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Effects of climate change on first-feeding brown trout growth and metabolism: a mesocosm experiment

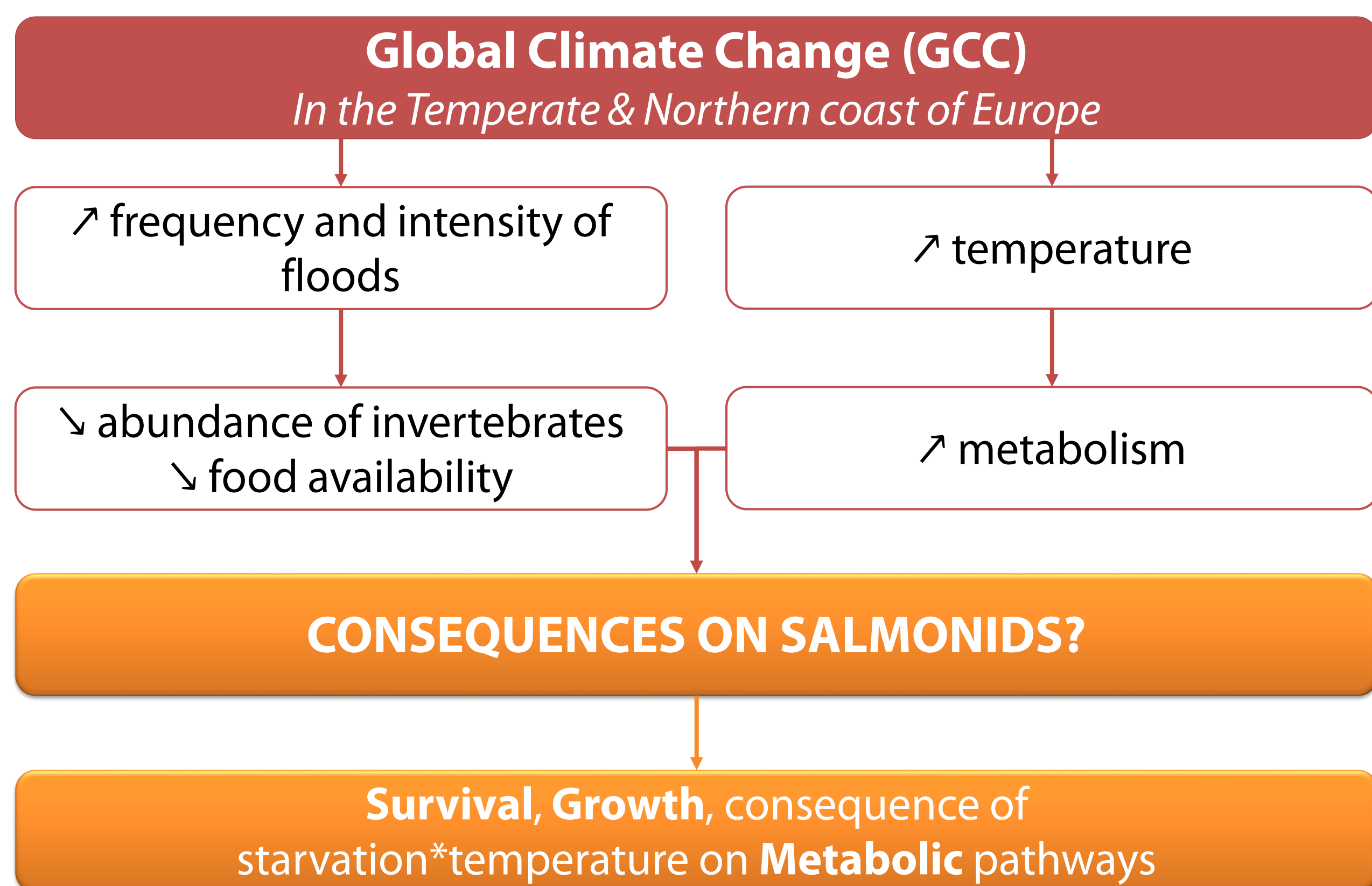
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Context



For Salmonids, **emergence** is a critical period during which high mortality rates occur. Indeed, young trout have a **limited amount of reserves** and they need to start food intake quite quickly to avoid mortality.

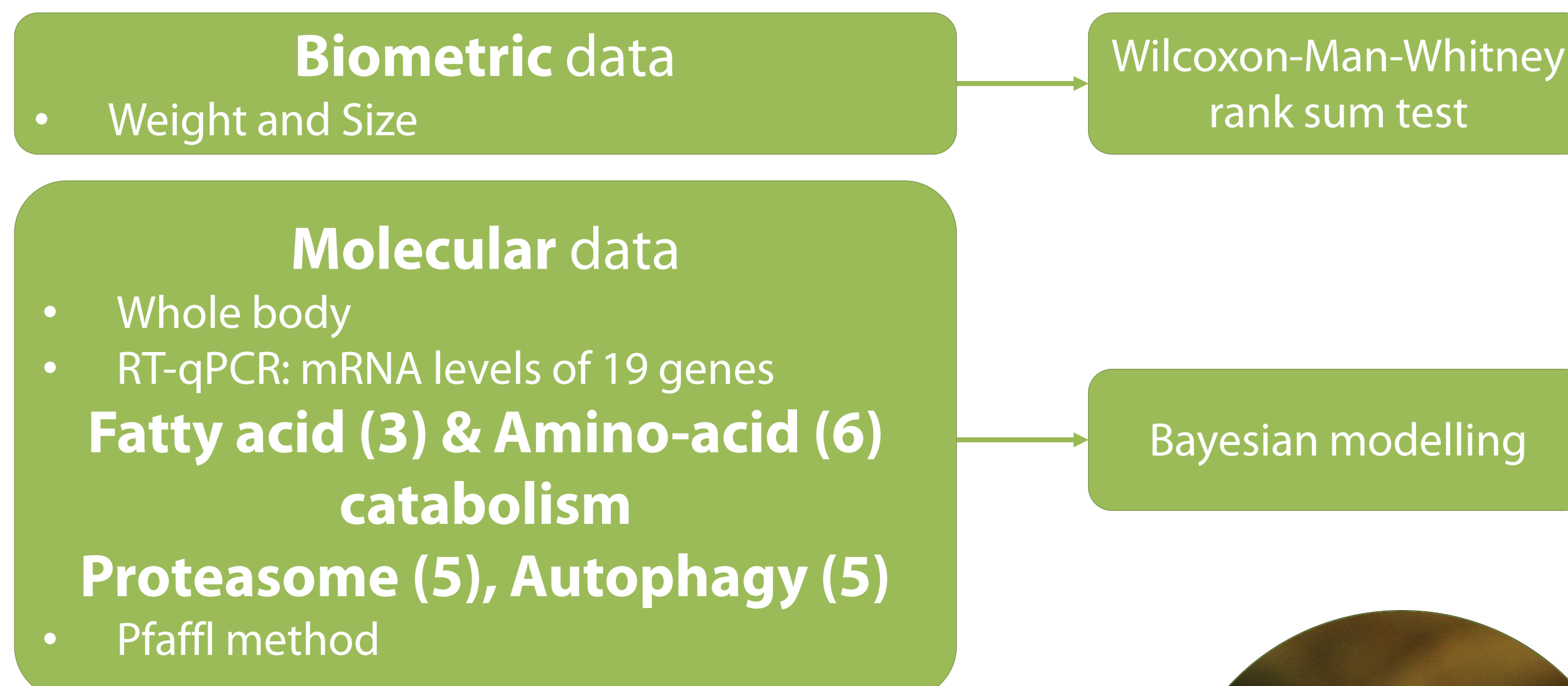
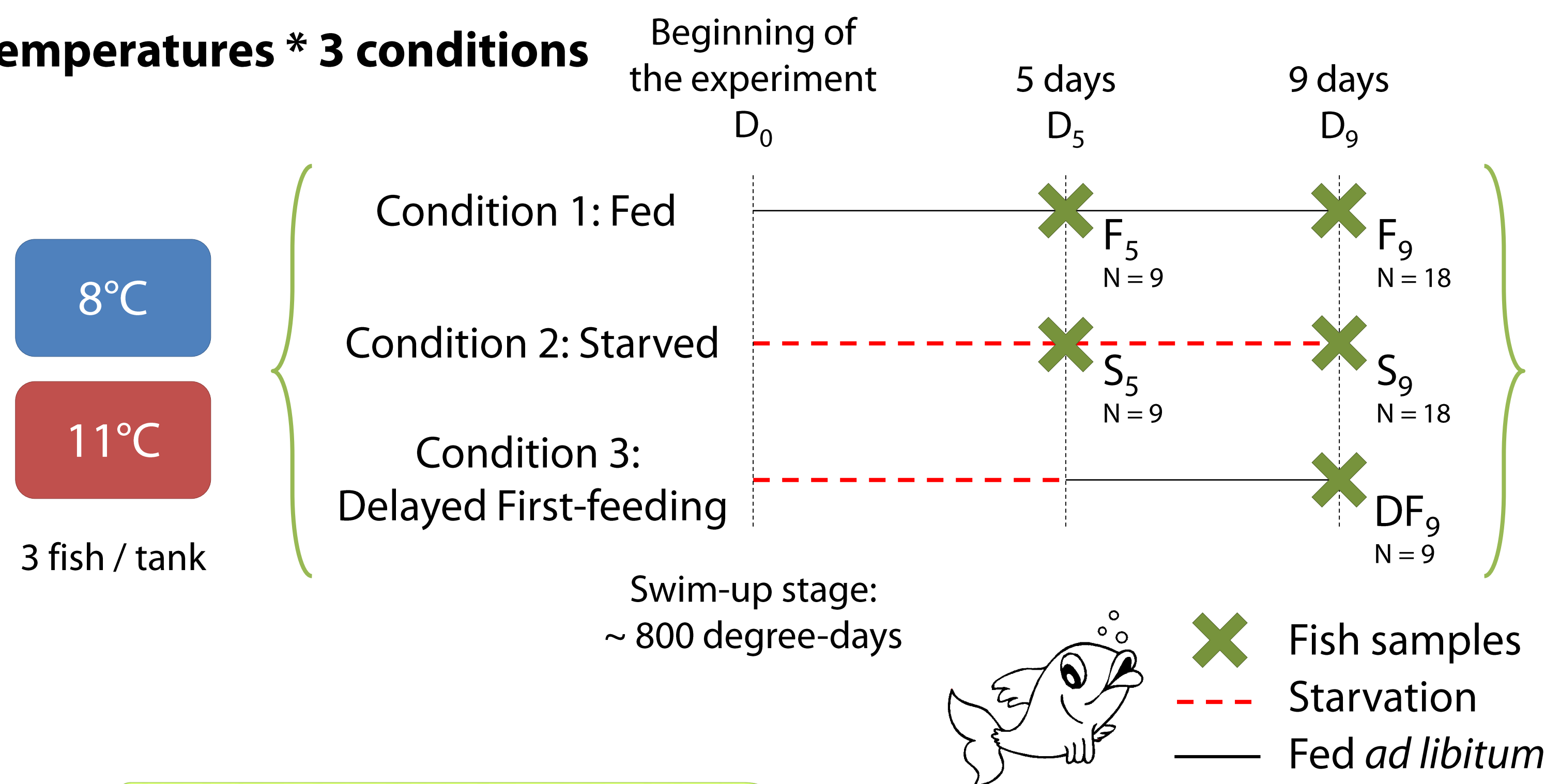
The aims of the present study were to better understand emerged brown trout response to Global Climate Change by:

- (1) Describing the consequences of **starvation** on their nutritional status,
- (2) Testing their ability to **recover** from a delayed first feeding,
- (3) Analysing the effect of **temperature** on both

Material and Methods



2 temperatures * 3 conditions

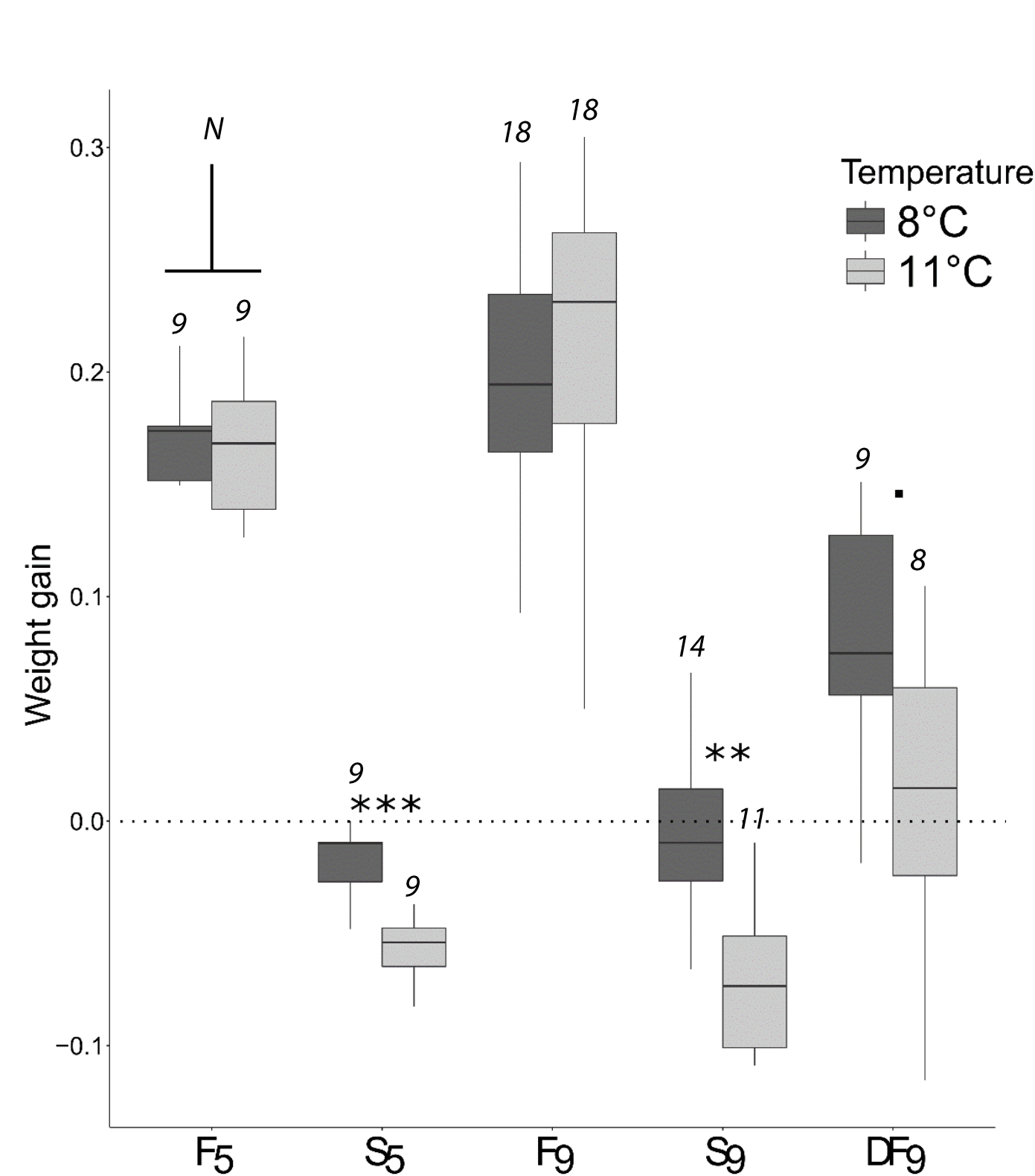


Results

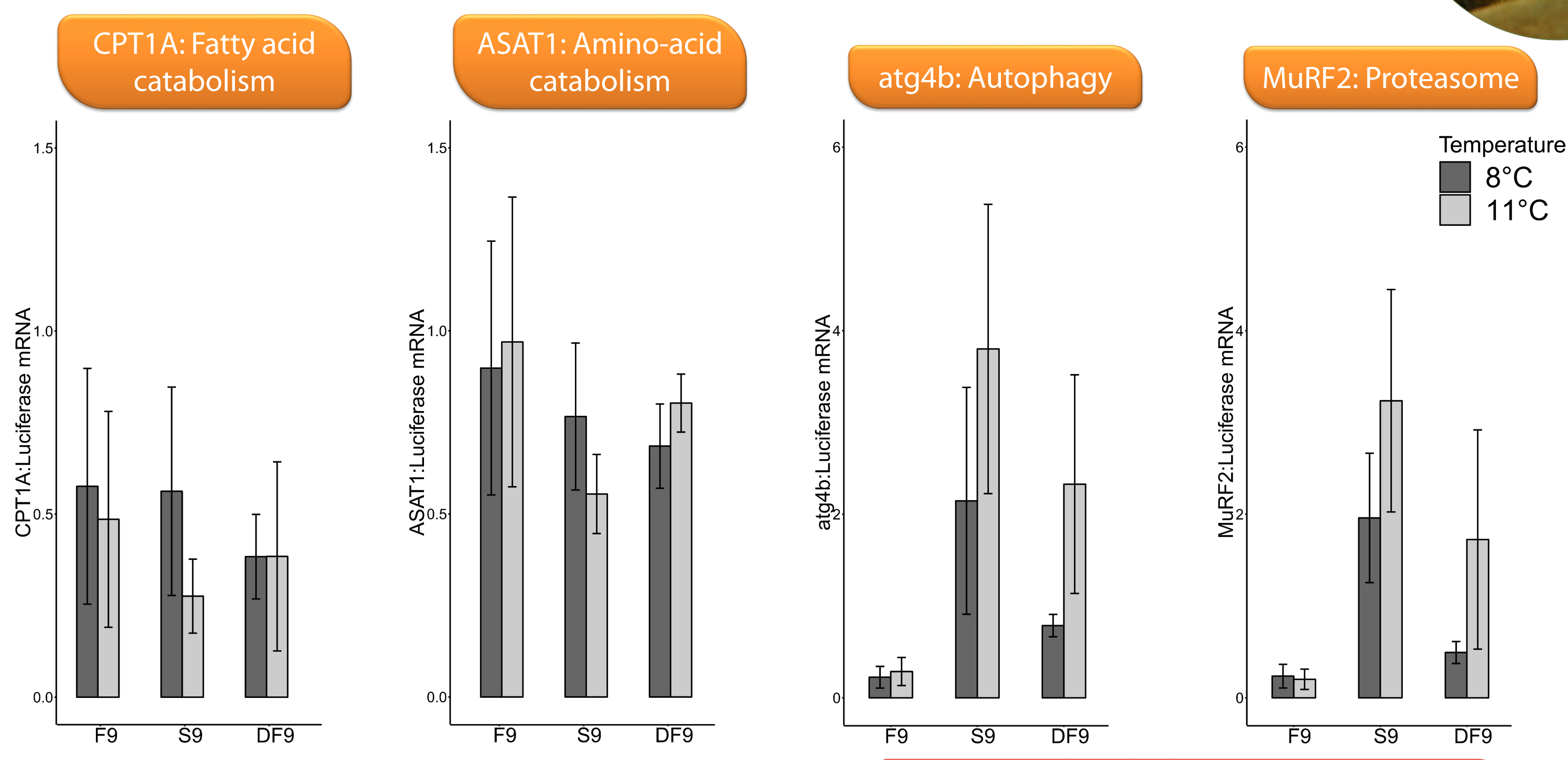
Mortality: On D₉, 12 fish died

At 8°C : 4 S₉

At 11°C : 7 S₉ + 1 DF₉



Weight gain of survivors from D₀ to D₉ for each condition at 8°C and at 11°C



mRNA levels of genes involved in each pathway for each condition at 8°C and at 11°C
 N = 6 by condition

Conclusions

- Growth and catabolism are **similar** between 8 and 11°C for Fed fish
- A **higher** temperature exacerbates the metabolic **distress** induced by **starvation**
- Despite 5 days of starvation, alevins are **able** to feed but **recovery**:
 - Is **not complete** after 4 feeding days
 - Is more **contrasted** at 11°C than at 8°C

GCC increases the risk that temperature reaches values above 10°C and that prey are washed out by large floods

The strength of 0⁺ cohorts could decrease in relation to starvation in years of large spring floods and the increase in temperature should worsen this effect