

PROJECT: BARRIER
SYSTEM: Semi-closed system in sea
PARTNERS: Nofima, NORCE,
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CtrlAQUA

Skin immune readiness in postsmolts

AIM:

To describe changes in skin structure and immune status of post-smolt Atlantic salmon.

DURATION: 2017-2018

FISH SIZE TESTED: 100-700 G

SALINITY TESTED: Salt water

HIGHLIGHTS:

- The skin of Atlantic salmon is a complex tissue and is composed of a mixture of different cell types. It is structured in three specific layers, the mucus (slime), and the underneath tissue, which includes the outer epidermis and the inner dermis layer of the skin.
- Fish transferred to seawater develop in the skin's outer epidermis and inner dermis by increasing the thickness of these layers. Also, mucus cell numbers in the outer layer increase.
- The change in structure development occurs in parallel with a gradual recovery of immune activity in skin post seawater transfer.
- These changes may be important for skin defence mechanisms, and the period post seawater transfer (approximately 2 months) should be considered a barrier recovery phase where the fish builds resilience and robustness for further growth.



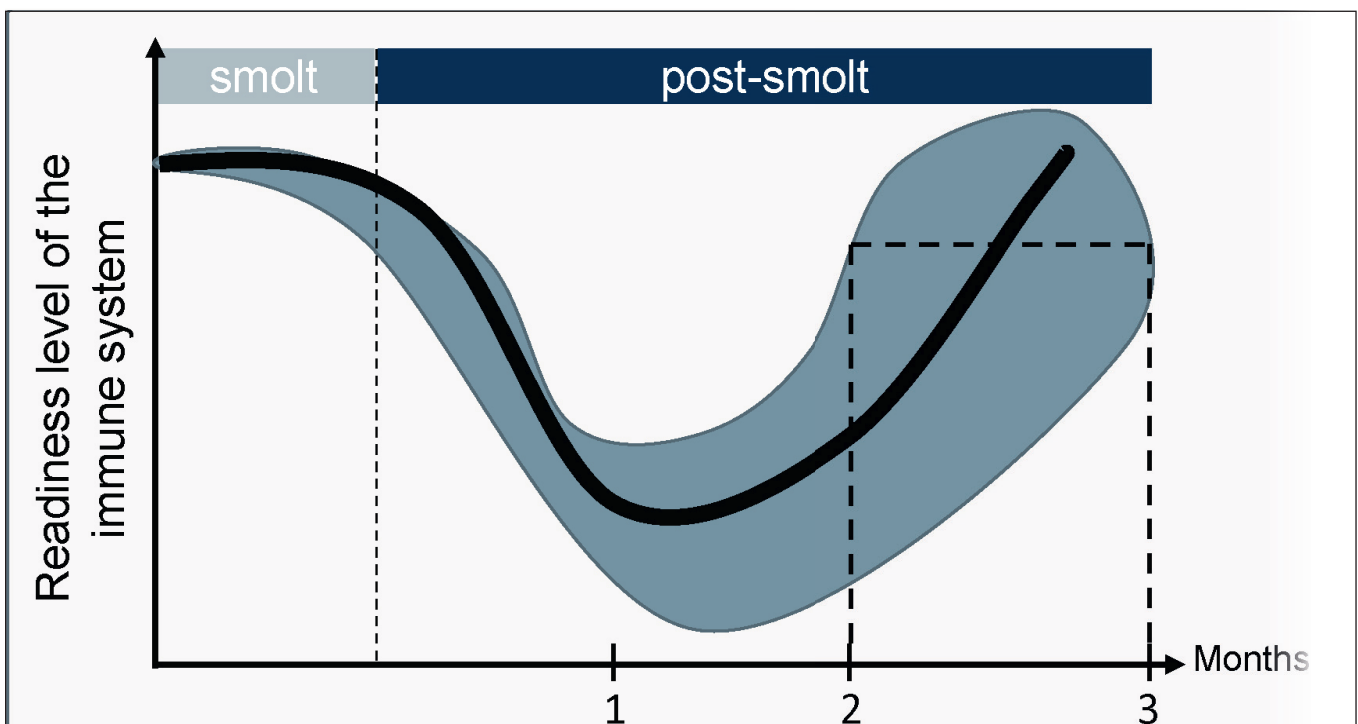
RECOMMENDATION:

- Temporary immune suppression during the first period post seawater transfer is an argument to operate equipment e.g. water treatment, use of transfer time slots etc. that reduce the risk of encounters with fish pathogens during the first months in the sea.
- Limit handling. When handling is needed, use procedures and technology that facilitate gentle handling of the skin in combination with other preventive measures prior to handling that will help strengthen the barrier tissues.

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

READ MORE:

- <https://www.nature.com/articles/s41598-018-27818-y>
- D3.3/BARRIER/2017



Atlantic salmon skin is composed of a mucosal surface with an epidermal and dermal layer containing different cells and structures throughout the layers. Loss of scales with the epidermis results in an almost complete loss of barrier function towards ions. It decreased by 80%, leaving the tissue highly permeable the first hours after damaged.