

SEEK-GAIN™ Improving Swine Performance



SEEK-GAIN™: GeneSeek's Swine Performance Trait Testing Program

TWO NEW TESTS ADDED!

Utilize Information from 2 Unique Genes That Impact Litter Size

GeneSeek is now offering validated porcine performance trait DNA marker testing utilizing information from 7 unique genes that impact:

- Litter Size - Estrogen Receptor - **NEW**
- Litter Size - Erythropoietin - **NEW**
- Feed Intake/Conversion
- Weight Gain
- Lean Growth
- Fat Content
- Meat Quality

NEW - Estrogen Receptor (Litter Size)

There is a genetic variant in the estrogen receptor gene that is associated with increased litter size. Estrogen plays a central role in many reproductive functions, including embryo survival, fetal development, fertility, maintenance of fertility, and secondary sexual characteristics. All of these traits can have an impact on litter size.

Animals that carry one copy of the favorable variation of the gene will, on average, yield a 0.4 pigs per litter increase. Homozygotes (2 copies) for this genetic variation yield a 0.8 pigs per litter increase (average). This test is effective in Large White or Yorkshire breeds or crosses that involve them. (Rothschild, et. al., Proc. Natl. Acad. Sci. 1996 Jan; Vol. 93: 201-205) (U.S. Patent #5,550,024)

NEW - Erythropoietin (Litter Size)

There is a genetic variant in the swine erythropoietin receptor gene associated with uterine capacity and litter size. The favorable genetic variation has demonstrated an increase in uterine capacity as well as an increase in live births in two different swine populations at USDA-MARC, including the industry-relevant BX population. In a commercial herd, an extra pig per litter was observed when comparing boars that have two copies of the favorable EPOR marker versus boars with zero copies. (Vallet, J.L., et. al., Animal Genetics. 2005 36(2): 97-103)

COMING IN LATE 2008:
Illumina's Swine Genome SNP Chip

Test All Seek-Gain Markers in One Total Package

SEEK-GAIN™ - TOTAL GAIN

GeneSeek is offering validated porcine performance trait DNA marker testing utilizing information from 7 unique genes that impact:

- Litter Size-(NEW!)
- Feed Intake/Conversion
- Weight Gain
- Lean Growth
- Fat Content
- Meat Quality

Gene Markers Tested: MC4R, HMGA, CCKAR, PRKAG, CAST, ER, EPOR

PRICE: \$35/sample

Test Selected Seek-Gain Markers for Reduced Prices

SEEK-GAIN™ - LITTER SIZE

GeneSeek is offering validated porcine performance trait DNA marker testing utilizing information from 2 unique genes that impact litter size:

- Reproduction Rates
- Uterine Capacity

Gene Markers Tested: ER, EPOR

PRICE: \$12/sample

SEEK-GAIN™ - ANIMAL GROWTH & MEAT QUALITY

GeneSeek is offering validated porcine performance trait DNA marker testing utilizing information from 5 unique genes that impact animal growth and meat quality:

- Feed Intake/Conversion
- Lean Growth
- Meat Quality
- Weight Gain
- Fat Content

Gene Markers Tested: MC4R, HMGA, CCKAR, PRKAG, CAST

PRICE: \$25/sample

SEEK-GAIN™ - ANIMAL GROWTH

GeneSeek is offering validated porcine performance trait DNA marker testing utilizing information from 3 unique genes that impact animal growth:

- Feed Intake/Conversion
- Lean Growth
- Weight Gain
- Fat Content

Gene Markers Tested: MC4R, HMGA, CCKAR

PRICE: \$16/sample

SEEK-GAIN™ - MEAT QUALITY

GeneSeek is offering validated porcine trait DNA marker testing utilizing information from 2 unique genes that impact meat quality:

- Tenderness
- Juiciness
- Glycogen level, pH, & Color

Gene Markers Tested: PRKAG, CAST

PRICE: \$16/sample

Information for the Additional Seek-Gain Gene Markers

MC4R* (U.S. Patent #6,803,190)

The melanocortin-4 receptor (MC4R) genetic test is associated with controlling growth and leanness. The producer and breeder can decide if they wish to choose the “fast” growth form of the gene (298Asn, A-nucleotide variation) or the “lean/efficient growth” form of the gene (298Asp, G-nucleotide variation). Effects are 3 days less to market weight for animals homozygous for the growth allele compared to those homozygous for the lean allele. Pigs homozygous for the lean allele have 8% less backfat and have a high feed conversion rate. Breeders can choose which characteristic (growth or leanness) is best for their program. These results have been well validated and are effective in all breeds tested to date except Hampshire. (Kim et. al., Mamm Genome. 2000 Feb;11(2):131-5.)

HMGA1* (U.S. Patent #7,244,564)

The high mobility group AT-hook protein 1 (HMGA1) genetic test is associated with lean mass percentage, growth and back fat in several swine breeds. Producers can test and select animals (T-variant at position 576) which are likely to be leaner and produce offspring that are leaner. (Kim et. al., Obes Res. 2004 Dec;12(12):1981-94.)

CCKAR

The cholecystokinin type A receptor (CCKAR) genetic test is associated with physiological control of feed intake, hunger fulfillment, and obesity. Animals with at least one copy of the dominant G-variant have, on average, ~5% higher daily feed intake, 3% higher daily gain, and 3% fewer days to reach 180 kg, when compared to homozygotes for the A-variant (Houston et. al., Genetics. 2006 Nov; 174(3):1555-63.)

PRKAG3* (U.S. Patent #6,919,177)

The protein kinase, AMP activated, gamma 3 subunit (PRKAG3) genetic test is associated with muscle glycogen content and meat quality. Certain variations of this gene has been referred to as the Rendement Napole (RN) gene – found to cause low ultimate pH and water holding capacity in pork, primarily observed in purebred or crossbred Hampshire populations. GeneSeek now offers a new test within this gene, available for use in all breeds tested to date (not only Hampshire), that determines the presence of another variation (1991le, A-nucleotide variation) also associated with lower glycogen, higher ultimate pH and favorable color in loin and ham tissues. This new genetic marker test is valid in all breeds tested to date and there is considerable opportunity to increase the frequency of the beneficial allele and improve meat quality traits. (Ciobanu et.al., Genetics. 2001 Nov; 159(3):1151-62.).

CAST* (U.S. Patent Application #20,070,172,848)

The Calpastatin (CAST) genetic test is associated with meat quality. Calpastatin is responsible for inhibiting proteases that affect meat tenderness postmortem. Two variations within this gene have been identified that, collectively, are significantly associated with firmness, juiciness, Instron force, cooking loss, chewiness, and tenderness scores. Considerable meat quality improvements can be made by selecting for the favorable CAST (249Lys/638Arg, A-nucleotide variation for both) alleles. (Ciobanu et.al., J Anim Sci. 2004 Oct;82(10):2829-39.)

The effects of the genetic marker tests outlined here were described in peer-reviewed research publications by independent researchers with no affiliations with GeneSeek. There is no guarantee that effects observed following use of these tests will be similar to those previously described. Many variables can influence observed results, including but not limited to genetic background, environmental conditions and management programs. GeneSeek assumes no responsibility for the observed performance of pigs following genotyping with SEEK-GAIN™ tests.

If you have questions or would like arrange for sample testing, please contact Jeremy Walker at GeneSeek, Inc. (jjwalker@genseek.com, 402-435-0665)

GENESEEK'S Other Great Swine Tests and New Lower Prices!

- PORCINE STRESS SYNDROME (PSS)
- PRRSV and PCV2 Testing
- SEEK-SIRE™: Parentage Testing Program
- RN (Hampshire) Genetic Test
- SEEK-TRACE™: Complete Source Verification Program
- E. coli F4ab/ac Genetic Test
- GenTec Insulin-Like Growth Factor 2 (IGF-2) Genetic Test
- **COMING IN LATE 2008:**
Illumina's Swine Genome SNP Chip

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