



IRISH CATTLE BREEDING FEDERATION

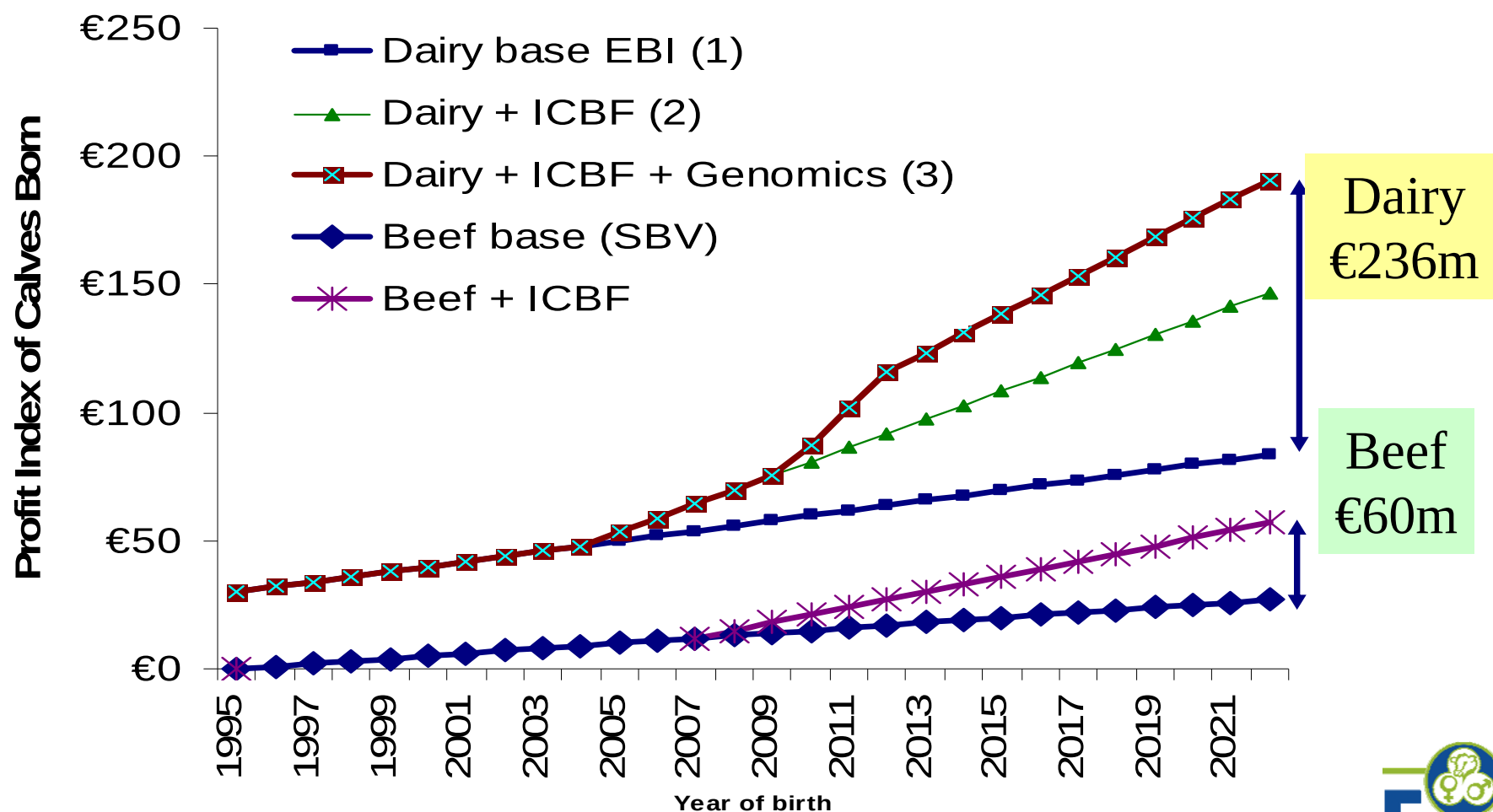
***Developments in Irish
Breeding Programs.
Draft Proposition – Version 1.***

Consultation meetings with Cattle
Breeding Industry.
19th March 2010.

Background.

- ICBF's mission statement is focused on genetic gain.
- Genomics has the potential to double rates of genetic gain in dairy & beef cattle.
- Capitalising on the full benefits of genomics will require us alter the conventional "AI-focused" models.
 - Shorter-term & market-based, i.e., the need to have a top bull.
- We must take a more holistic view of breeding;
 - Longer term perspective - balancing genetic gain & diversity.
 - Greater sharing of costs & benefits amongst all stakeholders.
- We must acknowledge the increasing threat of disease and take suitable precautions.
- ICBF board has asked us to "think outside the box" in developing new breeding² programs for Ireland

What can genetic gain deliver for our industry (€)?



Key Objectives of Program.

- Maximise long-term genetic gain (€).
 - 100 dairy bulls & 100 beef bulls per annum.
 - ~ €30/cow/year for Irish dairy & beef farmers.
- Provide an ongoing resource for R&D into genomic evaluations.
 - New traits, e.g., mastitis & meat quality,
 - New methodologies, e.g., use of foreign data.
 - New technologies, e.g., 3k SNP chip
 - “Retrain” SNP estimates on an annual basis.
- To minimise risk for the breeding program.
 - Ensuring supply of high health status bulls.
 - Manage inbreeding, evaluate new traits & indexes.

Key Elements of Future Dairy & Beef Programs.

<u>Time-lines</u>		<u>Key numbers</u>
-12 months	ICBF Cattle Breeding Database	1 million cows
-12 months	Identification. Elite females identified based on genomic index & diversity. Mating advice provided.	3k females
1 month	Selection. Calves born and selected based on genomic index & diversity.	1000 males
1-12 months	Rearing. Calves reared in “High Health” units.	300 males
12 months	Lease/ownership . Elite AI bulls identified. Lease/ ownership arrangements established. Surplus bulls sold.	125 males
12-24 months	Collection. Elite AI bulls moved to collection centres.	125 males
12-24 months	Processing. Semen processed by AI centres.	100 males
12-24 months	Distribution. Semen distributed by AI Service Providers	100 males
12-24 months	Breeding Replacements. Semen used to breed National Herd	100 males

3k elite females selected on genomic EBI & genetic diversity



300 elite young males selected for AI

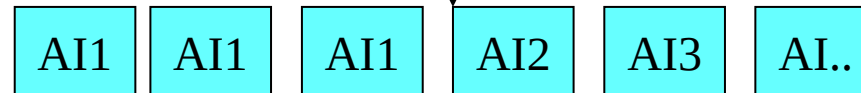
Bull Rearing Centres (e.g. 10 * 30 bulls)



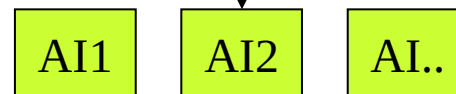
125 elite young males for AI



AI Semen Collection
Centres (~6....)



AI Semen Processing
Centre (~3....)



AI Semen
Distributor (~6...)



Irish dairy & beef farmers – 1 million cows & ~250k replacements.

Issues (i): Identification & selection.

- The role of ICBF in identifying elite cows for the program & providing mating advice to these farmers:
 - Use database to identify top 3,000 dairy and 3,000 beef cows, based on genomic index & diversity.
 - Suggest mating's that will be of long-term interest to industry.
 - Generate sufficient ideal combinations to ensure “100 high index & genetically diverse” dairy and beef bulls for AI.

Issues (ii): Leasing & ownership of bulls

- The principle that bull breeders could own bulls and then “lease” them to AI companies for semen collection, processing & distribution:
 - Already in place, e.g., some beef bulls for pedigree use. Also principle is same with imported semen and/or deals with private AI operators (i.e., margin retained by AI companies to cover costs).
 - Has the potential to shift ~€2-3 million of costs from AI companies, back to breeders.
 - Breeders would be prepared to carry costs – especially if “up-side” is attractive.

Issues (iii) : Rearing & Disease Control Units.

- The principle of multiple rearing units:
 - Located strategically across the country (i.e., 10 centres * 30 dairy bulls & 30 beef bulls).
 - Take calves from 2 weeks- 6 months. and rear until 12 months.
 - Final selection of young bulls for semen collection, with remainder sold as stock bulls.
 - Already in place. e.g., NCBC and Tully.
 - Farmer pays for cost of rearing – with costs covered by; (i) income from stock bull sale, or (ii) income from semen (if bull goes to AI – see later).
 - Strong guidance & support from AHI.
 - How to operate; (i) Independent operators and/or AI companies or (ii) under ICBF control?

Issues (iv) : AI Collection Centres.

- The principle of multiple AI collection centres:
 - Located strategically across the country.
 - Low numbers of bulls per centre.
 - 6 centres * 20 dairy bulls & 20 beef bulls = 240 bulls/year.
 - Bulls held for maximum of ~2 years = 480 bulls – across 6 centres = 80 dairy bulls per AI centre.
 - Licensed AI collection centres only.
 - Potential for new licensee's?
 - Should all bulls come via “rearing & disease free units” or do we also need centre(s) that will take bulls directly from farms - higher risks and costs for AI companies and farmers?

Issues (v) : Semen distribution centres.

- The principle of multiple semen distribution agents:
 - Commercial arrangements between semen collection/processing centres & distributors.
 - Distributors “compete” to ensure best bull teams for farmer clients.
 - Market for all ~100 dairy bulls/annum, with premium for high EBI teams with good diversity.
 - Potential for new distributors?
 - Full transparency in assembly of bull teams (initial 300 calves, selection of elite AI calves, sale of surplus calves, selection of bull teams...)
 - Use of website to improve efficiency of sale & distribution, e.g., pre-payment of bull teams.

Issues (vi): Sharing of costs & benefits.

- The principle of cattle breeding industry sharing costs & benefits (currently all carried by AI companies). For example;
 - Breeders/bull-owners pay for all costs of owning and rearing of bulls (including genotyping).
 - AI companies “lease” bull off breeders/bull-owners for semen collection period (3-4 months).
 - Bull returned to farmer at end of collection period.
 - AI companies distribute semen.
 - Breeders/bull owners receives margin on straw sale with additional monies if bull returned as “sire of sons”
 - AI companies retain their margin for semen collection, processing & distribution.

Issues (vii): GEN€ IR€LAND program.

- The principle that the GEN€ IR€LAND program would continue.
- Major successes with GEN€ IR€LAND have included; (i) pre-signing up of herds & (ii) accuracy of resultant proofs.
- Developments in genomics (R&D) will require high accuracy of data recording.
 - Continue to target a group of herds to get priority access to first 700 straws on each bull.

Issues (viii): Involvement of Herdbooks.

- The principle that herdbooks would be more directly involved in the breeding program:
 - Targeting herds and animals for program.
 - Promotion of program to members (& internationally).
 - Provision of herds for the program – commercial cows for beef progeny testing.
 - Currently import and distribute semen – opportunity to distribute high index Irish bred bulls to members in future.

Issues (ix): Involvement of Animal Health Ireland.

- The principle that stakeholders such as Animal Health Ireland would have a more direct role in the breeding program:
 - Animal Health issues have cost Irish breeding programs dearly (e.g., Tully, IBR & G€N€ IR€LAND).
 - AHI currently act in an advisory capacity to Tully. Limited role elsewhere.
 - Need to establish Herd Health programs at farm level.

Additional beef issues (i)

Progeny Testing?

- In addition to the program just outlined, we must continue “conventional” PTest program.
 - ~1500 straws collected per bull (700 progeny test & 800 for pedigree breeding).
 - Initial 700 straws for commercial cows.
 - Top sires identified after 4 years, and additional semen released to breed sires of sons.
- Target of testing 100 bulls across beef.
 - Optimal genetic gain.
 - Resource for R&D in beef genomics.
- Over time (~5 years) beef model will move towards the dairy model, i.e., bulls returned as proven sires at 2 years of age.

Additional beef issues (ii)

Progeny test capacity?

- Capacity for beef progeny testing?
- 170k heifer replacements per year.
- 35k are AI bred (~20%).
- G€N€ IR€LAND progeny test program:
 - 100 bulls & 100 daughters = 10,000 AI bred daughters per annum.
 - 1/3 of total AI-bred replacements per year from progeny test bulls.
 - Displacing “proven bull” product.
 - Will farmers use “test bulls” for maternal traits?
- Need strong industry support for initiative.

Additional beef issues (iii)

Balancing AI & Stock Bull.

- 1 million Suckler cows.
- 80% of calves from Suckler cows are stock bull bred.
 - Main focus of AI users in terminal sire attributes.
- Primary role of AI in beef breeding is to breed stock bulls for use in the Suckler herd.
 - Pertinent to note that 40% of dairy replacements are also AI-bred.
- How do we ensure a steady stream of high index & high health stock bulls for breeding?

Additional beef issues (iv)

Future role of Tully?

- Current role of Tully?
 - New data, e.g., feed efficiency, GHG emissions...
 - Screening station for entry to AI (IBR, BVD...)
 - Across breed comparison in standard conditions.
 - Ongoing debate over costs:benefits?
- Future rule of Tully?
 - Continue as-is. Collect additional data on a subset of the elite young bulls (~100 of 300).
 - Collection of new data, e.g., feed efficiency & GHG emissions, but on commercial progeny.
 - Rearing centre for young AI bulls?
 - Collection and/or processing centre?
 - Disbanded and money invested elsewhere.....?

Options for delivery.

- Using the attached framework, how do we ensure delivery and achieve the program objectives?
- Four options to consider:
 - Current model.
 - Breeder Model.
 - Breeder + ICBF Model.
 - Shared Industry Model.

Option 1 - Current Model

	AI Org's.	ICBF	Herd books	Bull Breeder's	Farmers	Stake- holders, e.g., AHI
Identification of elite cows						
Selection of bull calves						
Rearing of young bulls						
Lease/ownership of bulls						
Collection of AI bulls						
Processing of semen						
Distribution of semen						
Breeding replacements						

- Program is delivered by AI companies.
 - Shareholders versus non AI shareholders of ICBF?
- Some level of support from other stakeholders.

Option 1 - Current Model

Positives	Negatives
Little change to current systems & structures.....	?

Option 2 – Breeder model.

	AI Org's.	ICBF	Herd books	Bull Breeders	Farmers	Stake- holders, e.g., AHI
Identification of elite cows						
Selection of bull calves						
Rearing of young bulls						
Lease/ownership of bulls						
Collection of AI bulls						
Processing of semen						
Distribution of semen						
Breeding replacements						

- Increased role of breeder in choices regarding bull rearing and lease/ownership options for bulls.
- Increased involvement of other stakeholders, e.g., herdbooks & AHI.

Option 2 - Breeder Model

Positives	Negatives

Option 3 – Breeder & ICBF model.

	AI Org's.	ICBF	Herd books	Bull Breeder's	Farmers	Stake- holders, e.g., AHI
Identification of elite cows						
Selection of bull calves						
Rearing of young bulls						
Lease/ownership of bulls						
Collection of AI bulls						
Processing of semen						
Distribution of semen						
Breeding replacements						

- Increased role of ICBF in identification, selection and rearing of young bulls (overseeing rearing schemes).

Option 3 - Breeder & ICBF Model

Positives	Negatives

Option 4 – Shared Industry Model.

	AI Org's.	ICBF	Herd books	Bull Breeder's	Farmers	Stake- holders, e.g., AHI
Identification of elite cows						
Selection of bull calves						
Rearing of young bulls						
Lease/ownership of bulls						
Collection of AI bulls						
Processing of semen						
Distribution of semen						
Breeding replacements						

- Roles and responsibilities shared over more stakeholders.
 - Greater options for semen collection, processing & distribution.

Option 4 – Shared Industry Model

Positives	Negatives

Summary.

- The introduction of genomics has the potential to double genetic gain for our dairy & beef industries.
- Making full use of genomics will require substantial changes to the “conventional” genetic gain model (operated through AI).
 - Many of the elements are already in place.
- Greater opportunities to share costs & benefits across industry.
- We have the potential to develop a “unique” breeding partnership in Ireland.

What next?

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- Series of consultation meetings with industry (next 2 - 3 weeks).
 - AI companies.
 - Herdbooks.
 - Bull Breeders.
 - Commercial farmers (IFA & ICMSA).
 - Present & develop proposition.
 - Evaluate options rel. to program objectives.
 - Industry meeting(s) to finalise proposition.
 - Present to ICBF board over next 2 - 3 months