DNA Calf Registration

The Benefits and Potential of the Pilot Program

Mark Waters ICBF
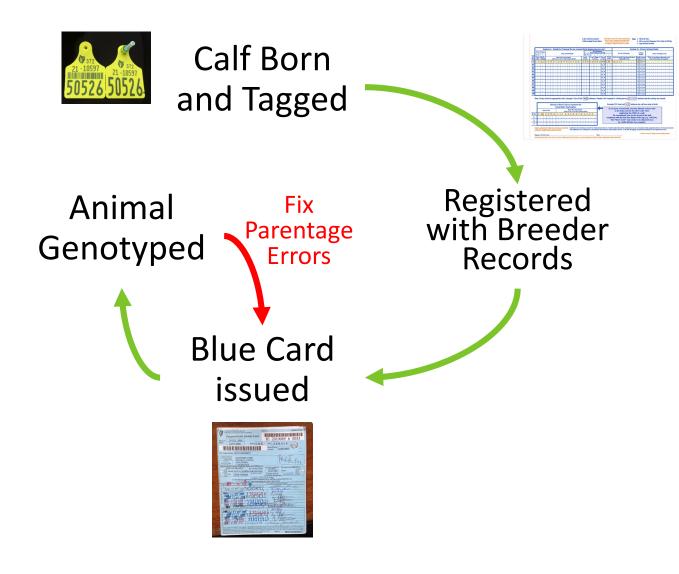
#ISGC20

Introduction

- Current context re Calf Registration.

- What is DNA Registration?

- 2018, 2019 and 2020 pilots.

- Benefits of DNA Registration.

- Benefits of Genotyping all calves

#ISGC20

Where we are now

Calf Born and Tagged

Registered with Breeder Records

Blue Card issued

Animal Genotyped

Fix Parentage Errors

- 1.5m dairy cows => 1.4m calves.
  - 400k dairy females.
  - 400k dairy males.
  - 600 beef sired calves.

Secondary to Dairy System

- 1m beef cows =>0.9m calves.

- 16% of all bovine population genotyped

- 15% Parentage errors!

#ISGC20

What is DNA Calf Registration

Calf Born and Tagged

DNA Sample →

DNA Sample Tested in Lab and Parentage Predicted

Breeder Enters Records

BVD Sample
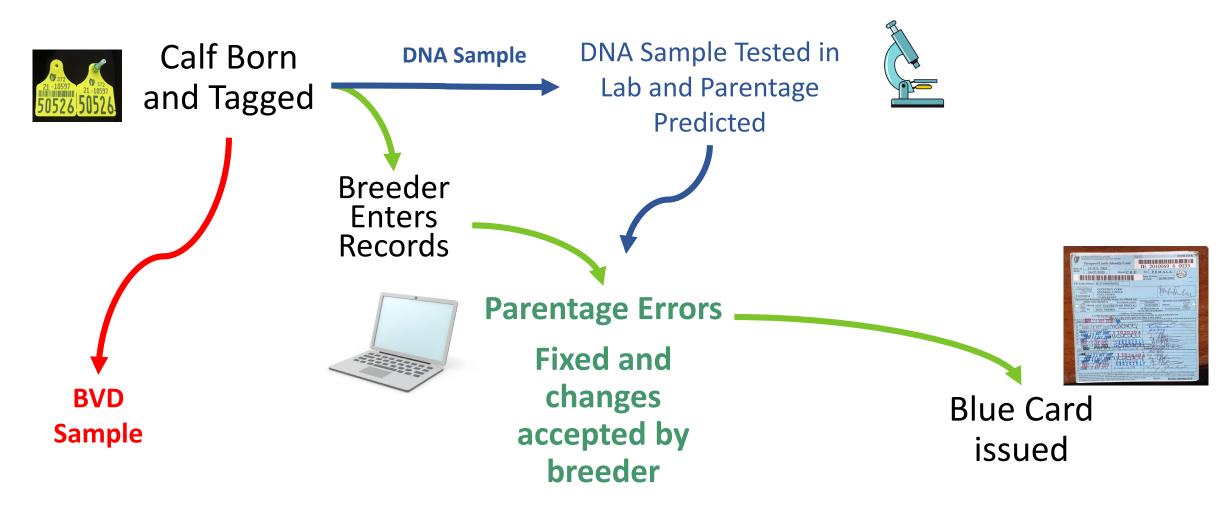
Parentage Errors

Fixed and changes accepted by breeder

Blue Card issued

#ISGC20

Challenges of DNA Registration

For Herd-Owner

- Waiting longer for Blue Cards

- Extra Sample

- Mixing up BVD and DNA samples

- Empty, lost, broken, poor quality samples

- Complete change in routine at busiest time of the year

- Cost

#ISGC20

2018 and 2019 Pilots

- 18 herds in 2018 → 30 in 2019.

- ~3000 calves DNA Registrations over 2 years.

- Average birth to blue card =17 days.
  - ~35% < 14 days.
  - ~85% < 21 days.
  - Improved year on year.

- Average 7 days in Lab.

- Infrastructure and processes built and improved.
  - From Animal Events sheets to web and mobile screens.
  - From Button tags to Double Tissue tags.

2018 and 2019 Pilots

Farmer Feedback

- Very simple system.
- Prevented inevitable errors.
- Routine of sending samples away helped keep on top of registrations.
- Can be confident parentage is correct.
- Would be happy to continue with system <u>cost permitting.</u>

Farmer Suggestions

- Move from sheets to online. ✓
- "Dual Tag" instead of 3 tags with button for DNA. ✓
- Facilitate recording of BDGP birth survey data at registration (e.g. Birth Size, Calf Vigour, etc.) (Under Development).
- Link in with Farm Software to prevent duplication. ✓

#ISGC20

Spring 2020 Pilot

- 270 herds across 25 counties.
  - 123 dairy
  - 105 pedigree beef
  - 41 commercial beef

- \>20K calves to be registered

- Double Tissue tags as standard across all 3 tag companies

- 140 herds using Farm Software Packages across 3 of the largest Farm Software Companies.

- Aim is to test scalability and reduce average turnaround times.

#ISGC20

Benefits of DNA Registration

At Farm level

- 100% Parentage verification.
  - Catching mistakes when they are easiest to fix re: Blue Cards, Certs etc.
  - Proven provenance when selling animals (dairy beef).
- Genomic Evaluation at earliest possible point in calf's life.
  - Identify genetically superior animals.
- Genomic Inbreeding (possible in future)

At Industry Level

- Enhanced traceability through entire food chain.
- Prevention of cattle theft and tampering.
- Verify twins, etc.
- Greater confidence in calf to beef supply chains due to proven parentage (Dairy Beef).

#ISGC20

Benefits of Genotyping All Calves

Return on investment study

- Increase accuracy of indexes (EBI, Replacement, Terminal, Dairy Beef)
  - Increased genomic reference population.
  - Correcting existing parentage errors.
  - 100% genetic linkage.
- Increased Quality of AI sires and stock-bulls.
- Increase rate of genetic gain
- Increased reduction in GHG emissions.
  - More accurate calculation of GHG emissions.
  - Selection of lower carbon animals.
  - Increased efficiency through improved rate of genetic gain.
- Improved supply chain integrity

#ISGC20

Summary (Where next?)

- DNA Registration is possible and feasible.

- 2020 spring pilot will prove/improve scalability.

- Improvements made (double tissue tags, link with Farm Software)

- Work to quantify return on investment ongoing.

#ISGC20