IRISH CATTLE BREEDING FEDERATION

Breeding for Quality

Irish Grasslands Assn – Beef Conference
7th November 2006, Tullamore.

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Irish Cattle Breeding Federation.

NDP
NATIONAL DEVELOPMENT PLAN

Overview

- Quality & Profit.
- Breeding for Quality & Profit.
  - Data
  - New indexes
  - New programs
- Summary

Quality & Profit

- *Definition of Quality* – how good or bad something is….
  - "high ***quality*** weanlings".
  - "***quality*** suckler beef replacements"
- "High quality weanlings & high quality sucklers" = Profit (€)
- ICBF focused on all aspects of "quality" beef production.
- More profit for beef farmers (€).

What profit?

- Increased profit of €20/cow/year achievable.
  - 20 cows = €400 in year 1, €800 in year 2, €1200 in year 3, €1600 in year 4, €2,000 in year 5…….€5,000 over 5 years (€1,000/year).
  - No extra cost…just a better way of doing things.

Breeding for Quality & Profit

- Three simple principles
  1. Good data (ID, ancestry & performance).
  2. Indexes that identify the best animals.
  3. Breeding program that ensure best animals are parents of next generation.

i. Data for beef breeding

1. Key profit data for breeding

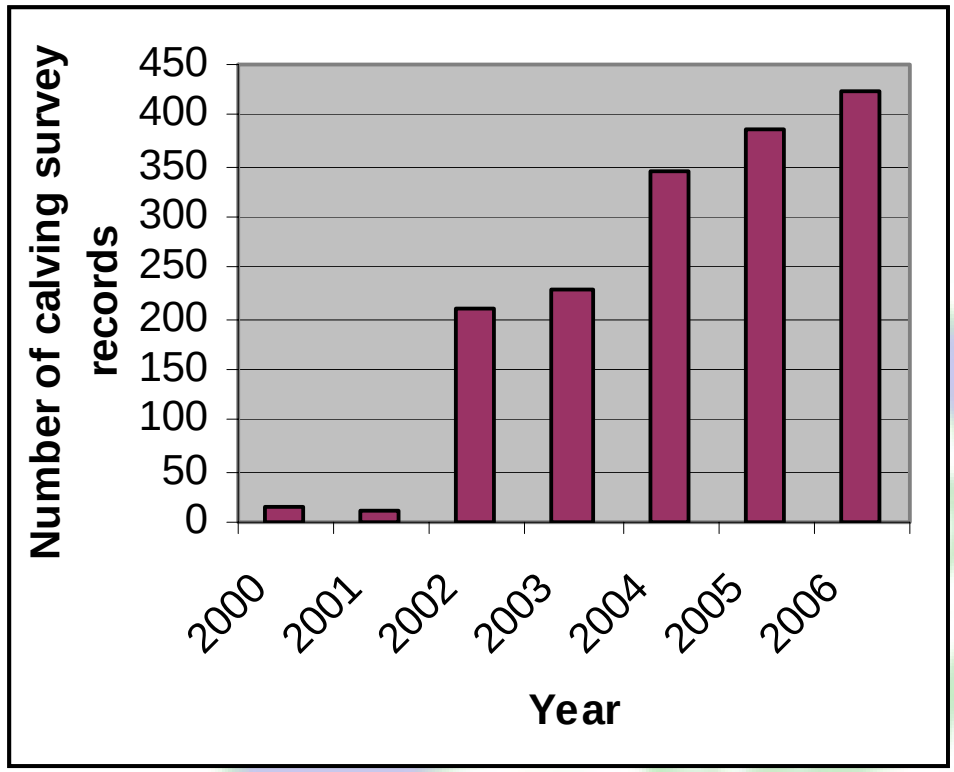
Data	***Source***
ID & Ancestry	Animal Events
Calving Performance	Animal Events
Maternal performance	Animal Events
Weaning weight & calf value	Marts & on-farm
Linear scores	On-farm
Carcass data	Factories
Feed intake & efficiency	Tully

i. Animal Events

- Launched in beef in 2004
- 1m calf births in database in 2006 (to-date)
  - 600k via Animal Events.
  - 80% by paper & 20% electronic.
  - 530k with known sire (260k with beef sire)
  - 425k with calving survey
- 250k births to beef cows.
  - 120k via Animal Events.
  - 110k births with known sire.
  - 70k dams with known sire (maternal traits)

ia. Animal Events & data improvements.

- Animal Events; major increase in data for cattle breeding, e.g., calving survey.
- Starting point for beef breeding improvement.



- ***<u>New DAF suckler cow welfare initiative; major help in this regard.</u>***

ii. Marts

- Ex. relationship with marts
- Project to collect more weaning weight & price data.
- 70 marts involved & 16 returns to-date.
  - 1.51 million records from 2002
  - 467k from “Animal Events” herds (31.1%)
  - 185k sold in singles (12.3%)
  - 49k with a known sire (3.2%)
  - ***9k sold as weanlings (0.6%)***
- Data collected at no cost to farmers.
- % useful data growing rapidly (Animal Events)

iii. On-farm weights & linears

- Past approach;
  - Within-breed (LM, CH & SI)
  - Focused on muscle.
  - % useful data?
- Present & future approach;
  - Weaning weights (+type)
  - All animals & breeds.
- New beef recording service launching soon
- Available to all beef herds (pedigree & commercial).

iv. Factories

- Excellent relationship with factories (via DAF);
  - Carcass weight, conformation & fat score.
- Future;
  - Need access to “cut data”
  - Kg loin, hind-quarter…..
- Data collected at no cost to farmers.
- % useful data growing rapidly (Animal Events)

v. Tully performance test

- Testing 250 bulls/year
- Objectives;
  - Feed intake & efficiency
  - Standardised environment for bull comparison (indexes)
  - Beef “focal point”
- Focus of Tully will change in next 12 months
  - Integral part of new beef progeny test program
  - Move from “growth” focus to “profit” focus.

Key profit data; CF52

1. Calving.

Calv Diff = 8% (1587)
Gest Length = 288 days (358)
Mortality = 3% (1755)

2. Weaning.

Wean weight = 329 kg (796).
Price = 2.22/kg
Loin dev = 8.9 (1669)

5. Maternal

Wean wt = 322 kg (56)
CI = 416 days (236)
SURV% = 73% (337)

4. Tully.

Feed intake = 9.9 kg dm/day (41)

3. Factories.

Carcass weight = 383 kg (390)
Carc conf. = 9.4 (R+)

- ***Same principle for all animals; AI bulls, stock bulls, cows, pedigree, commercial……***

2. Indexes to identify the best.

Raw data & genetic indexes

- Could use “raw data” to compare animals, e.g., CF52 = 383 kg cwt.
  - OK when comparing AI sires with large numbers of records across many systems & dam types..
  - Not OK when evaluating;
    - Individual animals (performance in one herd)
    - Stock-bulls (performance in one herd)
    - Animals/breeds used in specific circumstances, e.g., AA on dairy herd, CH used on ¾ bred beef cows.
- Objective of genetic evaluations is to correct “raw data” corrected for non-genetic” effects;
  - Type of dam, age, herd management, sex…

Example; Carcass weight

Br	AV_cwt	Dairydams	Male	Age	Herdmate	PD_cwt	BPSI
AA	310.8	53%	66%	754	315.7	0.8	-€5
CH	354.3	23%	68%	717	337.6	30.2	€109
BB	335.4	54%	66%	748	328.4	21.8	€88
HE	317.9	53%	72%	734	316.8	4.6	€8
LM	345.0	32%	69%	726	333.1	17.3	€68
SI	345.4	29%	80%	741	335.7	16.3	€63

- Simple fact; At slaughter, same dam type & same management, progeny of CH sire will be ***30 kg heavier than AA sire (€110/calf).***

Traits & economic indexes

- Raw data & evaluations for 50 traits.
- Which traits are most important?
  - Muscle, growth, calving difficulty….
  - Maternal……?
- New economic indexes focused on profit (€)
  - Combine key profit traits (17) into 4 sub-indexes; calving, weanling export, slaughter & maternal.
  - One overall economic index (EBI)
  - Profit indexes developed based on Irish beef industry data…costs, returns…..

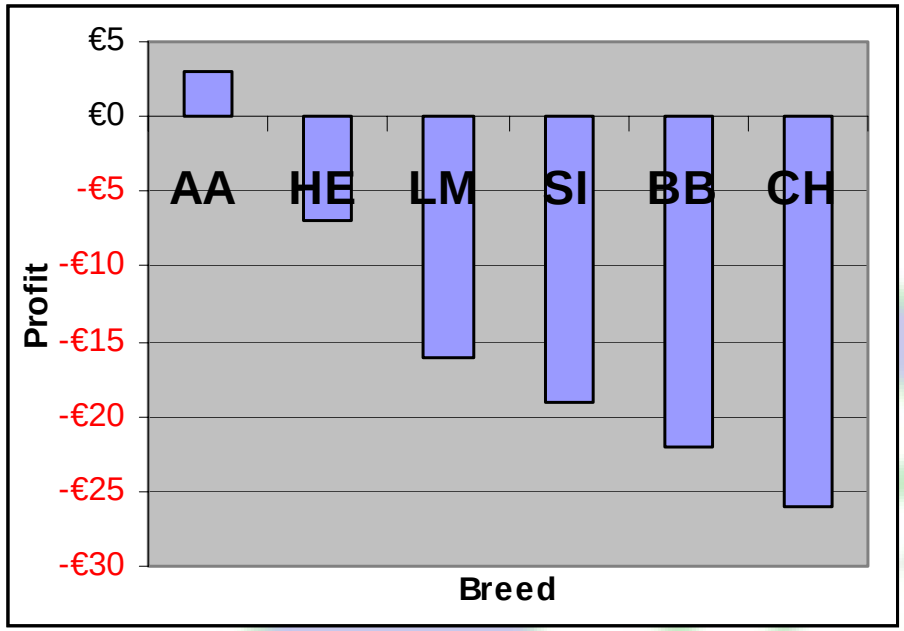
1. Indexes - Calving

Key traits	% emph
Calving difficulty (%)	53%
Gestation Length (days)	25%
Mortality (%)	22%

- Profit (loss) from calving performance.
- Objective; easy calving, short gestation & low mortality
- Evaluations based on 701k records from Animal Events.

1. Breeds – Indexes

	Indexes			
Breed	**BCSI**	CD	GL	Mort
AA	**€3**	-2.8	0.8	0.4
HE	**-€7**	0.2	2.3	0.5
LM	**-€16**	2.4	5.4	0.5
SI	**-€19**	4.2	3.7	0.7
BB	**-€22**	7.6	0.9	0.8
CH	**-€26**	7.2	3.6	0.9



- AA & HE best breeds for this index.
- On average each CH calf will have an increased calving cost of €29 relative to an AA calf.
- Large differences within breeds (~€30-€50)

1. Breeds – Raw data

Breed	Av34%	AvGL	Avmort
AA	5.1	282.9	4.5
HE	3.9	286.2	1.9
LM	6.4	290.2	3.5
SI	10.6	287.4	8.4
BB	11.0	284.1	4.1
CH	7.7	287.7	3.2

- Indexes & raw data; indexes do work

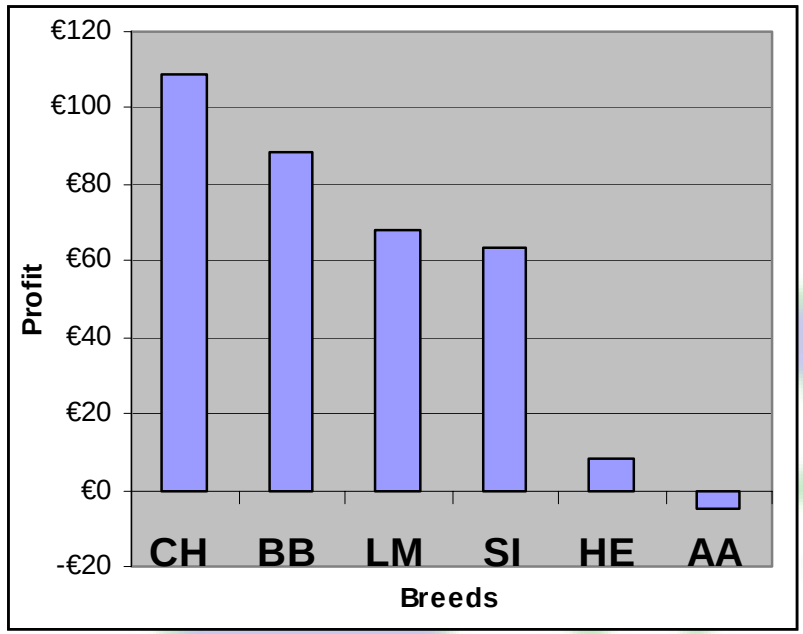
2. Indexes – Beef slaughter

Key traits	% emph
Carcass weight (kg)	**46%**
Weaning weight (kg)	**24%**
Feed intake (kg)	**12%**
Carc conformation (1-15)	**11%**
Carcass fat score (1-15)	**7%**

- Profit at slaughter (3wks to slaughter)
- Objective; Good weight for age, conformation & feed efficiency
- Evaluations based on 508k records from factories, marts, on-farms (linears) & Tully

2. Breeds - indexes

	Indexes					
Br	**BPSI**	Cwt	Wwt	DMI	Conf	Fat
AA	**-€5**	0.8	-7.4	0.37	1.4	0.9
BB	**€88**	21.8	-0.9	-0.17	2.8	-0.8
CH	**€109**	30.2	16.2	0.24	2.3	-0.4
HE	**€8**	4.6	-1.5	0.40	1.3	1.1
LM	**€68**	17.3	0.2	-0.09	2.3	-0.2
SI	**€63**	16.3	16.6	0.47	1.7	0.0



- CH & BB best breeds for this index.
- On average each CH calf will have an increased profit at slaughter of €111relative to AA (-€29 calving)
- Large differences within breeds (~€100)

2. Breeds – Raw data

breed	Cwt	Wwt	FI	Conf
AA	310.8	253.1	10.4	6.1
BB	335.4	285.6	8.8	7.8
CH	354.3	316.2	9.8	8.1
HE	317.9	259.7	10.1	6.5
LM	345.0	290.1	8.9	8.1
SI	345.4	305.7	10.4	7.3

- Indexes & raw data; indexes do work

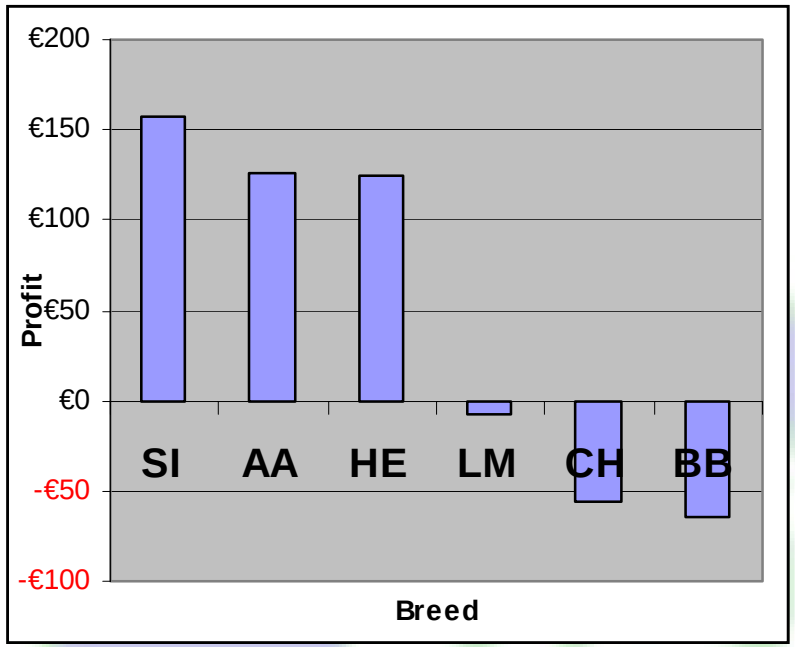
3. Indexes – Maternal

Key traits	% emph
Maternal wean weight (kg)	33%
Survival (%)	29%
Calving Interval (days)	17%
Age at 1st calving (days)	11%
Maternal calving difficulty (%)	9%
Cull cow weight (kg)	1%

- Profit from suckler replacements
- Objective; Easy-care cows with good milk ability
- Difficult to evaluate; low records and heritability.
- Evals based on 71k records from AE, marts & farms.

3. Breeds - indexes

Brd	MSI	MWv	SU	CI	Age	MCD	Cull
AA	€126	15	2.1	-3.7	6	0.4	-11
BB	-€65	14	-1.4	3.6	2	4.4	20
CH	-€56	-3	0.1	-0.7	33	-2.9	25
HE	€125	21	1.4	-3.3	18	-0.8	-14
LM	-€8	8	0.9	-1.5	33	-2.6	6
SI	€157	16	1.3	-2.7	10	-2.7	15



- SI, AA & HE best breeds for this index.
- On average each SI cow will have an increased profit in her lifetime of €223 relative to BB cow (€50/calf)
- Large differences within breeds (~€200)

3. Breeds – Raw data

Brd	SU	CI	Age	MCD	Mwwt	Cull
AA	0.81	386.1	850.9	2.0	294.2	211.6
BB	0.62	405.1	859.3	31.4	320.7	263.6
CH	0.75	405.2	934.1	8.4	327.9	303.4
HE	0.76	388.2	868.9	3.4	311.9	209.0
LM	0.79	400.0	910.7	4.5	292.4	262.2
SI	0.81	388.7	877.3	6.9	340.1	250.7

- Indexes & raw data; indexes do work

Confirming indexes work

	Genetic Indexes				Raw data				
	BPSI	Wean	Cwt	Cconf	Age	Wwt	Age	Cwt	Cconf
Top Bulls	**€94**	11.5	27	2.3	239	315	709	345	7.7
Btm bulls	**€15**	-5.5	3.1	1.7	236	248	759	317	6.3

- Based on top & bottom 5 bulls within each of 6 main beef breeds.
- High index bulls; better weight for age, better conformation & more profit.
- Same principle for all four sub-indexes
- Indexes do work….

Total Beef EBI & roll-out.

- Currently being finalised
- Will reflect “where genes are expressed”
  - Number of calvings (dairy & beef)
  - % animals slaughtered, exported, replacements.
  - Combination of direct & maternal effects.
- Total beef EBI (and all indexes) released in coming weeks (1st December)
- New indexes for all AI bulls, stock bulls, cows, young-stock.
- Bull lists & reports for herd-owners.

3. Breeding program

3. Breeding Program.

- Breeding program that ensure best animals are parents of next generation
- New program being developed
  - Target genetic gain of €18/cow/year (€18m/yr).
  - Current rate of gain (€3/cow/year)
  - 3 elements; (i) elite cows, (ii) performance & progeny test, & (iii) elite progeny test bulls.
- Excellent industry support.
- Currently with DAF for consideration in 2007-2013 development plans.

1. Elite Females

- 2,000 cows in total (all breeds)
  - 1,000 male calves generated per year.
- Selected on beef EBI, diversity & conformation.
- Responsibility of herd-book (in consultation with ICBF & AI orgs).

2. Performance & Progeny Test

- 300 bulls/yr selected for Tully test.
- Top 100 bulls selected for progeny test.
- Semen collected at end of Tully test.
- Bulls sold at 18 month as “elite test bulls”.
- Bulls progeny tested in targeted herds
  - 1,500 herds * 40 cows (60,000 doses)
- Excellent farmer incentives
  - Co-ordinated program (inc synch package).
  - Cash incentives (€250/female + €100/male).

3. Elite bulls for progeny test.

- 100 elite bulls for progeny test each year.
- Full proofs (250 calving records, 100 slaughter records & ***75 daughters***) after 4yrs.
- Proofs each year (e.g., calving, weanling, slaughter, maternal & total EBI).
- Top new bulls being identified
- Sires of sons for next generation (elite matings & stock bulls).
- Top elite sires (5-8/yr) returned to commercial AI
- Always sufficient semen for pedigree cows (elite mating's & stock bulls) through additional semen collected at Tully.

Cost Model (40 Bulls in 2007)

- Income: €800k
  - Tully €240k
  - Breeding charge €360k
  - Industry €200k
- Costs: €2.1m
  - Tully €240k
  - Semen €160k
  - Drugs €430k
  - Herd support & data collection €140k
  - Incentives (farmers) €1,050k
- Shortfall ***-€1.3m (€33k/bull)***
- Program runs itself…..all shortfall is directed to farmer incentives (cash & drugs).
- ***8:1 return on investment***

Overall Summary

- Breeding for quality
  - Quality weanlings and quality replacements
- Database & indexes now in place.
- Animal Events key to unlocking potential.
  - Animal Events & DAF suckler scheme major breakthough.
- New breeding program will help us identify the “best” bulls for breeding stock and AI bulls (€20/cow/year target)
- Great opportunities for beef breeding
- Permanent, cumulative & cost effective.