

ANIMAL BREEDING AND GENOMICS CENTER

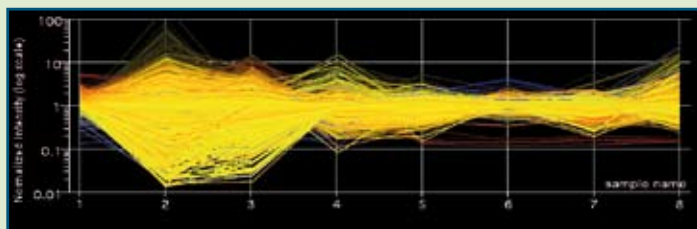
Genomics and bioinformatics

The knowledge about the genome of animals is developing very fast, and it is this new knowledge that offers opportunities to solve existing problems. The more we know of the genome of our animals and how it functions, the better we are able to control and work towards a sustainable and profitable animal husbandry. Genomics can be applied in a wide range of options, and the researchers of the Animal Breeding and Genomics Centre (ABGC) do this in a number of ways.

Our approach and the farming practice

Breeding for complex characteristics

Information about genes is essential in animal breeding, for genes are the foundation on which the constitution of living beings depends. The essence of breeding programmes is improving and optimising the performance of animals. In each generation, breeders select the best parents to create the next generation. This selection is often phenotypic, that is, on the basis of morphology or performance characteristics. Thanks to the emergence of genomics, it has become possible to measure these characteristics at the DNA level. And by doing so, selection on difficult-to-measure characteristics like resistance to diseases becomes possible. It is also possible to accelerate the speed of genetic progress of characteristics that can only be measured in the adult animal or in animals of the other gender for instance meat quality, or (female) fertility.



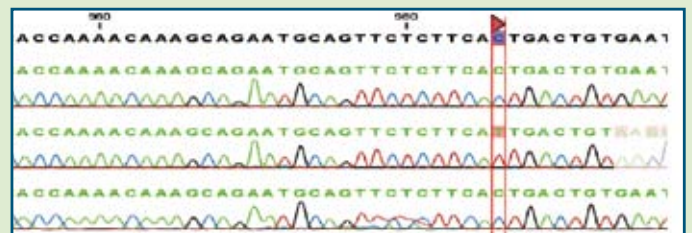
Nutrition

The health status of the intestine and the disease resistance of animals depend on several factors, among which nutritional aspects seem to be quite important.

Up till now, it has been difficult to measure the effect of the composition of animal feedstuffs on intestinal health. Measuring the effect of nutritional components on the expression of genes that are involved in intestinal health will help us to gain more insight into the effect of these components on the health status of the intestine. This knowledge at ABGC can immediately be applied to practical situations when new animal feeds are developed.

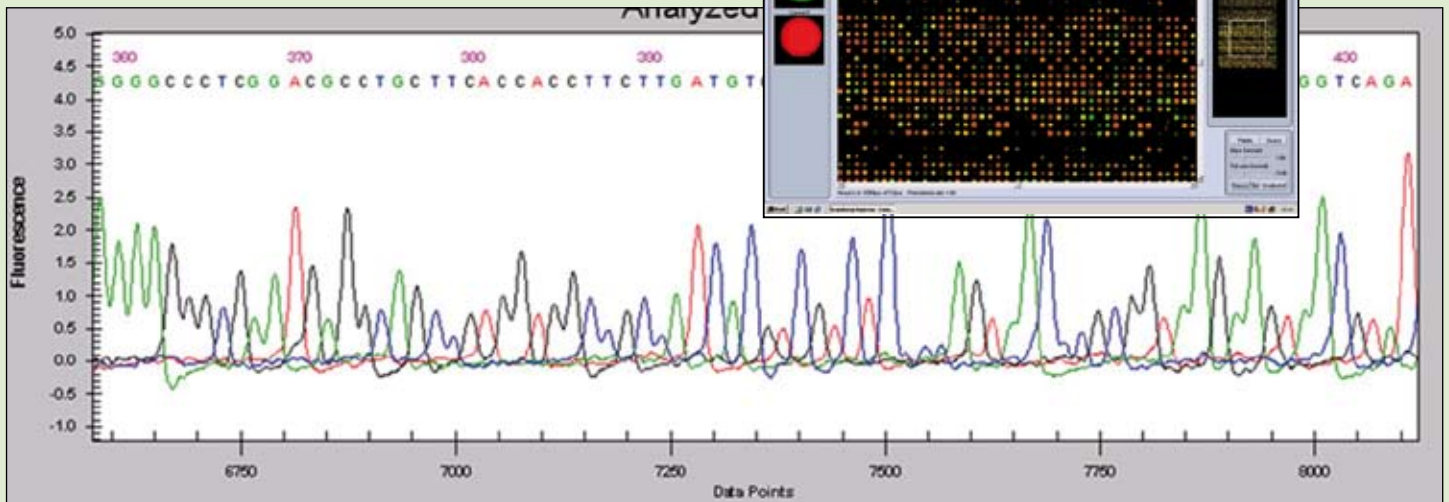
Customised product quality

Consumers demonstrate a growing interest in meat, dairy and egg products that have an added favourable effect on health. By means of breeding and nutrition it is possible to specifically improve, or differentiate, the composition of end products. New technologies enable us to measure the composition of fatty acids or proteins in foods such as milk. Research is progressing to identify relevant genes. On this basis, the contribution of ABGC researchers to product improvement can be even more specific in the future, for instance with regard to the fatty acid composition of milk or the tenderness of meat.



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Systems biology

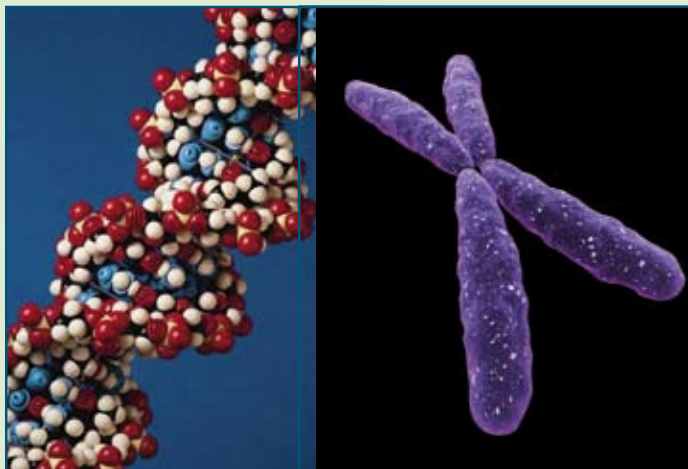
Genomics research in mammals yields a huge amount of data about genes, gene variants, the expression of genes under various conditions, the protein and metabolite composition of cells and tissues, etc. In this way, a kind of road map is created, which will help us to grasp all sorts of biological systems of living organisms. Scientists at ABGC are establishing mathematical models, which interconnect the data of this road map. These models can be used to describe the biological system, its dynamics and further characteristics, and become handsome tools to predict how the system will react on influences from outside. The central question here is, how to control certain biological systems.

Why opt for ABGC?

Wageningen UR is the only location in the Netherlands with the means and expertise needed for research in genomics, bioinformatics, and systems biology for farm animals all under the same

roof. ABGC researchers have access to an advanced genomics toolbox and they develop software and analytical methods themselves. The most up-to-date knowledge and expertise are available, as ABGC is an active player in a number of worldwide and European network organisations.

Examples are the participation of our scientists in the Swine Genome Sequencing Consortium and the Chicken Genome Sequencing Consortium, two worldwide organisations that locate all genes of pigs and chickens, respectively. ABGC also participates in the European SABRE research programme (Sustainable Animal Breeding), the "European Animal Disease Genomics Network of Excellence" (EADGENE), and the EU research programme "Q-PORKCHAINS - Pork quality: from fork to farm". Therefore, ABGC is the partner for businesses and authorities when it comes to applying genomics to the daily practice.



More information:

The Animal Breeding & Genomics Centre of Wageningen UR

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