

dairy

Genotyping our way to a more sustainable future

Genotyping is one of the key tools that farmers and industry can leverage to increase productivity and profitability while also reducing the carbon footprint of Irish dairy and beef systems

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Genotyping has been used since the late 2000s to identify genetically superior to be used in our breeding programmes.

At the end of May, the Minister for Agriculture Charlie McConalogue announced funding to commence the process of genotyping the national herd. The scheme opened for applications on 21 June. The National Genotyping Programme partners include the Department of Agriculture, Food & the Marine, Dairy Industry Ireland (DII), Meat Industry Ireland (MII) and participating farmers.

From 2024, the cost for genotyping a single animal of €18 will be divided equally between the three programme partners. Breeding animals being genotyped in 2023 will be free as funding from the Brexit Adjustment Fund is being used to 'kickstart' the programme.

Genotyping has been used since the late 2000s to identify genetically superior to be used in our breeding programmes. It was extremely expensive when it first came to market but the cost has come down and the potential of the test has increased dramatically.

Genotyping has been an option for all farmers for many years and schemes such as the Beef Data and Genomics Programme (BDGP) and, more recently, the Suckler Carbon Efficiency Programme (SCEP) have

incentivised genotyping. This has helped to identify cows that produce high quality, carbon efficient progeny while themselves being carbon efficient.

Benefits of National Genotyping Programme

- **Parent verification:** genotyping at birth will confirm parentage and correct any errors.
- **Cost:** herds accepted into the National Genotyping Programme will genotype their breeding stock FREE. From 2024 to 2027 (inclusive), farmers will be required to genotype ALL calves born at a reduced cost of approximately €6. This includes the farmer's contribution, the additional cost associated with a double tissue tag and postage cost.
- **Labour saving:** confirming parentage errors prior to registration prevents future issues and potential inspections. By sampling animals at birth, farmers avoid potentially having to round up and bring in animals for sampling at a later stage.
- **Higher reliability EBI/€uroStar**

figures: genotyping increases the reliability of these merit figures even before the animal has produced offspring.

• **Traceability:** genotyping ensures that there is full traceability of every meat and milk sample from birth.

The National Genotyping Programme will facilitate the genotyping of breeding females in herds across the country in 2023. Farmers will be genotyping all their calves from the spring of 2024.

For anyone who might think they never make a mistake when registering their calves, the pilot DNA registration programme which has been in existence since 2018, shows that sire or dam errors run at 10% to 15%. That means that 10 to 15 in every 100 animals do not have the correct parentage. DNA registration can resolve all this.



Advantages for dairy beef farmers

The commercial beef value (CBV) gives a better insight into an animal's genetic merit on the basis of carcass weight, conformation, carcass fat, docility and feed intake. The CBV figure exists for dairy x dairy (dairy sire and dam) and dairy X beef (dairy dam and beef bull) as well as sucklers from beef sires and dams.

Higher CBVs mean better performance and higher carcass values at slaughter.

The CBV will make it easier for calf buyers to know what they are getting. CBV will be underpinned by the DNA registration scheme.

Only calves that have been genotyped will have a CBV giving the buyer confidence in what they are buying. Work by ICBF has shown that CBV significantly influences the price received for carcasses for both dairy x dairy and dairy X beef animals (Tables 1 and 2).

By differentiating the good from the bad, CBV will help reverse the trend to easy calving, poor beef merit

Table 1: Comparison of prices for dairy x dairy males at different stages of production based on CBV

CBV category (€)	Calf price (€)	Weanling price (€)	Carcass price(€)
-20 to -29	48	292	1,268
0 to 9	51	311	1,452
0 to 9	54	317	1,478
40 to 49	59	370	1,552
Difference	11	78	360

(Source: ICBF)

Table 2: Comparison of prices for AA x dairy animals at different stages of production based on CBV

CBV category (€)	Calf price (€)	Weanling price (€)	Carcass price(€)
10 to 19	122	518	1,592
50 to 59	160	499	1,712
90 to 99	180	528	1,908
130 to 139	186	593	2,160
Difference	64	75	568

(Source: ICBF)

animals in dairy herds. This is important at two levels.

Firstly, dairy farmers need to have buyers for their calves each year so the quality of the offering will be important in order to retain customers. Secondly, the better CBV animals will be more efficient beef animals with lower slaughter ages. This is one

of the key areas where beef farmers can reduce greenhouse gas emissions from their systems.

If interested in learning more about the National Genotyping Programme, scan the QR code on your smartphone.




National Genotyping Programme

An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

The programme is based on a cost-sharing model between the DAFM, the beef & dairy industry, & participating farmers.

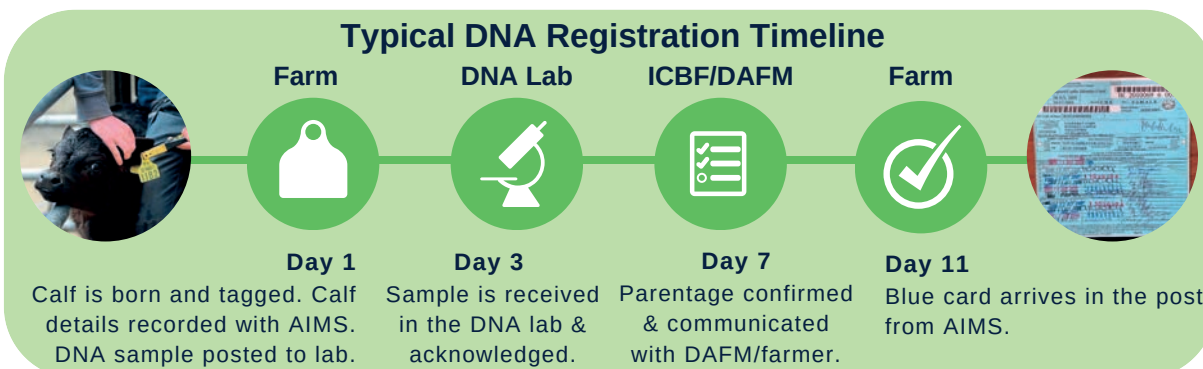
Online applications are open to all beef & dairy farmers. For more information, see

www.icbf.com

Benefits of DNA Calf Registration

- **Parentage verification:** Genotyping at birth confirms parentage & corrects any errors (on average 15% per herd).
- **Labour saving:** Confirming parentage errors prior to registration prevents future issues & potential inspections.
- **Cost:** Herds accepted into the National Genotyping Programme will genotype their breeding stock for **FREE**. From 2024 to 2027 (inclusive), farmers will be required to genotype **ALL** calves born at a reduced rate of €6.
- **Higher EBI & Eurostar reliability:** Genotyping increases the reliability of figures before the animal has produced any offspring.
- **Traceability:** Genotyping ensures that from birth there is full traceability of every meat & milk sample.

Typical DNA Registration Timeline





Continued from p12

Power of breeding

Genotyping brings much more to the table than just knowing who's who. Genotyping has been very effective in bull breeding. It has been used to identify the elite genetics that are required to increase fat and protein percentages and improve fertility.

However, that has only been through its application to the male population and in a limited way. AI companies spend the calving season trawling through lists of calves born each week trying to identify standout animals with the hope of finding the next table topper for the active bull list.

This is no easy task. The DNA registration process will make it easier to identify the elite animals but it will also dramatically increase the pool of animals that are being examined as potential sires.

With all bull calves in the programme being tested at registration, outliers will be found that might have slipped through the net. This will lead to more rapid genetic gain but also has the potential to widen the gene pool of AI bull panels.

If we apply this technology to the female population, what happens? Genotyping all females, will identify the best genetics in herds. These are the money-makers, the animals that will go in calf readily, produce high milk solids, and are healthy and carbon-efficient. These traits are going to underpin the future of the Irish dairy industry.

We want to breed cows that are efficient milk producers, calve each year and will last in the herd. We know that for every €10 increase in EBI, there is a 1% reduction in greenhouse gas emissions so increasing the rate of gain also speeds up our emissions reduction.

Work being done by Ben Lahart at Teagasc Moorepark has shown that there is variation between animals in terms of their enteric methane production.

This means that it may be possible to select for lower methane output into the future.

The power of breeding should not be underestimated. It is cumulative but, more importantly, permanent. We retain the advantages it achieves year and year and build on them. Genotyping of the national herd will allow the Irish dairy industry to exploit the power of breeding at a much faster rate than to date.



Farmer view: John O'Sullivan

John O'Sullivan and his family are milking approximately 300 cows on land overlooking the Bandon river near Kinsale. They supply Bandon Co-op and herd EBI is €232, which puts them in the top 1% of herds.

The herd EBI is made up of a milk sub index of €68 and a fertility sub index of €106. The carbon sub index, which was introduced in late 2022, is €9 for John's herd and the health sub index is five star at €9.

"I have always had a keen interest in the breeding side and we started genotyping in 2014 doing the heifer calves born that year," says John.

"I felt that at €22 a sample we were getting great value through the verification of parentage and the strengthening of individual EBIs and, consequently, the herd EBI figure."

As John was selling heifers, he was also able to identify the heifers to retain for his own herd from his maiden heifers. That is not to say that John was selling lesser stock, indeed on the contrary, the heifers being sold were still in the upper echelons of stock in the country but were just the lowest EBI animals of that particular year's group.

"We joined the ICBF DNA registration pilot programme," says John. "We had to genotype any breeding stock on the farm that were born prior to 2014 – when we had starting genotyping the heifer calves."

"Since 2019, we have registered all calves through the DNA registration programme. This involves taking a tissue sample when tagging the calf at birth and sending it to the lab for genomic verification. We record the date of birth and any calving difficulties that may have occurred and the DNA takes care of the rest such as the sex, the sire and the dam.

Samples

"By submitting samples to the lab regularly each week during calving, there is little or no delay in getting the blue card back for the calf and the registration is 100% correct.

"The DNA registration programme has also been useful when we have used high EBI Friesian bulls to pick up heifer repeats."

As well as knowing the genetic merit of the bulls, the DNA registration programme helps to identify the correct sires of the subsequent calves. In the past, John used to use different breeds of beef bulls with the cows late in the breeding season, so that he could easily identify the sire the following spring. This also allowed him to identify any potential calving difficulties with particular bulls.

With confidence in the ability of the DNA registration to differentiate, John ran all Aberdeen Angus bulls with the cows to 'clean up' towards the end of



Stuart Childs,
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the 2020 and 2021 breeding seasons. He has since invested in heat detection collars and gone 100% AI in the cow herd.

Beef AI is part of the breeding programme from day 1 of the AI season with John identifying those cows which he does not want a replacement from on the basis of their genetic merit and their milk recording performance.

However, he still depends on the DNA registration to ensure the correct parentage of any repeats in his maiden heifers as he puts a team of his own high EBI (genotyped) Friesian bulls with his maiden heifers to clean up following synchronised AI at the start of the breeding season.

The CBV, while relatively new, will be underpinned by the National Genotyping Scheme. John sells his beef calves to a few regular customers. He says DNA registration gives him huge confidence that the calves he sells to his customers are "exactly what it says on the tin".

"The simplification of life at calving and the improvement in reliability that DNA registration has brought means I can hand-on-heart encourage others to sign up immediately as they are getting their herd genotyped for free.

"And at just €6/animal to the farmer for genotyping of calves from 2024, the whole package is extremely good value and is an investment that no one will regret."

ADVERTORIAL
Time to reseed?
Kevin Havekes
Kilwaughter Lime

Research has shown that new varieties of grass can increase yield by 33% over a 5 year ley, with DM yields increased up to 10% for each of the next 4 leys. Sward performance is often reduced by poaching, or after a hard winter, allowing native grass and weed species to move in. These grasses and weeds are inefficient at converting nitrogen and nutrients into vegetative growth, resulting in lower yields and poor digestibility.

The decision to reseed should be based on assessment of individual fields to determine if:

- Sward productivity has fallen significantly
- The level of sown species has fallen below 60%
- There's a high proportion of native grass & weeds present
- There is evidence of soil compaction

If any of the above conditions are prevalent in any of your fields, the decision to reseed should be triggered. Key to establishing grass swards is to ensure the new seeding gets off to the best possible start. A recent soil test is critical to making management decisions, ensuring nutrients in the soil are readily available to the establishing crop. If seedlings struggle to access nutrients, reseed failure is possible.

pH is vitally important to nutrient availability, with 20% of applied nutrients locked into the soil, unavailable to the crop at pH 6.0, and increasing at lower pH. These conditions reduce plant counts of a newly establishing crop, as low energy and tiny root hairs, can't access enough nutrient to get established.

If your soil test in the intended reseed field is below 6.3, lime must be applied as part of your reseed program.

Applying G-Lime, a high quality, highly reactive, calcium-based lime is key component to ensure a successful reseed. G-Lime is the fastest acting, most reactive agricultural lime on the market. Unlike ground limestones, which are likely to contain large and ineffective chips, every pellet of G-Lime is 100% effective at raising soil pH. G-Lime raises and maintains your soil at the required pH and releases lost nutrients, ensuring your newly sown sward can access locked nutrients and gets off to the best possible start.

Every pellet of G-Lime is made up of highly-reactive calcium carbonate. The particles making up each pellet are microscopic, with the pellet breaking down on the soil surface immediately with as little as 1" of rain. G-Lime reacts fully to raise soil pH within 6 weeks of application, meaning your new grass seeding will have access to vital nutrients and get off to the best possible start.

G-Lime is available in 600kg, top-lift bags from agricultural merchants and co-ops across Ireland.

Contact us on **021 466 6400** or email kevin.havekes@kilwaughter.com to find your nearest stockist.



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