

# FISHMEAL REPLACEMENT BY FEATHER MEAL AND FEATHER MEAL HYDROLYSATE IN RAINBOW TROUT (*O. MYKISS*).

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## Introduction

Since the ban on the use of animal byproducts in fish feed has been lifted in the EU, interest from industry has increased. Empro Europe NV produces feather meal (EM'PAQ) and feather meal hydrolysate (PEP'SOL) from purified chicken feathers using new and patented techniques to increase the digestibility of the feather meals.

## Objective

to investigate the potential of both ingredients as fishmeal replacers in rainbow



## Materials & Methods

- Trial duration: 12 weeks
- 35 rainbow trout juveniles / tank
- 18.0 ± 0.3 °C
- Feed rate: 2.75%
- 6 treatments in triplicate
- 18 tanks of 140L, 1 RAS
- individually tagged
- 15L/9D
- 3 meals: 9 - 13 - 17 o'clock
- Faeces collection for ADC

6 Isonitrogenous and isoenergetic experimental diets were formulated to contain 4.2% CP, 2.2% CF and 5200kcal.kg<sup>-1</sup>. Lysine, methionine, threonine and P were supplemented to have equal concentrations in all test diets.

| Treatment   |   | FM | EM'PAQ | 75E/25P | 50E/50P | 25E/75P | PEP'SOL |
|-------------|---|----|--------|---------|---------|---------|---------|
| Fishmeal LT | % | 28 | 14     | 14      | 14      | 14      | 14      |
| EM'PAQ      | % | 0  | 14     | 10.5    | 7       | 3.5     | 0       |
| PEP'SOL     | % | 0  | 0      | 3.5     | 7       | 10.5    | 14      |



## Results

|               | FM         | EM'PAQ     | 75E/25P    | 50E/50P    | 25E/75P    | PEP'SOL   |
|---------------|------------|------------|------------|------------|------------|-----------|
| Survival (%)  | 98,1±1,6   | 100,0±0,0  | 98,1±1,6   | 100,0±0,0  | 98,1±3,3   | 100,0±0,0 |
| ABW start (g) | 31,4±5,9   | 31,4±6,2   | 31,3±5,7   | 30,8±5,9   | 31,0±6,1   | 31,4±6,1  |
| ABW end (g)   | 162,7±37,3 | 169,0±40,9 | 160,3±33,4 | 160,8±36,7 | 159,6±31,1 | 164±32,8  |
| SGR (%/d)     | 2,45±0,12  | 2,49±0,01  | 2,43±0,01  | 2,44±0,09  | 2,42±0,06  | 2,46±0,06 |
| FCR dw        | 0,97±0,06  | 0,91±0,01  | 0,96±0,01  | 0,96±0,06  | 0,97±0,02  | 0,98±0,02 |

Table 1

|             | FM       | EM'PAQ   | 75E/25P  | 50E/50P   | 25E/75P   | PEP'SOL  |
|-------------|----------|----------|----------|-----------|-----------|----------|
| ADC protein | 92,0±1,8 | 88,6±2,7 | 88,2±1,3 | 88,3±3,4  | 90,0±3,8  | 89,5±3,0 |
| ADC fat     | 92,6±1,6 | 87,9±1,1 | 84,3±3,2 | 85,2±6,4  | 86,7±4,5  | 84,1±2,4 |
| ADC carbo   | 64,1±6,4 | 62,2±7,9 | 69,0±7,4 | 63,2±10,5 | 65,9±11,6 | 68,5±6,4 |
| ADC energy  | 87,6±1,7 | 84,2±2,8 | 83,6±0,9 | 83,1±4,6  | 84,4±5,7  | 84,1±2,5 |

Table 2

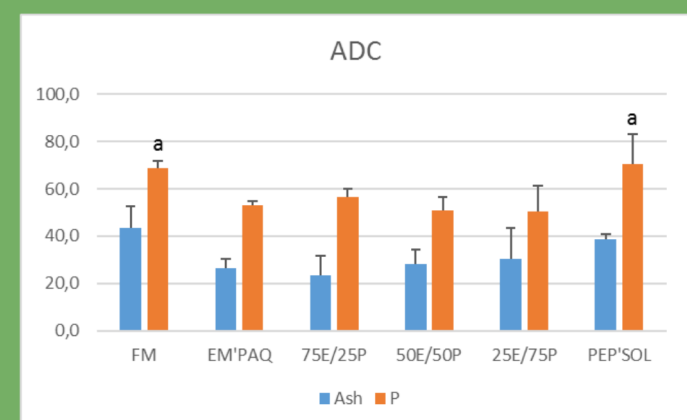


Figure 1

There was no significant difference in survival, SGR or FCR between treatments (table 1).

No significant difference was found for ADC of protein, fat, carbohydrates, energy or ash (table 2). A significant difference was found for the ADC of phosphorus ( $p = 0.032$ ) with FM and PEP'SOL having equal and higher ADC for phosphorus compared to the other treatments (figure 1).

## Conclusion

Growth performance and feed utilization were not affected when substituting 50% of dietary fishmeal by each one of the test ingredient ratios. All test diets were equally well digested except for phosphorus. The reduced phosphorus digestibility with diets containing EM'PAQ was not reflected in performance results, suggesting that available phosphorus levels in all diets were adequate.

EM'PAQ and PEP'SOL are promising fishmeal replacers for the development of more sustainable trout feeds. Because of a lower cost price, EM'PAQ will be the preferred product.

Currently a feeding trial is being performed in which up to 100% of the dietary fishmeal is replaced.

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