

Inbreeding: Why is it important?

Inbreeding tells us about individuals and the likelihood that they can express the genetic diversity in the population. It also gives us an indication of whether to expect hidden genes to “pop up”. Inbreeding can lead to ill-thrift and poorer production and reproduction.

Inbreeding has 3 major consequences:

Animals that are inbred tend to perform more poorly than those that are not inbred or are outcrosses. Numerous scientific studies have shown a relationship between the level of inbreeding and the level of productivity, health and reproductive success in sheep, pigs, cattle and other species. On average, inbred animals grow more slowly, are more likely to have health problems or succumb to parasites or other infestations, and have lower reproductive rates, in terms of conception rate, litter size and progeny survival.

Hidden genes, or recessive genes, are more likely to show up in inbred animals. Often these recessive genes are lethal or cause serious problems. They are more likely to turn up in inbred animals because they can't be “seen” in individuals that are carrying only one copy of the bad gene. If a sire carries a bad gene, his descendants several generations later may still carry it, and when these individuals interbreed the chances of progeny receiving two copies is much higher than if these individuals are bred to individuals where the bad gene is unknown. So as the average level of inbreeding rises, so too does the chance of these recessive genes pairing up to be expressed.

A population of inbred animals would tend to have low diversity and leave little room for selection. The only solution here is to buy-in animals from unrelated stock. Doing this successfully and at an affordable price depends upon having studs from which to source unrelated animals that are performing as well as your own. Buying-in is a good strategy in any case, but best done when superior genetics can be sourced rather than when there is an inbreeding problem to solve.

Avoiding inbreeding doesn't have to be complicated

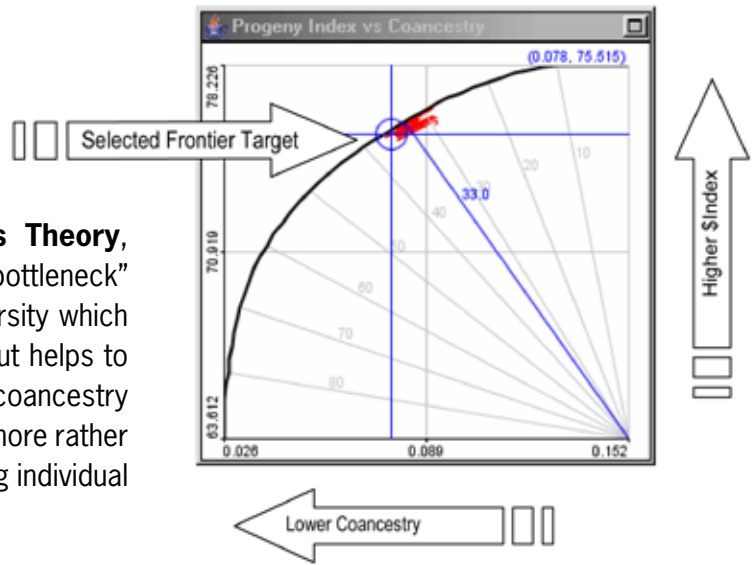
You can take a number of steps to avoid inbreeding:

1. Use more rather than fewer sires
2. Avoid using individual sires excessively
3. Monitor inbreeding levels each year
4. Plan matings to avoid inbreeding

TGRM® can help you do all of these and more...



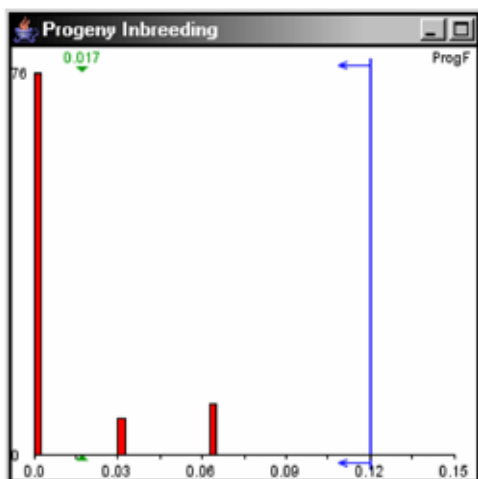
By applying Optimal Contributions Theory, TGRM® helps you avoid developing a “bottleneck” in your gene pool, ensuring future diversity which not only helps for effective selection, but helps to avoid inbreeding. As you choose lower coancestry points on the frontier, you will be using more rather than fewer sires, and you will avoid using individual sires excessively.



Mating List (sorted by Sire Ident)

Sire Ident	Sire Name	Dam Ident	Dam Name	Index	F	600d	Imf%	ema	ced	cem	ceP
IMP001	Improver	T103	T103	70.49	0	83.5	0.35	4.65	1.13	1.68	1.75
IMP001	Improver	T227	T227	66.03	0	82.0	0.3	3.75	1.72	0.65	0.26
IMP100	Milk Man	S245	S245	66.33	0	85.5	0.35	2.9	0.25	-1.86	-1.08
IMP100	Milk Man	T023	T023	70.9	0.062	87.5	0.25	3.1	1.17	-2.49	-1.4
IMP100	Milk Man	T071	T071	76.82	0	78.0	0.7	3.4	-1.01	-0.87	-0.36
IMP100	Milk Man	T125	T125	69.43	0	70.5	0.6	1.55	1.0	-1.43	0.54
IMP100	Milk Man	T97	T97	72.73	0	70.5	0.65	2.5	1.2	-0.55	2.5
USA0409	Top Gun	P025	P025	76.49	0	83.5	0.65	2.15	-3.57	0.71	-3.51
USA0409	Top Gun	Q002	Q002	73.97	0	74.5	0.55	2.85	-1.8	-0.65	-4.48
USA0409	Top Gun	Q065	Q065	76.81	0	70.0	1.2	2.95	0.02	0.56	-0.22
USA0409	Top Gun	Q099	Q099	76.97	0	77.5	0.85	3.45	-2.14	2.08	0.64
USA0409	Top Gun	Q113	Q113	75.62	0	80.0	0.8	2.3	-1.04	-0.24	-2.89
USA0409	Top Gun	R001	R001	75.64	0	74.0	0.9	3.8	-0.77	1.91	1.68
USA0409	Top Gun	R041	R041	75.27	0	82.5	0.8	3.05	-1.84	1.96	0.7
USA0409	Top Gun	R049	R049	74.43	0	92.5	0.8	3.4	-3.33	-1.22	-7.15

TGRM® reports contain not only the average inbreeding of all the matings, but provide inbreeding figures for the progeny of the predicted matings and the average inbreeding of predicted progeny of the recommended sires.



TGRM® can help you to minimise the average level of progeny inbreeding and avoid whenever possible closer matings that may result in some individuals with higher-than acceptable levels of inbreeding.

