

TROUTGANIC



Establishment of an organic line of rainbow trout

Marjolein Verweij, Albert Johannes Buitenhuis, Thinh Tuan Chu, Hanne Marie Nielsen

Centre for Quantitative Genetics and Genomics, Aarhus University, Denmark.

Goal: Increase fry robustness, reduce mortality & climate impact and improve fish welfare using selective breeding

Deliverables

- **Genomic variation assessment**
- Define breeding goal and estimate economic values
- Apply novel sampling approach “on-site” during RTFS outbreak
- Develop genomic tool to increase resistance to rainbow trout fry syndrome (RTFS)
- Develop breeding plan using simulations



Genomic variation assessment

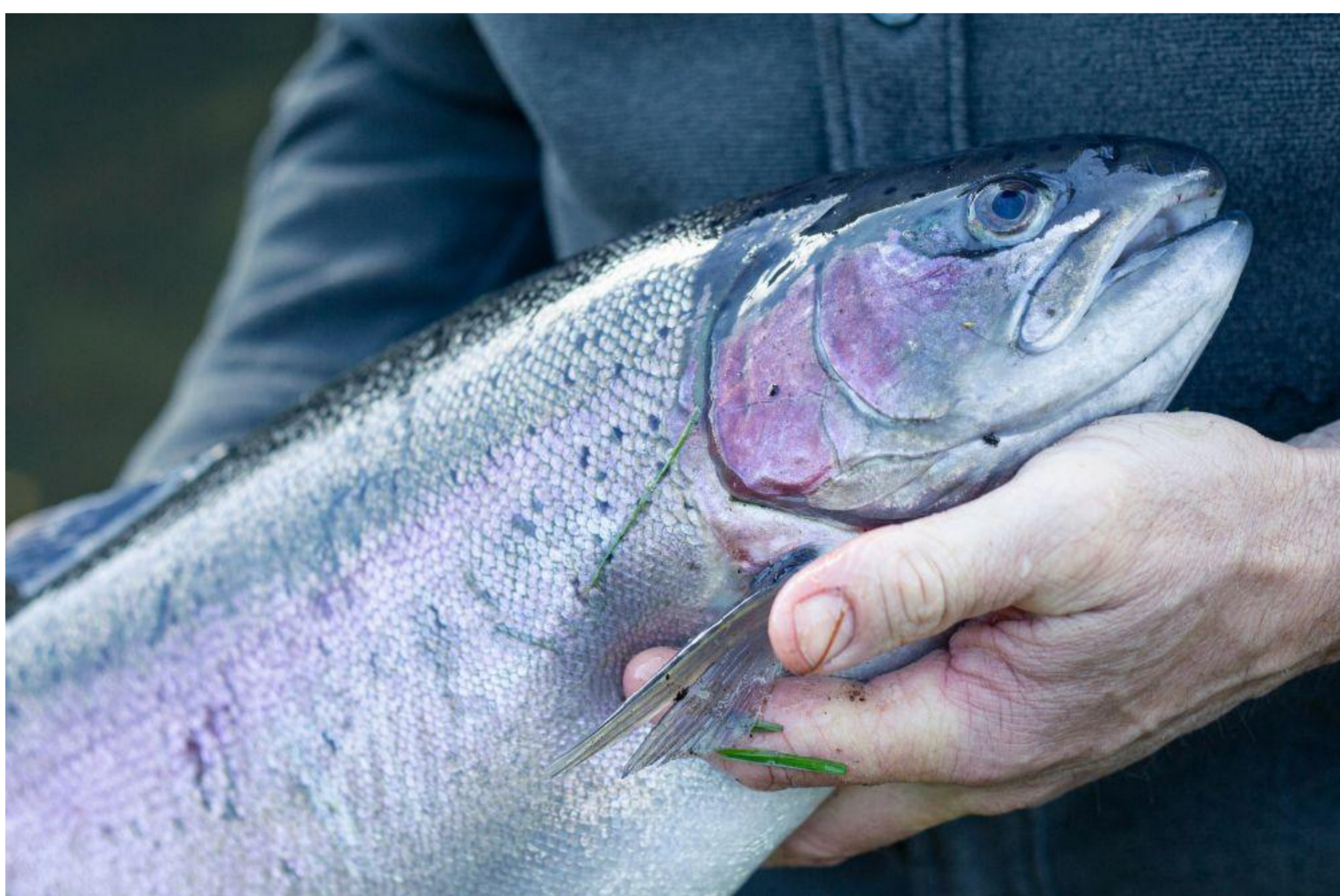
Materials and Methods

- 144 organic and 48 conventional fish sampled
- Genotyping on a 50K SNP chip

QC & Analysis using PLINK v1.9:

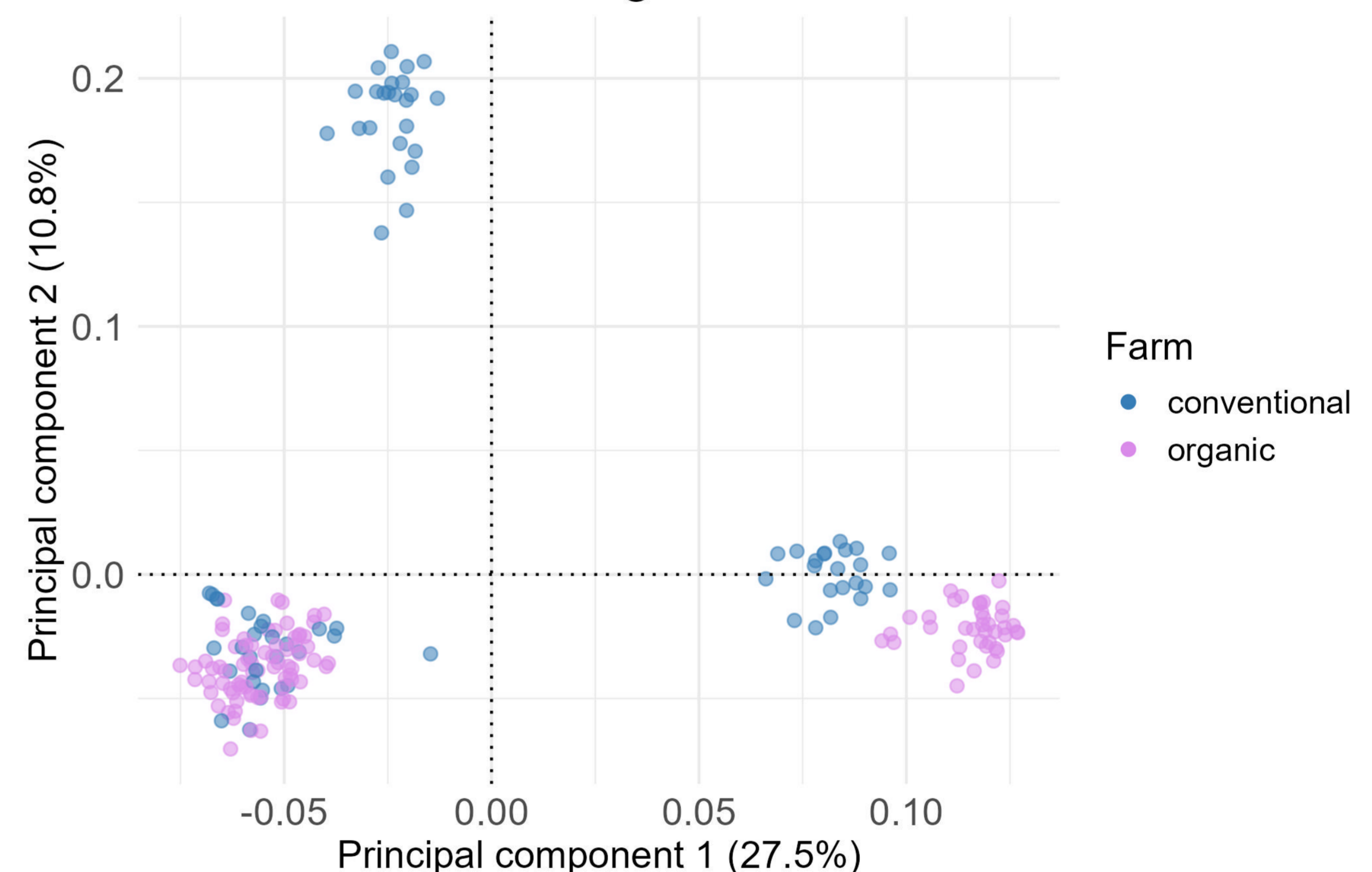
- Principal component analysis (PCA)
- Genomic Relationship Matrix (GRM)
- Inbreeding coefficient (F_{ROH})
- Inbreeding rate ΔF based on F_{ROH} :

$$\Delta F = 1 - \left(\frac{1 - F_{ROH_{t0+n}}}{1 - F_{ROH_{t0}}} \right)^{\frac{L}{n}}$$
- Wright’s fixation index (F_{ST})

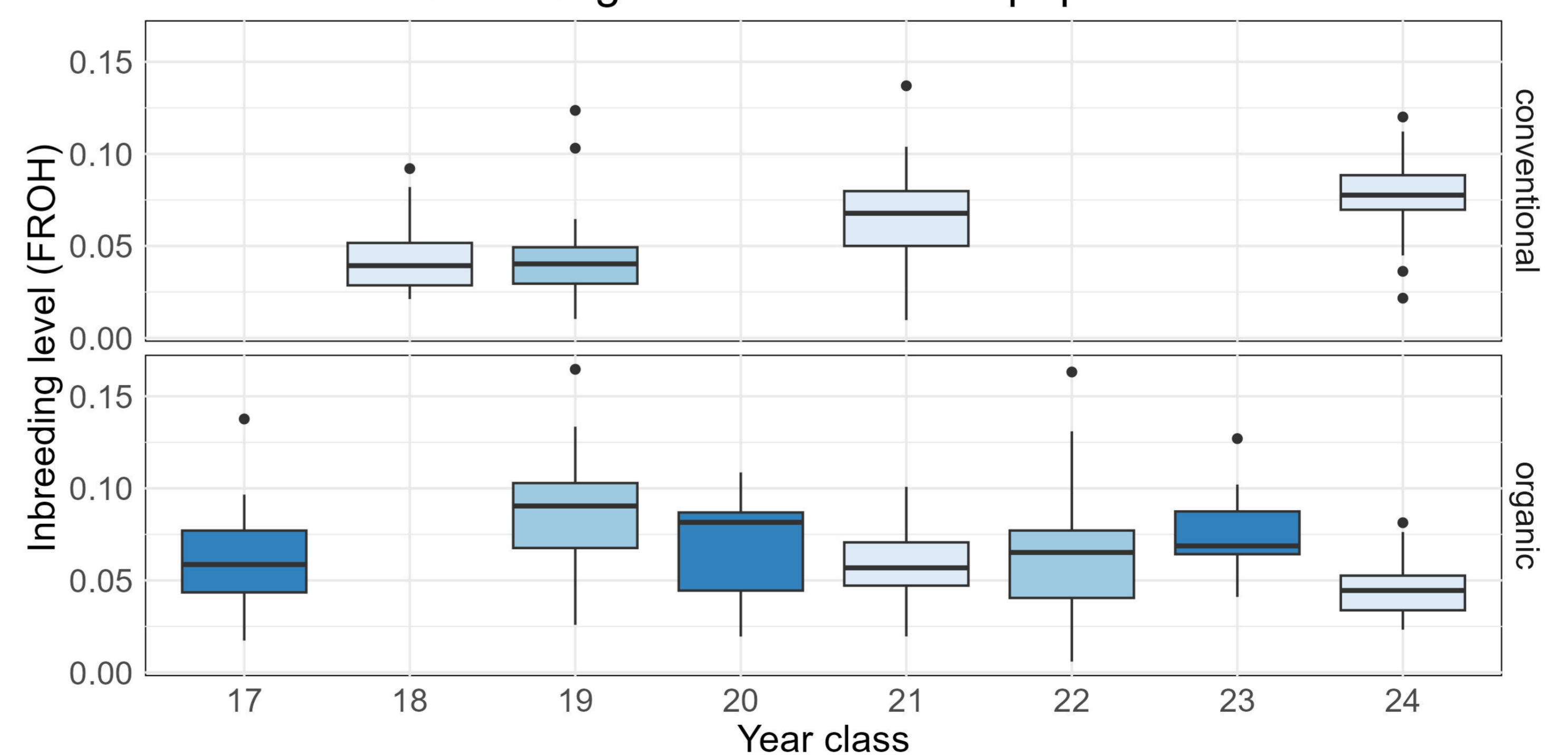


Results

PCA of trout from organic and conventional farm



Inbreeding level in both trout populations



Conclusion: Sufficient genomic variation in the organic line at Ådal Ørred