



# The Benefits of Genotyping and The National Genotyping Programme

## Breeding and Genetics Conference

### Mark Waters ICBF



An Roinn Talmhaíochta,  
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Department of Agriculture,  
Food and the Marine

**11<sup>th</sup> Dec 2024**



AgTech - it's in our DNA

# What is Genotyping?

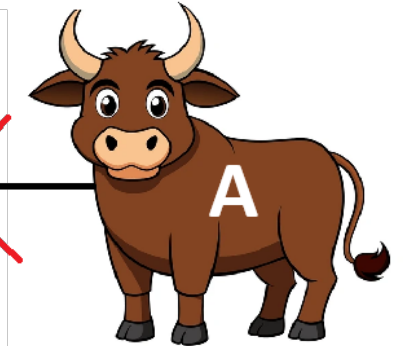
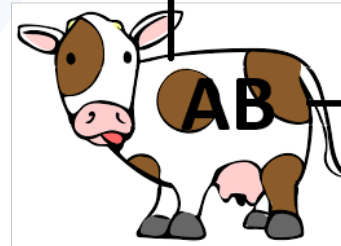
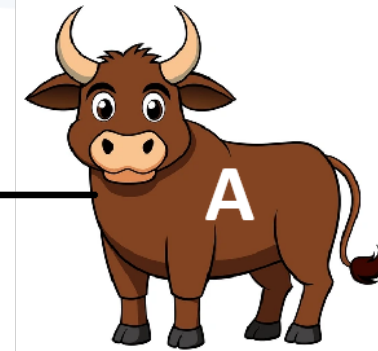
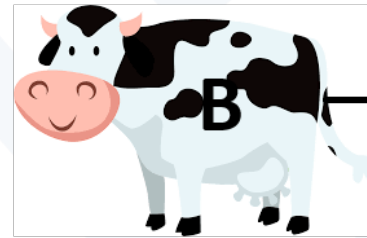


DNA

**X 50,000!**

# Parentage Correction

Accuracy of Indexes



Unintentional Inbreeding



Dairy Beef Index

BREEDING HIGH QUALITY BEEF CATTLE FROM THE DAIRY HERD

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icbf  
Commercial  
Beef  
Value





# Increased Reliability – Selection of Youngstock

30%



EBI Reliability

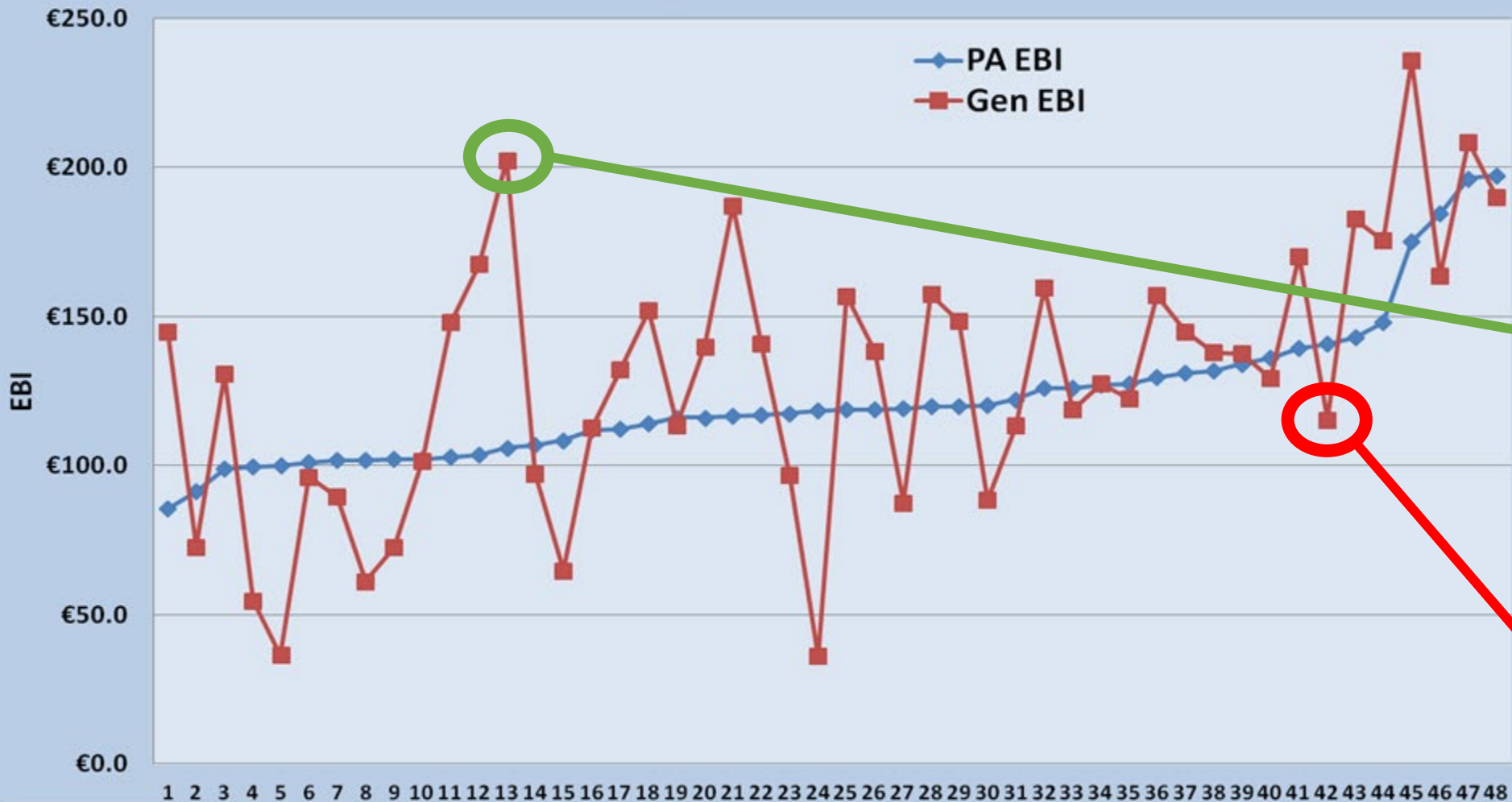
Keep

Sell



# Increased Reliability – Selection of Youngstock

Parent Avg. EBI V's Genomic EBI

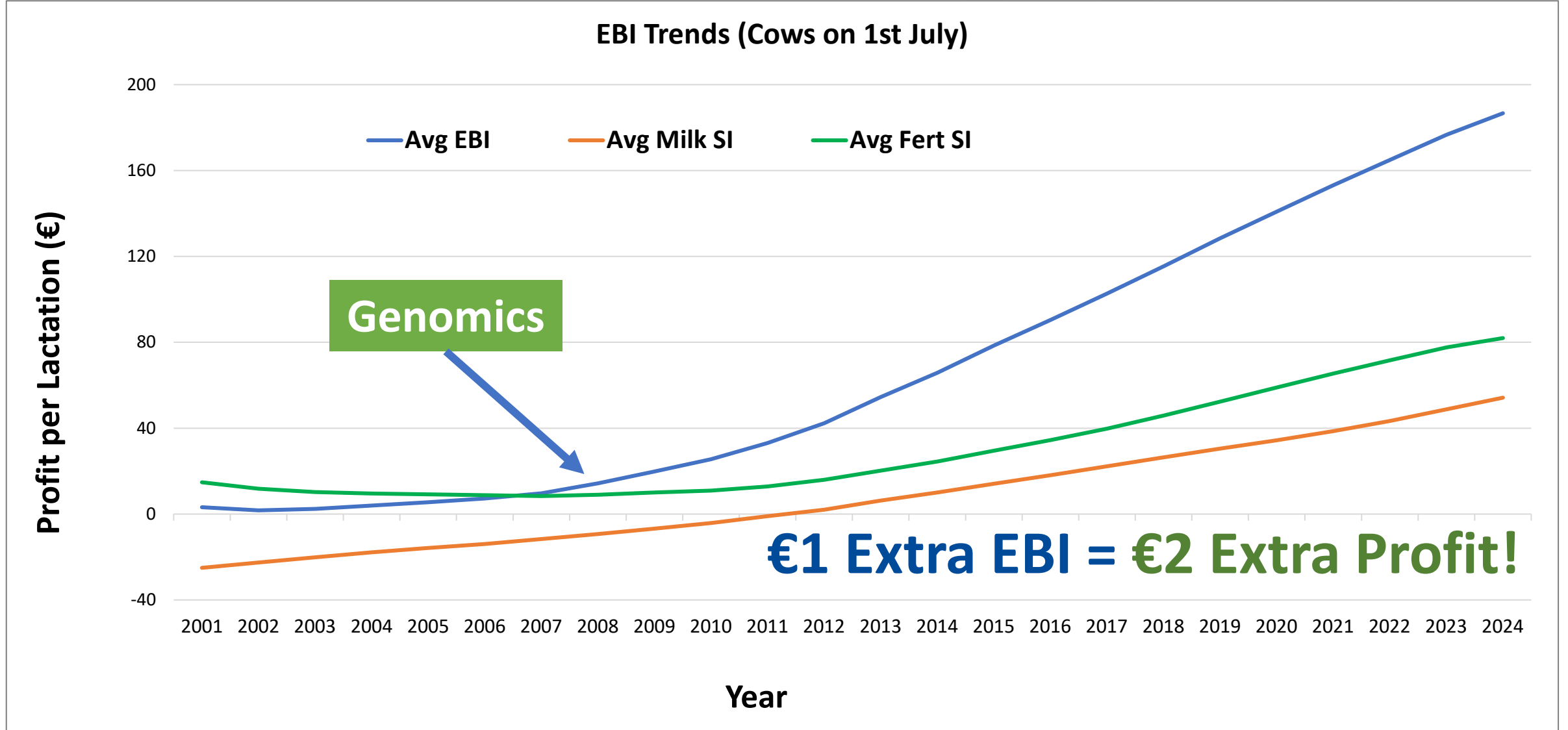


Example group of 48 heifers Genotyped

This animal went from ranked 35<sup>th</sup> in the group on PA EBI to ranked 3<sup>rd</sup> with Genomics included

While this animal went from ranked 7<sup>th</sup> to ranked 30<sup>th</sup>

# The Effect of Genomics on Genetic Gain





# Commercial Beef Value (CBV)

My daddy is a low carcass merit AA bull.



-€20



€87



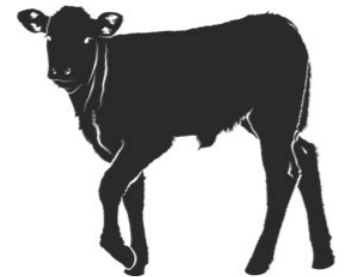
My daddy is a high carcass merit HE bull.

How can I tell the good from the bad?!?!



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Commercial  
Beef  
Value



# More Benefits to Come



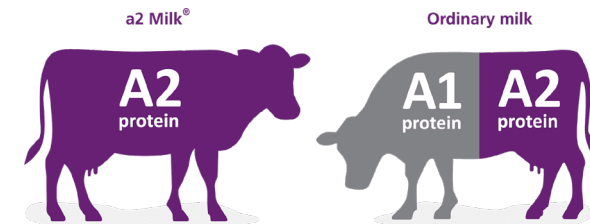
Enhanced traceability: Breed, meat, theft/"dumped" carcasses

Market point of difference - Create premium brand based on enhanced traceability right to the consumer



Genomic Inbreeding + Potential to manage carriers of Lethal genetic conditions

Product segregation - A2 milk



HAPLOTYPES	CARRIER percentage in Italian Holstein Population	EFFECT
HH1	3,24%	Abortion in the first 3 month of pregnancy
HH2	2,64%	Abortion
HH3	5,27%	Abortion in the first 2 month of pregnancy
HH4	1,10%	Abortion, often during the first month of pregnancy
HH5	6,88%	Abortion
HH6	0,72%	Abortion in the first 35 days of pregnancy
HH7	(Unknown)	Abortion



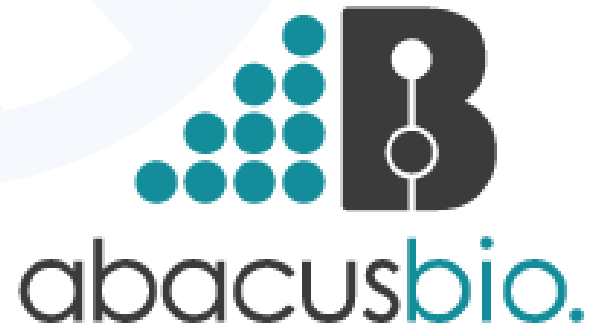
Source: ANAFIJ 2020



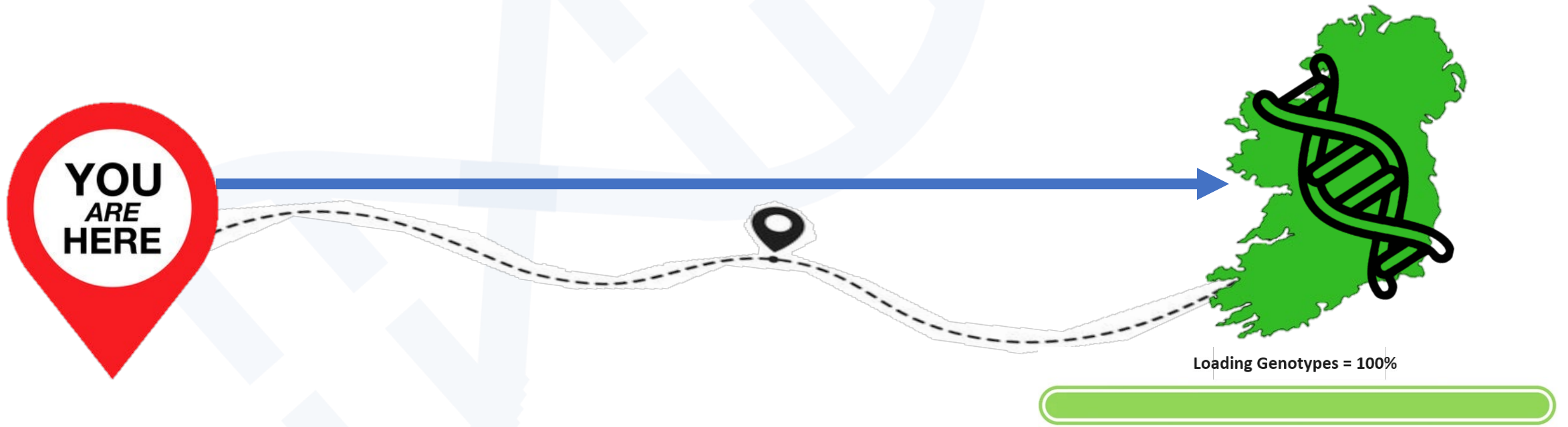
# Rewards of Genotyping



**€4 return for  
every €1 invested**



# How Do We Get to Fully Genotyped?



# National Genotyping Programme (NGP)



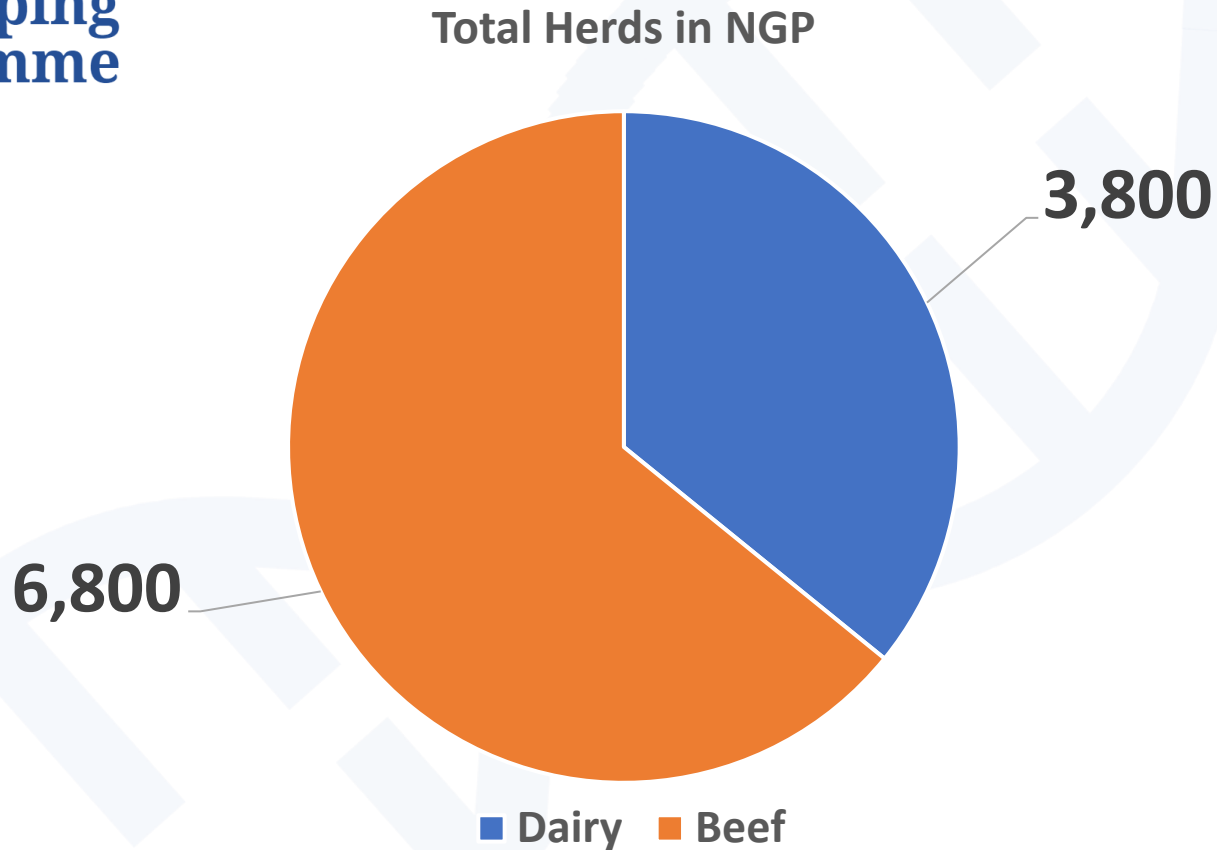
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Food and the Marine

## National Genotyping Programme

# NGP Phase 1 - 2023



10,600 Herds Total





# Level of Genotyping After NGP Phase 1

780,000  
Samples Total!

620K Genomic Evals  
Published at once – Jan  
2024

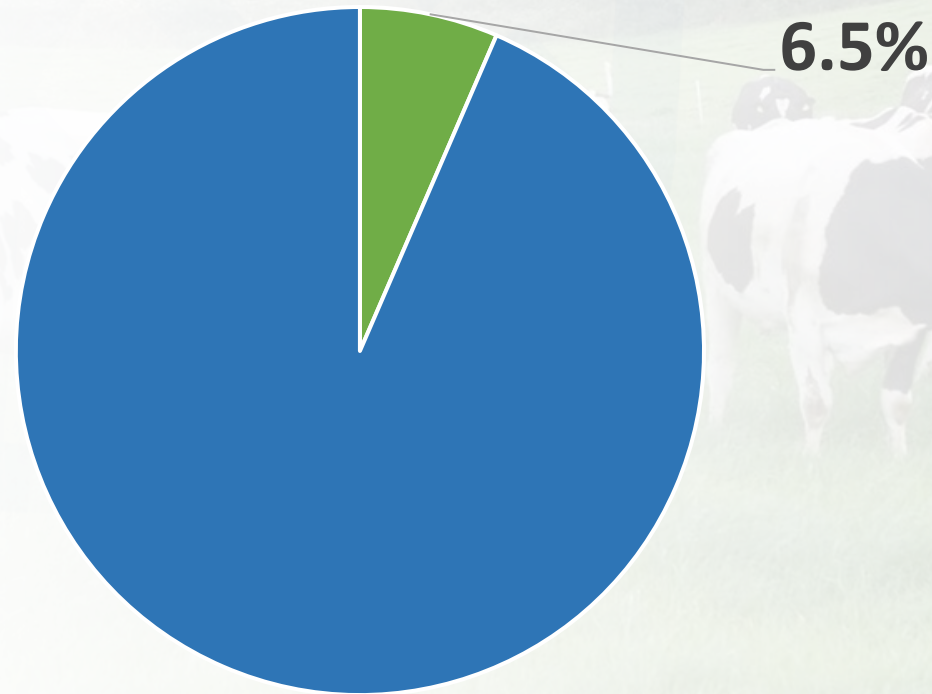


>4 Million  
Genotypes  
Total

Dairy Genomic Evaluation Report								
Jumbo/DOB	16-Jul-2023				Breed	HO (100%)		
Tag/Sex	372214444041389		M		Sire	372222281262260 (€49) <small>Sire Verified (SNP)</small>		
Name					Dam	372214444061119 (-€2) <small>Dam Verified (SNP)</small>		
Date of Evaluation	11-Aug-2023 (Evaluation valid until 26-Sep-2023)				MGS	IE371131831160 (-€23)		
Index	Official Genomic Evaluation (*)	Reliability	Weighting on Genomics	DNA Value	Parent Average Evaluation	Reliability	Diff.from Parent Avg	Increase in Reliability
EBI €	26	49%	29%	164	24	30%	+2	19%
Milk Sub Index €	33	67%	60%	26	32	36%	+1	31%
Fertility Sub Index €	17	38%	15%	89	21	23%	-4	15%
Carbon Sub Index €	-14	43%			-15	12%	+1	31%
Calving Sub Index €	-5	41%	7%	1	6	26%	-11	15%
Beef Sub Index €	-3	27%	0%	53	-22	29%	+19	-2%
Maintenance Sub Index €	-2	37%	0%	0	2	22%	-4	15%
Management Sub Index	-4	54%	0%	0	-3	29%	-1	25%
Health Sub Index	3	63%	48%	-3	-2	33%	+5	30%
<b>Milk Sub Index</b>								
Milk (Kg)	362	67%	60%	378	279	36%	+83	31%

# Level of Genotyping After NGP Phase 1

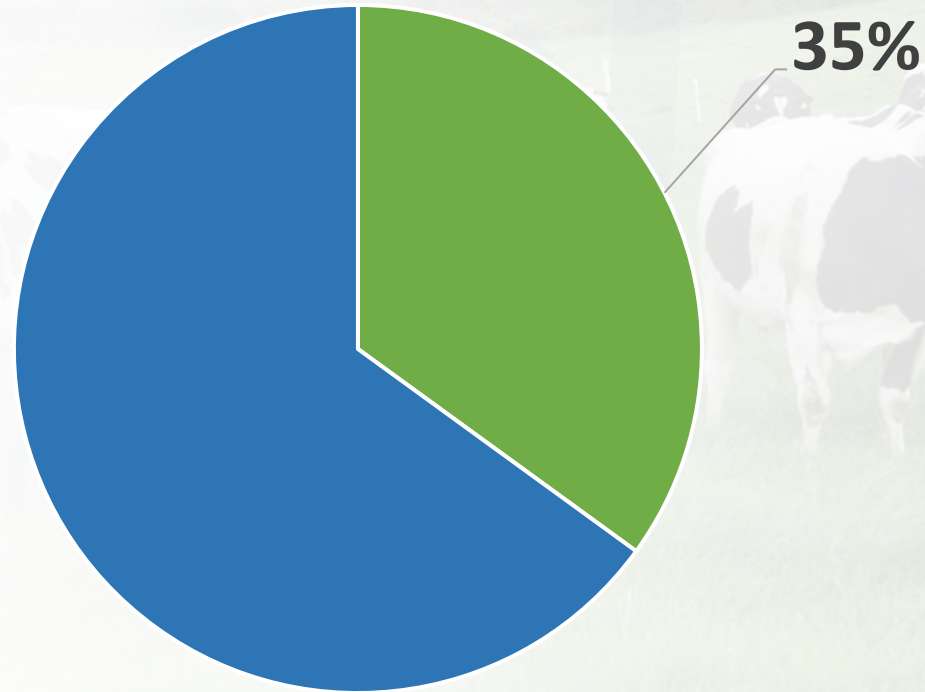
Percentage of National Dairy Herd Genotyped 2023



■ Genotyped

# Level of Genotyping After NGP Phase 1

Percentage of National Dairy Herd Genotyped After NGP Phase 1



■ Genotyped



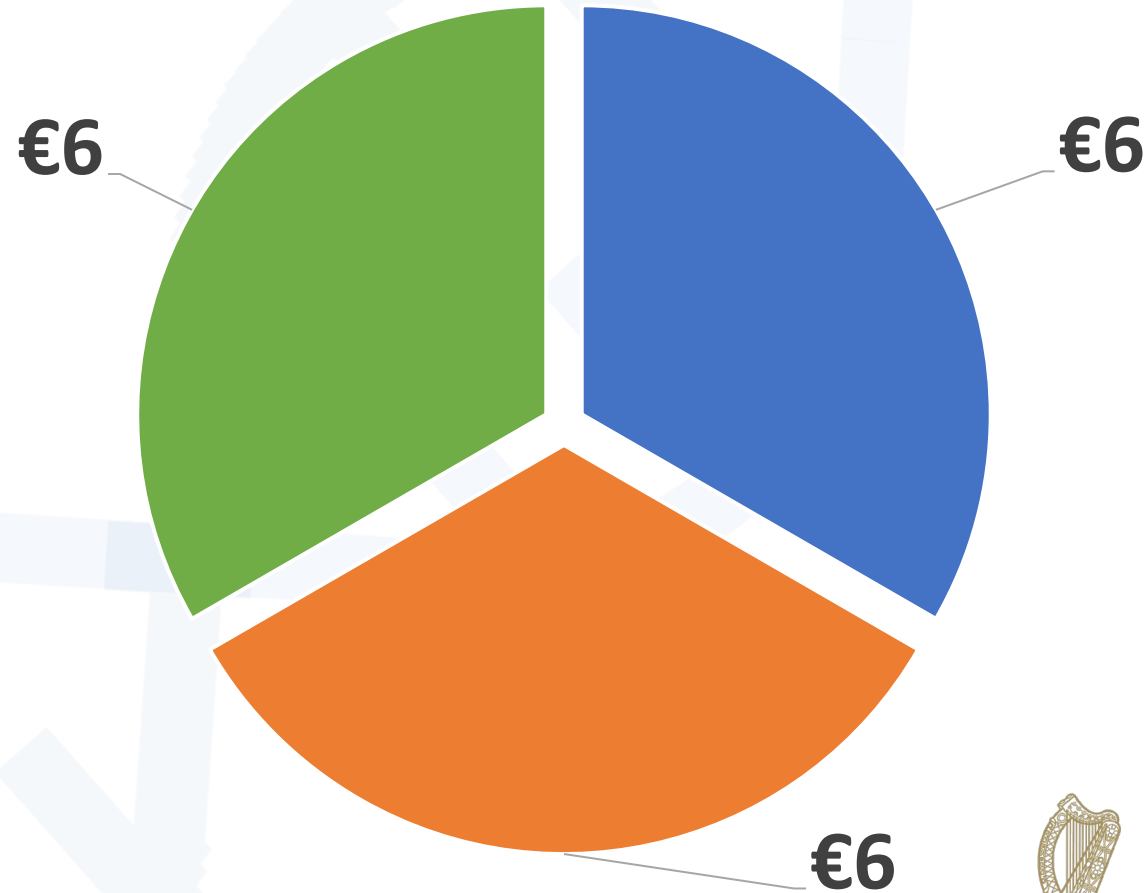
# NGP Phase 2 – 2024 - 2027





# NGP Phase 2 (2024 – 2027)

## Contribution to Calf Genotypes



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

# NGP Phase 2 (2024 – 2027)

700,000 Genotyped  
and Registered by end  
of November

35% of all calves!

>98K Calves in a Single Week!

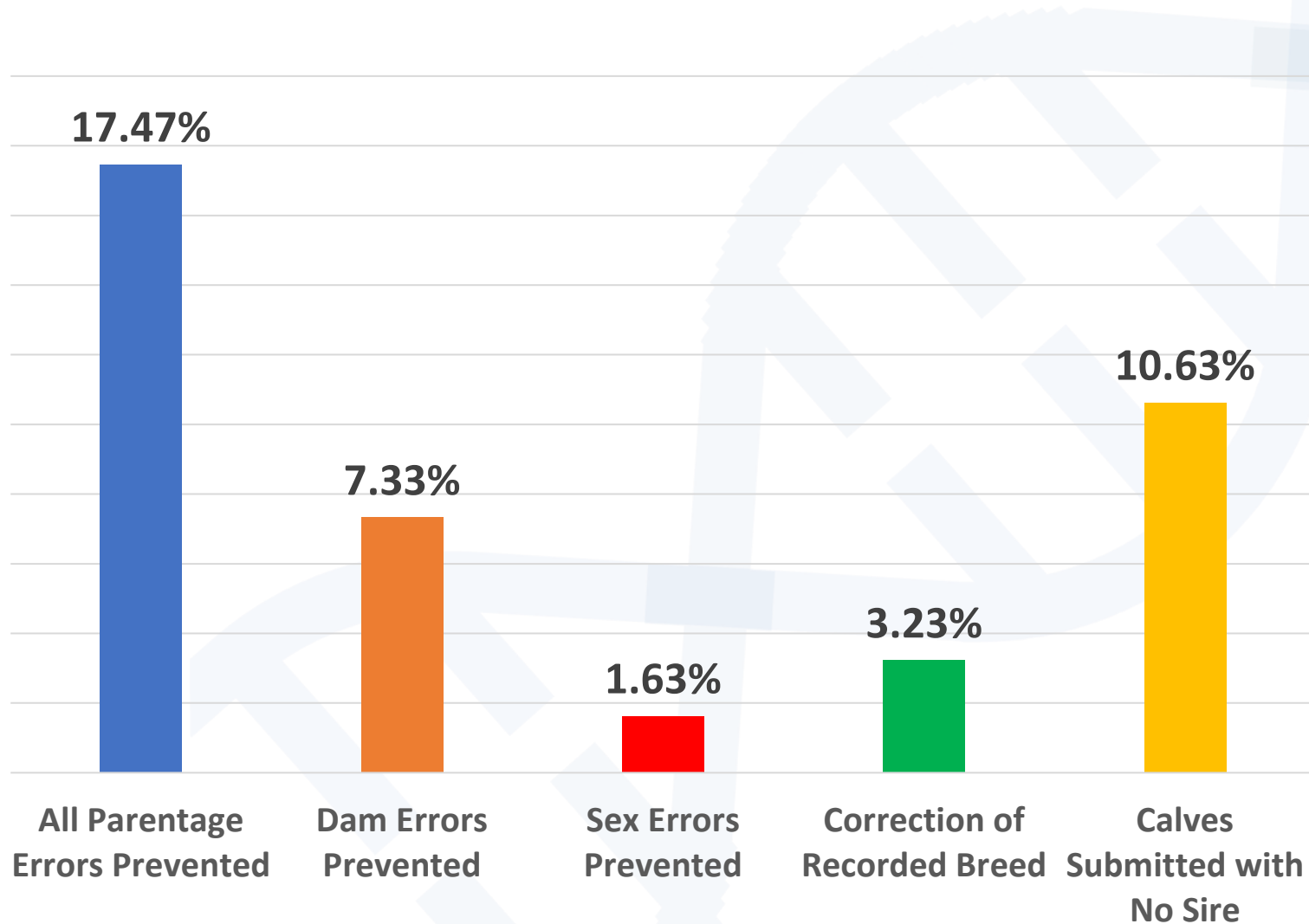
120K  
100K  
80K  
60K  
40K  
20K

WK 1 WK 2 WK 3 WK 4 WK 5 WK 6 WK 7 WK 8 WK 9 WK 10 WK 11 WK 12

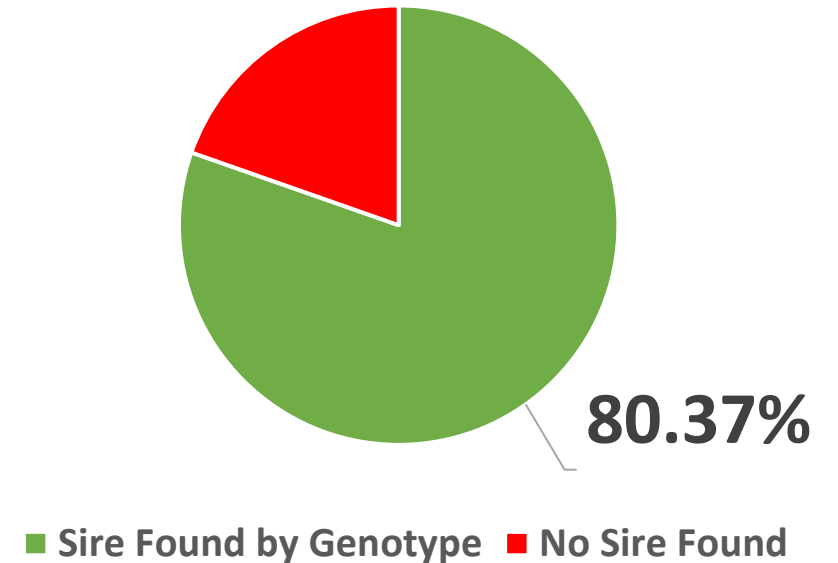
Calf Samples Processed per Week



# Parentage Corrections (Dairy Herds)



Where No Sire Recorded by Farmer

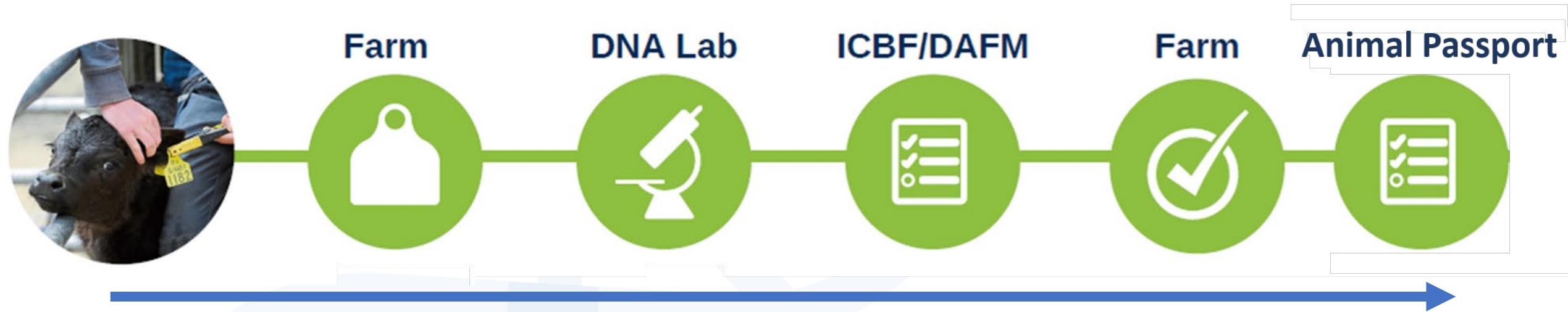


Example of ~18k breed errors corrected:

- 3,890 registered as AA but not AA
- 3,992 AA registered as another breed

# NGP Phase 2 (2024 – 2027)

## *Typical DNA Registration Timeline*



**Average Birth to Passport issued = 12.2 days at Peak**



# NGP Phase 2 (2024 – 2027)

## Typical DNA Registration Timeline



Average Birth to lab = 7 days at Peak but **increased towards end of season**

**Send Samples early and often!**

News > News  
Rachel Donovan on 21 February 2024

# Changes to genotyping programme an 'important move' - IFA

The changes announced should now ensure timely registration and orderly marketing of calves, the IFA has said.



The announcement from the Irish Cattle

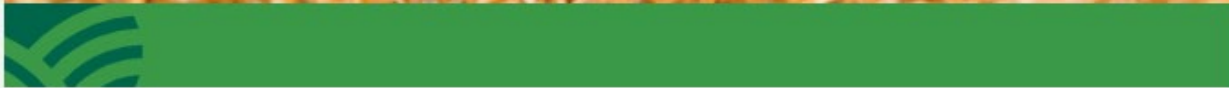
THE BEGINNING IS EVERYTHING  
Coliving Essentials for Success

35%

Tirlán FarmLife

# ICBF improving genotyping programme after farmer concerns

*Aisling O'Brien*  
February 20, 2024 5:15 pm



The Irish Cattle Breeding Federation (ICBF) has said that it is making a number of improvements to the National Genotyping Programme (NGP) in response to concerns raised by farmers.

# Essential Tweaks

# Automatic Pressure Release Valve!



AgTech – it's in our DNA

# Wrong Samples to Wrong Lab

**DNA Lab**

**BVD Lab**





# Some farmer feedback

“Sire/Dam Verification was a huge benefit with large number of cows calving in one day in pen. It **takes the guessing work** out of it.”

“**Far easier** to register calves with **less mistakes possible.**”

“The NGP is so much **better than taking hair samples or alternatives at a later date.** I send all samples by swift post to the laboratory in order to eliminate risk of tissue sample loss.”

“**I thought the app was very useful for tracking samples.**”

“we found that **when selling our dairy beef calves** that having them **genotyped and having parentage verification** added to the **sense of security for the buyers** of these calves that they knew that they were exactly who they were meant to be. These calves also had their own **CBV index values.**”

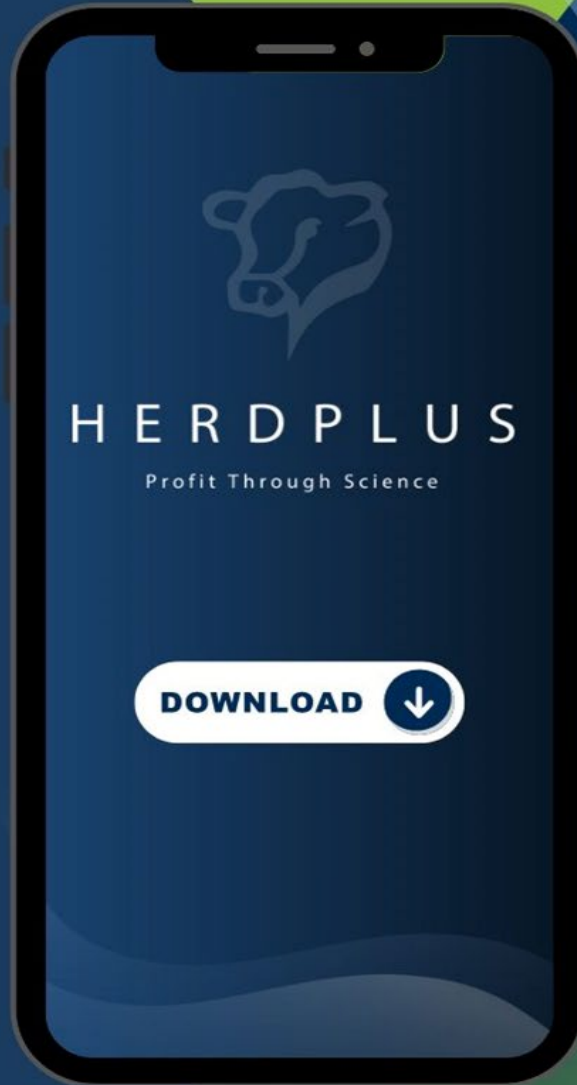




# ICBF HerdPlus App

The latest version of the ICBF HerdPlus App is now available to download.

Go to your relevant store to download the new update today!

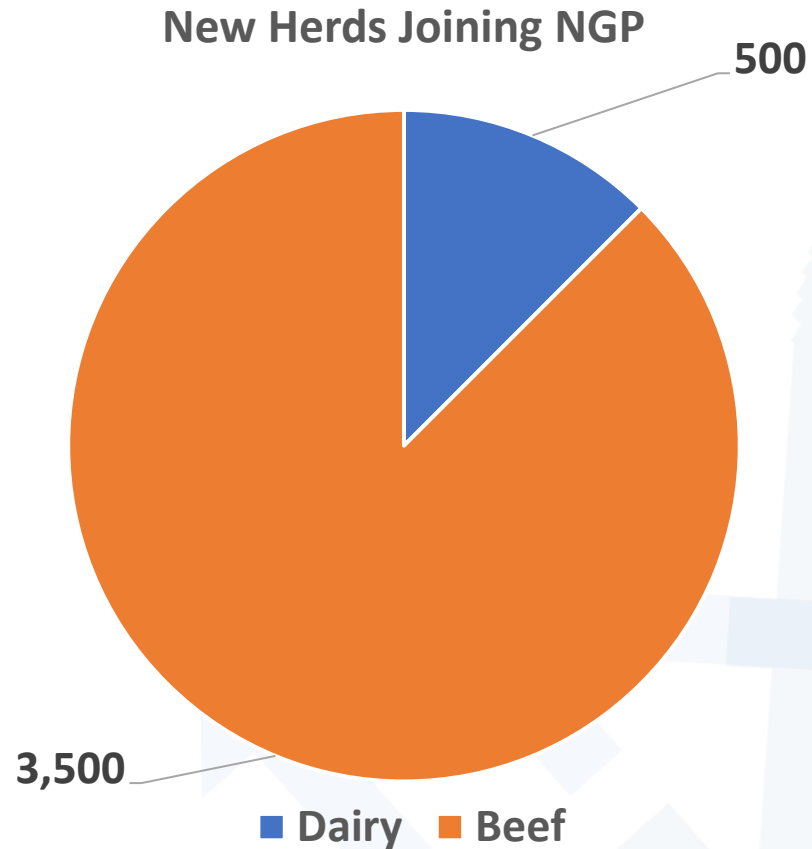


## Use New HerdPlus App to track samples

# NGP - New Herds 2025

14,600 Herds Total

850,000 Calves in 2025



**40% of all   
Calves!**

# NGP Reminder 1. Samples for Cows and Heifers



- NGP herds should return genotype samples for cows, heifers and stock bulls ASAP!



# NGP Reminder 2. Order Calf Tags



# Check Samples and Envelopes



**Pink = DNA**



# Key Messages

- Genotyping helps maximise profit by increasing genetic gain and through more accurate selection of replacements.
- More new technologies to harness the benefits of Genotyping are coming on board all the time.
- First Season of NGP was a major success and a huge step towards genotyping the national herd.
- NGP herds should return genotype samples for Cows and heifers ASAP!

# Our Farmer & Government Representation



An Roinn Talmhaíochta,  
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Department of Agriculture,  
Food and the Marine



# Our AI & Milk Recording Organisations



# Our Herdbooks



# Acknowledging Our Members