



NEOGEN

Dr. Ir. Pieter van As
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Euroopa Maaelu Arengu
Põllumajandusfond:
Euroopa investeeringud
maapiirkondadesse

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Who am I?

Pieter van As

Manager Business Development – APAC Genomics

- Based in Nelson, South Island, New Zealand
- Masters at Catholic University Of Leuven, Belgium
- PhD in Applied Biological Sciences, Belgium
- Post-Doc in Animal Breeding and Genomics, Wageningen, The Netherlands
- Molecular Geneticist Hendrix Genetics, 2009 - 2020
- Genomics Business Consultant for NEOGEN New Zealand, September 2020 – February 2021





NEOGEN

Introduction



About NEOGEN

NEOGEN

Founded in 1982 in Lansing, Michigan, NEOGEN's solutions can be found at every step of the food system, around the world.

NEOGEN provides the most comprehensive range of solutions for the food processing, animal protein and agriculture industries, not only protecting the world's food supply, but also allowing our customers to produce more efficiently and effectively than they could before.

From Gate to Plate

How it all ties together



Genomics

NEOGEN offers genomics solutions that allow animal protein producers to make educated breeding decisions that improve the efficiencies of their herds, breed associations to verify parentage, and for food safety professionals to identify bacterial strains associated with particular disease outbreaks.

Headquarters:
Lincoln, Nebraska



Animal Safety

NEOGEN develops solutions for the animal protein market, as well as the performance and companion animal segments. We offer veterinary instruments and supplies, cleaners and disinfectants for farm and veterinary settings, insecticides and rodenticides to limit the spread of disease and more.

Headquarters:
Lexington, Kentucky



Food Safety

NEOGEN reaches all segments of the food, beverage and feed industries with solutions that include: rapid diagnostics for the detection of unintended substances, sanitation verification tools, innovative pathogen tests, next generation genome sequencing and more.

Corporate and Food Safety Headquarters:
Lansing, Michigan



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Genomics

Who is NEOGEN Genomics?

- We are a service provider focused on the utilization of genomic technologies to improve agriculture and animal health.
- We are not a research facility, but facilitate researchers worldwide
- Worldwide footprint, with six labs spread across the globe
- We work primarily with livestock and companion animals, but also work in plant and human markets



Global Presence

Think global, act local

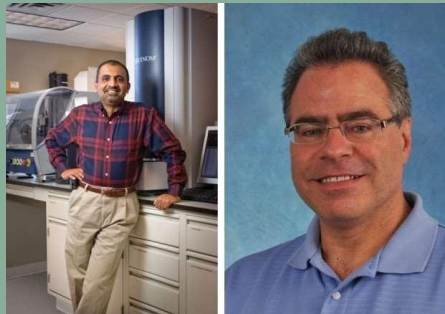


From a small Start Up... to a Global Leader

Neogen Geneseek, Lincoln, Nebraska, USA

1998

- Founded by 2 Nebraska based researchers
- 55 sq m of lab space
- 2 employees
- Few thousand samples



GeneSeek founders: Dr. Abe Oommen and Dr. Daniel Pomp

2020

- Acquired by NEOGEN (2010)
- 4600 sq m of lab space
- 225 employees
- 4.2 million samples processed annually



AYR, Scotland – Custom Built Lab

Neogen Europe

2020

- Opened 2016
- >40 employees in the lab
- >60 000 samples processed monthly
- Routinely running bovine, ovine, canine, porcine, equine, avian and aquatic samples
- Custom built facility



From a small University lab... to a Global Leader

Neogen Canada

2011

- Started off as a University of Alberta initiative
- Spun out of the University in 2014 to become a private, commercial lab
- >15 employees from 2012-2018
- Less than 5000 samples received each year, beef cattle focus
- Located in a small business incubator in Edmonton, Canada



2020

- Acquired by Neogen in 2019
- 14 employees
- >20 000 tests processed monthly
- Routinely running beef cattle, dairy cattle, swine, and ovine samples
- Custom built facility



From a small commercial lab... to a Global Leader

Neogen Brazil

- A private commercial lab located at Araçatuba/SP
- Founders: Professor from University (UNESP) and 2 students
- 2008 to 2012 the main business was prepared samples and ship those to GSK (Igenity – Merial)
- Less than 10 employees in total
- Less than 20,000 samples received each year: beef cattle focus and human
- Illumina products only



- Acquired by Neogen in April 2016
- 2021: 12 employees (3 commercial)
- More than 110,000 tests processed FY21
- Routinely running beef cattle, dairy cattle and swine
- Custom built facility – Area include Animal safety business



From a small University lab... to a Global Leader

Neogen Australasia, Gatton, Queensland, Australia

1993

- Originally a blood typing lab
- First microsatellites run Oct '93
- <10 employees
- 1142 samples received in first full year ('94), bovine only
- Squashed into 'lab under the stairs' in old UQ Vet Science building



School of Veterinary Science
Animal Genetics Laboratory

2020

- Acquired by Neogen in 2017
- >50 employees
- >40 000 tests processed monthly
- Routinely running bovine, ovine, canine and feline samples



A strong relationship getting better every day

Significant improvements since mid 2018

- **Custom-built facility at Gatton:** Australia's largest and leading genomic laboratory
- **Increased capacity – two shifts per day**
 - Lab is operational between 6am and 9pm
 - Sample Reception is operational between 7am and 7pm
- **Rapid Turn Around Time:** Helping you make better decisions faster
- **High Quality Data** Driven by Globally Recognized Products
GGP 50K, GGP 150HD, GGP F250

Custom built testing facility



What is the overall goal?

Our goal is to help animal producers improve:

- The profitability of their operation
The cheaper the animals are to raise the lower our food costs are at the grocery store.
- The health of their animals
Which requires fewer medications and vet visits \$\$
- The quality and safety of our food

Our Clients

Large pharma
Food companies
Animal breeding associations
AI/ animal genetic suppliers
Research universities
Government
Farmers/ranchers

We receive samples from all over the world:

Sheep from New Zealand
Alpacas from Peru
Pigs from Italy
Cattle from Brazil
Cats from Australia
Dogs from Norway
Chickens from US, France, UK, the Netherlands, ...



Primary technology platforms

ABI and Li-Cor DNA Sequencers

Microsatellite panels for identity management and single gene tests for selection and disease management

ELISA and Real-time PCR

Pathogen detection for disease management

Agena MassARRAY (fka Sequenom)

Custom SNP panels (1-500) for marker assisted selection and Identity Management

Thermo Fisher GeneTitan / Illumina I-Scan

Higher density SNP profiling (1000-1,000,000+)

Thermo Fisher Ion Torrent NGS / Illumina NovaSeq

GBS (200-5000 SNPs)

Metagenomics/Microbes

Whole Genome Sequencing

Expanded sequencing capabilities





NEOGEN

Portfolio



Beef Cattle

Genomic sequencing services

- GeneSeek Genomic Profiler (GGP)
- Angus GS
- Igenity
- Custom panels and arrays



“For Angus. By Angus.”

Angus GS

- increase in density from 49,000 to 72,000 SNPs
- the added markers are particularly relevant to the economically important traits of **calving ease**, **birth weight**, **marbling** and **female fertility**
- SNPs discovered in sequenced animals that have never been part of any commercial genotyping array in history.
- the additional SNPs explain a greater proportion of the genetic differences between Angus animals
- developed in partnership between the Angus Genetics Inc, Angus NZ, PBB and Neogen Australasia



“The continued improvement of Angus GS is really a testament to Angus breeders worldwide and their commitment to innovation.”

Angus GS

- includes parentage verification
- capability to conduct “add-on” testing for
 - Angus genetic conditions:
 - Congenital Contractural Arachnodactyly (CA)
 - Mannosidosis (MAN)
 - Arthrogryposis Multiplex (AM)
 - Developmental Duplication (DD)
 - Neuropathic Hydrocephalus (NH)
 - Osteopetrosis (OS)
 - myostatin
 - coat color
 - homozygous polled



Dairy Cattle

Genomic sequencing services

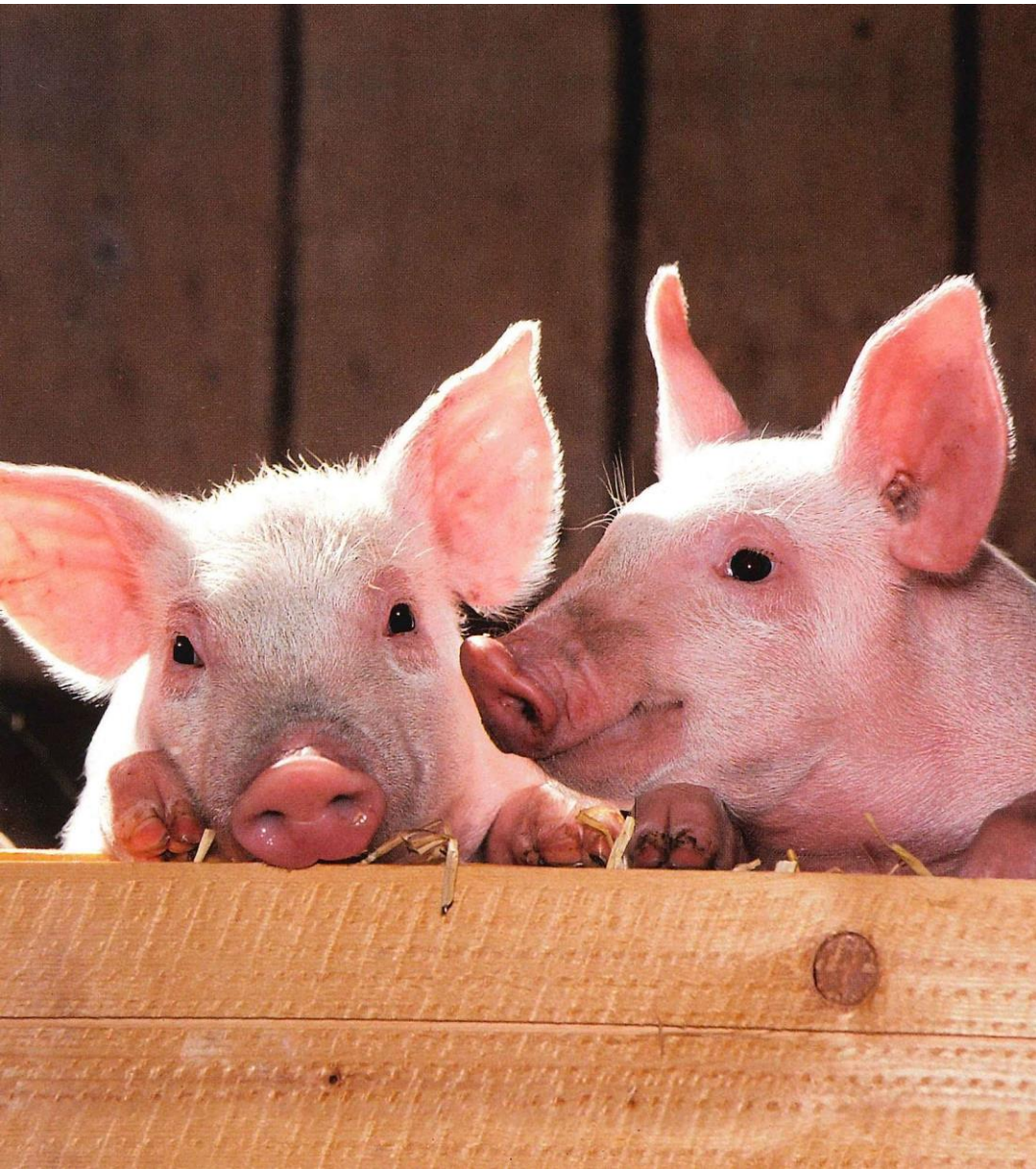
- Igenity
- GeneSeek Genomic Profiler (GGP)
- Custom panels and arrays



Sheep & Goat

Genomic sequencing services

- GoatSNP50 BeadChip
- OvineHD Array
- OvineLD Beadchip
- OvineSNP50 Genotyping BeadChip
- Custom panels and arrays



Swine

Genomic sequencing services

- Affymetrix Axiom Porcine Genotyping Array
- GGP Porcine
- PorcineSNP50 BeadChip
- SeekGain
- Custom panels and arrays



Aquaculture

Genomic sequencing services

- Affymetrix Axiom Arrays for salmon and trout
- Custom panels and arrays



Canine

Breed identification and animal health

- DNA identification and parentage
- Illumina Canine HD BeadChip
- Igenity Canine VDD-GNA
- Canine HD 712k
- Custom panels and arrays



Feline

Breed identification and animal health

- Pedigrees and parentage
- Custom panels and arrays



Equine

Genomic sequencing services

- Affymetrix Axiom Equine HD Array
- GGP Equine 70k
- SynchroGait
- Custom panels and arrays



Poultry

Genomic sequencing services

- Affymetrix Axiom Chicken Array
- Custom panels and arrays



Livestock Veterinary Diagnostics

Animal health

- Identifying disease risk
- Bovine disease
- Porcine disease



Plant Genotyping

Wide variety

- Apple, brassica, cherry, cotton, cowpea, eucalyptus, grape, maize, oat, peach, pepper, potato, rice, soy, tomato, wheat
- Custom panels and arrays



Research & Development

- Livestock
- Equine
- Mouse
- Plants
- Custom panels and arrays
- Sequencing NGS
- Skim Sequencing
- ...



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Questions & Answers

**Thank you
for listening**

Get in touch

www.NEOGEN.com





IGENITY Enhanced

NEW Igenity Beef Profile

Neogen has been proud to offer **Igenity Enhanced**, the first and only heifer profile customized for your crossbred and straightbred cattle.

Igenity Enhanced reports Igenity Beef customised figures, based on your genotypes and phenotypes of progeny and pedigree information (sire EBVs), and phenotypes of close relatives if available (TBA).

The deliverable is **blended IgB scores** with your phenotypes/genotypes for the IgB traits. If you only supply phenotypes for 3 traits, then they will get “enhanced” results for those 3 traits.

