Producing Elite Young Test Bulls for G€N€ IR€LAND

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Objective

Design a mating scheme to generate ELITE bull calves annually for entry into G€N€ IR€LAND

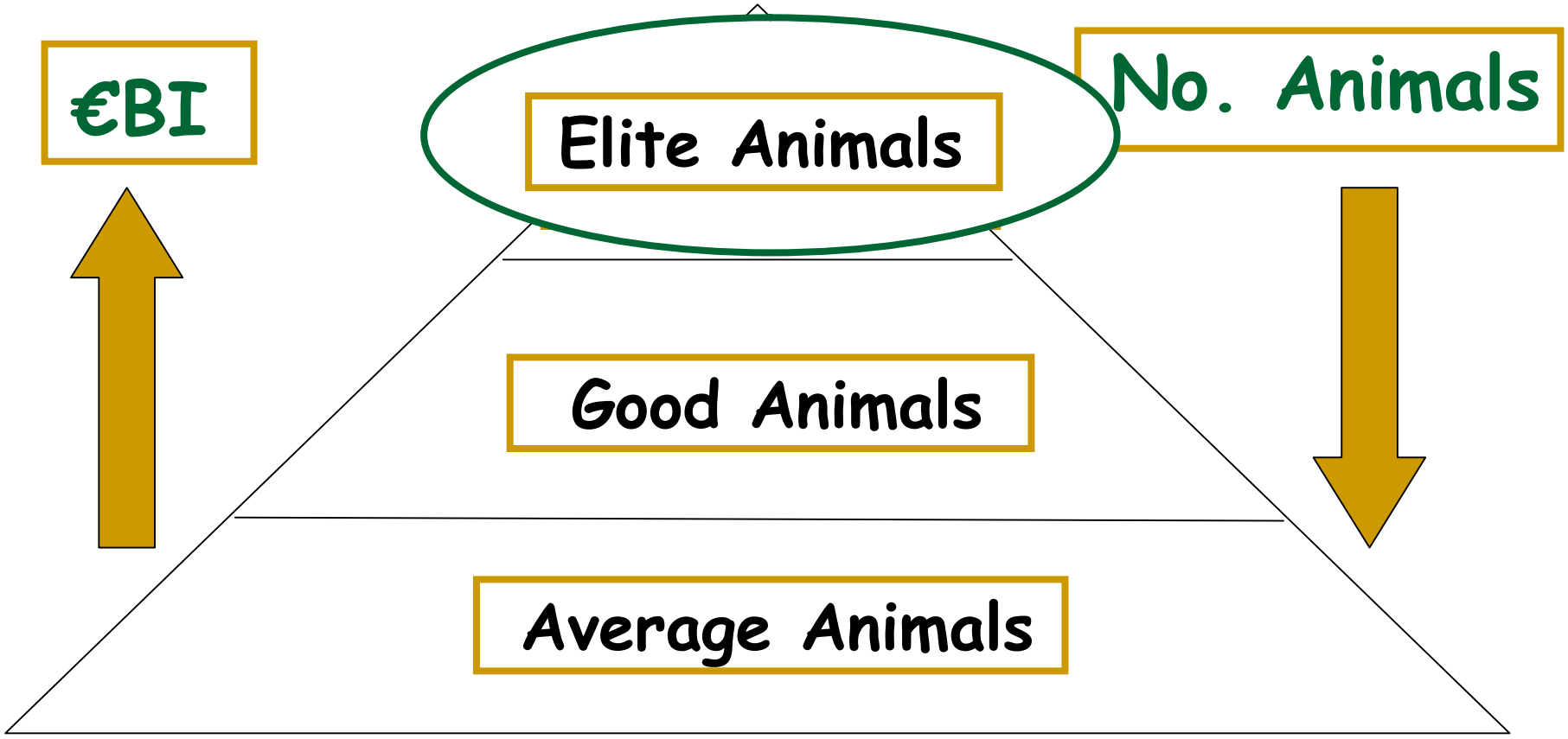
Focus:

1. Continually improve genetic gain
2. Maintain genetic diversity

Rationale

- Maintenance of genetic gain is important
- SHORT TERM genetic gain must not come at a cost to LONG TERM genetic gain
- Ensure the best sons of new families are continually coming to the top

Population Structure



Current Active Bull List

Rank	Bull code	Name of Bull	Sire	EBI
1	OJI	O-BEE MANFRED JUSTICE	HCM	€287
2	MJI	MORRISHEEN OJI FRANK	OJI	€252
3	UPH	MARS UPHILL	OJI	€240
4	BHZ	BALLYBROOK ASHLING JUSTICE	OJI	€229
5	ROF	RALMA O-MAN CF CRICKET	OJI	€225
6	MMU	MACOMBER O-MAN BOGART	OJI	€224
7	AXP	ALL-RIEHL PAXTON	OJI	€221
8	CGH	CROCKETT-ACRES EIGHT-ET	OJI	€221
9	RDO	RADON	RXO	€219
10	TTY	TIMMER TYSON	OJI	€215

Not as bad as it looks

- OJI, his sire and maternal grand-sire not used extensively
- OJI has a low relationship with the average breeding female in the population
- OJI genes not prominent in todays population

Selection of Bull sires

- Initial criteria
  - No OJI descendents
  - Holstein-Friesian only
  - Minimum reliability 35%
  - Minimum EBI €100
- Ranking list
  - 189 bulls ranked by breeders & Industry
  - 50% weighting given to scores of each
  - Top 50 bulls returned
  - 2 additional bulls suggested

3 Steps Involved

1. ✓ Identify elite bulls to act as bull sires
   - Sought globally
2. Identify elite cows to act as bull dams
   - National data base
3. Identify best combination of matings between elite bulls and cows

Selection of Bull Dams

- **Production information**
  - **One completed lactation**
  - **Milk solids>390kg**
    - **>350kg in Parity 1**
  - **Milk sub-index value (+'ve)**
- Fertility information
  - Calving interval (300 to 425 d)
  - Average calving interval <390d
  - Age at first calving 21-38 months
  - Fertility sub-index value >€10
- In addition
  - EBI > €100
  - 2 complete generations of pedigree recorded
  - Overall linear type score >79
  - Prominent sire lines removed
  - Top 150 daughters & granddaughters per bull

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- Production information
  - One completed lactation
  - Milk solids>390kg
    - >350kg in Parity 1
  - Milk sub-index value (+'ve)
- Fertility information
  - Age first calving (22 to 38 mo)
  - Calving interval (300 to 500 d)
  - Calved in the last 18 mo
  - Fertility sub-index value (+'ve)

- **In addition**
  - **EBI > €100**
  - **2 complete generations of ancestry recorded**
  - **Overall linear type score >79**
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Top 3,489 potential bull dams

Variable	Average	Minimum	Maximum
EBI (€)	128	100	201
Milk SI (€)	56	17	125
Fertility SI (€)	59	10	126

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EBI (€)	128	100	201
Milk SI (€)	56	17	125
Fertility SI (€)	59	10	126
Milk (kg)	6,389	4,291	10,067
Solids (kg)	503	371	764
Fat (%)	4.28	3.45	6.02
Protein (%)	3.63	3.22	4.35
Calving interval	364	301	390

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ICBF.com

3 Steps Involved

1. ✓ Identify elite bulls to act as bull sires
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2. ✓ Identify elite cows to act as bull dams
   - National data base
3. Identify optimum combination of matings between elite bulls and cows

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Determine optimum matings

- Elite bull dams and elite bull sires are entered into computer programme
  - Computer generated "phantom" matings
  - All combinations of bull sire and bull dam
    - 100 bulls * 3,489 cows = 348,900 combinations
- Screen all potential matings for the best sire-dam combinations
  - Parent average EBI
  - Relatedness to future females
  - Balanced for milk and fertility

77 bulls used as bull sires

Data	DP-INT	DP-IRL	GS	Grand Total
Number bulls	19	17	41	77
EBI	€165	€152	€179	€170
EBI Rel	56.9	78.5	51.0	58.5
Milk SI	€69	€62	€67	€66
Fertility SI	€87	€75	€96	€89
Total matings	820	1179	1490	3489

Genomic selection

- The necessary elite cows are in Irish herds
- More difficult to identify cows because of lower reliability compared to proven bulls
- Genomic selection can increase reliability of cows
- Need to revise breeding programme
  - Genotype heifers and mate

In Conclusion

- National breeding programme incorporating traits important to Irish farmers is the key to sustainable genetic gain
- Identifying elite bull dams is crucial to achieve this
- Interaction and collaboration between farmers, the dairy industry, the ICBF and Teagasc is vital