

Genetics not injections

Breeding is playing an increasingly greater role in animal health management.

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Antimicrobial resistance is becoming a major concern for human medicine. Antimicrobials include antibiotics, antivirals, antifungals and antiparasitics that are used to prevent and treat infections in humans and animals.

Resistance by pathogens to these products is on the increase at both human and animal level. Such resistance is forecast to be the cause of death for up to 10m people per year

by 2050 if current trends remain unchecked.

Recent regulatory changes to the use of veterinary medicines will mean some change to the way antimicrobials are used in farming. Prophylactic use of antibiotics such as routine blanket dry cow therapy is no longer allowed and antiparasitics will require a prescription from 1 June 2022.

Products to treat diseases will be available where required, but only under veterinary supervision. The old adage of 'prevention is better than cure' very much applies to the future of livestock farming.

Prevention can include:

- Good biosecurity to prevent transmission of disease.
- High levels of hygiene to prevent disease.
- Vaccination has a significant role to play in eliminating some disease on farms, reducing the requirement to treat with antimicrobials.

Is there a role for breeding naturally healthier animals?

For many years, farmers, breeders and advisors have focused on more milk solids, easier calving and higher fertility; but can we also breed for improved animal health?

Health traits such as SCC, mastitis and lameness already account for around 4% of the EBI value. These are important economic traits for all dairy farmers and will be of even greater importance in the future once antimicrobial availability is reduced.

Cows with low breeding values for mastitis and lameness (i.e. showing strong genetic merit for resistance to mastitis and lameness or any other trait of interest) will be less likely to suffer from these illnesses. This will mean they will need fewer treatments, if any.

Looking at the progress in relation to fertility in the Irish national herd gives us some insight into the poten-

Figure 1: Fertility trends for Irish dairy herds participating in HerdPlus from 2012 to 2021 (source: ICBF)



Figure 2

Prevalence of TB, liver fluke, mastitis and lameness in the poorest and best 20% based on breeding values for each disease.

Source: Alan Twomey, Teagasc and Siobhan Ring, ICBF

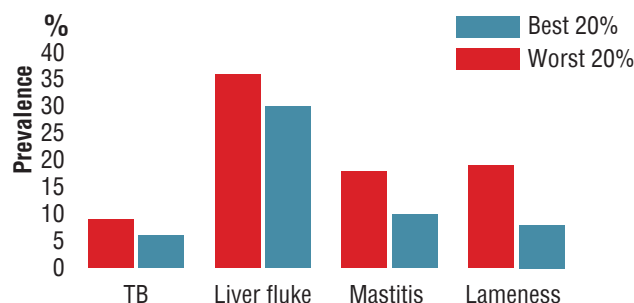
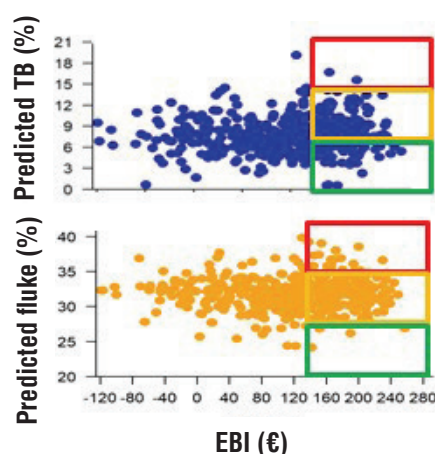


Figure 3: Traffic light system highlights best, average and worst breeding values for TB and liver fluke resistance.

Source: Alan Twomey, Teagasc and Siobhan Ring, ICBF



Traffic light system for using TB and liver fluke resistance breeding values



- ⇒ Highest overall index bulls with highest predicted prevalence of infection (Red)
- ⇒ Highest overall index bulls with average predicted prevalence of infection (Yellow)
- ⇒ Highest overall index bulls with lowest predicted prevalence of infection (Green)

tial for breeding for health.

Fertility, while believed to be a low heritability trait, has improved significantly over the last decade due to the emphasis placed on it in the breeding programme.

While health is also seen as a low heritability trait, we can now, through the use of genomics, dramatically increase the population contributing data.

This helps to overcome the low heritability as it allows for greater selection of animals with the traits of interest. It also allows them to be used in the population of breeding bulls sooner, which reduces the generation interval.

As cow fertility improves and cows remain in herds for longer, animal health will become the main reason for involuntary culling. The emphasis placed on health traits when selecting bulls will, logically, increase.

TB and liver fluke

Depending on where you are in the country, TB and liver fluke may or may not be of significant interest to you. These are two health traits that have been researched extensively at Teagasc Moorepark. The aim has been to investigate whether there is animal resistance to them.



Cows being treated with a pour-on drench to target liver fluke.

This research has found that there is variation between animals' ability to resist TB or liver fluke infection. (see Figure 2).

The data shows that there was a 26% difference for TB and a 17% difference in the case of liver fluke between the best and worst groups. This shows that we could breed for greater resistance to both TB and liver fluke.

While these traits are not currently incorporated in the EBI, they are available on the ICBF website. If you are in an area that is particularly susceptible to either TB, liver fluke or both, you should pick your bull team

for the 2022 breeding season on the criteria that you have identified as needing improvement for your farm.

Then, using the TB and liver fluke proofs and the traffic light system that goes with it (Figure 3), you can make an informed decision in relation to the bulls you use in your herd with regard to these particular health traits.

It will not be an instant fix, but breeding for health traits, as with other traits, is both additive and cumulative, so will be steadily improving the health of your herd over a period of time.

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