

# Evaluation of protein-rich feed ingredients for the organic production of freshwater prawns *Macrobrachium rosenbergii* by smallholders in the inlands of Costa Rica.

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## Introduction

In Costa Rica, there are many freshwater bodies appropriate for aquaculture purposes, that remain unused so far. They are particularly suitable for the cultivation of the freshwater prawn *Macrobrachium rosenbergii*. Such cultivation has the potential to rise the income of smallholders, especially in the case of organically produced prawns that are high-value-products. The aim of this study was to test protein-rich feed ingredients for organic production of freshwater prawns. This ingredients were fish meals from regional by-catch and shrimp head meal, which is a locally occurring processing waste.



### Evaluated fish meals:

- *Hippoglossina bollmani*,
- *Physiculus talarae*,
- *Pontinus cf sierra*

### Evaluated shrimp head meal:

- *Heterocarpus vicarius*

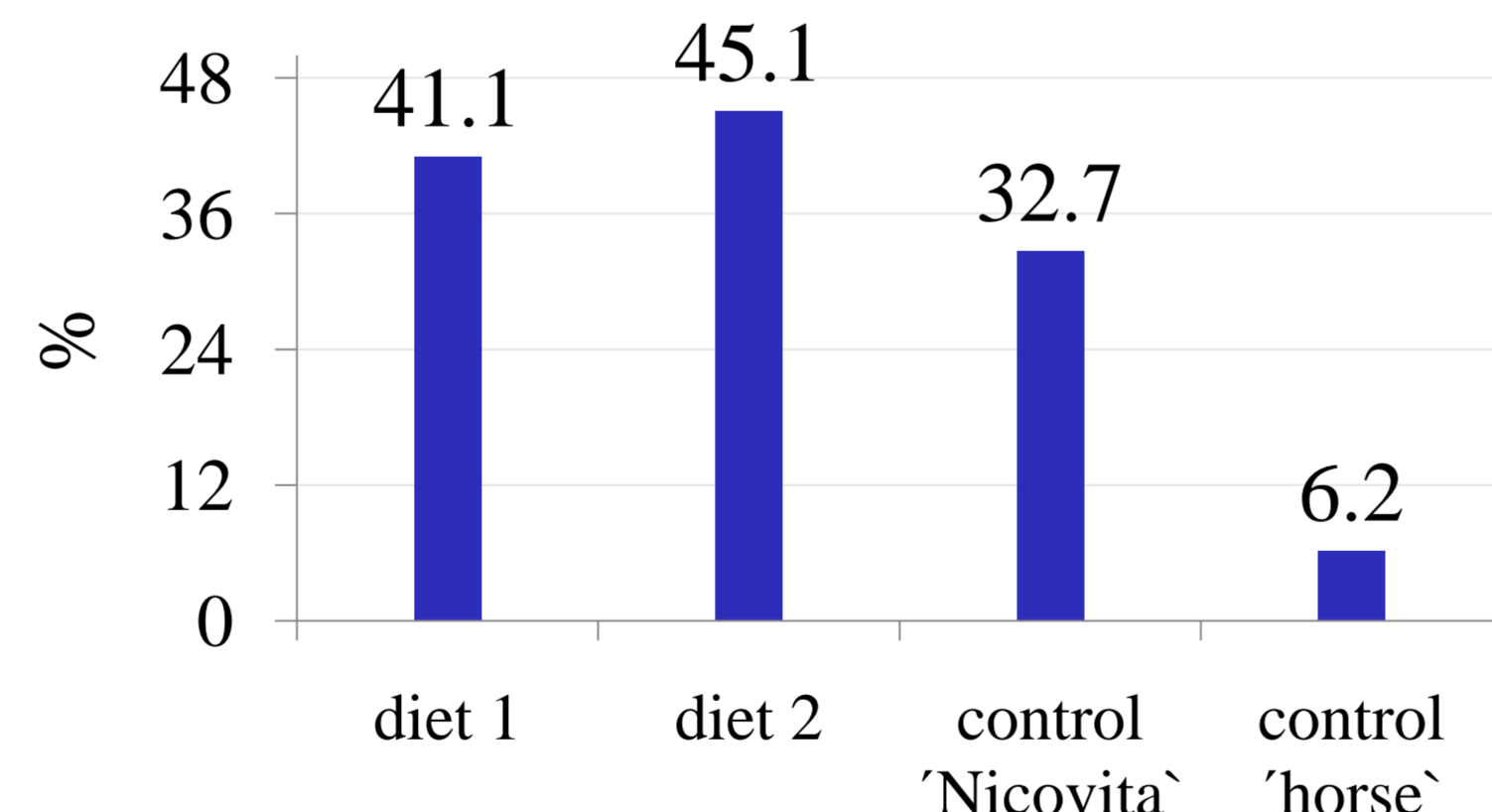
## Methodology

- Two test diets were compared to a commercial shrimp feed used for the cultivation of marine shrimp (control 'Nicovita') and to a pellet feed for horses used in the only existing prawn farm in Costa Rica (control 'horse').
- Randomized set-up of three outdoor ponds, each with four net cages of 2 m<sup>2</sup> for a period of 28 days.
- Monitoring of growth and feed utilization of *M. rosenbergii* and the water quality parameters of the experimental ponds.

## Results

- Water quality parameters met the prawns' requirements.
- Body Weight Gain and Specific Growth Rate of control 'horse' significantly different from other three treatments.
- Test diet 1, test diet 2 and control 'Nicovita' met the nutritional requirements of *M. rosenbergii*.

### Body Weight Gain



### Specific Growth Rate

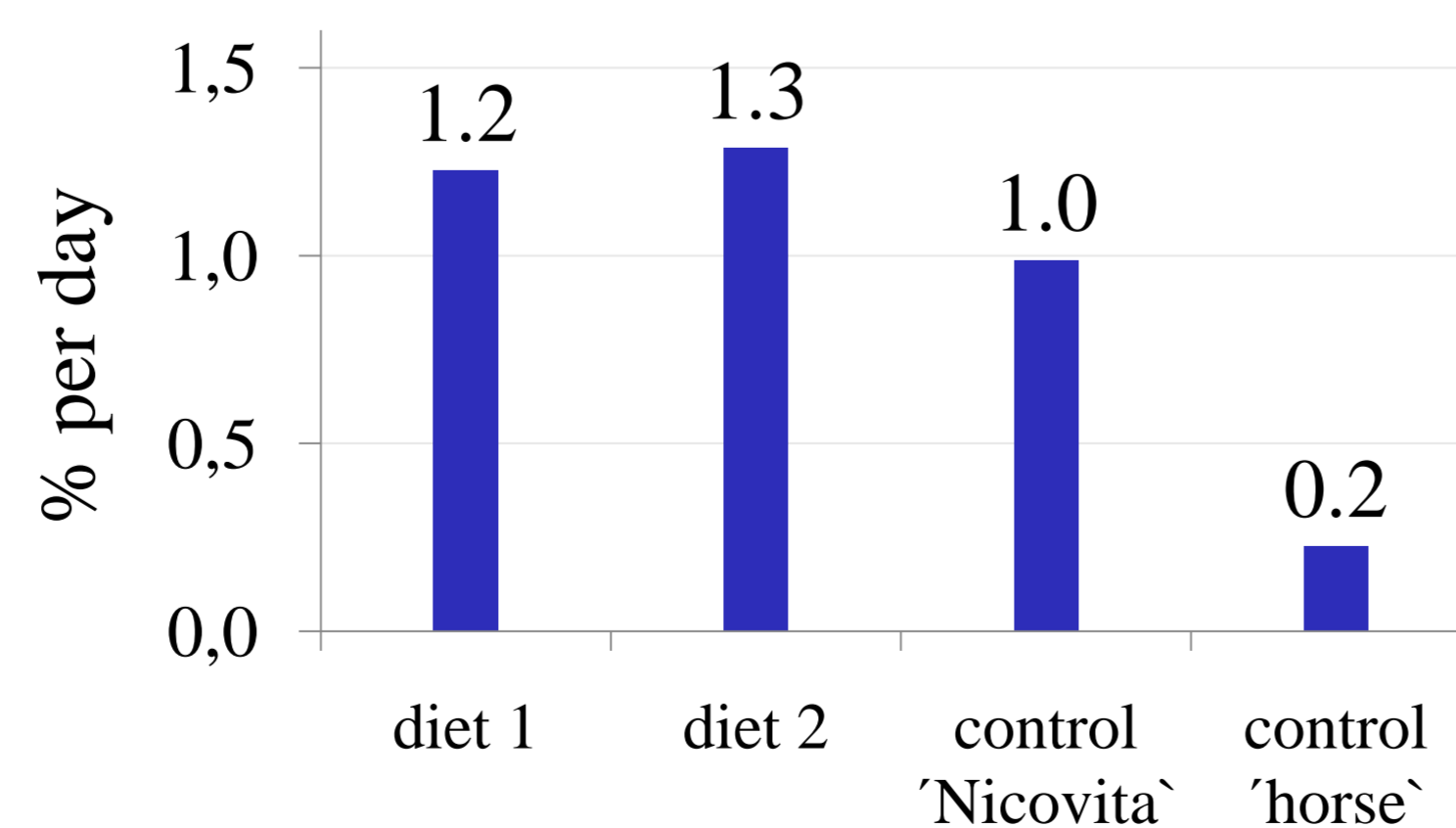


Table: Chemical composition of experimental diets (% DM)

	diet 1	diet 2	control 'Nicovita'	control 'horse'
Dry matter	92.3	94.1	90.3	90.9
Crude Protein	25.4	26.9	35.5	15.5
Crude Lipid	8.1	8.3	9.1	4.7
Crude Ash	10.6	9.8	8.2	7.0

## Conclusion

The tested by-products and processing wastes from coastal shrimp fisheries are adequate protein sources for *M. rosenbergii* and confirm to the regulation of organic farming. Based on the results there is a possibility to rise the income of Costa Rican smallholders.

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