

Dairy and beef farmers can now breed cattle that have a greater ability to resist tuberculosis (TB) and liver fluke infection. Find breeding values on www.icbf.com

TB and liver fluke resistance explained

Have you ever wondered... why only a handful of your cows became TB reactors during a herd-breakdown when all cows were managed the same?



- Genetic resistance is a measure of an animal's ability to fight off infection due to its genetic makeup
- Just as genetics dictates how well an animal can produce milk or gain weight, animal health is also under genetic control
- Research has revealed that certain family lines of cattle are very susceptible to TB or liver fluke infection (Fig. 1)
- Farmers can now breed cattle that are less likely to become infected with TB or liver fluke (i.e., more resistant), resulting in fewer TB reactors, fewer TB-breakdowns, and fewer cattle diagnosed with liver fluke infection

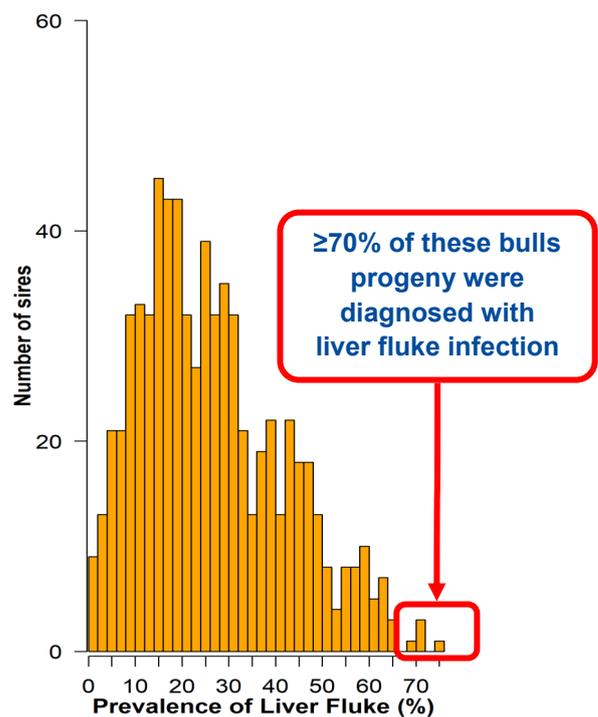
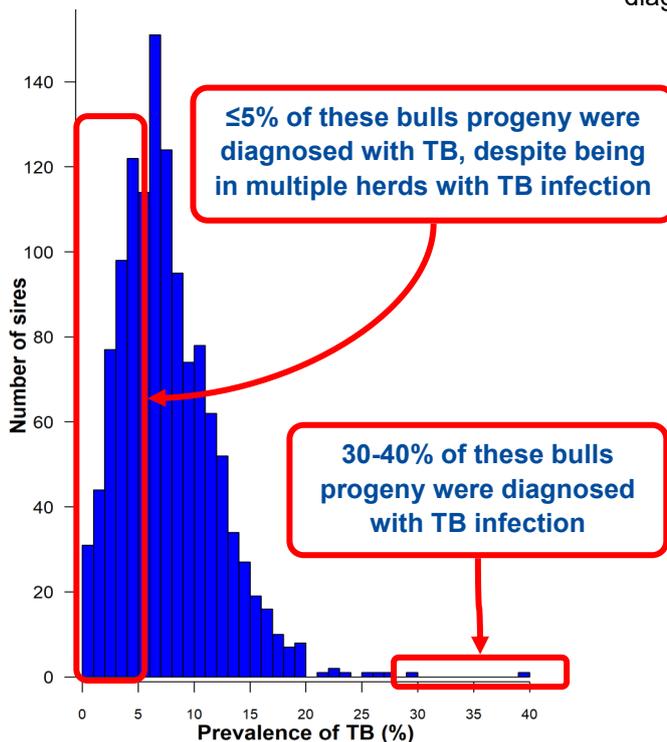


Figure 1. The average prevalence of TB and liver fluke infection among the progeny of sires that had at least 50 progeny in 10 infected herds

Protect your herd from infection by using TB and liver fluke breeding values

- The number of TB reactors in herds undergoing a TB-breakdown is, on average, 26% higher in cattle with the worst breeding values for TB resistance compared to cattle with the best breeding values for TB resistance
- Cattle with more favourable breeding values for TB resistance are less likely to become infected, therefore, herds that have many cattle that are genetically more resistant to TB are also likely to incur fewer TB-breakdowns
- The number of cattle diagnosed with liver fluke infection is, on average, 17% higher in cattle with the worst breeding values for liver fluke infection compared to cattle with the best breeding values for liver fluke infection

Understanding breeding values

- Breeding values for resistance to TB and liver fluke can identify genetically superior and inferior breeding bulls, cows, and heifers for resistance to TB or liver fluke infection
- Each animal's breeding value is expressed as the expected prevalence of infection in that animal's progeny
- Breeding values typically range from 0% to 20% for TB resistance, and from 20% to 40% for liver fluke resistance
- For example, if a bull has a breeding value of 2% for TB resistance, on average, 2% of his progeny are expected to be TB reactors in their lifetime
- Similar to health traits already in the EBI, lower breeding values for resistance to TB and liver fluke are desirable
- The importance of breeding for resistance to TB or liver fluke will depend on many factors including precedence of infection, location to neighbouring TB infected herds, as well as emphasis on other traits

Achieving the most profitable and healthy herd

- Select cows and bulls for breeding that have the highest overall index (i.e., EBI, Replacement Index, or Terminal Index) with the lowest breeding value (i.e., lowest predicted prevalence) for TB and liver fluke resistance (Fig. 2)
- Breeding for higher EBI or Replacement Index alone will, on average, result in more favourable breeding values for TB and liver fluke resistance
- Breeding for a higher Terminal Index alone will, on average, result in less favourable breeding values for TB and liver fluke resistance
- Breeding for resistance to TB or liver fluke is complementary to existing control and eradication programmes which should accelerate the rate of TB removal from Ireland as well as reduce the prevalence of liver fluke without having any major negative ramifications on other traits

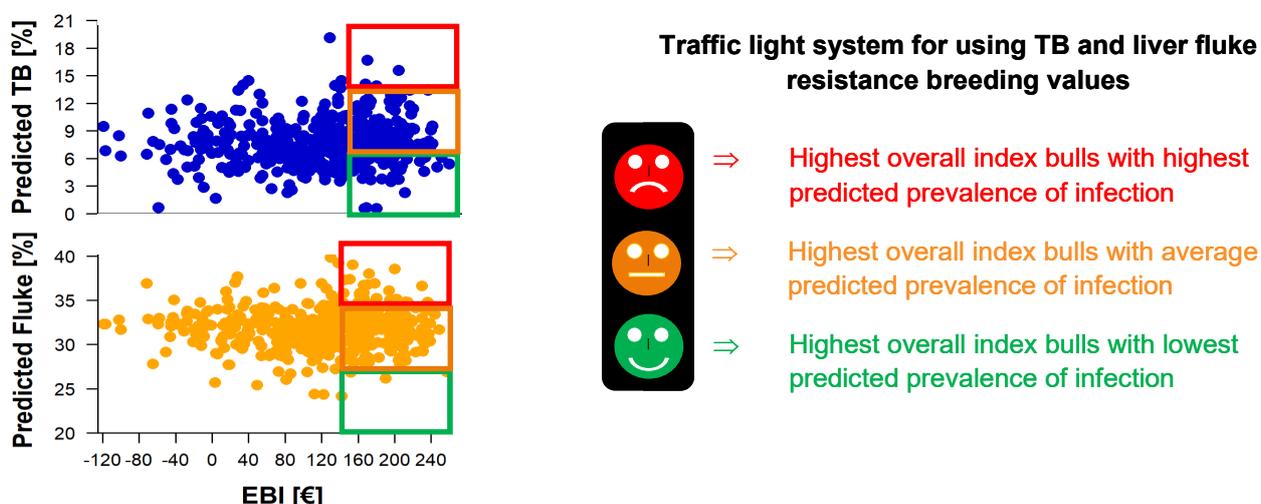


Figure 2. Optimum use of breeding values for resistance to TB and liver fluke is to select cattle that have the highest overall index which also have the lowest breeding values for TB and liver fluke resistance

Acknowledgements

- This research was undertaken by Teagasc, Moorepark, in collaboration with ICBF. Data were provided from the Bovine TB Eradication Programme (DAFM) and the Beef HealthCheck Programme (AHI). Funding was provided by DAFM through the HealthyGenes and Flukeless research grants