

INCREASED RESISTANCE TO *Vibrio parahaemolyticus* IN PACIFIC WHITE SHRIMP FOLLOWING DIETARY SUPPLEMENTATION WITH NUCLEOTIDES AND A BIOACTIVE OLIVE EXTRACT.

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INTRODUCTION:

Acute hepatopancreatic necrosis disease (AHPND) is a bacterial disease mainly caused by *Vibrio parahaemolyticus*, which negatively affects the health of **Pacific white shrimp (PWS)**.

Dietary nucleotides modulate the immune response, and a particular nucleotide-rich yeast extract, **Nucleoforce®** (Bioiberica S.A.U., Spain), has been reported to improve survival in AHPND-infected PWS in several studies performed in Indonesia and Vietnam.

On the other hand, fruits and leaves of the olive oil tree contain bioactive compounds with anti-inflammatory, antioxidant, and antimicrobial effects. **Aquolive®** (NATAC Biotech SL, Spain), a bioactive **olive extract (OE)** has been proven efficacious in different aquaculture species.

The objective of this trial was to evaluate the effects of the combined use of nucleotides and OE on PWS survival upon challenge with an AHPND-causing *V. parahaemolyticus* strain.

METHODS:

- A total of **600 PWS** (0.57 ± 0.11 g) were used in this trial performed in Vietnam.
- After acclimatation for 2 days, PWS were classified into **5 groups** (4 replicates/group; 30 PWS/90L-tank) (Figure 1) and received different diets for 28 days: 1 group with no challenge (**NC**, Negative Control) and 4 groups **challenged by immersion with *V. parahaemolyticus*** and supplemented with either 500ppm Nucleoforce® (**NU500**), 500ppm Aquolive® (**OE500**), 500ppm Nucleoforce® with 500ppm Aquolive® (**NU500OE500**) or no supplementation (**PC**, Positive Control).
- **PWS were followed for 10 days post-challenge** to quantify and compare survival rate between groups.



Figure 1. Shrimp from the study allocated in 90L tanks.

RESULTS:

- The PC group (Figure 2) showed a significantly lower survival rate ($30.63 \pm 4.70\%$) vs NC ($88.29 \pm 2.73\%$; $p < 0.05$).
- A non-significantly **higher survival rate vs PC** was seen with **NU500** ($33.95 \pm 9.62\%$) and **OE500** ($40.99 \pm 11.07\%$).
- **NU500OE500** achieved a significantly higher ($p < 0.05$) survival rate ($55.80 \pm 10.02\%$) vs PC and NU500 (Figure 3).

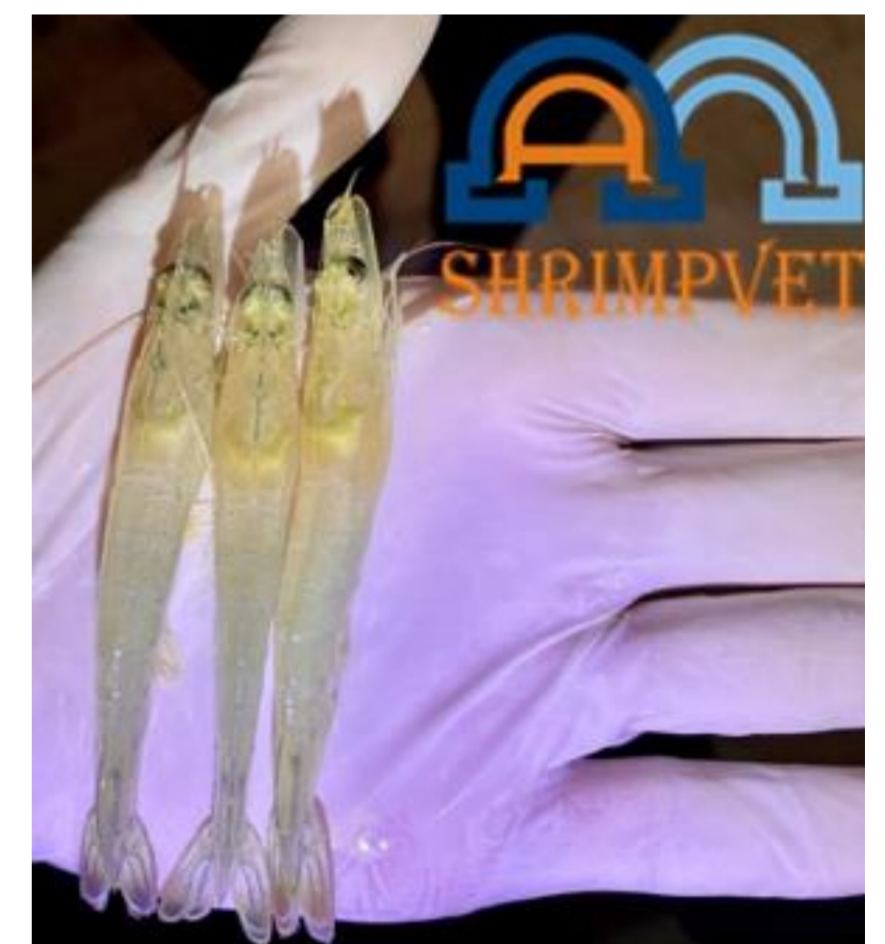


Figure 2. Shrimp from the PC group 15 hours post-challenge.

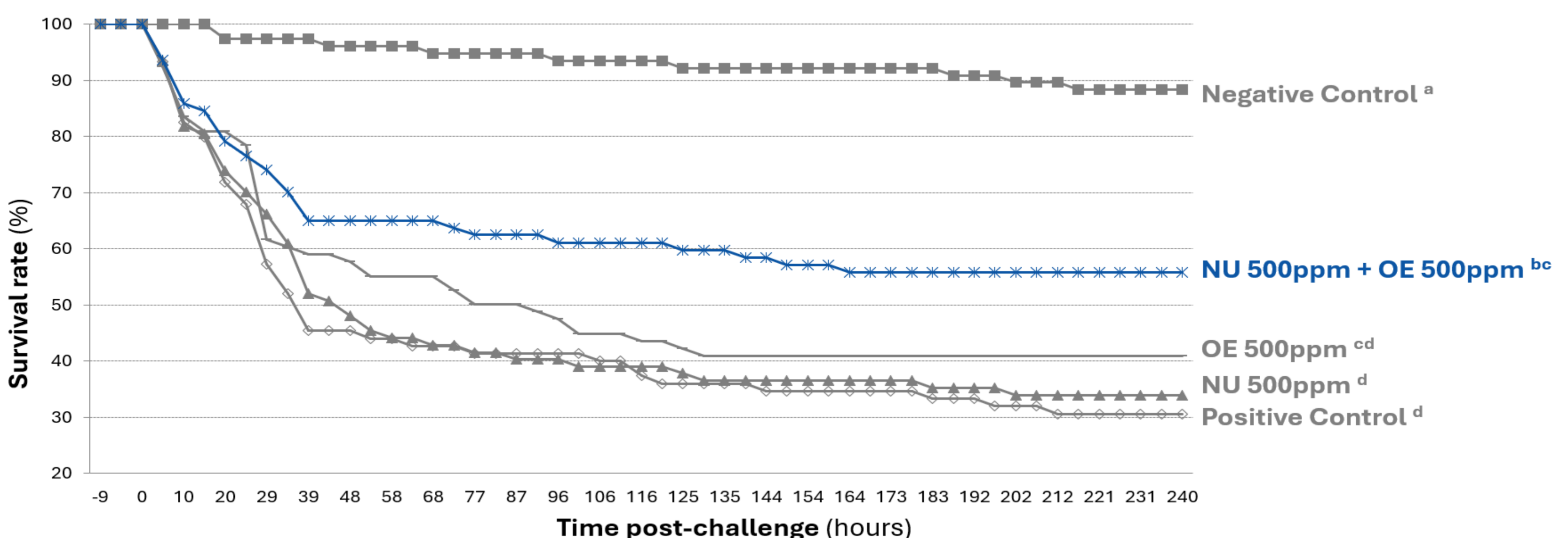


Figure 3. Survival rate of shrimp in each study group after challenge. Different superindex letters indicate statistically significant differences.

CONCLUSIONS:

The 1:1 combination of nucleotides with OE has a synergistic effect, reducing PWS mortality upon AHPND challenge. This innovative nutritional intervention could therefore be used to improve PWS health, especially as an alternative to conventional AHPND therapies, such as antibiotics and disinfectants, which often have limited success and negative consequences.

