SORTING GATE

New hair-shedding EPD will improve profitability through heat tolerance

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Smart business managers know the importance of identifying and hiring the right employees. New hires should fit the specifics of a job. The same strategy applies to our cow herds.

Even within a single breed, performance varies between animals across different environments and conditions. Some of the variation is due to interactions between genetics and the environment. Unfortunately, many beef producers have learned this the hard way.

The reranking of genetic potential across environments is currently difficult to predict. Fortunately, new tools are being developed to tackle genetic-by-environment interactions. These tools will improve beef sustainability (defined as social responsibility, environmental stewardship and, importantly, profitability). One tool producers in heat-stressed environments, including those grazing toxic endophyte-infested or "hot" fescue, can use to judge their employees is early-summer hair-shedding scoring.

Background

Early-summer hair shedding is an adaptive trait that prepares animals to better cope with the heat. Cattle that shed their winter coat earlier are less stressed and can direct more energy toward production. Hair shedding may also be an indicator of an animal's tolerance to the toxins produced by the fungus in Kentucky 31 (KY-31) fescue.

Australian researchers developed the hair-shedding scoring system in 1960 (Turner & Schleger, 1960: *https://doi.org/10.1071/AR9600645*). Others, such as the University of Missouri (Mizzou) Livestock Extension Specialist Eldon

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Cole, developed similar systems upon realizing that cattle that shed their winter coat later in the spring tended to have decreased performance.

How to

Cattle are scored on a 1-to-5 visual scale. On this scale, a 1 is completely slick (100% shed off), a 2 is 75% shed off, a 3 is 50% shed off, a 4 is 25% shed off, and a 5 still has a complete winter coat (0% shed off). While there is some variability in shedding patterns between individuals, cattle tend to shed from front to back and top to bottom. So, compared to a 5 (0% shed off), a 4 (25% shed off) will usually have shed only on her head and neck. A 3 (50% shed) has additionally lost hair along her topline and further down her brisket. A 2 (75% shed) is usually only holding winter coat on her flanks and around her belly.

Hair-shedding scores should be collected between mid-April to mid-June. It's recommended that producers score cattle when they see the most variability in hair score. The timing of hair shedding depends partly upon latitude (north vs. south). For most producers in the United States, the best time to score will be between early- and mid-May. Cattle should be at least yearlings when hair-shedding scores are recorded.

Angus research on hair shedding

Since 2016, the Mizzou Hair Shedding Project has collected 26,316 hair-shedding scores on 12,651 cattle from 11 breeds. Of these scores, 8,041 come from

registered Angus cattle. During the summer, Angus Mizzou Hair Shedding Project data were combined with hair-shedding data at the American Angus Association that were collected in 2011 and 2012 as part of other research projects partly funded through the Angus Foundation and led by North Carolina State University and Mississippi State University. This combined data set of 14,465 scores from 8,642 cattle was used to design an Angus hair-shedding research expected progeny difference (EPD) that is scheduled to be released in 2020.

We find a significant effect of age on hair shedding, with yearlings, 2-year-olds and 3-year-olds having higher average hair-shedding scores than mature cows.

Hair can be shed rapidly in the spring, so it is important to compare animals scored at the same time. To create large contemporary groups, all scored in the same season, producers should score their whole herd over a short period (ideally on the same day).

Another way to increase the accuracy of genetic predictions is through multi-year reporting. When evaluating traits with repeated records, we can use the trait's repeatability (or, variation in the trait that is due to genetic effects and permanent environment effects) to estimate how much each additional data point is going to improve EPD accuracy. Based on the heritability (approximately 0.42 in Angus cattle) and repeatability of hair shedding, we recommend collecting at least three years of data. However, each data point increases accuracy. Preferably, producers would record hair-shedding scores every year on their whole herd.

Using Angus data, we estimate a moderate genetic correlation between a dam's hair-shedding score and the weaning weight of her calf. There is also a likely relationship between early hair shedding and fertility. While previous work confirms a relationship between heat stress and conception rate, there has not yet been thorough research to link hair shedding to pregnancy outcomes.

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Economic impact

Employees that are a poor fit for the job are costly. The Certified Angus Beef LLC (CAB) white paper titled "Genetic Basis for Heat Tolerance in Cattle" reports that heat stress costs the industry approximately half a billion dollars every year. Forage and management solutions can be time-consuming and costly. A sustainable option is to select well-adapted cattle that will work for you and pay their keep. The hair-shed research EPD to be released in 2020 is one tool to allow Angus breeders to develop these more well-adapted cattle. In the future commercial bull buyers can look for the hair-shed EPD to help them select sires that will leave more adapted female replacements for their operations.