Neogen introduces second generation GeneSeek Genomic Profiler (GGP) for Porcine

Developed in collaboration with corporate and academic scientists, the second generation GeneSeek Genomic Profiler (GGP) for Porcine is built on the foundation of the most globally utilized porcine arrays ever developed. The GGP porcine array features more than 51,000 SNPs specifically chosen for optimal chromosomal spacing and high minor allele frequency values for use in most commercial breeding lines.

“This chip is the first commercial genotyping product that utilizes a new chemistry and chip format from the technology vendor, Illumina,” said GeneSeek’s Jeremy Walker. “These new developments allow for very efficient, high volume laboratory processing and should keep sample processing at a low cost while also decreasing the amount of time for data turnaround.”

The GGP porcine array also includes several genetic markers that may directly impact disease and performance traits. These include:

- Porcine stress syndrome (HAL)
- Rendement napole (RN)
- Resistance marker to E. coli (F4 ab/ac)
- PRRS tolerance marker (WUR100000125)
- SNPs that have been demonstrated to have an impact on:
  - Feed Intake
  - Conversion/weight gain
  - Lean growth/fat content
  - Meat quality

In addition to increased processing efficiencies, this chip is also extremely accurate in its ability to impute to the most heavily utilized commercially available genotyping arrays. The new chip has higher density marker placement at the telomeric regions of each chromosome for increased imputation accuracy.

“The new GGP porcine chip also utilizes an unique internal control for every sample processed that can account for every well position in a 96 well DNA plate,” Jeremy explained. “This feature helps to guarantee highly accurate and timely results. Another major benefit, in addition to genomic selection, are the licensed disease and performance trait markers that are included with the array.”

For more information, contact GeneSeek at 877-443-6489 (USA/Canada) or at geneseekinfo@neogen.com.
Investigating the microbiome

“The application of bacterial classifications in a food processing plant opens opportunities for food safety and food quality improvement,” said Neogen’s Joe Heinzelmann. “The Affymetrix Microbiome array or 16s metagenomics provides new insights into the microbiota of a processing facility. The microbiological profiles of a facility provide processors with a deeper understanding of the microflora in an environment, and often a means to troubleshoot unwanted microorganisms.”

Bacterial classifications and phylogenetic studies have been largely improved by the targeted amplicon sequencing of the hypervariable regions within the 16s rRNA gene, which is represented in all bacteria\(^1\).

However, limiting the classification investigation to solely 16s sequencing often leads to difficulty in discerning closely related organisms down to the species level. To aid in the pursuit of accurately identifying bacterial species and serotypes (strains), Affymetrix (a part of Thermo Fisher) has recently created the Axiom\(^\text{®}\) Microbiome Array as an effective assay to distinguish not only bacteria, but also viruses and yeasts at the species and even serotype level.

The Microbiome Array is a highly developed micro-array technology that incorporates more than 130,000 unique probes in order to detect over 11,000 individual microorganisms—including bacterial, protozoal, viral, fungal, and archaeal species—whereas 16s sequencing is strictly limited to the detection of bacterial organisms within a given sample\(^2\).

While 16s sequencing still holds some advantages in the field of bacterial classification, GeneSeek recognizes the many unique applications of the Microbiome Array. This extensive coverage array is a cost-efficient microbial analysis that will allow GeneSeek to provide quality solutions for agricultural industries such as animal health, as well as soil and feed quality. The application of the Microbiome Array technology will also have a significant impact on the crucial business of food safety and the importance of accurate microbial detection in edible products.


Beef breed associations visit GeneSeek

Last month, GeneSeek welcomed members from beef breed associations for their annual visit to our facilities in Lincoln. In its third year, this forum is designed to provide a setting for beef breed staff to share their experiences and suggestions with GeneSeek, as well as to help them learn about new products and services offered at GeneSeek.

The meeting also creates an opportunity for its attendees to establish personal relationships with their counterparts in bioinformatics and lab operations. This interaction has continued to improve how GeneSeek does business with the breed associations.

“I believe the meeting not only serves to introduce livestock associations with the staff at GeneSeek, but also to offer them a basic introduction to DNA testing,” said Emilio Silvas, of the International Brangus Breeders Association and meeting attendee. “Most association staff members will be largely unfamiliar with genetics and DNA testing, so the meeting is a good primer on how large-scale testing is accomplished.”

Over the years the complexity of the subject matter at these meetings has continued to change and this year included discussions on advancements in sampling technology, order entry and IT support for LIMS (GeneSeek’s laboratory information management system), demonstrations on several lab improvements and one-to-one meetings.

The LIMS system, which drives daily activity at GeneSeek, was particularly well received by those in attendance. LIMS was developed to support and manage the samples GeneSeek receives, including the overall workflow and processes, as well as data reporting. GeneSeek has continually worked to improve its LIMS system, integrating the massive amounts of data necessary, while still creating a highly accessible user interface.

“I believe LIMS is an invaluable tool not only for testing status, but also for data delivery and management,” Silvas added. “This separates GeneSeek’s products and services without question, making it easier for non-technical staff to access and download data on demand. Simply put, LIMS is your ace in the hole for meeting our data access needs. It makes my life easier when our staff can download data without having to ask for help.”

The event also included laboratory tours, updates from the marketing and billing departments and dinner at The Nebraska Club. Thank you to all those who attended—we look forward to seeing you again next year.
Data Analyst I

The GeneSeek Data Group is currently seeking candidates for a Data Analyst 1 position. The ideal candidate will possess a science based degree with a general understanding of animal science and genomics. Candidates must have the ability to learn and integrate unique software programs with common laboratory protocols. The selected candidate will be responsible for quality control, report generation and customer support from an international customer base. The position is ideal for those who thrive in a fast paced environment. Complete training will be provided.

**Education and/or Experience:** Bachelor’s degree from four-year college or university in genetics, molecular biology, biology, bioinformatics or related field.

Apply at careers.neogen.com

Laboratory Technicians

GeneSeek has a number of openings for lab techs. If you are currently finishing up your educational program, working in a lab, or you have students looking for work, we welcome applications at neogen.com. As part of the GeneSeek team you will perform laboratory tests and services to support customer data generation through sample processing and DNA extraction. The range of duties include sample and reagent preparation, DNA extraction and isolation, quality analysis prior to genotyping, analysis of reagents for performance, and other related tasks.

As part of the team, the ideal candidate should be proficient in a variety of molecular biological techniques, and reliably follow established SOPs accurately to support ISO and GLP processes. They should also have the ability to maintain laboratory notebooks, sample archives and sample or specimen repository. In addition to sample processing, the candidate will contribute to maintaining the laboratory including ordering supplies and equipment, calibrating instruments, performing preventive maintenance and assuring a clean and safe environment. In our team, we emphasize assistance in training new staff to better manage laboratory workload and provide suggestions that will maximize laboratory efficiency.

**Education and/or Experience:** Associate’s degree (A.A. or A.S.) in science or lab related field; or 1–2 years related experience and/or training; or equivalent combination of education and experience. Bachelor’s degree (B.S. or B.A.) or other advanced degree (M.S. or Ph.D.) is preferred.

Apply at careers.neogen.com

Neogen Corporation recently announced that its GeneSeek subsidiary will now guarantee results from two of its most popular dairy genomic tests within 17 days—or the testing is free.

GeneSeek’s 17-day guarantee applies to its popular Igenity-Select and Igenity-Essential dairy genomic tests. To qualify for this offer, samples must be submitted as tissue sampling units, be accompanied with an electronic manifest containing all required information, and be properly identified upon arrival.

“In the world of raising dairy heifers, time is money. Neogen demonstrates our continued commitment to the success of the dairy producer by providing genomic testing results faster than ever with our new 17-day turnaround guarantee,” said GeneSeek’s Dr. Stewart Bauck. “This allows dairy producers to make economically impactful decisions on a younger animal, potentially reducing costly days on feed. Our operational strength and the size and efficiency of our expanded laboratory allows us to make this new guarantee.”

The two dairy genomic tests covered by the guarantee include:

- Igenity-Select is a streamlined genomic profile that provides an excellent decision-making tool for the commercial dairy, and highly reliable results at a significant value for cost-conscious producers. It is powered by a low-density chip with custom content, and supported by the CDCB to give accurate results. The test is available for Holstein, Jersey and Brown Swiss purebred cattle.

- Igenity-Essential provides the 15 most important key traits essential for improved dairy production targeted to commercial producers. It provides a cost-effective simple sorting tool for commercial heifers that does not rely on submission to the CDCB. Igenity-Essential is available for Holstein and Jersey purebred cattle.

Certain add-on content may not qualify for the turnaround time guarantee.

For more information, please visit www.neogen.com, or contact your local Neogen or Merck Animal Health representative.
Those are amazing statistics, but it immediately raises some important questions for us and our clients—namely, what do we do with all of this data? How do we store and transmit it? And what does it all mean? To answer those questions, we have evolved a number of tools. First, we have invested in software such as BC Platforms that gives us a means to store, manipulate and package genotype data for our customers. That helps answer the question of: “Can you send my data to Dr. X whom we are working with on a project?” This also gives us a seamless platform to support requests for genotype transfer in the case of international animal registration requests, and helps speed up turnaround time.

We have also installed pipelines for imputation that assist customers in getting data back in a format that is consistent with prior chip manifests. That allows us to harness the power of “alternative chip designs” and still guarantee customers compatibility of data across platforms. On top of all that, we have installed programs and virtual machines that convert genotype data into actionable molecular breeding values (or MBV). These MBV can be seamlessly and effortlessly integrated into the specific genetic evaluation program of interest.

But, the thing that has probably changed more than anything is the emergence of the bioinformatics and bio-statistics group led by Dr. Nick Wu. With this team, we are able to assist customers with end-to-end solutions, which take you all the way from a unique or custom chip design, right through to genome-wide association studies and development of prediction equations for breeding and management.

These solutions are some of the most satisfying to work on, when you see the impact that they have on the goals and objectives of the clients. It is a brave new world of genomics, and many people are coming into it with limited experience in transforming data into actionable information. If we can assist in that regard, there is nothing more satisfying for us than seeing customers derive value from the products we provide.