




QTL for eggshell quality



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Eggshell quality

- poor quality -> cracked or broken eggs -> a route for pathogen contamination
- losses may be up to 10 % of total production
- measured by breaking strength (quasi-static compression) or resonance (dynamic stiffness)
- indirectly by e.g. specific gravity, egg shell thickness and weight



Chicken genome scans

- first genome scans based on medium-density linkage maps (microsatellites)
- significant QTL findings can be found in the Chicken Quantitative Trait Loci database <http://www.animalgenome.org/QTLdb/chicken.html>
- includes tools to link the QTL information to genomic tools (RH maps, FPC maps, linkage maps and SNP information)
- 113 QTL reported for egg quality traits, only a handful for eggshell quality

WP7, aims for QTL analysis

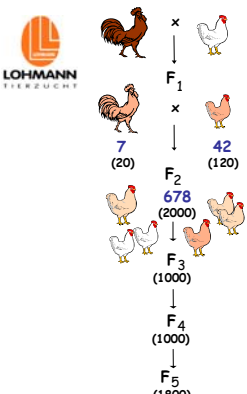
To understand the genetics of eqq quality:

- conduct comprehensive genome scan
- analysis of epistatic QTL -> knowledge of the effects of alleles in different genetic backgrounds
- combining the information from QTL mapping, transcriptomics and proteomics to identify candidate genes

To improve selection efficiency:

- fine-mapping to identify markers associated with eggshell quality to be included in evaluation

Task 7.1: Fine mapping of QTL in a resource population



Reciprocal line cross
 - RIR, White Rock

Phenotypes
 - scored for 6000 animals

Genome scan
 - 162 microsatellites, 27 chromosomes
 - single chromosomes by QTLEXPRESS -> GridQTL (WP1): different models with different covariates & analysis of epistatic effects

Phenotypes

	at age (weeks)
deformation (mm)	35, 40, 50, 70
breaking strength (kp)	35, 40, 50, 70
shell weight (g)	42
egg weight (g)	25, 30
body weight (g)	30
yolk weight	42
feed intake	35-45
feed conversion	35-45
Haugh unit	40
shell colour	40
egg production (%lay)	28-52

