

Just the Facts!

Porcine Stress Gene: What the Show Pig Industry Needs to Know

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Handling, animal health products, nutrition and genetics all affect the quality of the meat we produce. Packing plants now “rest” the incoming animals for at least two hours prior to harvest. Animal health products are labeled with “withdrawal times,” or the number of days an animal must wait before harvest for the product to safely clear the system.

However, a genetic mutation, the stress gene, is still causing meat quality and welfare problems in the show pig industry. A number of traits are associated with this gene, including extreme leanness, increased muscling, excitability, and poor meat quality. The commercial swine industry has taken aggressive steps to eliminate this gene due to the negative effects on meat quality. Unfortunately, a Texas A&M University study found the stress gene in almost half of the class winners and breed champion barrows from the 2000, 2001, and 2002 San Antonio Livestock Exposition and the Houston Livestock Show and Rodeo.

What is a stress positive pig?

Pigs inheriting a copy of the mutant stress gene from both parents are referred to as stress positive (nn-genotype). They exhibit extreme nervousness and excitability (including “tail twitching”) and some animals die when exposed to a stressful situation.

High value pork cuts from stress positive animals are often PSE, or pale, soft and exudative. The meat is light pink to grayish white in color, does not hold its shape well and appears watery in the package. Carcasses drip in the cooler and lose moisture, causing the meat to be very dry when cooked.

An Iowa State University study revealed that more than 95% of nn-genotype animals produced PSE pork. Additionally, more than 15% of stress positive animals died while being moved from one location to another.

What is a stress carrier?

Pigs that inherit a single copy of the stress gene, one inherited from either the sire or the dam, but not both (Nn-genotype); exhibit characteristics that are intermediate between normal and stress positive animals. While death loss is reduced, pork quality is significantly poorer in carrier animals than animals without the stress gene.

The main reasons that this gene has been used are increased muscling and extreme leanness. This has resulted in a 2.7% to 4.0% increase in percent lean for stress positive animals compared to normal (NN-genotype) littermates. Stress positive animals tend to consume less feed per day while still converting that feed to lean muscle tissue very efficiently. A relatively simple genetic test is available for identification of stress genotype.

Today’s swine industry has the improved genetics, nutrition, and management practices to accomplish acceptable muscling and leanness traits without the stress gene. Due to the disadvantages, including excitability and death, poor meat quality and the reduced ability to produce high quality bacon due to extreme leanness; the negative effects of the stress gene greatly outweigh the gains in leanness and muscling.