Nutrient flows of carbon, nitrogen, and phosphorus in *Hediste diversicolor* (OF Müller, 1776) fed aquaculture sludge

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POLYCHAETE

1 Introduction

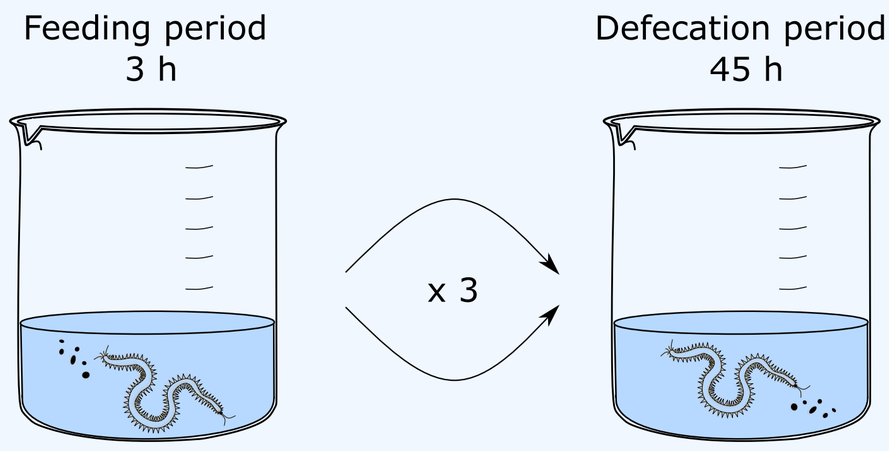
Growing **Atlantic salmon** (***Salmo salar***) production in Norway, projected 4-fold expansion of salmon aquaculture by 2050: 5 mio mt y^{-1}.

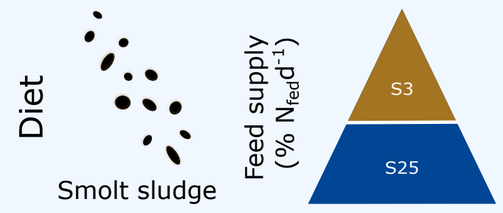
Overall sludge production from Norwegian salmon aquaculture: 700.000 mt y^{-1} – greater land-based production leads to increased **aquaculture sludge** which is rich nutrients.

Upcycling of nutrients contained in sludge through cultivation of **polychaetes *Hediste diversicolor***.

Need for further understanding of **nutrient flows** of carbon, nitrogen, and phosphorus.

2 Method





Nutrient flows of

C Carbon

N Nitrogen

P Phosphorus

4 Conclusion

Strong effect of feed supply on nutrient flows.

Carbon uptake > nitrogen uptake > phosphorus uptake in S25, no differences in S3.

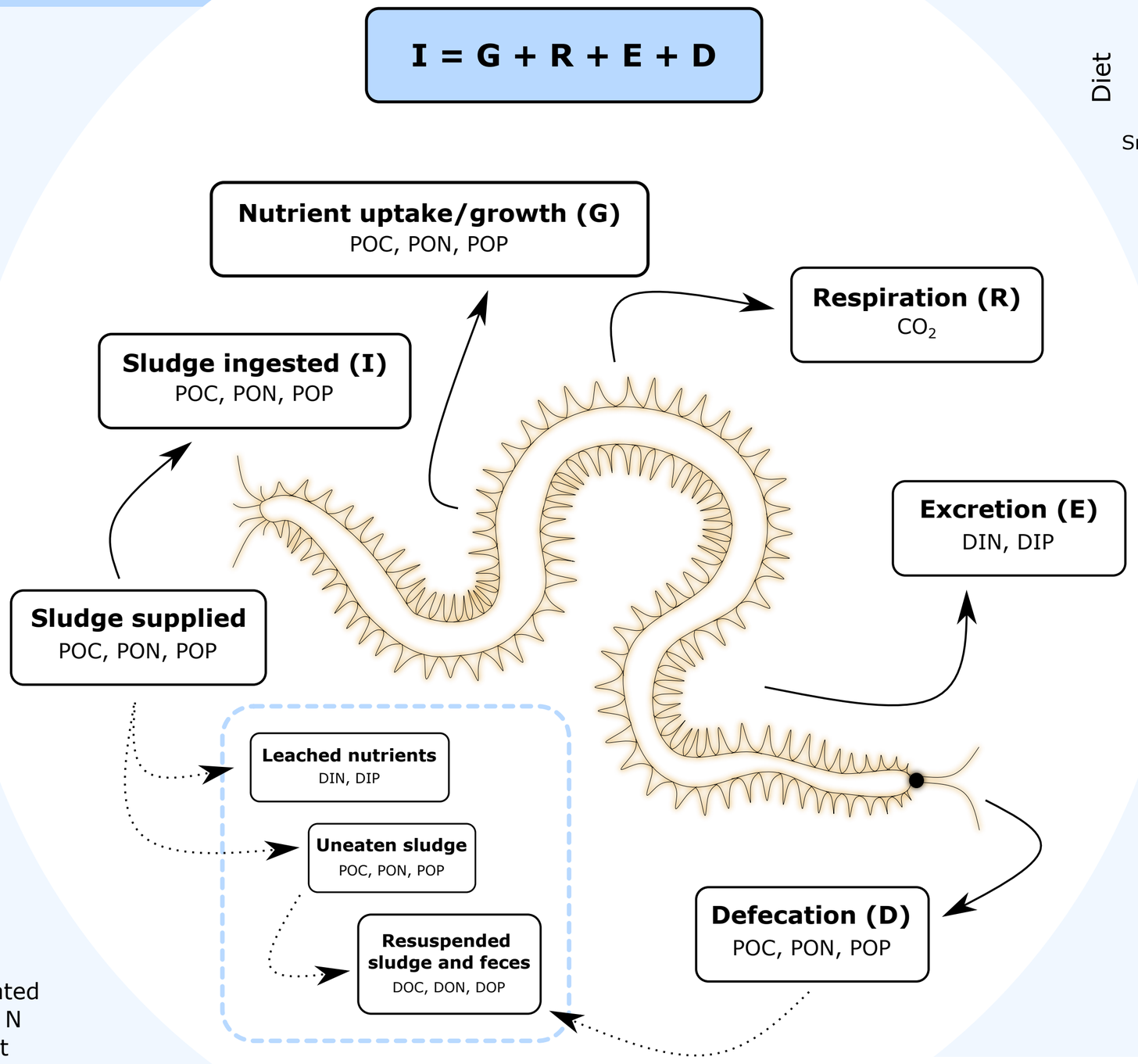
Insufficient nutrient supply in S3, with most energy spent on basal metabolism.

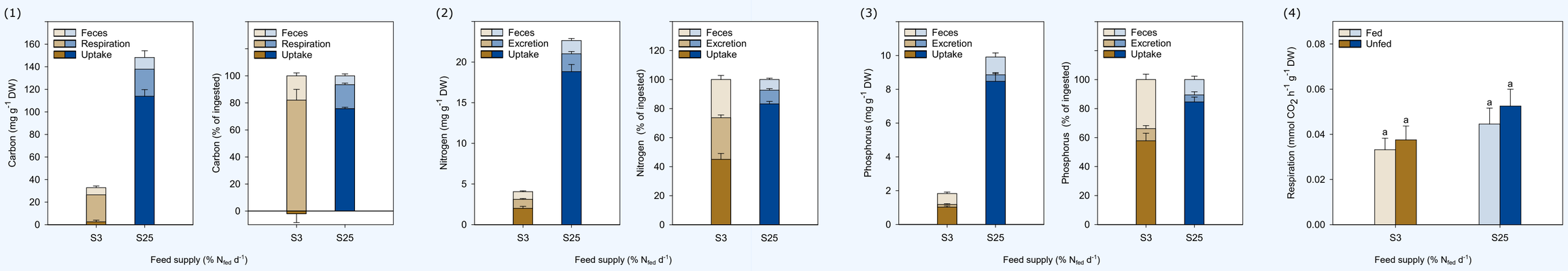
Nutrient uptake followed smolt sludge composition, needs further investigation with longer studies.

In S25, most ingested C, N, and P allocated to uptake.

In S3, most ingested C allocated to respiration, most ingested N allocated to uptake, and most ingested P allocated to uptake and fecal production.

Ingestion, defecation, excretion, and uptake strongly affected by feed supply. Respiration unaffected by feed supply and feeding state.





Carbon (1), nitrogen (2), and phosphorus flows (3), and respiratory rate (4) in polychaetes *H. diversicolor* fed different levels of smolt sludge (n=10). Same superscripts indicate non-significant differences ($p > 0.05$).

3 Results

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