Enhancing Farm Resistance to TB

ICBF Breeding and Genetics Conference

11th December 2024

Siobhán Ring (sring@icbf.com)

AgTech - it's in our DNA

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

Bovine Tuberculosis (bTB)

National Bovine Tuberculosis Statistics

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

29 September 2024 (Q3)

Reactors

37,964
(01 Oct 2023 – 29 Sep 2024)

25,916
(02 Oct 2022 – 01 Oct 2023)

Herds Restricted

5,712
(01 Oct 2023 – 29 Sep 2024)

4,868
(02 Oct 2022 – 01 Oct 2023)

Herd Incidence

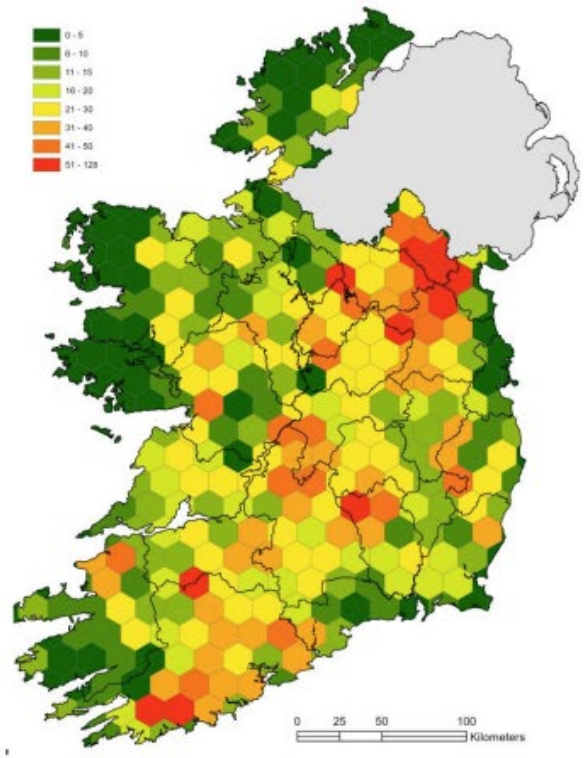
5.62%
29 Sep 2024

4.73%
01 Oct 2023

5-year herd Incidence

2023 - **4.94%** 2022 - **4.31%** 2021 - **4.33%** 2020 – **4.38%** 2019 - **3.72%**

New restrictions in the last 12 months Q3 2024



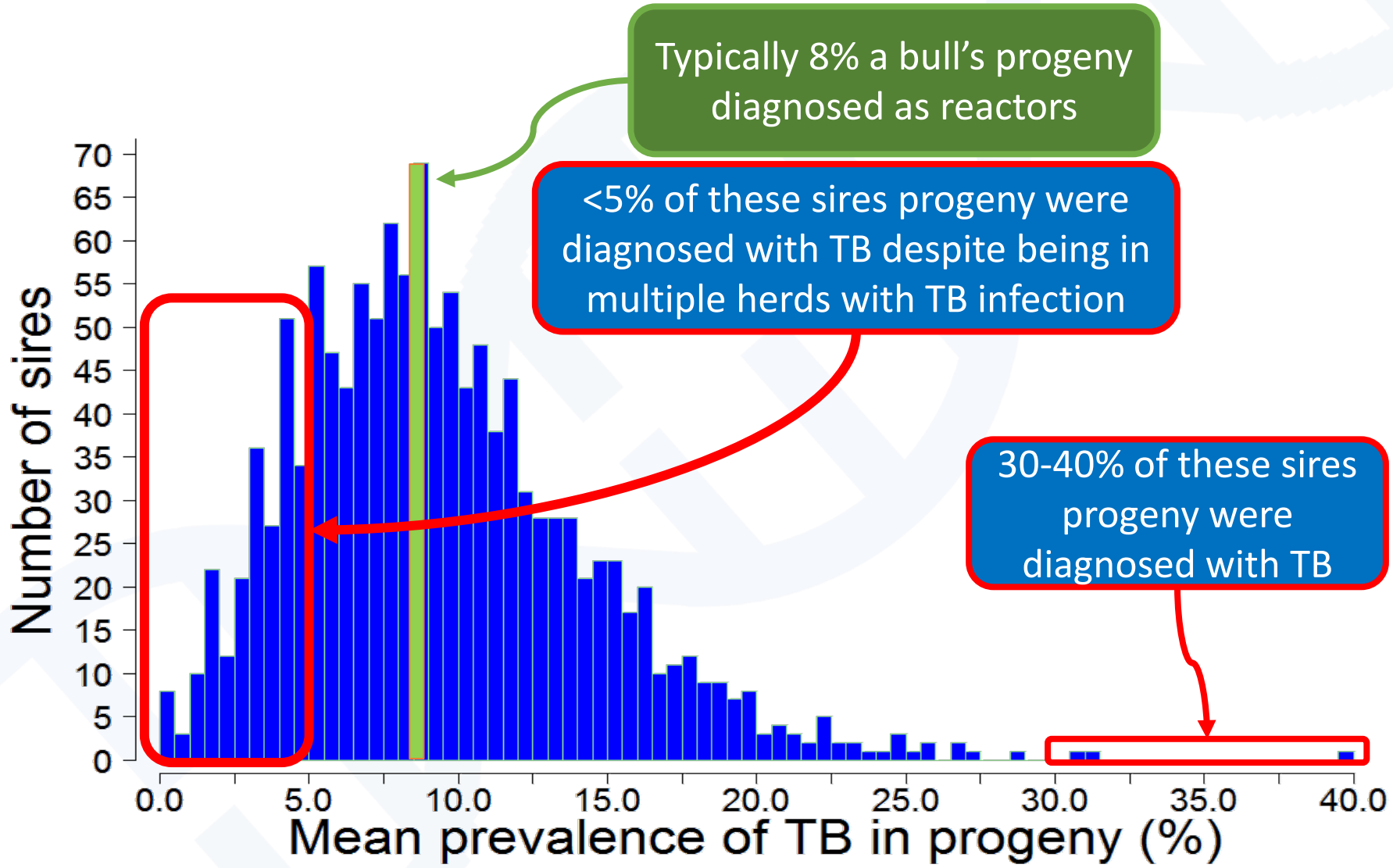
Expenditure Year to date ('000)

Total Expenditure end of Q3 2024

€66,196 Q3 2024
€48,749 Q3 2023

36%

Evidence of Genetic Resistance to TB in Cattle



Validation

Genetically high risk of TB+ result

Genetically low risk of TB+ result

Risk based on genetic make-up	Mean TB Incidence	Difference
Genetically high risk of TB+ result	9.3%	26% additional TB reactors In the high risk group
Genetically low risk of TB+ result	6.9%	

Genetic merit determined from ancestral data

Risk of a TB+ result derived from genetic merit

Cattle tested for TB throughout life

Analyses of test results confirm a higher incidence of TB in cattle deemed high risk because of their genetics

Timeline of analyses

Potential Impact of 2023 Bull Usage

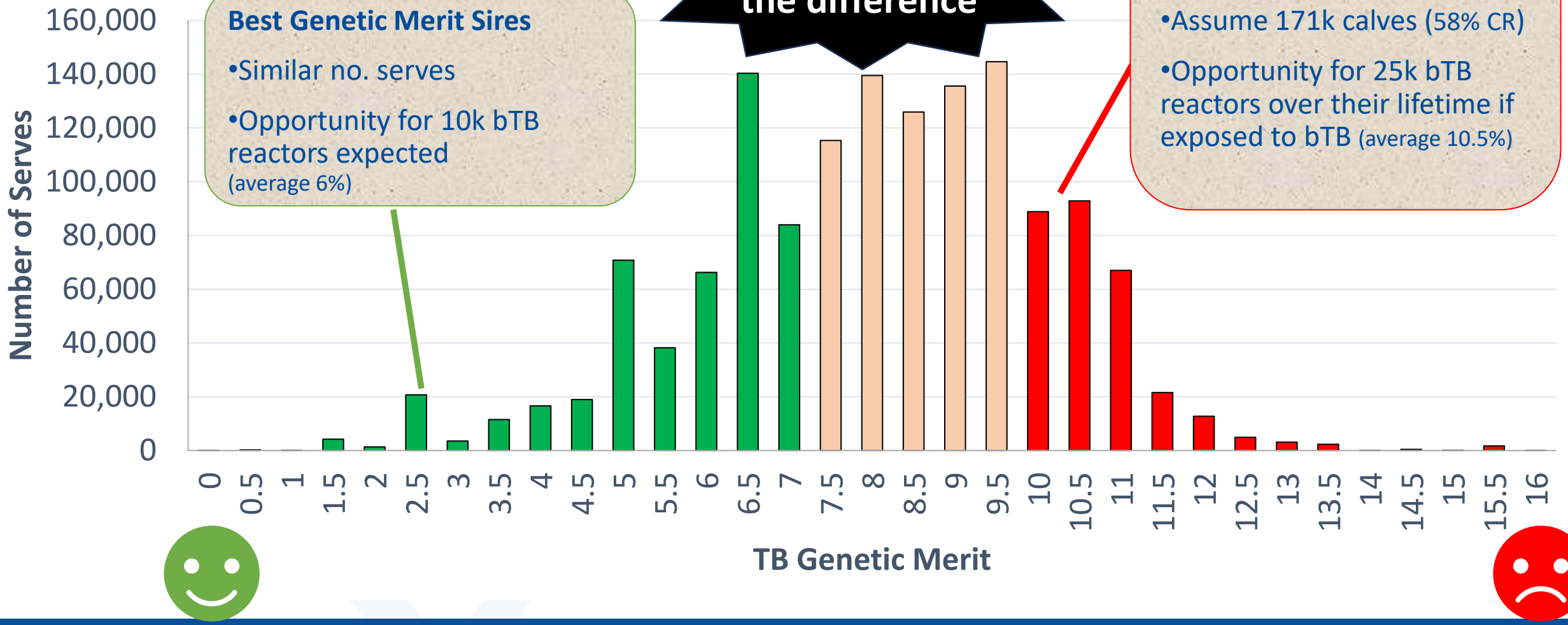
15,000 reactors in the difference

Best Genetic Merit Sires

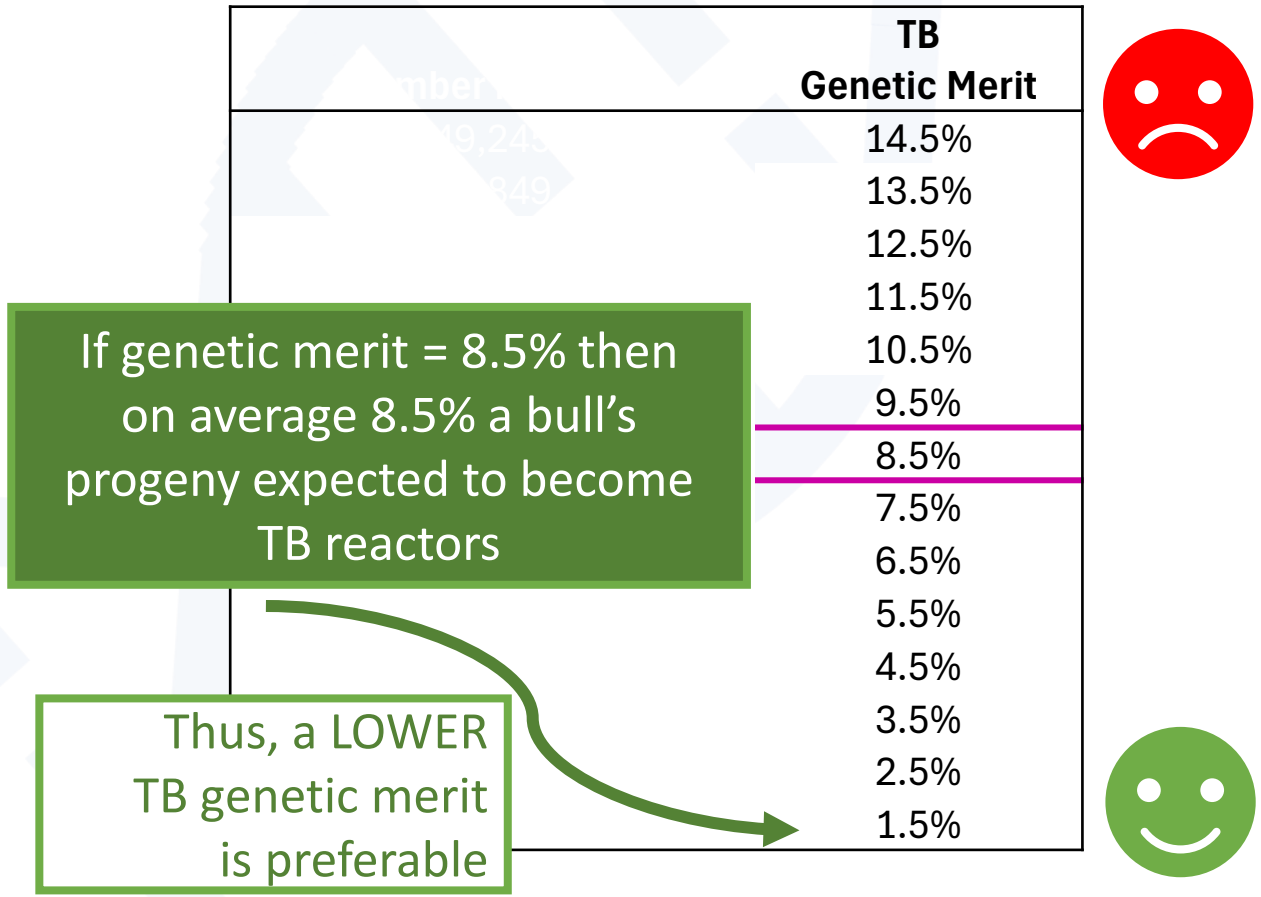
- Similar no. serves
- Opportunity for 10k bTB reactors expected (average 6%)

Worst Genetic Merit Sires

- ~300k serves to high-risk TB bulls
- Assume 171k calves (58% CR)
- Opportunity for 25k bTB reactors over their lifetime if exposed to bTB (average 10.5%)



Potential Gains for Breeding for TB Resistance



Potential Gains for Breeding for TB Resistance

Est. Number reactors	TB Genetic Merit
28,868 reactors in 2023	8.5%

Impact of choosing calves based on TB PTA

- 1,000 high EBI calves (>€350 EBI), these categorised equally according to TB PTA:
  - Best, good, average, poor, worst

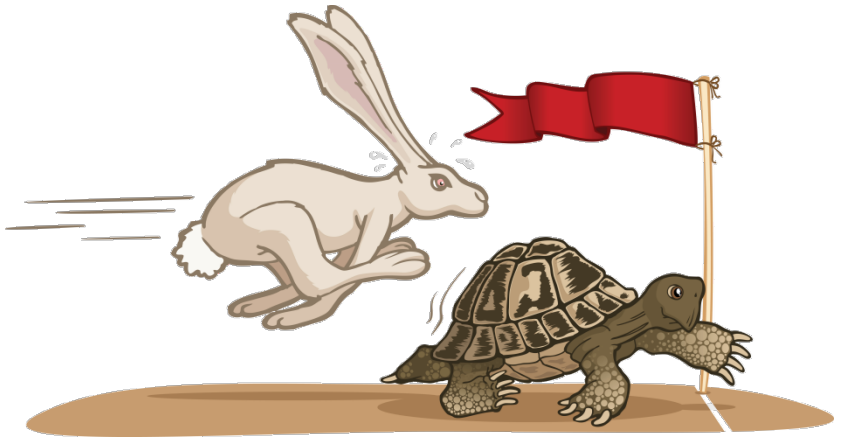
TB_rank	Mean TB	Max TB	EBI	Milk	Fert	Calv	Maint	Beef	Health	Manage	Carbon	Milk_kg	Fat_kg	Pro_kg	CIV	Surv
1. Best	5.3	6.5	€368	€86	€190	€49	€16	-€14	€21	€3	€18	28	15	10	-11.4	3.7
2. Good	6.8	7.5	€370	€91	€191	€50	€15	-€12	€15	€3	€17	29	15	11	-11.6	3.6
3. Average	7.7	8.5	€368	€88	€194	€51	€15	-€12	€12	€2	€18	9	15	10	-11.9	3.6
4. Poor	8.7	9.5	€368	€89	€197	€50	€16	-€14	€8	€2	€20	-14	15	10	-12.1	3.6
5. Worst	10.2	13.2	€366	€92	€197	€51	€15	-€12	€4	€2	€18	-3	15	10	-12.0	3.7

- Key Insights:
  - No loss in genetic gain (EBI or associated traits)
  - TB Genetic Merit Matters
  - Must be cognizant of gene pool considerations

Summary

- Breeding for bTB resistance is a PROACTIVE not reactive solution
  - Think of it like vaccination
- Breeding values available on all animals
  - For your animals: download your Profile on ww.ICBF.com
  - For individual animals: use the animal search
  - For choosing bulls for breeding: use Active Bull List, AI bull files or AI company catalogues, ask your technician
- Choose high Index bulls with lowest TB value to minimise risk of TB reactors
  - Less than 8% all herds
  - Ideally less than 6.5%

Genetics is cumulative and permanent



Our Farmer & Government Representation

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

Irish Creamery Milk Suppliers Association

Feirmeoirí Aontaithe na hÉireann – The Irish Farmers' Association – IFA

Our AI & Milk Recording Organisations

DoveaGENETICS

MUNSTER BOVINE
Collectively Improving Farm Life

PROGRESSIVE GENETICS

TIPPERARY COOP

Our Herdbooks

Irish Limousin Cattle Society

MRI Cattle Society of Ireland
Meuse Rhine Issel -- Milk & Muscle!

AYRSHIRES

The Irish Aberdeen-Angus Association

Irish Simmental

EASBB

The Irish Moiled Cattle Society

Jersey Cattle Association of Ireland

Parthenais

Blonde D'Aquitaine

IHFA Irish Charolais Cattle Society

Irish Belgian Blue

Irish Shorthorn Society Ltd.

Droimeann Cattle Society

ISP

Salers Cattle Society of Ireland

Irish Hereford Breed Society

Irish Aubrac

Montbeliarde

Ireland's native dairy breed

Norwegian Red Cattle Society

icbf Acknowledging Our Members