

March 15, 2021

Dear AWA Members

The following fact sheet was written by the AWA Board of Directors to inform members of the American Wagyu Association about IARS (isoleucyl-tRNA synthetase) that has been linked to Weak Calf Syndrome in Wagyu cattle.

AWA Board of Directors

What is IARS?

IARS (isoleucyl-tRNA synthetase) is a protein coding gene that has been linked to Weak Calf Syndrome in Wagyu. The disease is responsible for embryonic and perinatal death in Affected calves. Japanese and Australian studies show that it has an estimated incidence rate of 17% in a population of Wagyu cattle, and 0.7% of the population are calculated to be at risk of becoming Affected. Since there is an estimated 56.5% - 59.8% mortality rate for Affected animals, the calculated death rate in a population is 0.4%. The surviving 0.3% generally does not mature to full potential.

Why are we starting to test for IARS?

When the incidence of a particular disease in a population increases, researchers look for a genetic mutation that may be responsible. If the disease is determined to be detrimental to the breed or has a fatal outcome, DNA is used to screen for Carriers of the mutated gene. This helps to make educated breeding decisions in an effort to avoid having diseased offspring and helps lower the incidence in a population.

What is Carrier screening?

Carrier screening is genetic testing that looks for individuals carrying a mutated gene responsible for certain genetic disorders. Every human being on the planet, for the most part, is a Carrier of an unexpressed mutated gene. Does that mean that people should no longer have children? Of course not. The same goes for cattle. Avoiding use of Carrier animals may hinder genetic progress. Combining available genetic information with a strategic breeding model can help take advantage of the best genetics while increasing the odds of having healthy offspring. An animal whose DNA reveals that it is a Carrier of a mutated gene may be safely bred to an animal known to be Free of that

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mutated gene. That genetic mutation will not be expressed in the offspring. What should be avoided is breeding two animals that carry the same genetic mutation. Their offspring is 25% likely to be Affected by the diseased gene. See the chart below for more genetic predictions. Carrier screening through DNA testing determines the status of an animal's genetic mutations and helps avoid experiencing economic loss caused by undesirable genes, yet facilitates the use of the industry's best genetics.

The Science of Genetics Predicts the Following Results from Each Type of Mating:

Mating	Offspring Distribution		
	Free	Carrier	Affected
Free x Free	100%		
Free x Carrier	50%	50%	
Carrier x Carrier	25%	50%	25%
Free x Affected		100%	
Carrier x Affected		50%	50%
Affected x Affected			100%

Will Carrier Status affect the meat quality?

No. A Japanese study (Maeda, 2014) showed no significant difference in meat quality, beef marbling score, marbling area percentage or fineness of marbling. Do I need to test all of my animals for IARS?

Testing your herd for IARS is a personal decision, but here are some points of information that may assist in your decision making. There isn't much point in testing terminal stock, since they will not be used for breeding purposes. Some people opt to only test their bulls, however, if you are using a Carrier bull, then the breeding cows should be tested. Once animals are determined to be Free of IARS, then it shouldn't be necessary to test their offspring when mated to animals that are also Free of IARS.

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