EFFECT OF YEAST AUTOLYSATE, Maxi-Nutrio®, ON GROWTH PERFORMANCE, IMMUNITY AND RESISTANT AGAINST *Vibrio parahaemolyticus* (AHPND) IN WHITELEG SHRIMP *Litopenaeus vannamei*

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INTRODUCTION

YEAST AUTOLYSATE, Maxi-Nutrio®, is a unique immune support product, supplemented in animal feed, particularly in the current environment. On the market, Maxi-Nutrio® is designed to get the most out standing of animal feeding approaches, especially during the middle and downstream stages of production such as disease outbreak or during animal get pathogen infection. Maxi-Nutrio® is also a very efficient option that allows for a low inclusion rate to offer customers greater flexibility in their feed formulations.

OBJECTIVES

- **To study on the efficacy of Yeast Product in white shrimp diet on growth performance, and disease challenge against Vibriosis**

MATERIALS AND METHODS

Trial design

- **CRD with 5 treatments 6 replications (30 aquariums)**
- **Standard balance nutrient diet of isonitrogenous 36.47% crude protein and isolipidic 6.54% lipid without any immune augmenting or growth promoting products**

Treatment Groups

Treatment 1 **(T1-0 ppm): Control diet + Yeast Product @ 0 ppm**
Treatment 2 **(T2-125 ppm): Control + Yeast Product @ 125 ppm**
Treatment 3 **(T3-250 ppm): Control + Yeast Product @ 250 ppm**
Treatment 4 **(T4-500 ppm): Control + Yeast Product @ 500 ppm**
Treatment 5 **(T5-1000 ppm): Control + Yeast Product @ 1,000 ppm**

Experimental feed composition

Materials	Basal diets
Fishmeal	15
Poultry meal	10
Squid liver meal	3
Soybean meal	32
Wheat gluten	4
Wheat flour	25
Tuna fish oil	1.5
Soya oil	1
Soy lecithin	2
Mono-calciumphosphate	1.5
Polymethylcabamide	0.5
Vitamin-mineral premix	4.5
Sum	100

Experimental condition and data collection

- **Shrimp initial weight 1.36-1.39 g,30 aq. of 240 L, water 150 liters**
- **Stocked 25 ind./aq.(167 ind./m^3)**
- **Salinity 10-15 ppt, pH 7.7-8.2, DO> 5 mg/L, Alk. 80-120 mg/l, Ammonia < 1.0 mg/l, Temperature 27-30 °C,**
- **Change water 20% every 3 days**
- **Fed diets 3 times a day at 3-10% BW for 8 weeks**

Data collection

- **Growth parameters: final weight(Wf), weight gain (WG), average daily gain (ADG), specific growth rate (SGR), feed conversion ratio (FCR), and survival rate (SR%)**
- **Immune parameters: hemocyte count, hemolymph protein, phenol oxidase activity, lysozyme activity, superoxide dismutase activity, glutathione and Vibriosis count**
- **Color of cooked shrimp by colorimeter**
- **Disease challenge: *Vibrio parahaemolyticus* (AHPND) by immersion treatment at 2.7×10^7 CFU/ml for 24 Days, survival rate, immunity and Vibriosis count**

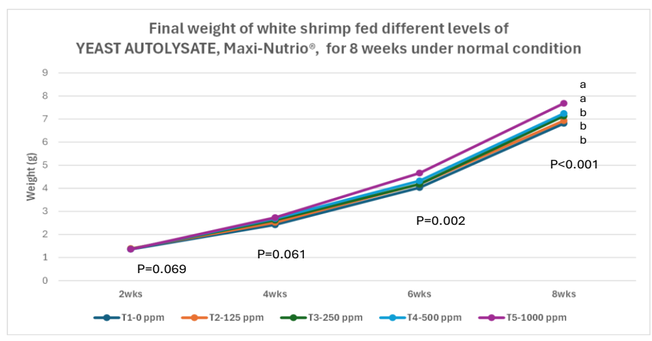
RESULTS

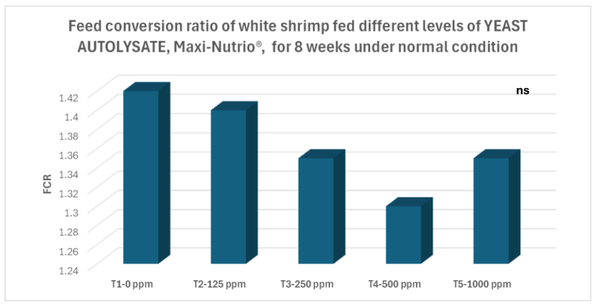
Growth performance

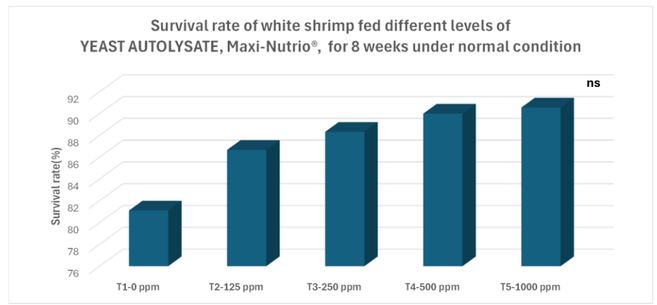
- **Shrimp of the yeast autolysate groups (125-1,000 ppm) showed higher growth performance (Wf, WG, ADG, SGR), immune response and reduced vibrio infection in hepatopancreas and intestine under normal conditions (p<0.05)**

Cooked shrimp color	T1 Control	T2 Y125	T3 Y250	T4 Y500	T5 Y1000	P-value
Lightness (L*)	63.89	63.73	63.64	63.59	63.11	0.593
Redness (a*)	6.81[b]	6.92[b]	6.97[b]	7.12[b]	8.28[a]	0.003
Yellowness (b*)	17.01	18.08	18.16	18.25	18.81	0.156

Note: a, b, c means values with different superscript letters in row show significant differences (p< 0.05)

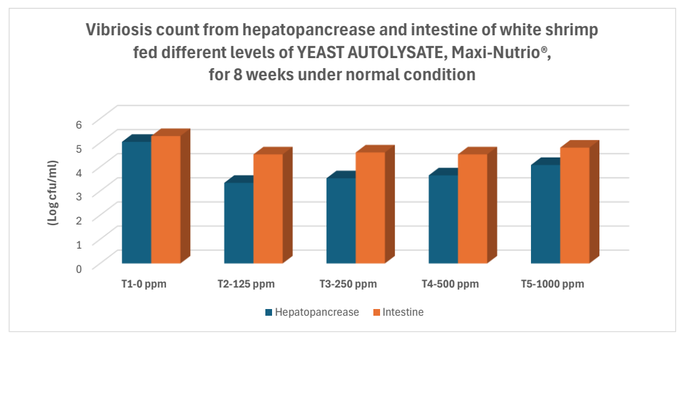






Immune parameter	T1 Control	T2 Y125	T3 Y250	T4 Y500	T5 Y1000	P-value
Haemocyte count (X105 cell/ml)	33.67	34.00	39.33	37.67	37.67	0.121
Hemolymph Protein (g/dL)	2.15	2.25	2.74	2.89	2.99	0.080
Phenoloxidase activity (unit/min/mg Proteine)	114.21[c]	120.43[bc]	162.42[a]	150.83[ab]	154.14[a]	0.023
Lysozyme activity (unit/ml)	133.33	136.67	163.67	180.00	180.33	0.060
Superoxide dismutase activity (unit/ml)	6.24	6.46	7.01	7.01	6.91	0.062
Glutathione (nMole/ml)	30.23[b]	30.49[a]	30.67[a]	30.51[a]	30.59[a]	0.028

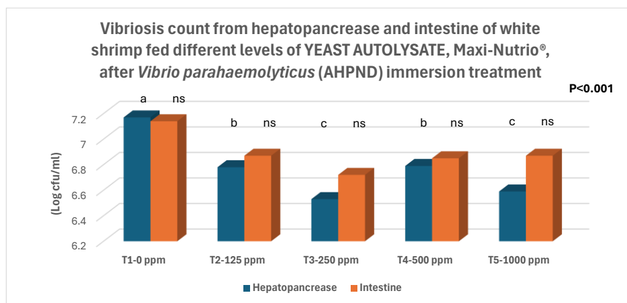
Note: a, b, c means values with different superscript letters in row show significant differences (p< 0.05)



Disease challenge against *Vibrio parahaemolyticus* (AHPND) immersion treatment

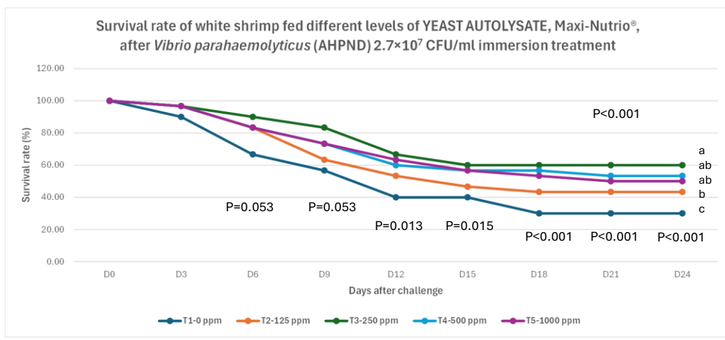
- **Shrimp fed YEAST AUTOLYSATE, Maxi-Nutrio®, 250-1,000 ppm after *Vibrio parahaemolyticus* (AHPND) challanced test demonstrated the better survival rate and immunity including lowering Vibriosis count from hepatopancrease**

Vibriosis count from hepatopancrease of shrimp fed shrimp fed different levels of YEAST AUTOLYSATE, Maxi -Nutrio®, after *Vibrio parahaemolyticus* (AHPND) immersion treatment



Immune parameter	Periods	T1 Control	T2 Y125	T3 Y250	T4 Y500	T5 Y1000	P-value
Haemocyte count (X105 cell/ml)	V. para	18.00[b]	26.67[a]	20.33[b]	21.67[b]	21.67[b]	0.024
Hemolymph Protein (g/dL)	V. para	3.43	3.64	3.67	3.79	3.63	0.436
Phenoloxidase activity (unit/min/mg Proteine)	V. para	32.16	29.98	29.76	29.08	29.52	0.888

Note: a, b, c means values with different superscript letters in row show significant differences (p< 0.05)



CONCLUSION

YEAST AUTOLYSATE, Maxi-Nutrio®, 250-1,000 ppm was recommended for improve growth performance, promoting shrimp immunity and enhancing disease resistance against *V. parahemolyticus*, it is highly recommended to include yeast autolysate, Maxi-Nutrio®, from CBS Bio Platforms in the diets.