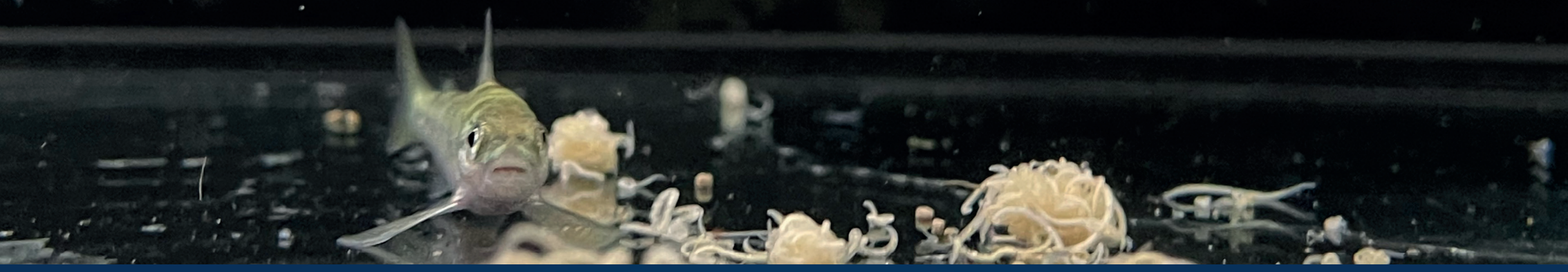

TINY worms, BIG potential

Enchytraeus albidus as starter feed for rainbow trout

AARHUS UNIVERSITY

Dennis Grantland[1], Martin Holmstrup[1], Johannes Overgaard[2], Mathias Engell Holmstrup[1,3] & Stine Slotsbo[1]*

[1]Aarhus University, Department of Ecoscience, Denmark | [2]Aarhus University, Department of Biology, Denmark | [3]Fishlab, Denmark

Background & Rationale

The aquaculture industry is seeking sustainable feed alternatives to enhance the health and growth of farmed fish during their early life stages. This study examines the potential of the annelid worm *Enchytraeus albidus* as a live starter feed for rainbow trout fry (*Oncorhynchus mykiss*), with a focus on growth performance, health, and fatty acid composition.

Aim & Objectives

The aim was to evaluate the suitability of *E. albidus* as an initial live feed for rainbow trout fry. The specific objectives were to:

1. Assess the effects of replacing commercial dry feed with live *E. albidus* during the first 21 days of feeding on fry growth and health.
2. Evaluate growth and health responses upon the transition from *E. albidus* to commercial dry feed (days 22-43)
3. Determine whether *E. albidus* meets the fry's essential fatty acid requirements.

Experimental Design

Fry were fed for 21 days with either standard dry feed (DF), live *E. albidus* (EF), or a combination (DF/EF), followed by 22 days on DF.

Growth (mass and length) and health indicators were monitored throughout the experiment. Fatty acid profiles of both fry and feed were analysed at day 21.

Outcome

Fry fed EF showed significantly enhanced growth, maintaining a 10% higher body mass than DF-fed fry at the end of the trial (Fig. 1). Health indicators remained high across all groups.

Feeding responses were similar across diet treatment, suggesting comparable palatability between *E. albidus* and dry feed. However, PCA of fatty acid profiles (Fig. 2) revealed that DF/EF-fed fry clustered closely with EF-fed fry, indicating a preference for *E. albidus* when both feeds were available.

Despite lower whole-body n-3 fatty acid levels in EF-fed fry, DHA levels appeared to be preserved in the neural tissues.

Key Takeaway

This study confirms the potential of *E. albidus* as a promising live starter feed for rainbow trout fry, supporting enhanced growth and maintaining health without adverse effects, and highlights its potential as a bio-carrier for oral vaccines.

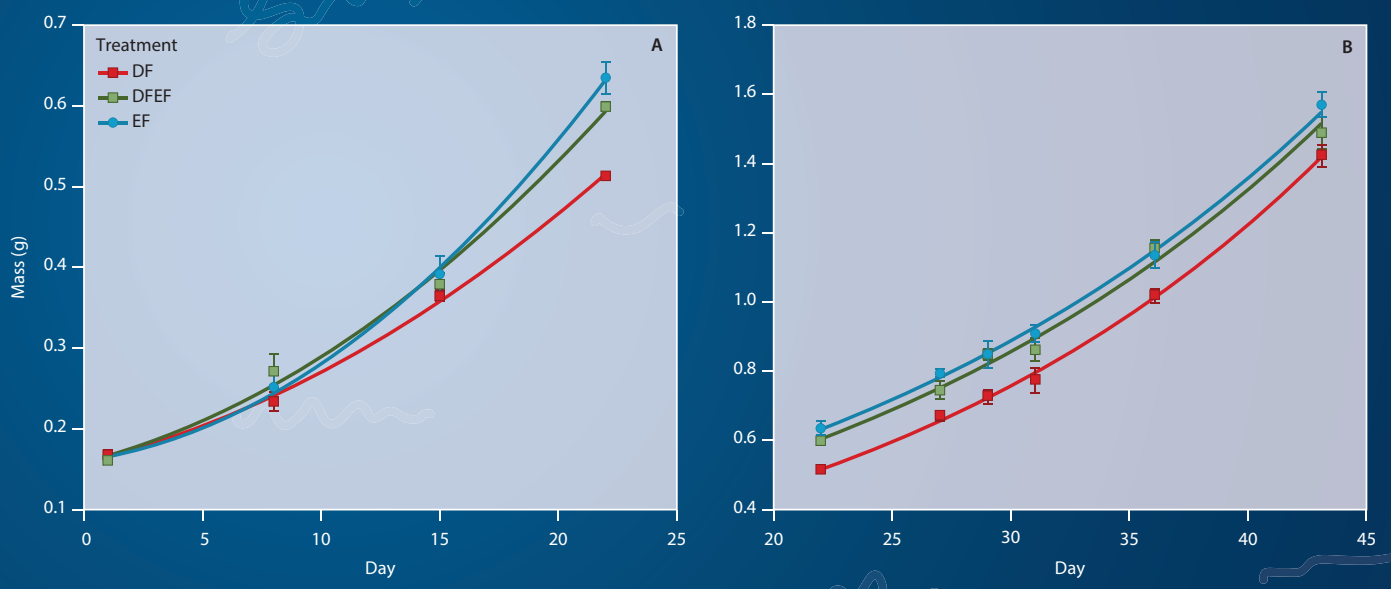

Figure 1. Effects of feed type on length and mass of rainbow trout fry during a two-phase feeding experiment. A) shows mass from day 1–22, and B) shows mass from day 22–43. Fry were feed dry feed (DF), *E. albidus* (EF), and a combination (DF/EF) in phase 1 (day 1-22), followed by dry feed for all groups in phase 2 (day 23-43). Values are means ± SE from five replicates (10-25 fish each).

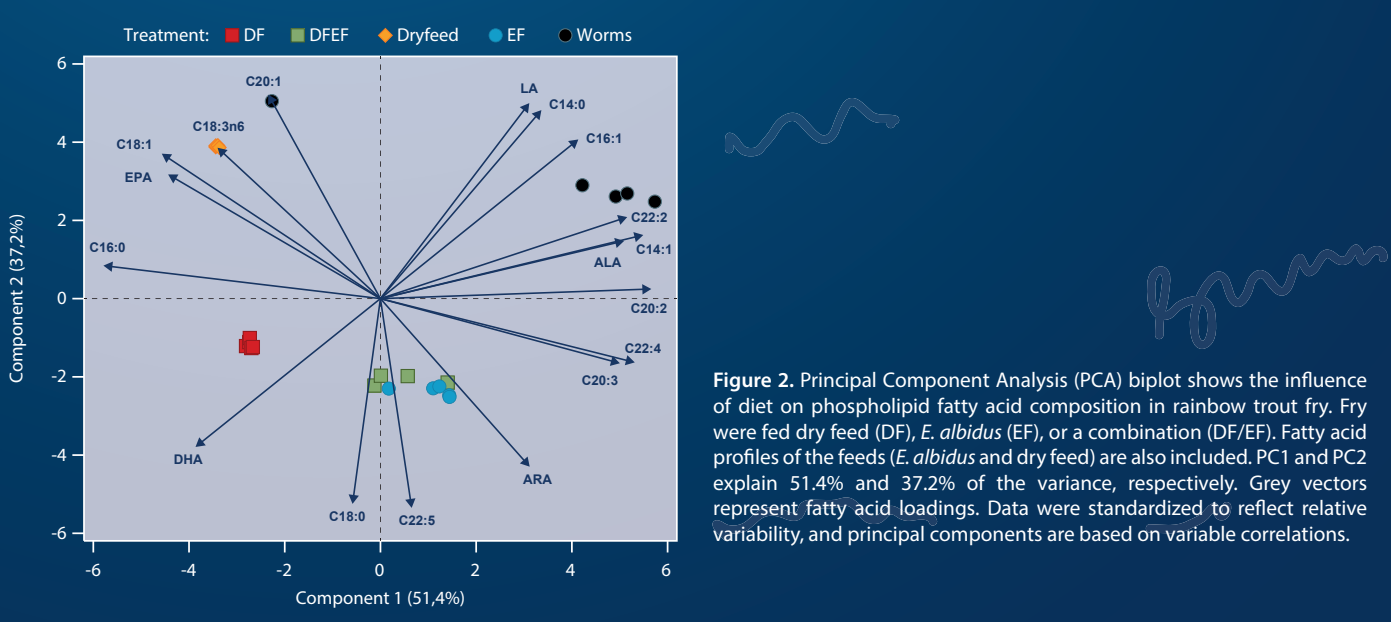

Figure 2. Principal Component Analysis (PCA) biplot shows the influence of diet on phospholipid fatty acid composition in rainbow trout fry. Fry were fed dry feed (DF), *E. albidus* (EF), or a combination (DF/EF). Fatty acid profiles of the feeds (*E. albidus* and dry feed) are also included. PC1 and PC2 explain 51.4% and 37.2% of the variance, respectively. Grey vectors represent fatty acid loadings. Data were standardized to reflect relative variability, and principal components are based on variable correlations.

LiveFishHealth

ICROFS Organic RDD