

The value of using FEC EBVs

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Current problem with parasite control

Infection with gastrointestinal parasites or worms threatens the economic viability of sheep and goat production in warm, humid climates and is the major health concern due to dewormer resistance. Gastrointestinal worms can lead to reduced weight gains, anemia, and death of infected animals. Alternatives to dewormers that aid in control of worms are extremely important such as the use of copper oxide wire particles, good nutrition, and perhaps, most importantly, genetic selection for parasite resistance in the animals.

Genetic selection for parasite resistance

The National Sheep Improvement Program (NSIP; nsip.org) provides predictable, economically important genetic evaluation information to the American sheep and goat industry by converting performance records into relevant decision-making tools. By using sheep or goats with predictable genetics or performance attributes, including growth, reproductive or maternal traits, and parasite resistance, an economically-productive parasite resistant flock can be developed. Estimated breeding values (EBVs) are calculated for each individual animal enrolled in NSIP that gives genetic predictability for each trait, which are science-based, industry-tested measures of a predicted animal performance.

Significant progress has been made in identifying sheep that are superior for parasite resistance in the last few years. This greatly helps with raising pasture-based and organic sheep sustainably by reducing worm infection and the need for deworming. Coupling genetic resistance with other important traits can lead to economic success.

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Most of the data on parasite resistance EBVs came from the Katahdin breed, but any breed of sheep or goat can submit data to NSIP in the US. There can be a large variability within a group of animals in the marker for parasite infection, fecal egg counts (or FEC). Within the Katahdin breed, FEC EBVs ranged from -100 to more than +500% (-100 is the best EBV for parasite resistance), indicating great potential for genetic selection. For more information on using FEC EBVs see the fact sheet on Genetic Selection at wormx.info/bmps.

Impact of using sires with high FEC EBV

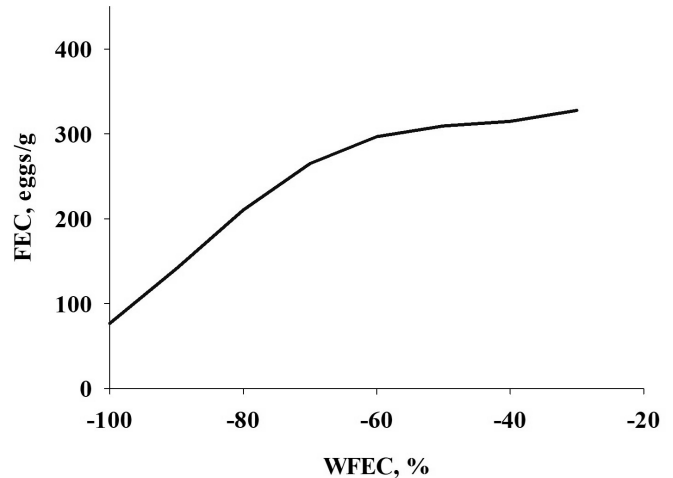
The weaning and post-weaning FEC EBVs of sires influence FEC and degree of anemia (barber pole worm is a blood-sucking parasite that causes blood loss or anemia) of offspring. The lower the FEC EBV (the more negative the number, the better the resistance) of the sire, the lower the FEC of offspring. This suggests the importance of selecting breeding sires with



the highest resistant EBV or the closest to -100% to minimize worm infection in offspring. In the USDA ARS flock in Booneville (Arkansas), for every 1-unit reduction in the sires post-weaning FEC there was a reduction of up to 8 eggs/g in the offspring's FEC. Also, as a sire's FEC EBV decreased (became more resistant), packed cell volume (a measure of anemia; a lower value approaches anemia) increased. In other words, lambs were less or not anemic when sire EBV was closer to -100. A way for farmers to estimate packed cell volume is through FAMACHA© scores. The more resistant sires will give offspring with lower FAMACHA© scores (1 = red or not anemic; 5 = white or severely anemic). Use of FAMACHA© as a selection tool may be quite useful in flocks that have not begun selection for worm resistance and for those with predominantly barber pole worm as FAMACHA© is not useful in detecting other kinds of worm infections.

Influence of lamb EBV on lamb value

It may be an important consideration to producers wishing to sell animals with NSIP EBVs. Would sale price be impacted by FEC EBV? A study conducted by agricultural economists using sale data from ARS and three private farms determined that the Ewe Productivity Trait, also known as the Katahdin Index was an important consideration in the sale value of a lamb. Buyers were offered a premium for animals with higher index values. Also, sale prices were influenced by sale venue with premium sales such as an NSIP or Katahdin Hair Sheep International Expo sales being higher than selling directly from the farm. Retention of breeding animals was also associated with a premium value to farmers who raised the animal. Thus, buyers appear to be interested in sheep with balanced EBVs (above average in two or more traits of interest) and high Index, which will lead to productive daughters. Other breeds and goats may benefit from having information such as this for marketing purposes.



Summary

An important tool in the management of worm parasites is genetic selection for resistance within a flock or herd. Even the use of a parasite resistant sire that may have been purchased from a flock with measured genetics can lead to more resistant lambs. Differences in farm management and pasture worm load are minimized across flocks when selecting genetics for parasite resistance from other sheep operations. The more parasite resistant a sire is, the lower the worm infection will be in his offspring. When it comes to selling lambs, even though parasite resistance is a desirable trait, it does not necessarily influence the sale price of breeding stock lambs but rather the overall genetic profile of the lamb. An individual buyer's desire to meet their flock goals through other or balanced traits may be more important than solely considering the parasite resistance status of the ram.



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