

Smoltification protocol for autumn transfer

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. Constant light can increase maturation frequency in 300 g and 800 g smolts. Additional light during winter is not recommended. Lowest maturation is observed in group without winter signal, especially when grown in fresh water.

Nephrocalcinosis:

Largest smolts show lowest frequency of nephrocalcinosis (i.e. highest frequency of score 0 and score 1 postsmolt fish). Highest score 0 nephrocalcinosis frequency is observed in FW groups irrespective of smoltification protocols

RECOMMENDATIONS:

Large postsmolts grown in brackish water is recommended for reduced maturation frequency and low nephrocalcinosis. Extra light during winter may cause maturation and should be avoided.

These are preliminary data as not all results are processed.

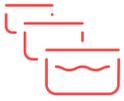
The factsheet is ready for implementation, but with the note that the testing has not been done for all industrial relevant conditions.

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.



Autumn transfer/100 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing light
NW-FW	**	***	+++	++++	++++	++++	++	--
NW-BW	*	***	+++	++++	++++	++++	+++	-
EW-FW	**	****	++++	++++	++++	++++	+++	++
EW-BW	*	****	+++	++++	++++	++++	+++	++

Autumn transfer/300 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing light
NW-FW	*	***	+++	+++	++	++	+++	-
NW-BW	**	****	+++	+++	++	++	+++	+++
EW-FW	****	***	++++	++++	-	++	+++	++
EW-BW	****	***	++++	++++	++	++	++++	+
LW-FW	*	*	++	+++	--	++	++++	+++
LW-BW	**	**	++	+++	+	++	++++	+

Autumn transfer/800 g								
Protocol	Growth (within group ranking) *		Growth (overall ranking) #		Maturation ##		Nephrocalcinosis ###	
	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing light	24h light	Decreasing 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 (1.505-1.815; +++: 51-75 percentile (SGR 1.333-1.493); ++: 26-50 percentile (SGR 0.86-1.332); +: 0-25 percentile (SGR 0.62-0.85).

* 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.