

# Genetic qualities of research fish:

## Availability and limitations

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# Scientific use of experimental fish:

Testing of

- disease resistance in brood stock
- effect of vaccines/ formulations
- various pathogens
- pathogen vs. host interactions
- different feed/ uptake

Etc.

# Available experimental fish

Various degree of (un-) defined fish/ families:

- Local breeders (local strains)
- Various test station stocks (local strains)
- National breeding companies (selected families)

# Does choice or availability of fish influence scientific results?

Supply of experimental fish varies over time!

Different families and strains are available at different timepoints.

This makes reproduction of scientific results hard if not impossible.

# Effect of specific genes within family:

Most likely many genes influence most traits, where some genes are highly polymorphic. Thus, the genetic mixture can be large even using animals from one family.

# genes affecting trait	# alleles per gene (highly polymorphic)	# possible genotypes in population	# fish per genotype per 100 fullsib animals
1	1x1 (2x2)	1 (4)	100 (25)
2	2x2 (4x4)	4 (16)	25 (6)
3	3x3 (4x4x4)	18 (64)	6 (1,5)

# **How do we get a well-defined continuous supply of experimental fish?**

## **Establish well-characterised research fish:**

Problem long generation interval (4 year salmon)

Can freeze and thaw milt but so far not eggs nor embryos.

Continuous inbred lines of dams fertilized with defined milt?

## **Isogen or instant inbred fish**

Equivalent to well-defined inbred mice strains

Reproducible results, but not representative for outbred population

Difficult to maintain due to inbreeding depression

# Conclusion

A lot of work ahead to generate well-defined experimental fish

- useable for a variety of research purposes
- available upon demand

BUT once established they will refine experimental setups and hopefully reduce the number of experimental fish required