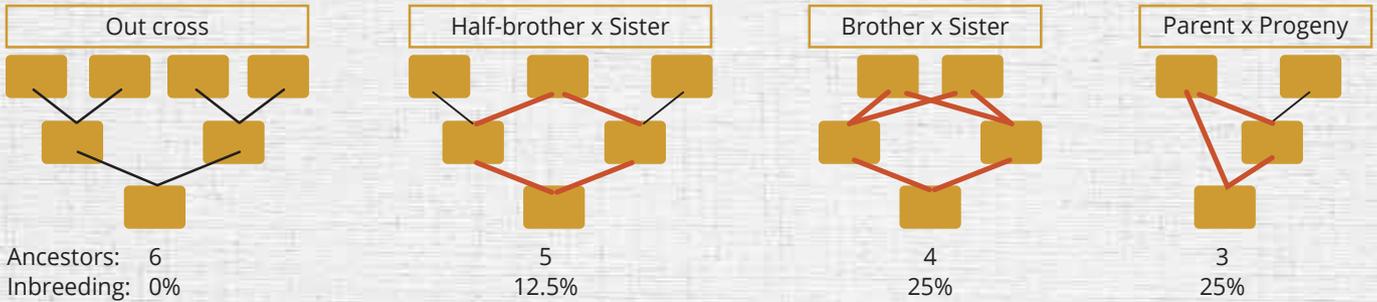


Inbreeding & Line breeding

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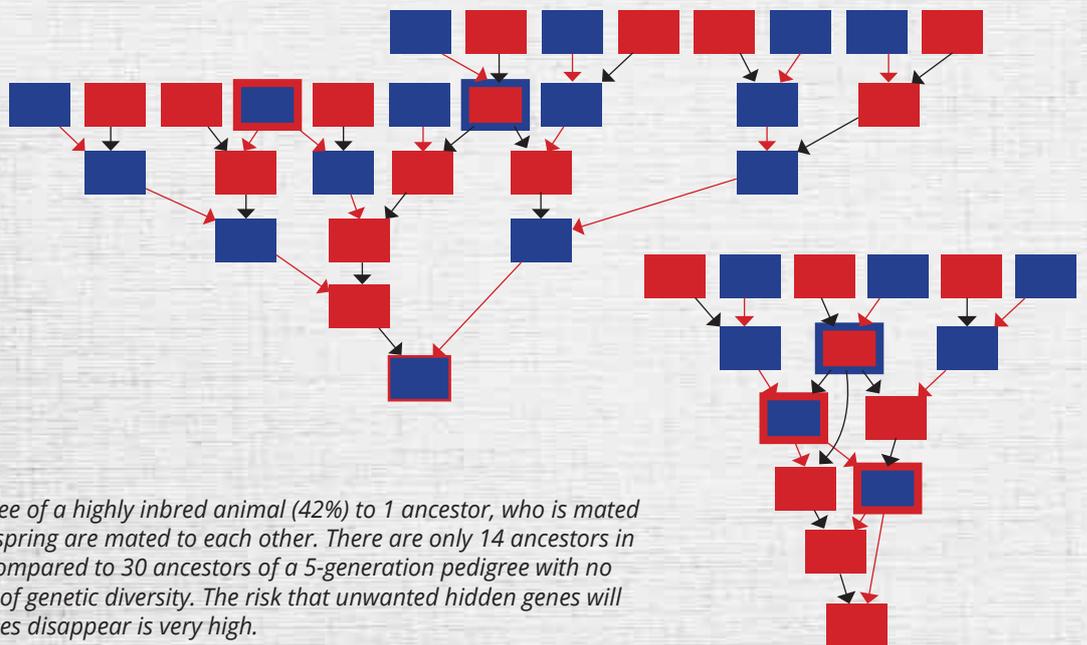
INBREEDING

- Inbreeding is the mating of related animals, for example brother on sister, parent on child, cousin on cousin, etc.
- It is used to concentrate “good” genes in a population, or to increase uniformity in the offspring.
- However, it can also cause a gradual decrease in productivity, fertility and survivability, a phenomenon known as inbreeding depression.
- As a rule of thumb, inbreeding should be kept under 6.25%, although highly inbred animals sometimes do not show inbreeding depression. (The theoretical maximum inbreeding is 50%).
- High levels of inbreeding can lead to a situation that there are too few unrelated parents in a breed - thus reducing genetic diversity and causing the breed to disappear.
- Generally not recommended.

LINE BREEDING

- Line breeding is also inbreeding, but a slower form to avoid the disadvantages of inbreeding.
- Start with an outstanding individual that has outstanding traits or features that needs to be fixated in the breed.
- Keep on selecting for the trait(s) in the offspring, while at the same time selecting against any signs of infertility or weakness.
- Only mate distant family members with one another (ie slow inbreeding or low levels of inbreeding).
- It is advantageous for a breed to consist of several lines, which are only minimally mated with each other.
- Try to maintain genetic diversity in the breed by using only male animals that will limit the inbreeding.
- Use many different males as sires to increase genetic diversity.

Examples of pedigrees on SABeefBulls.com. Above: A Line bred pedigree showing slow inbreeding of 2.64% to 2 ancestors. There are 28 ancestors in the pedigree which make a contribution to genetic diversity.



Right: A 5-generation pedigree of a highly inbred animal (42%) to 1 ancestor, who is mated to her own offspring and offspring are mated to each other. There are only 14 ancestors in her 5-generation pedigree, compared to 30 ancestors of a 5-generation pedigree with no inbreeding, leading to a loss of genetic diversity. The risk that unwanted hidden genes will appear, or that essential genes disappear is very high.