

A Simple Strategy for Managing Many Recessive Disorders in a Dairy Cattle Breeding Program

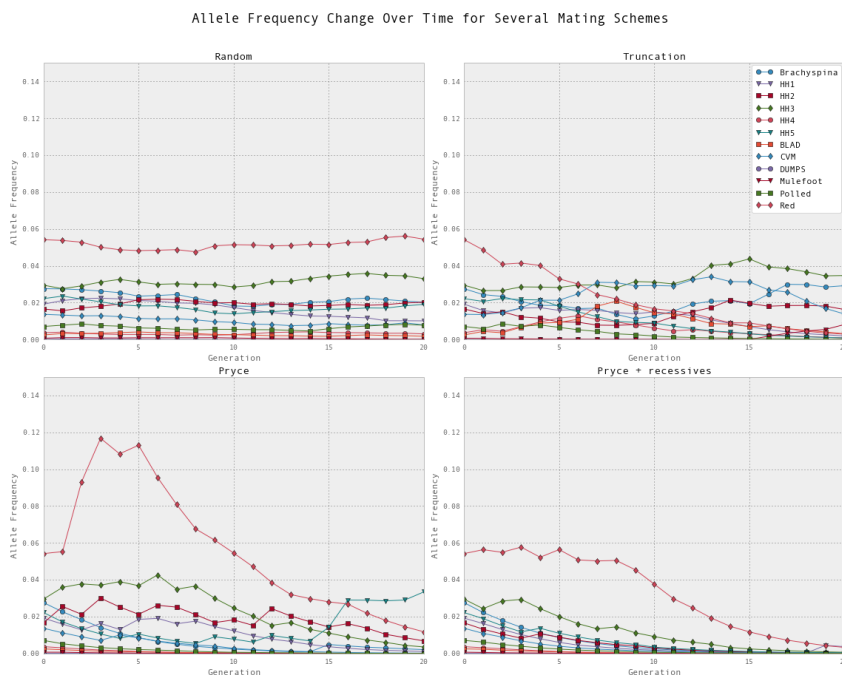
Objective: Extend Pryce's (2012) strategy for constraining inbreeding to control frequency of recessives.

Methods:

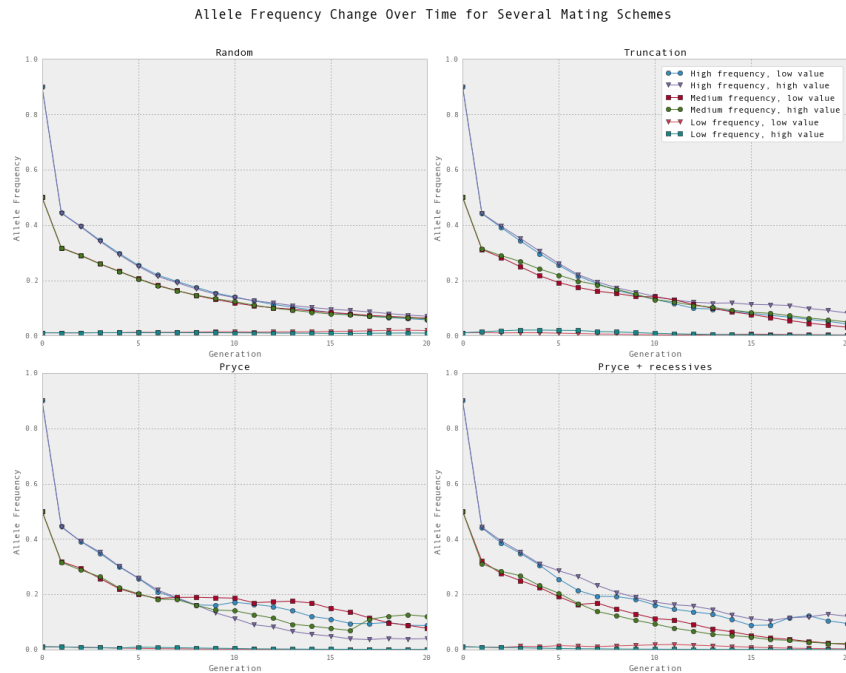
- Simulate cow population (Python programs)
- Four mating systems:
 - Random – mates randomly assigned
 - Truncation – truncation selection – the top 10% of the bulls based on TBV are mated randomly until all cows are serviced
 - Pryce – Pryce's (2012) method used to allocate bulls to cows, PA of matings penalized for inbreeding, limit to number of matings (baseline)
 - Pryce + recessives – Pryce's (2012) method used to allocate bulls to cows, PA of matings penalized for inbreeding **and for recessives**, limit to number of matings
- Several scenarios (Table PARAMETERS, Table RECESSIVES), including all haplotypes in current Holstein population

Results:

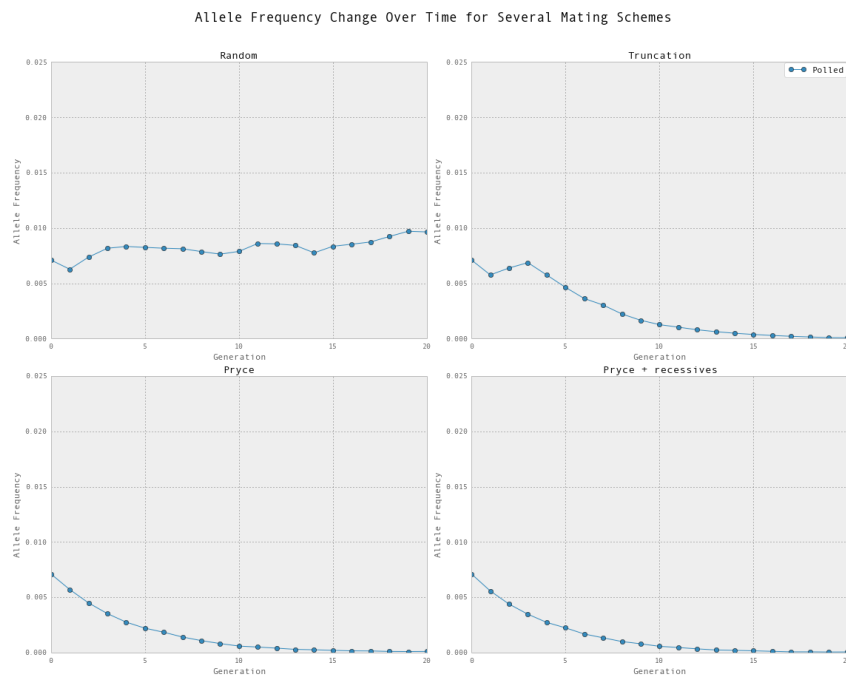
1.) All Holstein recessives



2.) Six hypothetical recessives



3.) Polled only



Conclusions:

- Pryce + recessive method decreases allele frequencies faster than Pryce only using real-world data
- Appears to be more sensitive to allele frequencies than economic values