



# PRESS RELEASE

## Aquaculture: Ynsect unveils the results of its insect protein YnMeal™ on sea bass

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Ynsect is an innovative company that specializes in breeding insects and transforming them into high quality ingredients for pet, livestock and plant feed and health. Its protein YnMeal™ has once again demonstrated its outstanding performance, this time on the European sea bass, following impressive results on shrimp, trout and salmon. Gut health improvement, reduction of cumulative mortality, weight gain: Ynsect products are scientifically tested and proven to deliver superior performance on sea bass.

In collaboration with the well-known HCMR research institute in Greece, Ynsect launched trials on the European sea bass, a carnivorous fish known to be highly dependent on the inclusion of fish meal in its diet. Juveniles of 4g were fed for 9 weeks with three different treatment diets: a control group with 30% fish meal inclusion, TM 30 (30% fish meal replacement) and TM100 (100% fish meal replacement).

After 9 weeks of feeding, 8 fish from each tank were anaesthetised and blood samples were collected by a caudal puncture. A histopathology procedure was carried out to assess gut health. Sixty fish per group were kept for an additional challenge test with the most important pathogen in marine fish: *Vibrio harveyi*. The cumulative mortality and syndrome score were measured over 10 days.

The results are very promising. Both the TM30 and TM100 diets improved feed efficiency and weight gain when compared to the control group. The best results were obtained at **TM30, with a weight gain of +13.7%** higher than the control (29.2g vs 25.7g) and the FCR was significantly lower (-7%). After 9 weeks, the lowest Feed Conversion Rate (FCR) was **0.77** for TM100 and 0.87 for CTRL, **a reduction of 11.5%**. The Total Feed Intake was similar between all the treatment groups.

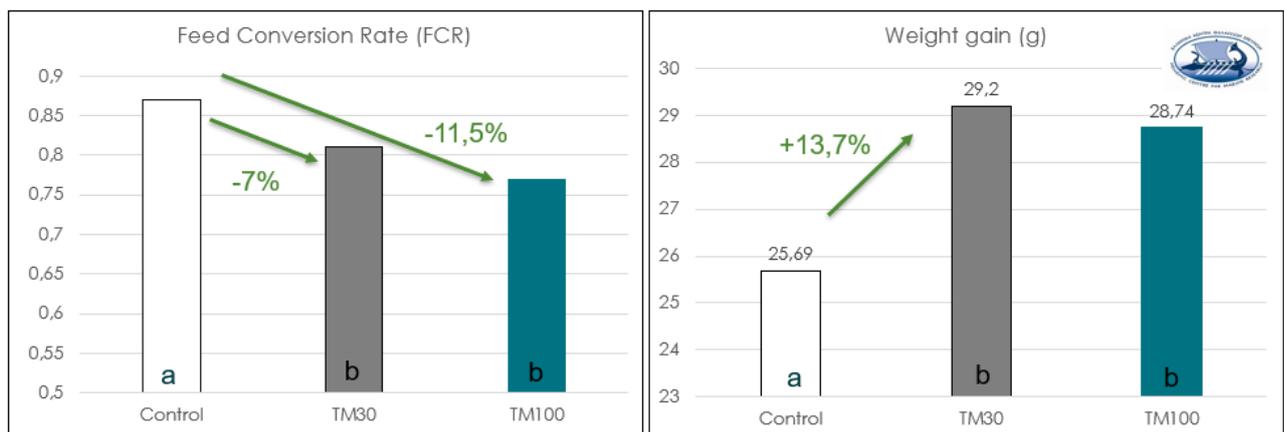


Figure 1 Feed Conversion Ratio and the Weight Gain after 9 weeks of feeding trial (n=70)

TM30 and **TM100 reduced the appearance of abnormal intestinal villi** in the gut from 5 in the control group to 2 (n=15). **Gut health is improved.** This is a breakthrough, and has never been previously assessed in research based on *Tenebrio Molitor* meal.





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During the challenge test, TM30 showed a **reduction of cumulative mortality by 45%** (TM30: 18.3% vs 33.3% in the control). The symptom scores also showed a similar pattern.

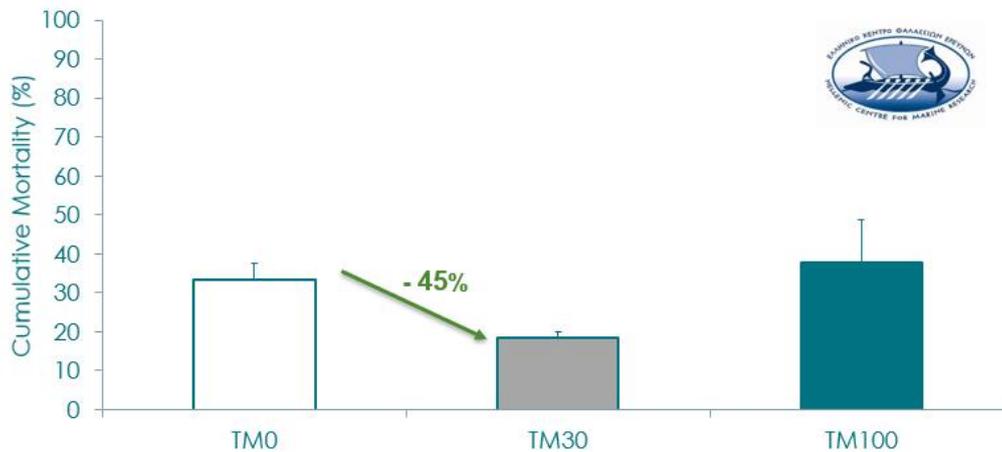


Figure 2: Cumulative mortalities in triplicate tanks ( $P=0.261$ ).  $N=60$

In conclusion, ŸnMeal **boosts the anabolism** (biosynthesis) of the fish. This was already proven in the trout trial in 2015 (**+34% of weight gain and -15% of FCR**). In previous trials, ŸnMeal was shown to increase the resistance of shrimp and salmon in stressful conditions. This new study confirms ŸnMeal as a premium product that delivers **outstanding performances and enhanced health**.

It takes Ÿnsect to another level and the company is confident this protein meal will be implemented in **preventive medicated feeds**. This would also help to reduce the financial impact of diseases in aquaculture; bearing in mind that, on some fish or shrimp farms, the mortality rate can easily reach 40% due to a common bacterial infection. Every shrimp farmer is concerned by the *Vibrio parahaemolyticus* - known to have a **global cost of US\$ 45 billion over the last decade**. ŸnMeal is effective on this pathogen and can **deliver a fourfold reduction in mortality rates**.

**Ÿnsect's unique position in the field of insect and other alternative proteins is reinforced by its commitment to high-performance premium ingredients with nutrition and health benefits for animals and plants.**

## About Ÿnsect

Founded in 2011, Ÿnsect is one of the leaders in large scale vertical insect breeding and for the production of premium, high value ingredients for animal and plant health and nutrition, such as ŸnMeal; a 70% raw protein meal made from the yellow mealworm larvae - *Tenebrio Molitor*. These larvae are reared on safe, controlled vegetable by-products of low market value. The *T. Molitor* is known to be very energy efficient and retains protein from these low value substrates. Ÿnsect currently has a pilot unit in France that has been operating since 2016, where they have developed this technology, boasting 104 employees and 23 patents (PCT). In 2019, Ÿnsect will be constructing a commercial-scale unit in the vicinity of Amiens (northern France), with a production capacity that outstrips all existing operations.

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