PROJECT: ROBUST
SYSTEM: Literature review-FW, RAS, S-CCS
PARTNER: NORCE
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CtrlAQUA

Optimal temperature conditions for robust smolts

HYPOTHESIS:

Temperature between 9-13°C gives optimal growth and feed conversion ration together with reduced osmoregulatory disturbance and reduced frequency of early maturation in post-smolts.

DURATION: Literature review from 2020 to 2022, on flow through systems, RAS and semi-closed systems in sea

HIGHLIGHTS:

- Temperature affects growth, feeding, feed conversion ratio, maturation, osmoregulatory performance and stress response.
- For smolt and post-smolt, optimal growth and feed conversion ratio are observed in temperature between 12-14°C.
- Least osmoregulatory disturbance is observed at 9°C in smolts and post-smolts
- Maximal swim speed is observed at 10.5°C.
- High temperature (16°C) condition gives better growth, however, in continuous light condition, it triggers maturation in male during and after smoltification.
- Temperature higher than 15-16°C and lower than 6°C induces reduced feeding and growth, triggers stress response, and increases risk of osmoregulatory dysfunction and mortality.

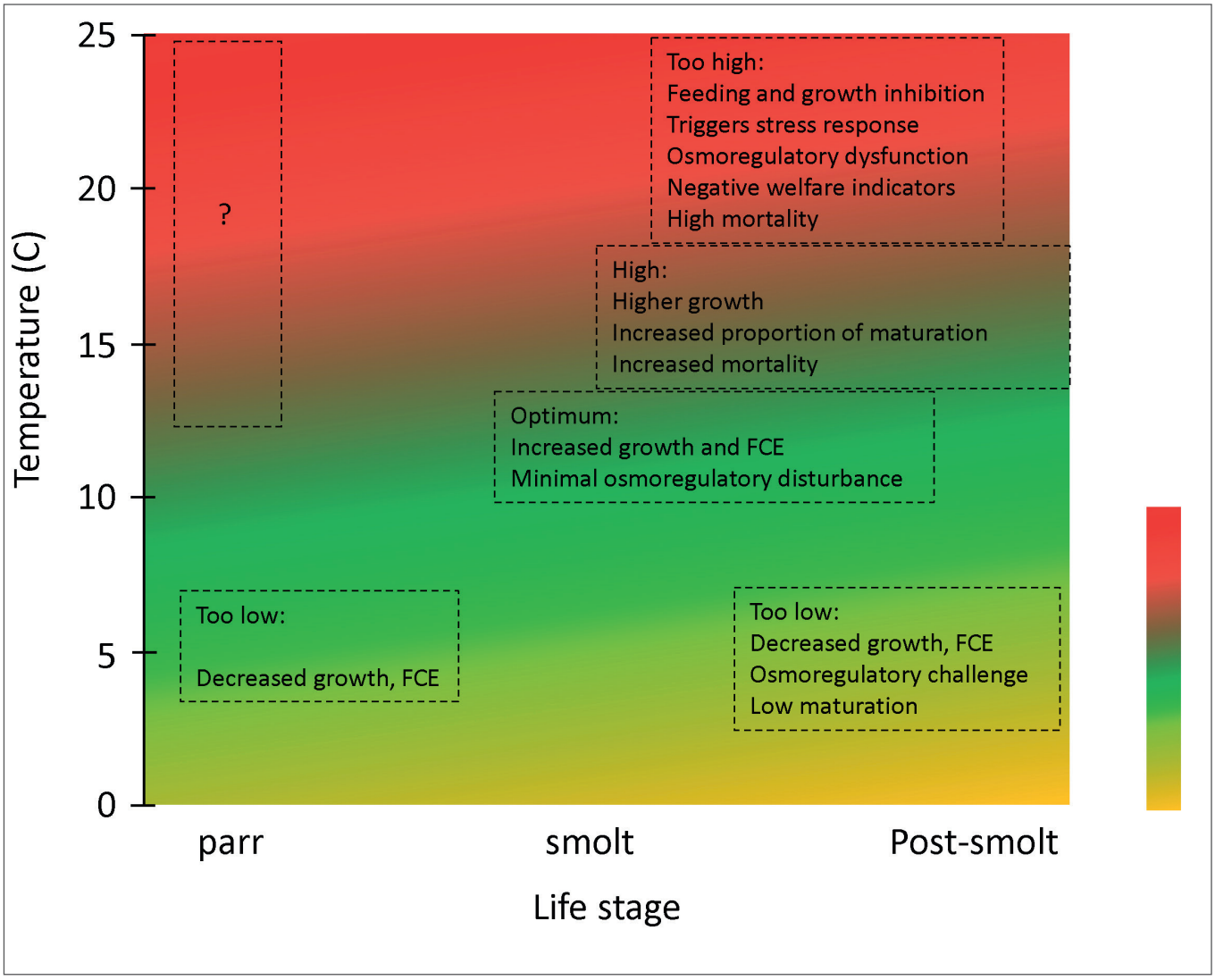
RECOMMENDATION:

- For smolt and post-smolt, temperature between 11-13°C is recommended for optimal growth, feeding, swimming and osmoregulation. Dark period of 6 hours is needed to avoid early maturation at higher temperature (>15°C) in postsmolts above 150g .
- Lower temperature (9-11°C) can be used together with continuous light to avoid early maturation.

READ MORE:

Lal, P., Tang, P., Tronci, V., Gharbi, N., Nilsen, T.O. (2023) Impact of environmental conditions on growth and post-smolt performance of Atlantic salmon (In revision)

The factsheet is ready for implementation, but with the note that the testing has not been done for all industrial relevant conditions.



Optimal temperature conditions for robust smolts: *Temperature between 9-13°C gives optimal growth and feed conversion ration together with reduced osmoregulatory disturbance and reduced frequency of early maturation in postsmolts.*