

Omega-3 EPA and DHA from algal oil improve pacific white shrimp zootechnical performance and nutritional quality without changing sensory quality

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Objective & Background

To assess the impact of **algal oil (AO) inclusion in plant-based shrimp feed** on performance, fatty acid (FA) deposition, sensory quality, and FFDRoil.

Shrimp farming plays a crucial role in ensuring global food security for the growing population and farming practices must align with both sustainability metrics and market demands related to nutritional quality, taste and texture.

Methodology

- 4 pelleted isolipidic (8% lipid) and isoproteic (36% crude protein) diets were formulated.
- Reference (F0) diet was formulated with fish oil.
- Test diets (P0, P1, P2) were formulated with non-marine plant-based ingredients.
 - 0%, 1% and 2% AO respectively
- 51 days feeding.
- Initial body weight 4g.

Diet	Fish Oil	Soy Oil	Algal Oil
F0	4%	–	–
P0	–	4%	–
P1	–	3%	1%
P2	–	2%	2%

Analysis

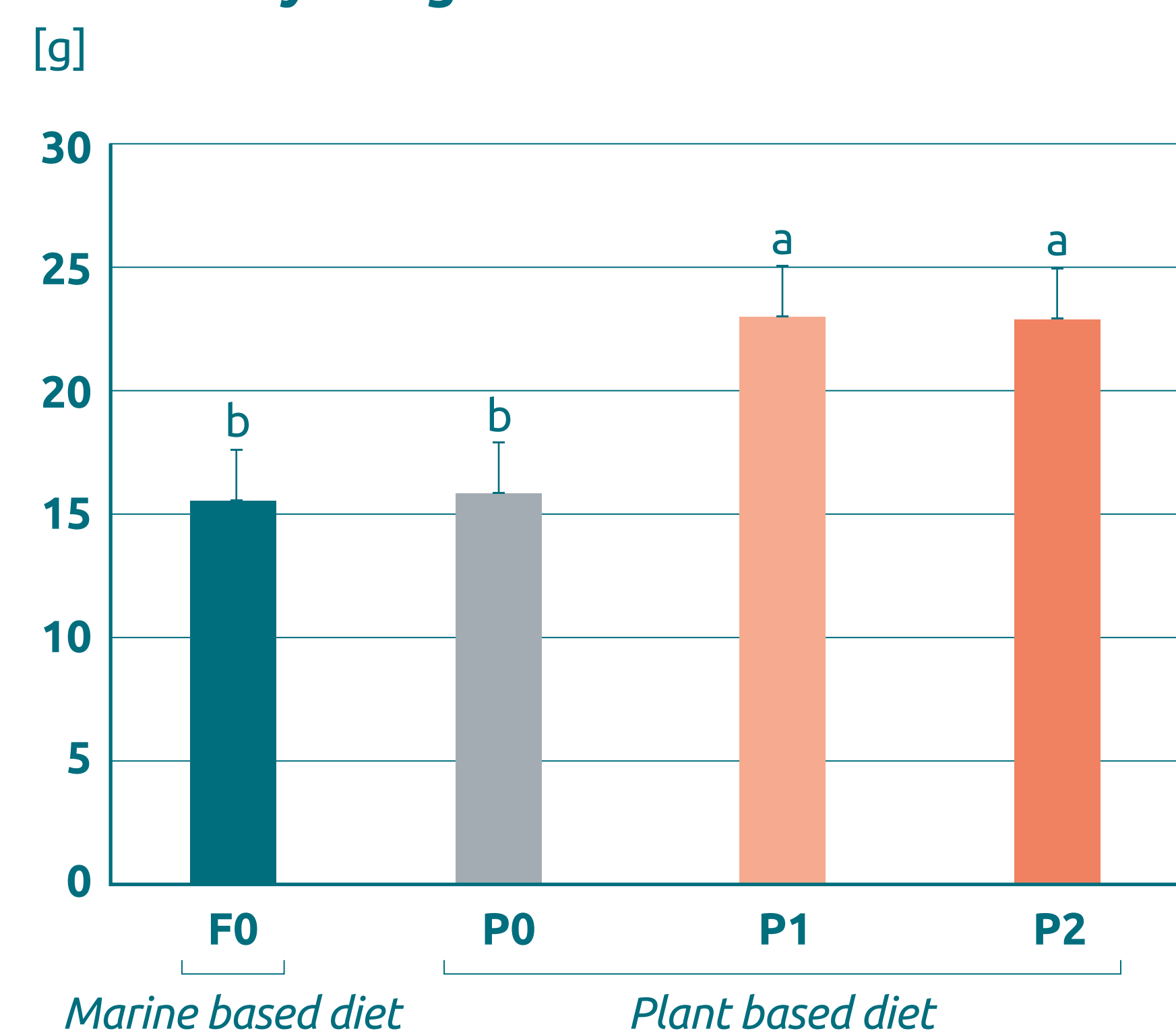
- Growth performance
- FA deposition
- Sensory evaluation
- Dependence on marine forage fish

Conclusion

AO supports the efficient production of *L. vannamei*, enhances the nutritional value of the shrimp, and contributes to the overall sustainability of the aquaculture industry.

Results

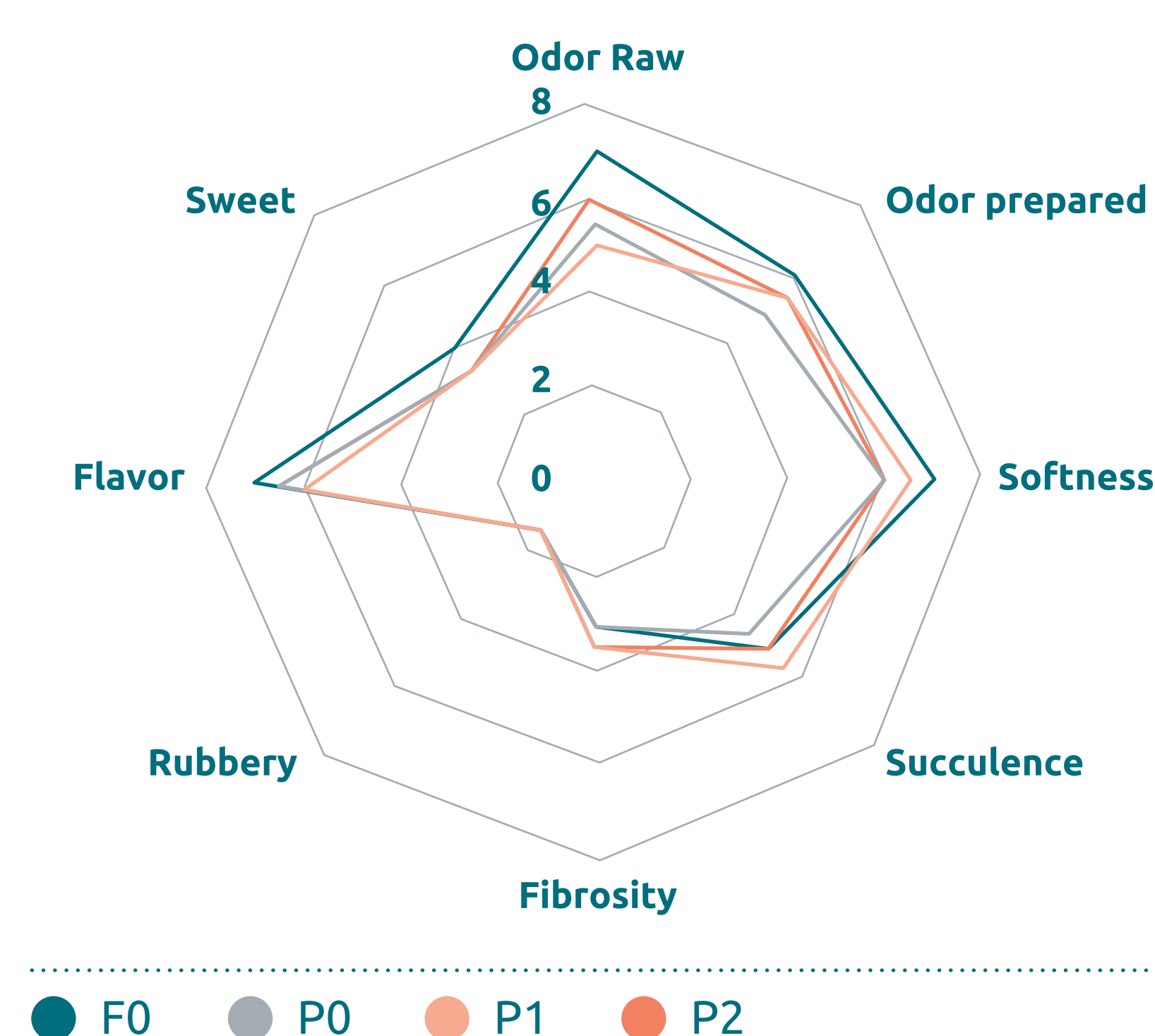
Final Body Weight [g]



The inclusion of AO at either 1% or 2% (P1 and P2 respectively) significantly improved:

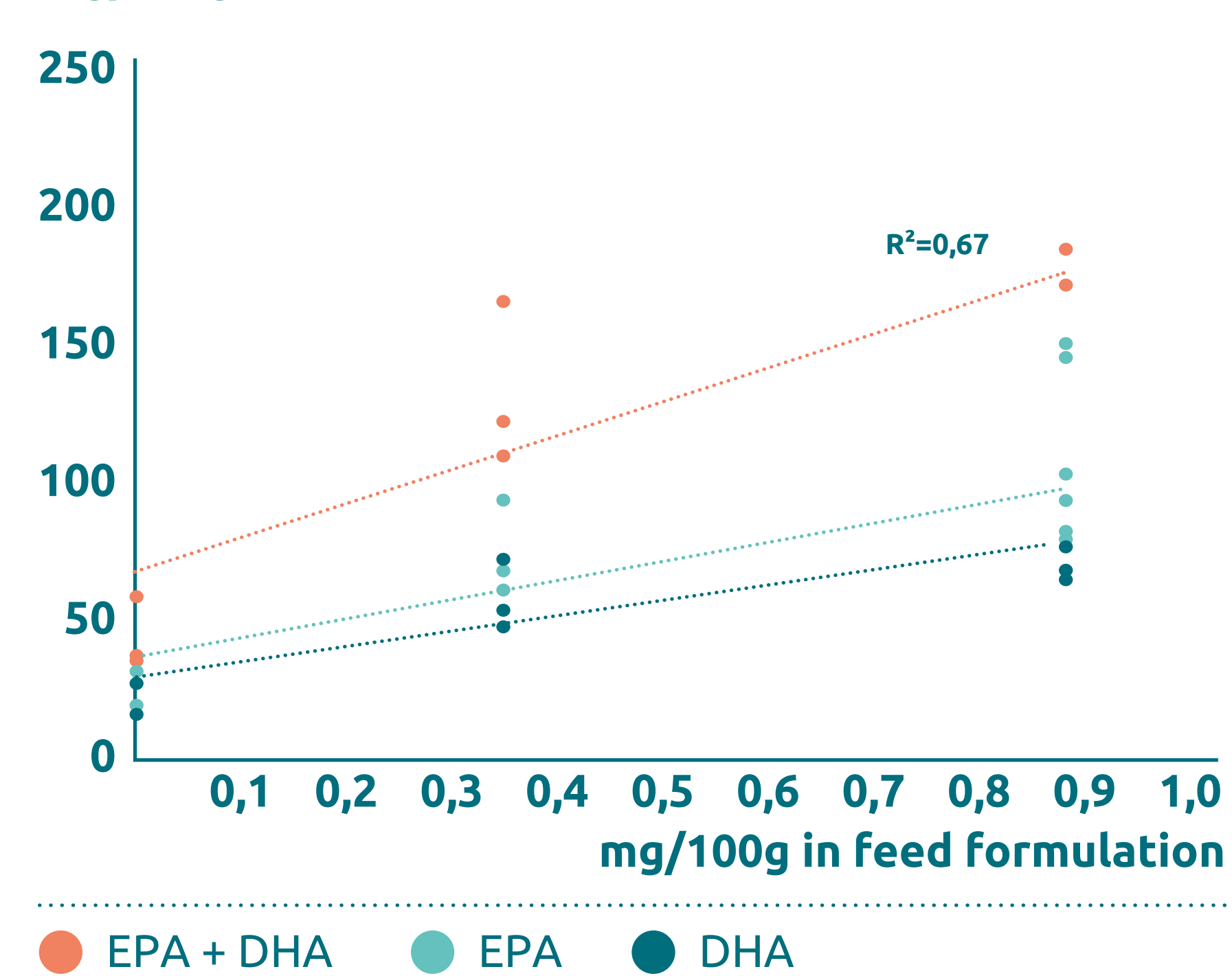
- Shrimp growth by 47%
- SGR by 14.7%
- FCR by 55%
- Survival by 30%

Sensory Evaluation



All diets resulted in similar sensory scores, although shrimp fed the marine diet exhibited stronger odor.

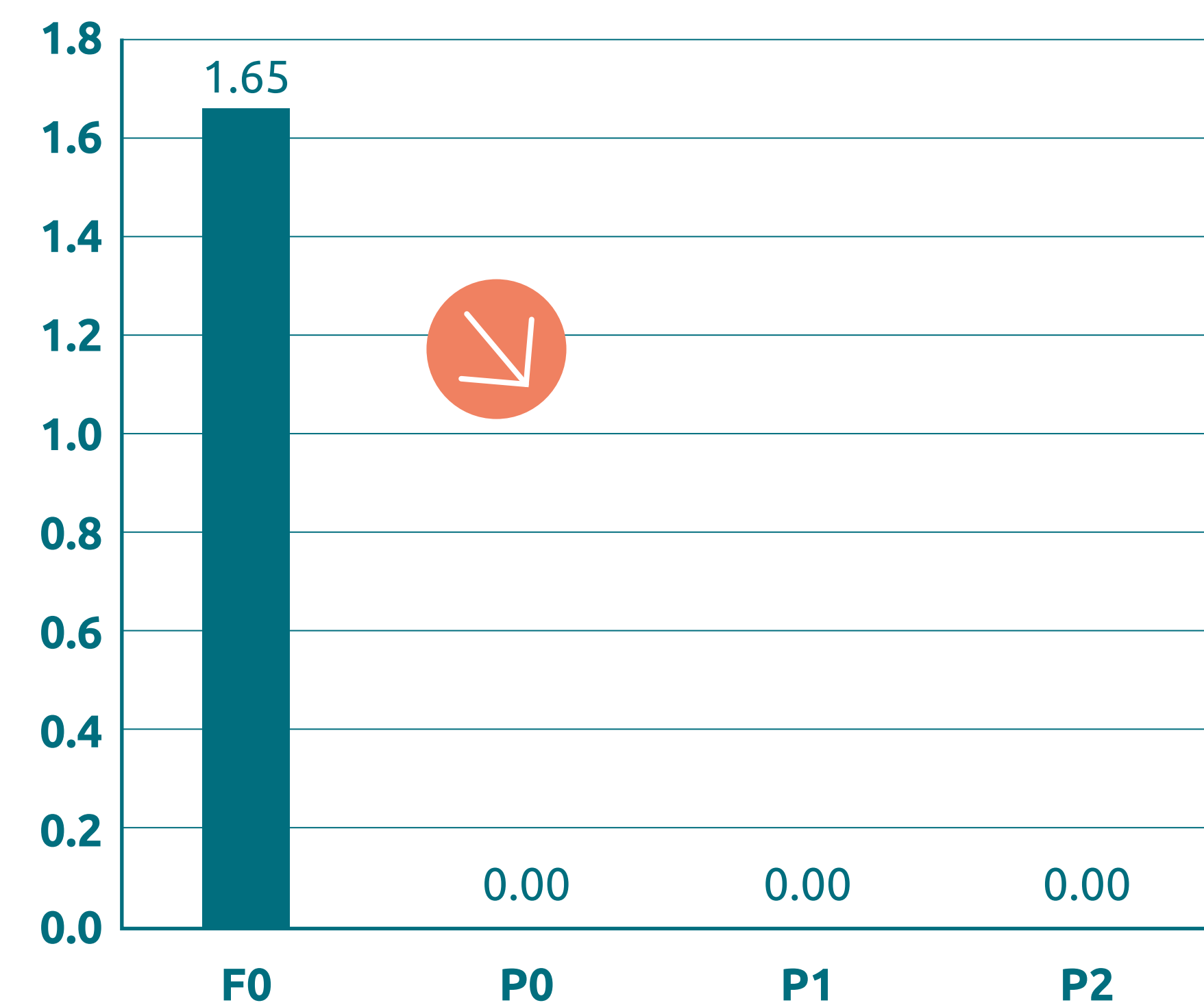
Fatty Acid Deposition mg/100g in tail muscle



EPA&DHA in shrimp tail muscle is highly correlated to dietary levels.

In plant-based diets, only the inclusion of AO at 2% restored EPA+DHA levels close to those of marine-based diets.

FFDRoil



The use of plant-based diets reduced the FFDRoil to 0, reducing dependency on marine forage fish.

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