EFFECT OF A NEUROSENSORY FEED ADDITIVE ON SHRIMP FEED INTAKE EVALUATED THROUGH HYDROACOUSTICS

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Introduction

Vannamei shrimps thrive in a turbid, low-light environment, making feeding behaviour observation difficult. Hydrophones, based on passive acoustic monitoring, record the «clicks» produced during feeding and analyse their count in real time, providing a reliable indicator of feeding activity (Reis et al., 2021).
Feeding behaviour is driven by appetite and modulated by stress-induced hormonal signalling (Kulczykowska & Vazquez, 2010), and by water temperature. During cold periods (≤ 24°C), metabolism slows and stress increases, reducing feed intake (Peixoto et al., 2025).

This study aimed to evaluate feeding activity in *Litopenaeus vannamei* under low temperature conditions using passive acoustic monitoring, for diets supplemented with a neurosensory feed additive (Olpheel® Good, Laboratoires Phodé, France).

Material & Methods

Animals

- 168 juvenile whiteleg shrimp (*Litopenaeus vannamei*) with average body mass of 4 ± 0.12 g
- 16 rectangular polyethylene 27L tanks (4 replicates/treatment)
- Controlled environmental conditions of salinity (20 ± 0.8 ‰), temperature (24.3 ± 0.2 C), oxygen (6.5 ± 0.3 mg L^{-1}) and pH (8.2 ± 0.2)

Feeding program

- 7 days of acclimation with a commercial feed (Samaria® SM LINE 350)
- Experimental feeds:
  - Control diet
  - Olpheel Good 1 (OG1): diet supplemented with OG at 1 g/kg "on-top"
  - Olpheel Good 3 (OG3): diet supplemented with OG at 3 g/kg "on-top"
  - Olpheel Good 5 (OG5): diet supplemented with OG at 5 g/kg 'on-top
- Ration (2g) was offered for 30 minutes during passive acoustic monitoring

Measures

- Feed consumption (30 minutes)
- Passive acoustic monitoring of click counts (15–30 minutes) with a hydrophone recorder and Raven pro 1.5 software for analysis
- Observations carried with "naïve" (first Olpheel Good feeding on day 0 of the study) and "non-naïve" shrimp (maintained Olpheel Good feeding in supplemented groups until day 5 of the study)
- Statistical analysis with RStudio using Shapiro–Wilk, Levene, ANOVA, multiple linear regression, and Fisher LSD post hoc tests

Results & Discussion

Feed consumption results in the naive phase (fig. 1) showed an increase in feed intake for all treated groups, particularly significant for OG1 (0.67 g vs. 0.55 g for the control). In the non-naive phase, consumption decreased across all groups, partly linked to an unexpected molting event caused by low temperatures. The OG groups nevertheless showed a progressive improvement from OG1 to OG5, returning to a level equivalent to the naive control.

Hydroacoustic results in the naive phase (fig. 2) confirmed these observations: OG1 produced the highest number of clicks.
The difference between the 15- and 30-minute intervals reflects greater voracity at the start of feeding.

In the non-naive phase (fig. 3), the number of clicks decreased across all groups, but the OG groups showed a notable increase, statistically significant at 15 minutes for OG1, and with a higher final count for OG5.

Finally, although OG1 performed best in consumption and number of clicks, the reduction in clicks between phases (fig. 4) was more pronounced in OG5 than in the control group, revealing a regressive gradient in favor of the Olpheel Good doses.

Figure 1. Feed intake results in both phases

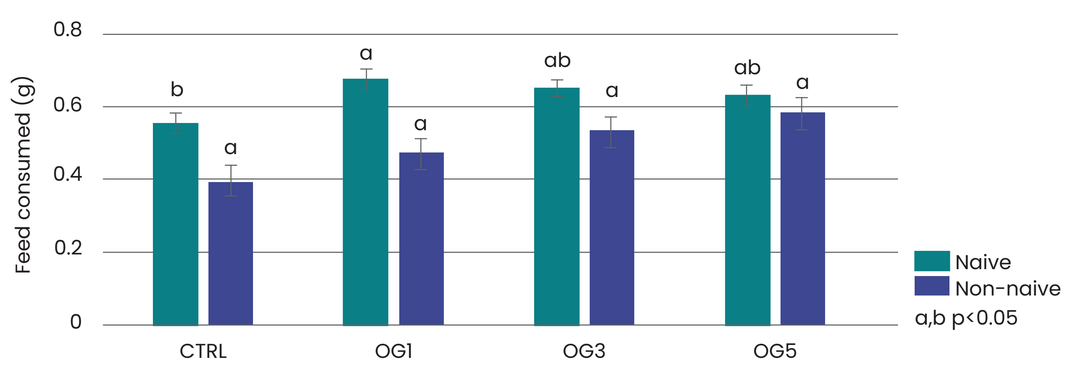


Figure 2. Results of hydroacoustic recordings of naive shrimp

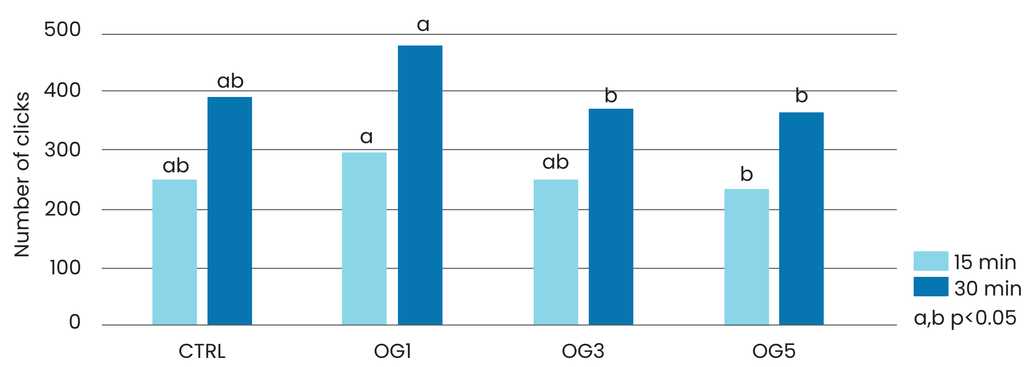


Figure 3. Results of hydroacoustic recordings of non-naive shrimp

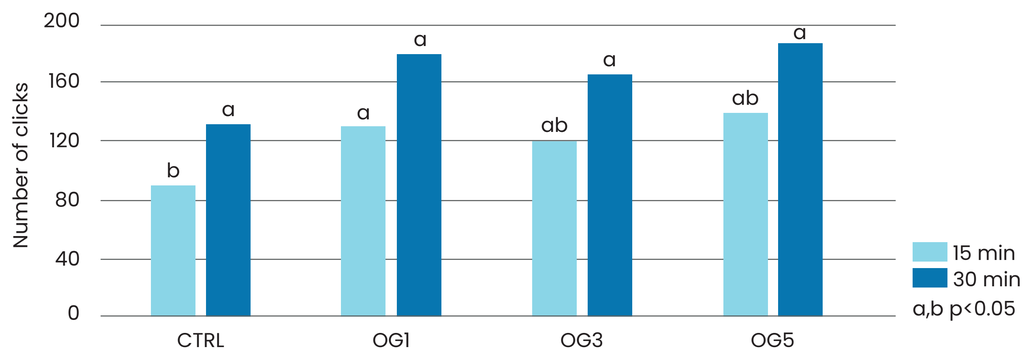
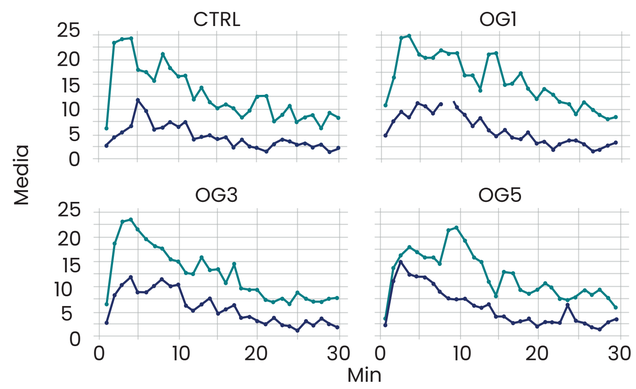


Figure 4. Evolution of the number of clicks



Treatments	Reduction of clicks number (%)
CTR	65.4[a]
OG1	63.1[ab]
OG3	57.9[ab]
OG5	55.1[b]

These results highlight the potential of a neurosensory feed additive (Olpheel® Good) to stimulate feeding behaviour under stressful conditions, and confirm passive acoustic monitoring as a reliable evaluation tool in shrimp aquaculture. Further experiments should be carried out to confirm observations made with passive accoustic monitoring.