

Multibreed PAP EPD Released

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Colorado State University (CSU) and International Genetic Solutions (IGS) partners provide a tool to identify cattle less susceptible to brisket disease.

Breeders in high elevation regions (greater than 5,000 feet) are distinctly aware of high altitude disease, more commonly known as brisket disease. High altitude disease is a condition resulting from pulmonary hypertension that often leads to heart failure and death.

High altitude disease accounts for a 3 to 5% calf death loss for herds managed at higher elevations. This death loss can be 20% or higher for cattle not adapted to high elevation. Estimates of deaths from high altitude disease suggest a \$60 million annual loss to the beef industry.

The importance of understanding the genetic impact of this health trait is paramount to seedstock and commercial cattlemen alike.



Example of an animal with high altitude disease, notice the swelling around the neck and brisket region.

What is PAP?

Pulmonary arterial pressure (PAP) testing is a veterinary procedure used to confirm the presence of pulmonary hypertension by measuring the pressure in the pulmonary artery. Simply put it gauges the amount of stress the heart is undergoing to ensure oxygen is distributed throughout the body.

Observations for PAP are expressed in millimeters of mercury (mmHg) by inserting a flexible catheter with a pressure gauge into the jugular vein and passing it into the pulmonary artery. These measurements are typically taken at > 5,000 feet of elevation in yearling cattle.

PAP is an indicator of high altitude disease and is used for the screening of animals who are susceptible to pulmonary hypertension. In this case, a lower PAP score indicates less pulmonary stress, reduced susceptibility, and a more desirable phenotype.

Historically, cattle producers have used phenotypic PAP measurements on yearling cattle for the survivability of animals in altitude. The introduction of new genetics into a herd maintained at high elevation can be problematic for breeders. The use of the wrong bull could lead to a high calf death loss from high altitude disease.

Research has shown that PAP is moderately heritable and like most traits, this

data can prove useful in genetic evaluation. PAP EPDs provide breeders at higher elevations a selection tool to decrease the incidence of high altitude disease.

PAP EPD Development

International Genetic Solutions (IGS) is excited to work in partnership with Colorado State University (CSU) on the development of a multi-breed PAP EPD. CSU is hailed as one of the worldwide leaders in PAP research and development.

Over the course of 2019, Simmental, Red Angus, and commercial producers contributed historical PAP records to a multi-breed database. The team at CSU was able to develop a prototype EPD in an evaluation including approximately 9,000 PAP phenotypes.

The research project provided valuable insight into the genetic parameters of PAP in a multi-breed database. The range of PAP EPD in the IGS database is -7.4 to 24.1 with an average accuracy value of 0.20. The heritability of the trait is 0.53.

How to use PAP EPD

Think of PAP in terms of getting your blood pressure taken, a lower measurement is more desirable. The PAP EPD is expressed in mmHg and predicts differences in the progeny PAP measurement at high elevation. For example, if Bull A has a PAP EPD of 0.7 and Bull B has a PAP EPD of -1.5, you can expect on aver-

age, Bull B will sire progeny with 2.1 mmHg lower PAP score than Bull A.

It's important to note, a PAP EPD does not replace the need for actual PAP measurements. PAP is unique because this is one of the few traits where both the phenotype and the EPD needs to be considered. For producers purchasing a bull to be used at elevation, a PAP measurement is still needed to determine the likelihood of the bull's survival at elevation. But when considering the survival of the bull's progeny, the PAP EPD will help serve producers at elevation by identifying animals as a herd improver for PAP.

If a producer located at high elevation is interested in using an AI sire, they would have little knowledge of how those progeny would perform for PAP in elevation without a PAP EPD. With the development of a PAP EPD, breeders can make informed decisions for breeding selection purposes.

"The development of a PAP EPD is a critical step towards addressing health concerns and providing a valuable tool for beef cattle producers located in high elevations," said Wade Shafer, EVP of the American Simmental Association.

Due to limited PAP records, the IGS evaluation will initially publish PAP EPDs on animals with PAP progeny records (in other words, not all animals in ASA will have a PAP EPD). To find the PAP EPD list, head to herdbook.org. For more information contact Lane Giess at lgiess@simmgene.com ◆