Duck breederfocus

Launch of duck genomic selection: A world first

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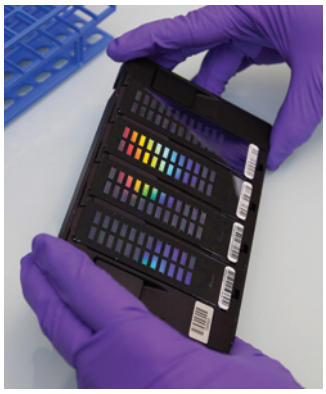
As is the case for meat chicken and laying hens, knowledge of duck genomes is also progressing fast. In order to develop the molecular tools necessary to implement genomic selection, Grimaud Frères has participated since 2016 in the European 'CanArray' project which has enabled the very first chip containing 600,000 SNP (Single nucleotide polymorphism) multi-species palmiped markers (Meat Muscovy, Meat Pekin, mule parents and other wild species,etc) to be launched internationally contained on a so-called 'high density' chip.

These SNPs correspond to localised variations of a single nucleotide base of DNA that are very frequent and appear consistently along the DNA. These markers make up the majority of the DNA variations and are used to estimate the effects of chromosome portions on different traits of interest.

Because genomic programmes require significant forward planning, Grimaud Frères targeted its most strategic lines more than five years ago to implement genomic selection for them. The DNA of all the breeding stock of these lines was thus collected and then stored cold to constitute so-called 'reference' populations composed of thousands of subjects.

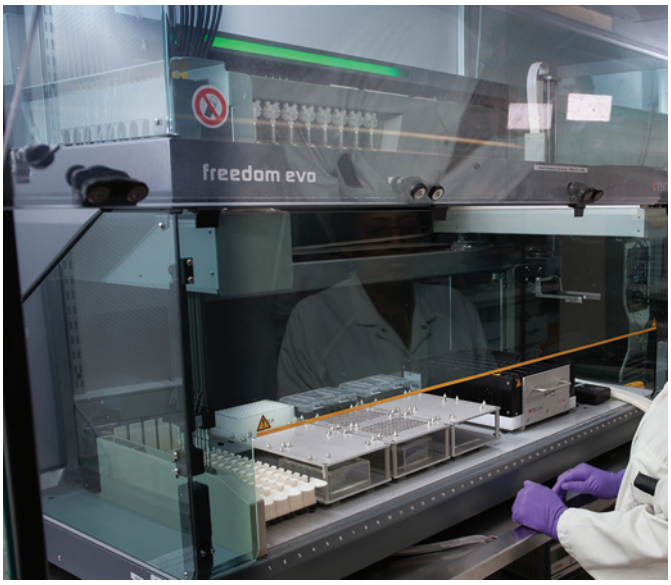


It was from these very specific populations that a sub-sample of SNP markers included on the HD chip was specifically selected according to several implicit criteria such as their origin, their quality of hybridisation or more technical criteria such as their allelic frequency and their position on the genome.

At the same time, Groupe Grimaud's 'Genetech' multi-species R&D platform has made it possible to use to best advantage the experience of genomics already acquired by the Group's other subsidiaries, such as Novogen (laying hens' genetics) or Choice (porcine genetics).

It is thanks to this very special expertise that Grimaud Frères teams were able, last March, to successfully launch the very first SNP chip, especially dedicated to their lines.

The first hatching of DNA-derived ducklings for genomic selection thus took place on 22nd April 2021. This world-first opens up significant prospects for innovative and ultra-effective selection programmes.



The following benefits are expected from genomic selection compared to conventional selection methods:

- A sharp acceleration in genetic progress thanks to potentially higher selection pressure, faster estimation of future breeding stock (shorter generation interval), and greater accuracy of the genomic values as compared to the genetic values.
- A more effective selection of complex traits to be measured, of measurable traits late in an animal's life (behaviour, mortality, brooding, meat quality, laying potential of breeding males, etc) or traits of low heritability (maternal traits or resistance to disease).
- Better management of inbreeding rates in lines and between lines (genetic distance between populations, genomic inbreeding levels, etc) allowing improved exploitation of genetic variability of traits and thus an improvement in genetic progress over the long term.
- Identification of genes which have simple genetic determinism and high-effect (responsible in large part for the variability of the agronomic trait and/or anomalies).
- The development of parental assignment to retrospectively find a duckling's reproductive parents.

Grimaud Frères' customers will soon benefit from the progress made on its breeding animals thanks to this first 'genomic revolution' for ducks. ■