

SENSORY QUALITIES AND METABOLITE PROFILE IN FILLET OF RAINBOW TROUT *Oncorhynchus mykiss* FED A DIVERSE SET OF ALTERNATIVE FEEDS

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INTRODUCTION:

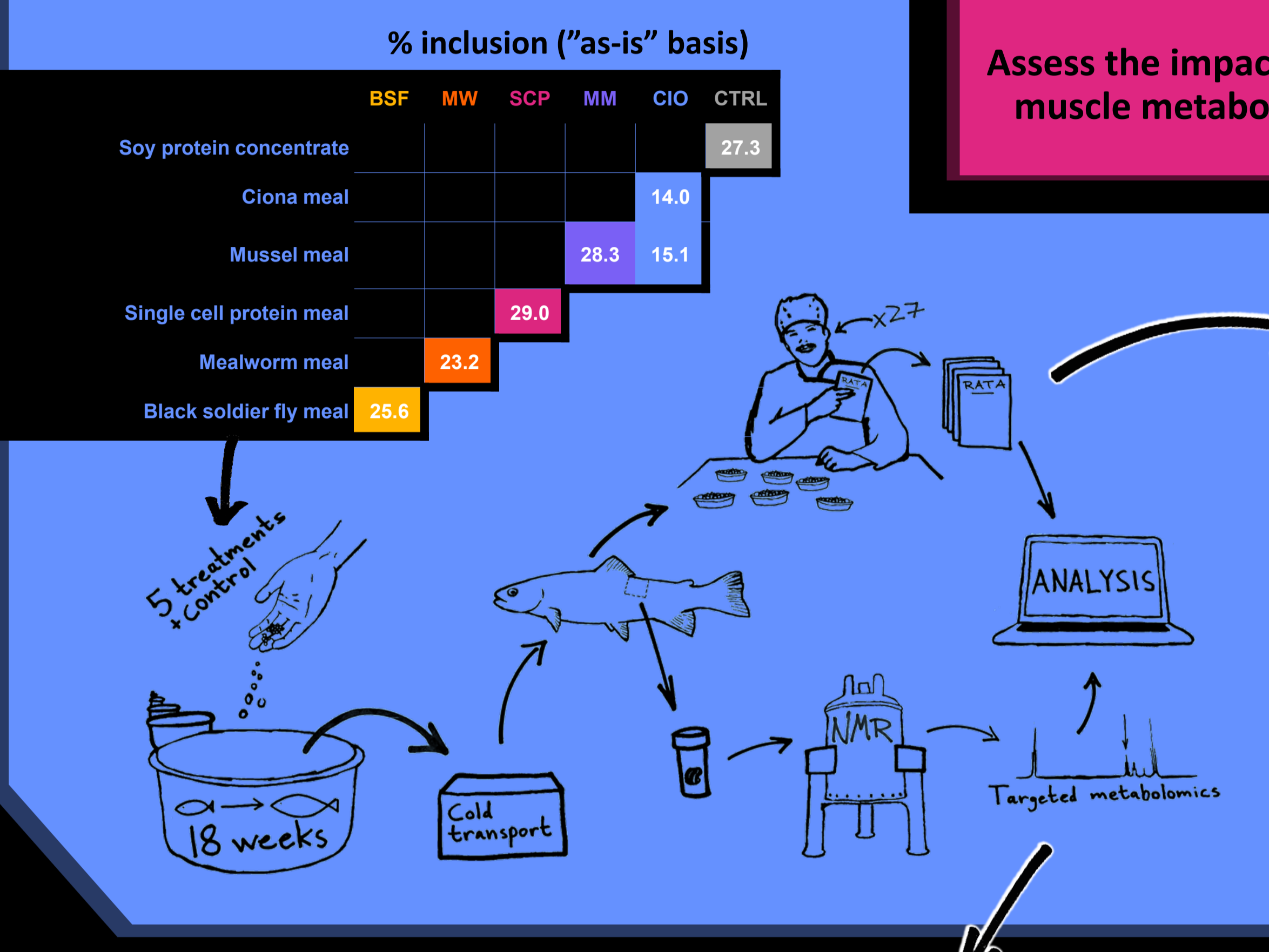
There are sustainability improvements to find in replacement of conventional protein sources in fish feed, and the list of contestants keeps growing. This study took on a phylogenetically wide scope of alternative protein sources for rainbow trout. All with an extra purpose in recycling nutrients back to our food production systems.

However, if the quality of the final product is subpar, is it worth the effort? We set aim to compare the sensory attributes of rainbow trout fed a broad group of promising protein sources, using 1H NMR as a potential translator between metabolome- and sensory characteristics.

METHODS:

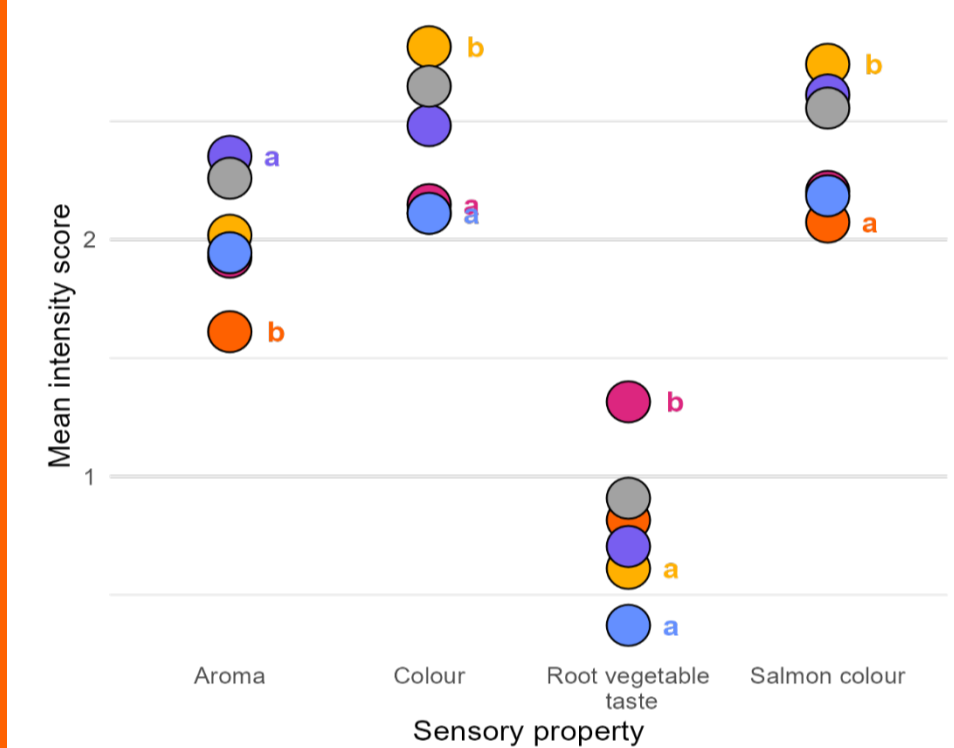
OBJECTIVE:

Assess the impact of alternative feeds on the white muscle metabolome and fillet sensory qualities.



KEY FINDINGS:

Sensory

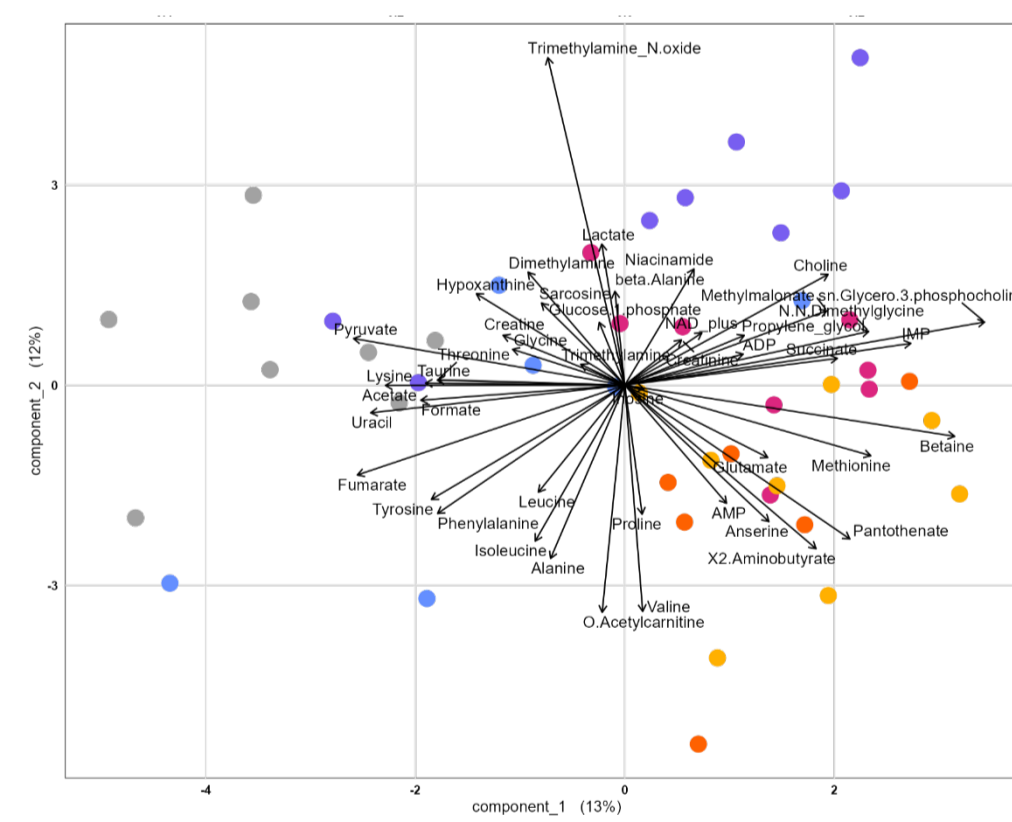


The mean intensity scores assigned by the judges. Treatment groups tagged 'a' are significantly different to 'b'.

Feed treatment groups

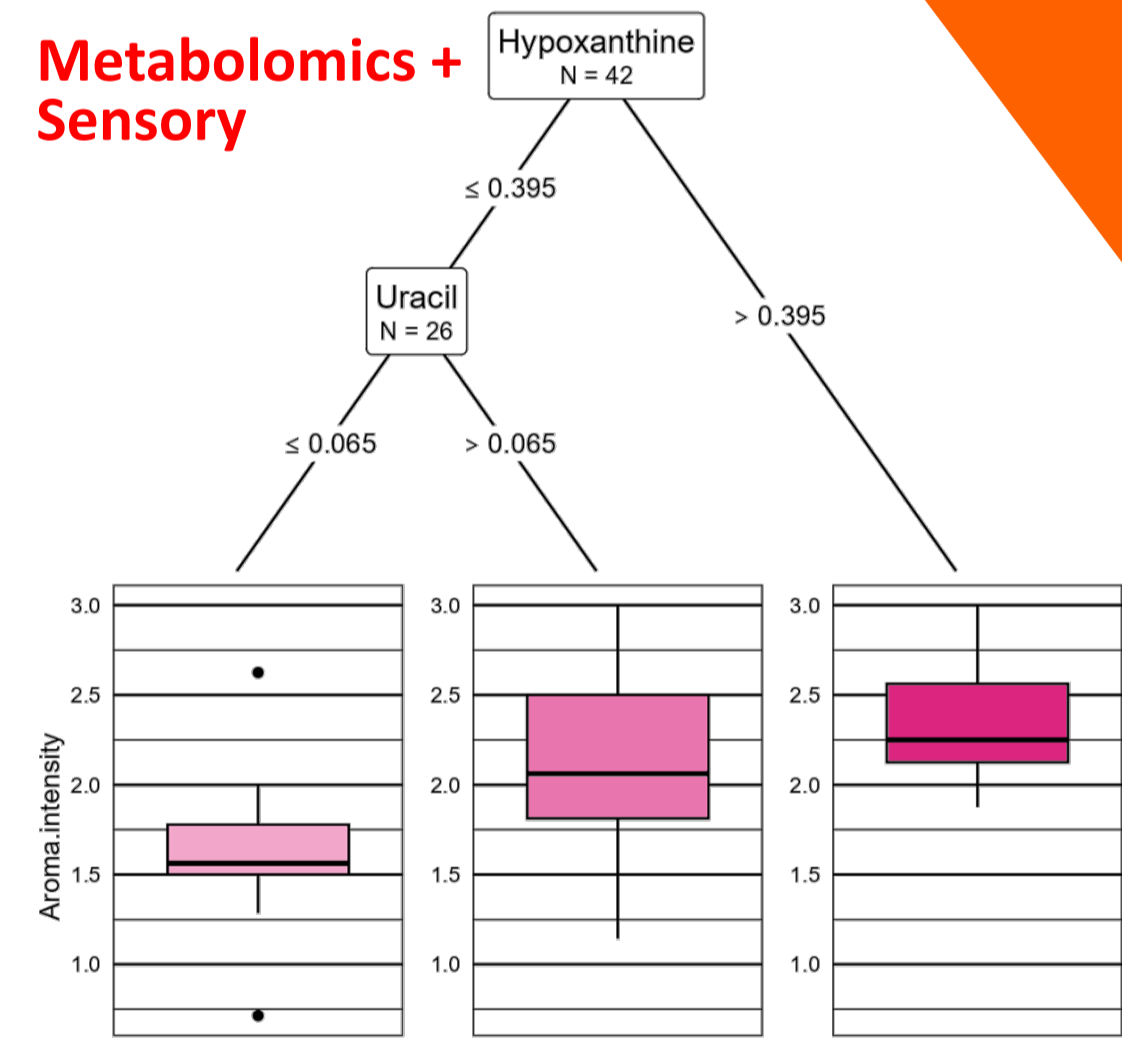
- Bsf – Black soldier fly (*H. illucens*)
- Mw – Mealworm (*T. molitor*)
- Scp – single cell protein (*P. variotii*)
- Mm – Blue mussel (*M. edulis*)
- Cio – Seasquirt (*C. intestinalis*)
- Ctrl – Control (soybean, *G. max*)

Metabolomics



sPLS-DA plot showing metabolome clustering differences between the treatment groups.

Metabolomics + Sensory



Conditional inference tree (CIT) analysis showing the most important metabolites for explaining aroma intensity.

CONCLUSIONS:

- The alternative feeds affect the metabolic profiles of the muscle tissue.
- Phylogenetically closer ingredients tend to produce more similar muscle metabolite profiles.
- The alternative diets results in fillets of comparable sensory characteristics.
- Metabolites associated with muscle tissue degradation are correlated with higher aroma intensity.
- Mussel-, black soldier fly-, and mealworm meal, causes lower muscle concentration of these metabolites (Hypoxanthine), which could be linked to longer shelf-life of the product.

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