

Tailoring your feeds

IMPACT OF NOVEL FEEDING PROTOCOLS ON ORGAN DEVELOPMENT AND SKELETAL ANOMALIES IN ATLANTIC COD (*Gadus morhua*) LARVAE

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INTRODUCTION

Challenges in cod larval rearing

- High mortalities
- Skeletal anomalies
- Susceptibility to pathogens



Knowledge gaps

- Limited data on cod nutritional needs
- Lack of optimized microfeeds



Test novel feeding protocols combining:

Cryo Plankton & Tailored microfeeds

- Evaluating larvae KPIs:
- Growth performance
 - Skeletal development
 - Organ ontogeny

CONCLUSION

► Combining **cryoplankton** with **tailored microfeeds** improved skeletal and organ development in Atlantic cod larvae. Specifically, **microdiets 1 & 4** promoted organ maturation and led to healthier skeletal formation, ultimately enhancing juvenile quality.

MATERIALS AND METHODS

► TRIAL 1

- 3 treatments (2 live feed regimes & 3 microdiets):

D1	Rotifers + Cryo-μ + Cryo-S + Cryo-L + D1 diet
D2	Rotifers + Cryo-μ + Cryo-S + Cryo-L + D2 diet
CTRL	Rotifers + Cryo-L + CONTROL diet

- Cod larvae fed from 3-66dph:

Live Feeds	→ 3-27 dph
Co-feeding	→ 28-45 dph
Inert Feeds	→ 46-66 dph

► TRIAL 2

- 3 treatments (1 live feed regime & 3 microdiets):

CTRL	Rots + Cryo-μ + Cryo-S + Cryo-L + CTRL diet
D3	Rots + Cryo-μ + Cryo-S + Cryo-L + D3 diet
D4	Rots + Cryo-μ + Cryo-S + Cryo-L + D4 diet

- Cod larvae fed from 3-67dph:

Live Feeds	→ 3-27 dph
Co-feeding	→ 20-45 dph
Inert Feeds	→ 46-67 dph

RESULTS

► HISTOLOGY

15 DAH	D1	D2	CTRL
Anterior Intestine	3	2	2
Posterior Intestine	4	3	4
Liver	2	2	2
Eyes	3	3	3
Gills	3	3	1

66 DAH	D1	D2	CTRL
Anterior Intestine	5	4	3
Posterior Intestine	4	3	4
Liver	4	3	4
Eyes	3	3	3
Gills	4	2	4

At 15dph, **Cryo-μ, Cryo-S and Cryo-L** led to higher villi length and more goblet cells in anterior intestine (Fig. 1).

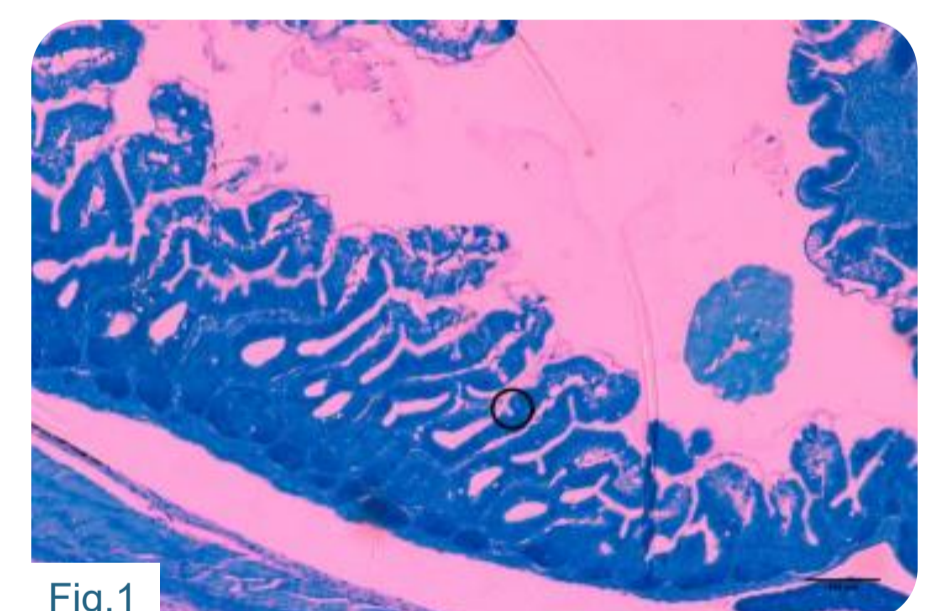
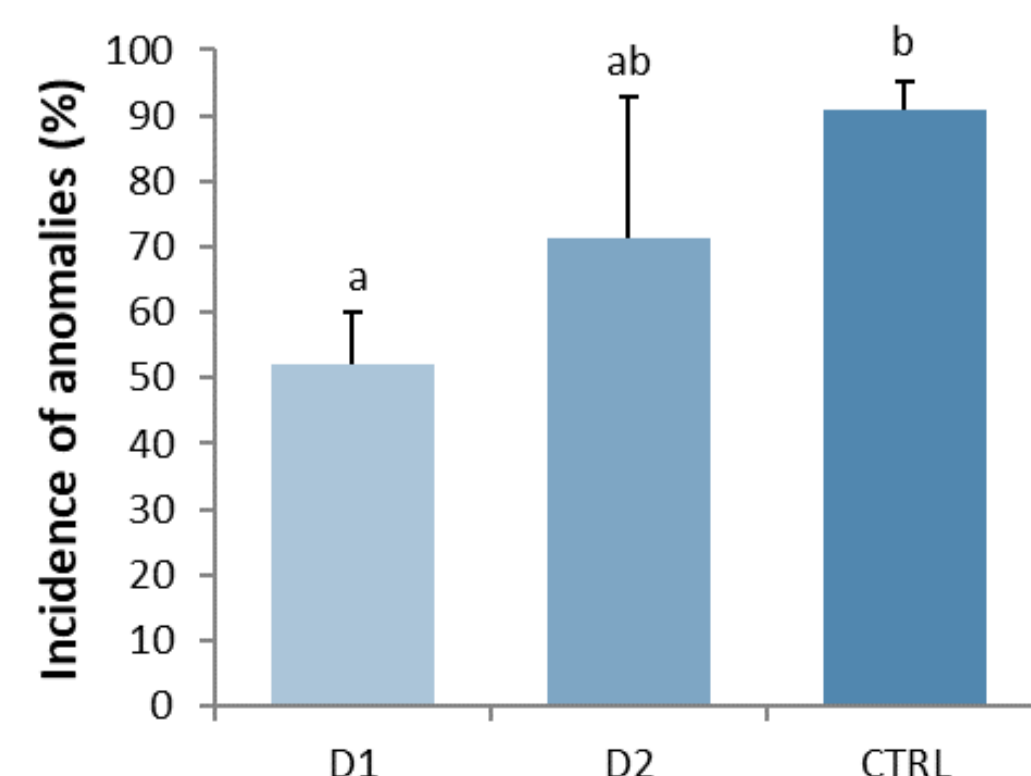


Fig.1

At 66dph, **Diet 1** linked to enhanced organ ontogeny in cod

Fish larvae quality scoring system (Pacorig et al, 2022):
 - Scale from 1 (very poor development) to 5 (very well developed)

► SKELETAL ANOMALIES



D1 (Trial 1) and D4 (trial 2, results not shown) presented lower incidence of skeletal anomalies (Fig. 2) than the control group.

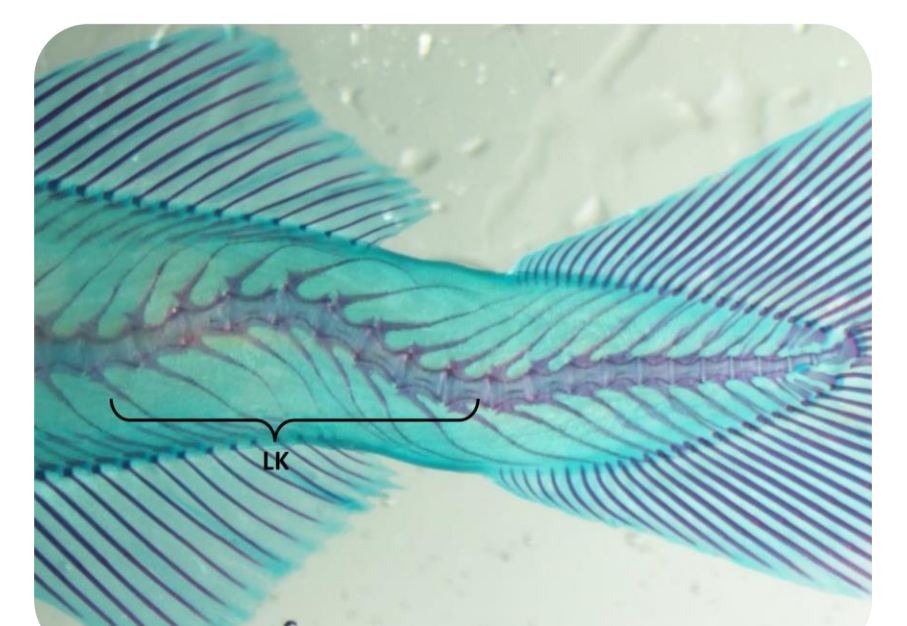


Fig. 2 Example of skeletal anomalies in cod larvae: (LK) Lordosis/Kyphosis.