J The impact of genetics on mastitis and SCC

With the spotlight focused on cell counts and udder health, do genetics have a part to play in achieving the best results?

Nearly all udder infections are caused by bacteria that enter the quarter through the end of the teat. The likelihood of an infection occurring is a balance between the number and type of bacteria present, and the cow's natural defences designed to stop bacteria entering the teat or multiplying in the quarter. Although the end of the teat is marvellously set up to reduce entry of bacteria, it still sometimes occurs.

Most of the factors that affect the balance of infection and defence are influenced very significantly by the cow's environment. For example, the number of bacteria present and 'challenging' a cow may be greatly increased if she has sores and cracks on her teat skin, and these may have occurred for many reasons. Perhaps the roadways are wet and muddy or the teat spray may have been made up to the wrong concentration? These are factors in the cow's environment which are influenced by management.

Generally, the greatest impact on udder health is achieved by activities to do with managing cows before, during and after the milking process. However, genetics play a part, too. For example, the cow with teat sores may have a genetic tendency for poor teat skin health, or may have longer than average teats which are more prone to damage.

There is a slight tendency for higher production bulls to leave daughters with higher mastitis levels. Currently selection for production also leads to a small increase in the genetic susceptibility of cows to mastitis. The level of mastitis inheritance is low (clinical mastitis is about 3% and cell count level about 13%). Despite this and the fact that genetic changes take many years, improved udder health from genetics should not be ignored. Indeed it would be a mistake to underestimate the potential impact that genetics can have on mastitis incidence/resistance. Similar to mastitis, fertility also has a heritability of approximately 3%. Yet it is widely acknowledged that breeding is an effective way of improving a fertility problem at herd level.

How could an improved genetic component to udder health be achieved?

Logically, it would be sensible to measure the occurrence rate of cases for every progeny test daughter of each bull. All milk recorded cows in Ireland receive a regular somatic cell count result. This means there is a considerable bank of data which can be used to evaluate bulls. The genetic association between mastitis and somatic cell count is 70% which is high. Thus additional genetic gain in breeding for mastitis resistance could be achieved by recording cases of clinical mastitis as they occurred on dairy farms and directly selecting bulls and cows on their resistance to clinical mastitis. Genomic selection could also be used to help circumvent some of these hindrances.

When selecting AI sires, select sires that are positive for the Health sub-index which is principally based on the sires' daughters genetic resistance to mastitis when wishing to improve a herd's resistance to mastitis.

MANAGEMENT NOTES