for shrimp – developed during H2020 project.

Time period for trial: 19.02 – 15.03 2021.

Trial facility: European commercial hatchery/producer of *L.vannamei*.

Preparations prior to trial:

- A single female, stage 5 and fertilized, was separated in a spawning tank in the evening of 19.02.21
- She was removed at 4 am on 20.02. The estimated number of fertilized eggs was 156 000 eggs.
- Nauplii hatched on 20.02 around 6pm.
- Nauplii 6 metamorphosed to Zoea1 on 22.02 around 9am.
  - They were fed with live *Chaetoceros* and freeze-dried *Thalassiosira*.
- At Zoea2 stage, the number was estimated by counting 1 liter 5 times. The estimated number was 22 000 Zoea2.
  - During Zoea2 and Zoea 3 stage, they were fed live *Chaetoceros* and freeze-dried *Thalassiosira* and *Tetraselmis*.
- On 24.02 before 8am, they were Zoea3. At 2 pm, the tank was split in two tanks.
- On 26/2, the Zoea3 metamorphosed to Mysis 1:
  - 10am: 10 %
  - 1pm: 50 %
  - 4pm: 100 %

“Sterimax” was given the day before, no differences between the two tanks were observed.

The following feeding schedule was then used:

- At 2am and 5am feeding, frozen artemia nauplii were supplied through a belt feeder. “Sterimax” was prepared and mixed in 1 liter of seawater and distributed into the larval tank.
- The other feeds were given manually.

Day (after hatching)	stage	Algae	artemia nauplii	“Sterimax” or artemia nauplii	Dry feeds
6 (26/2)	Zoea3-Mysis 1	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
7 (27/2)	Mysis1-2	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
8 (28/2)	Mysis 2-3	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
9 (1/3)	Mysis 3	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
10 (2/3)	Mysis 3-PL1	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
11 (3/3)	PL 1	2 x /day Tetra	2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm

12 (4/3)	PL 2		2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
13 (5/3)	PL 3		2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
14 (6/3)	PL4		2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
15 (7/3)	PL5		2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
16 (8/3)	PL6		2 am and 5 am	7-8 am, 7-8 pm	10 am, 4 pm, 11 pm
17 (9/3)	PL7		2 am and 5 am	copepods	10 am, 4 pm, 11 pm
18 (10/3)	PL8		2 am and 5 am	copepods	10 am, 4 pm, 11 pm
19 (11/3)	PL9		2 am and 5 am	copepods	10 am, 4 pm, 11 pm

At mysis 3 stage on 01.03, an estimation of numbers was done:

- Tank L13 (Sterimax): 12, 9, 11, 6 and 7 Mysis 3 per liter (400 liter in total): 3600 larvae
- Tank L14 (artemia): 8, 16, 8, 11, 11 and 14 Mysis 3 per liter (400 liter in total): 4560 larvae

On 01.03 at 11 pm, the first PL were observed (about 10 %)

On 02.03 at 8am we counted:

- L13 (Sterimax), 5 scoops with a net: total 46 Pl and 20 Mysis 3, so 60 % PL
- L14 (artemia), 5 scoops with a net: total 22 Pl and 18 Mysis 3, so 55 % PL.

It seems the Pl fed with “Sterimax” are metamorphosing to Pl a bit faster.

On 09.03 and 10.03, 10 Pl length was measured individually:

09.03

length	Tank L13 (“Sterimax”)	Tank L14 (artemia nauplii)
4-5 mm	0	2
5-6 mm	1	2
6-7 mm		1
7-8 mm	5	2
8-9 mm	2	3
9-10 mm	2	
Average	7.9 mm	6.7 mm

10.03

length	Tank L13 (“Sterimax”)	Tank L14 (artemia nauplii)
4-5 mm		3
5-6 mm		1
6-7 mm	1	1

7-8 mm	3	2
8-9 mm	3	1
9-10 mm	1	1
10-11 mm	2	1
Average	8.5 mm	6.9 mm

Pl receiving “Sterimax” twice per day have 1-2 days faster growth minimum.

From day 17 (09.03), both tanks received the same feeding, the 7am and 7pm feeding was replaced by frozen copepods (500-800 micron).

On 15.03 (PL13 stage), both tanks were transferred and counted individually.

- Tank L13 (Sterimax): 3049 PL = 85 % survivals from the estimated number at Mysis 3 stage)
- Tank L14 (artemia nauplii): 864 PL = 19 % survivals from the estimated number at Mysis 3 stage)

## Conclusions from trial.

The use of “Sterimax” (twice daily) during the Mysis and early Pl stages of *Litopenaeus vannamei* results in a faster growth and higher survival. The PL 7-8 were 1.2 to 1.6 mm larger, which is 18-23 %. In terms of survival, the differences were even bigger (85 % survival from Mysis 3 till PL13 compared to 19 %).