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SELECTIVE BREEDING TO REDUCE THE ECOLOGICAL FOOTPRINT OF AQUACULTURE

M. Vandeputte, M. Besson, F. Allal, F. Phocas, E. Quillet

The big question

Fish farming has to grow to meet increased demand for fish
Selective breeding is an efficient method that has mostly been used to increase production in quantity (growth rate)

How to use this potential to improve production efficiency and decrease global and local environmental impact?

Our vision

Adaptation to Plant-based Diets
Feed Efficiency
Survival/Disease resistance
Fillet yield

5.8 kg ↔ 2.9 kg ↔ 2.6 kg ↔ 1.0 kg

Producing 1 kg of sea bass fillet requires 5.8 kg of compound feed
All efficiency traits have a genetic basis that can be selected
Could sea bass reach the efficiency of rainbow trout?

1.9 kg ↔ 1.7 kg ↔ 1.6 kg ↔ 1.0 kg

Challenges to be met

Develop efficient phenotyping methods and/or indirect predictors of efficiency traits
Evaluate how genomic selection can help use less (more precise) phenotypes
Ultimately, co-adapt fish strains and novel, agro-ecological production systems