

FAMILY DIFFERENCES IN FEED INTAKE AND FEED EFFICIENCY IN ATLANTIC SALMON

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Background and Aim

- Feed accounts for 50% of production costs and 80% of the carbon foot print in salmon farming
- Family differences in feed intake, specific growth rate and final lipid content all contribute as energy sources and sinks to feed efficiency
- Can we quantify family differences in the feed efficiency of Atlantic salmon?

Study Design

Design & Duration

70 tanks
 35 families
 Parr
 46 days
 Precise daily feed intake

Phenotypes

Feed Intake **FI**
 Feed conversion ratio **FCR**
 Residual Feed intake **RFI**
 Specific growth rate **SGR**
 Final lipid content **FLC**

Analysis

Multi-trait models:
 $Y = Xb + Za + e$
 Fixed effect: Tank location
 Random effect: Family

Main Findings

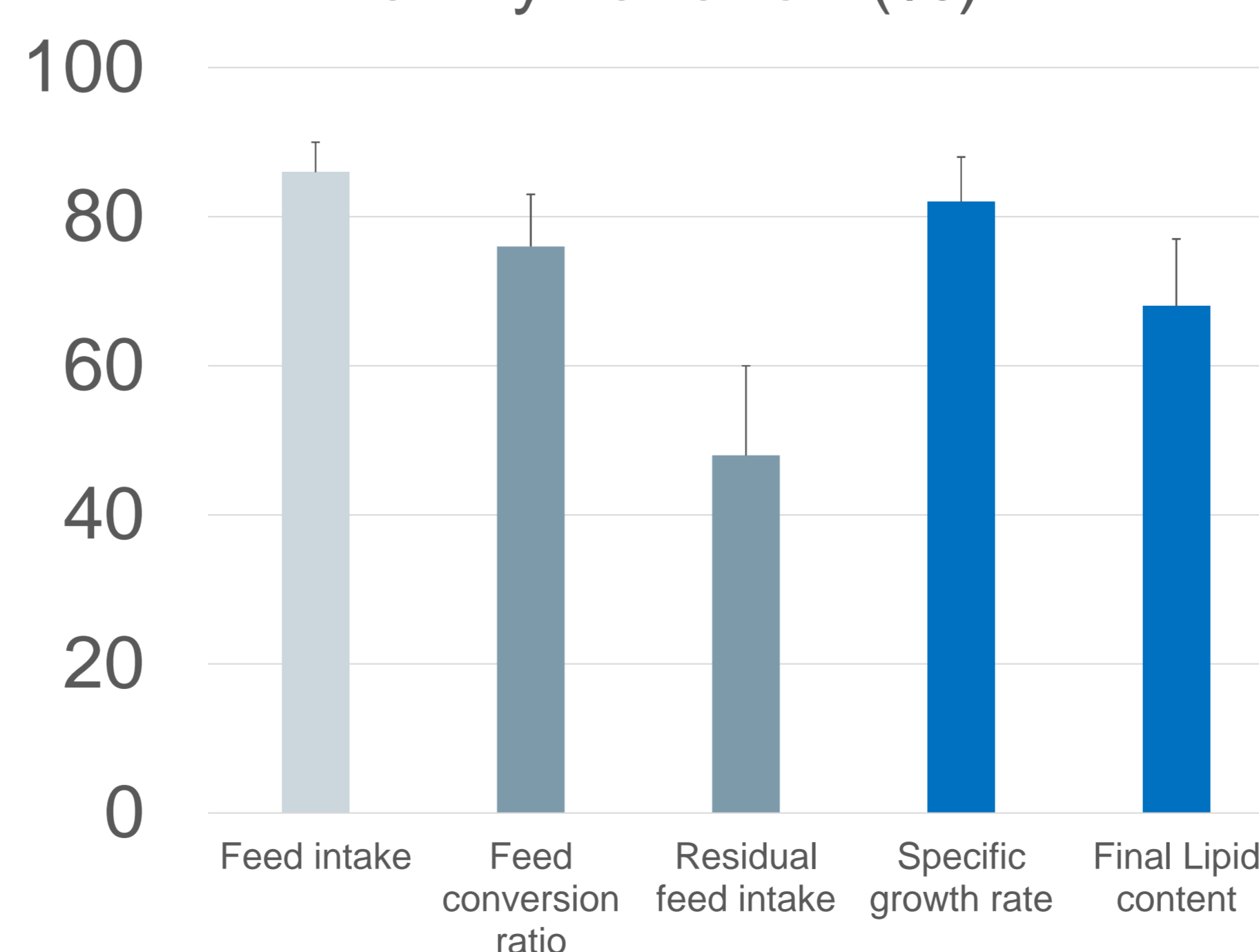
- Large family differences found for all energy sinks and sources 68 – 86%
- Family differences persisted for FCR 76% and RFI 48%
- Both FCR and RFI had favourable correlations to FI
- FCR retained correlations to energy sinks while RFI was uncorrelated
- RFI can be added to existing breeding indices with minimal disruption to the breeding goal

In conclusion, selecting for RFI will reduce feed costs and carbon foot print without reducing growth rate or lipid content!



Automated feeding & feed collection

Family variation (%)



Family correlations

	FI	SGR	FLC	FCR
FI	1	0.82	0.31	-0.70
FCR	-0.70	-0.77	0.21	1
RFI	0.15	0	0	0