

Smoltification protocol for spring transfer

HYPOTHESIS:

Seawater performance (in spring condition) of smolts produced using eight different protocols were benchmarked and ranked using growth, maturation and nephrocalcinosis frequency

HIGHLIGHTS:

Growth:

Small difference in growth is observed for within similar size smolts groups; largest difference in growth rate was observed across smolts of different sizes and highest growth rates are observed in smaller smolts (100 g and 300 g).

Maturation:

Low maturation across all postsmolts sizes 100 g, 300 g and smolts.

Nephrocalcinosis:

Low frequency of nephrocalcinosis is observed for smaller smolts of 100 g and 300 g groups. In large smolt of 800 g group, additional light (24h light) reduced frequency of nephrocalcinosis.

RECOMMENDATIONS:

- Smaller smolts (100 g-300 g) using early winter signal (FW/BW) and large smolts (800 g) combined with addition light (24h light) are recommended for reduced maturation frequency and low nephrocalcinosis.
- These are preliminary data as not all results are processed.

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

READ MORE:

Benchmark presentations from Annual meeting 2023

Multiple Authors (2021). Annual Report 2020 CtrlAQUA – Centre for Closed-containment Aquaculture, eds.

Table 1 (next page): Performance of smolts after 3 months in seawater. Eight different smoltification protocols were used and transferred to seawater mimicking autumn temperature (12C) and light conditions (decreasing day length). As control, a 24hour day light group with 12C temperature condition is used. Recommended protocols are highlighted in green.



Spring transfer/100 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light
NW-FW	*	****	+++	++++	+++	+++	-	+++
NW-BW	**	***	+++	++++	+++	+++	-	--
EW-FW	**	*	+++	+++	+++	+++	+++	++++
EW-BW	***	****	++++	++++	+++	+++	+++	++++
Spring transfer/300 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light
NW-FW	*	***	+++	++++	+++	++	+++	++++
NW-BW	**	****	+++	++++	+++	++	+++	+
EW-FW	****	***	++++	+++	+++	++	++++	++++
EW-BW	****	***	++++	++++	+++	++	++++	++++
LW-FW	*	*	++	++	+++	++	+++	+++
LW-BW	**	**	+++	+++	+++	++	++++	++
Spring transfer/800 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light	24h light	Increasing light
NW-FW	**	**	+	+	++	++	++++	+
NW-BW	***	**	++	+	++	++	++++	+
EW-FW	****	*	++	+	++	++	++++	++
EW-BW	****	***	++	++	++	++	++++	+
LW-FW	*	*	+	+	++	++	++++	+
LW-BW	****	***	++	++	++	++	+++	++
LLW-FW	***	*	+	+	++	++	+++	+
LLW-BW	****	**	++	+	++	++	++++	+

For growth: Specific growth rates (SGR) of all groups were ranked. ++++: 76-100 percentile (1.120-1.224; +++: 51-75 percentile (SGR 1.023-1.112); ++: 26-50 percentile (SGR 0.641-0.983); +: 0-25 percentile (SGR 0.522-0.631).

* is used for within group ranking. More * means better SGR.

For maturation: +++: 0-5% score 1-2; ++: 5-10% score 1-2; +: 10-20% score 1-2; -: 20-30% score 1-2; --: >30% score 1-2.

For nephrocalcinosis: ++++: 100% score 0 and 1; +++: 85-99% score 0 & 1; ++: 70-84% score 0 & 1; +: 50-69% score 0 and 1; -: 37.5-50% score 0 & 1; --: 12.5-37% score 0 and 1; ----: 0-12% score 0 & 1.