

Relationship of Somatic Cell Score With Other Traits

Somatic Cell Score has quickly grown to become a trait of very high importance to producers. Essentially every producer enrolled on milk recording has a milk sample from each cow voluntarily analyzed for somatic cell count on each test day. This service has become an integral part of the management information used by producers. The actual cell counts that can range from near zero to several millions are transformed to a linear score ranging from 0 to 10. These somatic cell scores are reported back by milk recording to producers but are also used by Canadian Dairy Network to compute genetic evaluations for bulls and cows. Given these genetic evaluations, it is possible to get some insight into the genetic relationship that somatic cell score has with other traits of interest.

Production

Bull proofs for somatic cell score have no visible relationship with yields of milk and protein or with protein percentage. With fat, however, there appears to be a slight tendency indicating that bulls with higher proofs for fat yield and fat percentage also tend to be desirable for somatic cell score. While statistically significant, the correlation values of only 8 to 10 percent reflect that there is not a highly consistent trend so some bulls that are high for fat yield and/or fat percentage can be poorer for somatic cell score.

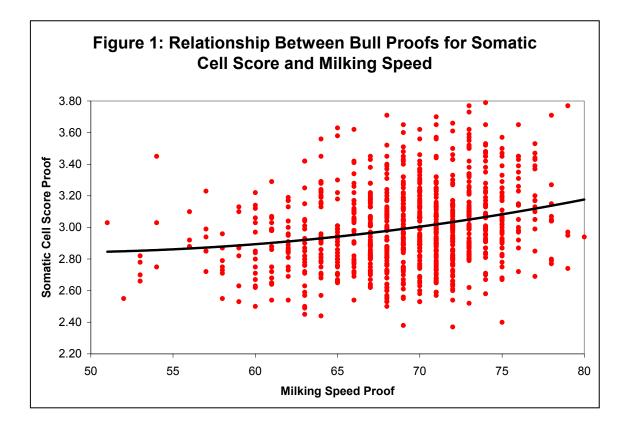
Type Traits

As with most production traits, the majority of the type characteristics are also independent of somatic cell score. Clear examples include traits related to body structure (ie: capacity, size, stature) as well as those associated with rump and feet and legs. More surprisingly perhaps is the fact that several udder-related traits appear to have little relationship with high or low cell counts. These include fore and rear teat placement, fore teat length, median suspensory ligament, udder texture as well as rear udder height and width.

The two descriptive type traits that have the strongest relationship with somatic cell score are udder depth (26%) and fore udder attachment (14%), both being desirable. In other words, bulls that sire daughters with higher udders or stronger fore attachments also tend to produce daughters that have lower somatic cell counts, which indirectly suggests they are more resistant to mastitis infection. On an overall basis, bulls with higher proofs for fore udder, rear udder and mammary system also have desirable somatic cell score proofs with correlations ranging from 9 to 16 percent.

Auxiliary Traits

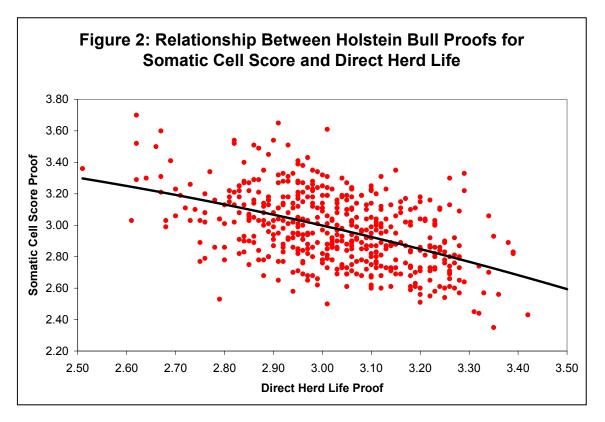
Due to some common biological relationships, producers often ask about the association between somatic cell score and milking speed. Concern exists about the possibility of bulls that are high for milking speed also have undesirable proofs for somatic cell score. Figure 1 is a plot of Holstein bull proofs for these two traits and the solid line indicates the general relationship. Since the solid line is not completely flat it appears that a slightly negative relationship does exist, as reflected by a correlation of 18%. There are many bulls that are below average for milking speed (ie: less than 69%) and poorer than average for somatic cell score (ie: higher than 3.00). Nevertheless, selection for both desirable milking speed and somatic cell score should be done and can be easily achieved through the use of the Lifetime Profit Index (LPI) that includes both of these traits for bulls and cows.



Similar to milking speed, milking temperament also has a correlation with somatic cell score just under 20%. It appears that bulls with very calm daughters at milking time also have a tendency towards higher somatic cell counts.

Two other auxiliary traits that have an important and perhaps less recognized relationship with somatic cell score are persistency and longevity, as represented by direct herd life. In this case, both traits have a favorable trend. Since lactation persistency is a relatively new trait, it is interesting to discover that bulls that produce daughters with a flatter, more persistent lactation curve also tend to be genetically

superior for somatic cell score (ie: 22% correlation). More importantly, however, is the fact that the single trait that is most related to desirable somatic cell score is direct herd life with a correlation of 26%. To show this relationship, Figure 2 is a plot of bull proofs for somatic cell score and direct herd life based on bulls born before 1993, which ensures that the true survival rate of each bull's daughters was known. The significant impact that desirable somatic cell counts have on extending longevity is quite apparent. For this reason alone, producers are placing increased importance on somatic cell score when making sire selection decisions. This observed relationship has also been introduced by CDN in the calculation of bull proofs for herd life for newly proven bulls with daughters that are too young to express their true survival rate.



Summary

Somatic cell count is an important trait both for herd management and genetic improvement. It serves as an indicator of mastitis resistance and generally has a desirable genetic relationship with other traits of importance. Traits that have a slight undesirable relationship with somatic cell score include milking speed and milking temperament but selection based on LPI should be sufficient to account for this trend. In terms of positive associations, selection for desirable udder depth, fore attachment and udders in general should lead to lower cell counts. Of particular interest, however, is the fact that lower somatic cell counts are also related to more lactation persistency and especially greater longevity.